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U. S. Nuclear Regulatory Commission
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Braidwood Station, Unit 1
Facility Operating License No. NPF-72
NRC Docket No. STN 50-456

Subject: Submittal of Supporting Documentation for January 6, 2010 Regulatory Conference

Reference: (1) Letter from Steven West (U. S. NRC) to Charles G. Pardee (Exelon Generation Company, LLC), "Braidwood Station, Unit 1, NRC Follow-up Inspection Report 05000456/2009007; Preliminary Yellow Finding," dated November 30, 2009

(2) Letter from Amir Shahkarami (Exelon Generation Company, LLC) to U. S. NRC, "Response to NRC Follow-Up Inspection Report 05000456/2009007," dated December 10, 2009

In Reference 1, the Nuclear Regulatory Commission issued an inspection report with respect to the June 24, 2009, failure of the B Train Containment Sump Suction Valve, 1SI8811B, to stroke full open during surveillance testing. In Reference 2, Exelon Generation Company, LLC (EGC) requested a Regulatory Conference to present to the NRC our perspective on the facts and assumptions used to assess the finding and its significance. As a result, a Regulatory Conference is scheduled for January 6, 2010. The NRC requested in Reference 1 that supporting documentation be submitted at least one week prior to the conference. This letter provides the NRC with the requested supporting documentation.

Attachment 1 provides a document entitled, "BW-SDP-003, Revision 1, 'Braidwood Phase 3 SDP Evaluation of Failure of 1SI8811B to Fully Open.'" and its applicable appendices. EGC has calculated changes in core damage frequency (CDF) and large early release frequency (LERF) using the Braidwood PRA model and crediting local operator action to fully open the 1SI8811B valve. Attachments 2 through 7 provide evaluations performed to support the conclusions of BW-SDP-003, Revision 1.

Included in Appendix J of the document contained in Attachment 1 is information related to the impact and sensitivity of certain assumptions on the conclusions of EGC's SDP evaluation.

As part of the Regulatory Conference on January 6, 2010, EGC plans to present the results of our Root Cause Evaluation, the impact of the 1SI8811B failure on system operation, the expected environmental conditions that support local valve operation, and the dominant risk scenarios and SDP evaluation results.

A001
NRR

If you have any questions concerning this letter, please contact me at (815) 417-2800.

Respectfully,

David Gullott
Regulatory Assurance Manager
Braidwood Station

Attachments:
(1) BW-SDP-003, Revision 1, "Braidwood Phase 3 SDP Evaluation of Failure of 1SI8811B to Fully Open"
(2) EC #377204, "Evaluate 1SI8811B Flow at Partial Opening"
(3) EC #377329, "Post SBLOCA Dose Rate Assessment for 1SI8811A/B Accessibility"
(4) EC #378302, "Evaluate Temperature of the Pipe Penetration Curve Wall Area Aux. Bldg. Elev. 364', Using a Bounding Case and Realistic Case" Revised Analysis from EC #377814
(5) EC #378180, "Analysis to Determine Back Flow from RWST to ECCS Recirculation Sump While 1SI8811A/B and 1SI8812A/B are Open for Six Minutes"
(6) ER 392870, "Accessibility of 1SI8811B Following SBLOCA – Revised for 5.2 Inch Break," November 17, 2009
(7) ER 393342, "Accessibility of 1SI8811B Following SBLOCA – Revised to Include Potential ECCS Termination at RWST Empty"

Cc: Regional Administrator, USNRC, Region III
NRC Resident Inspector, Braidwood Station
Rick Skokowski, USNRC Region III
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ATTACHMENT 1

BW-SDP-003, Revision 1, "Braidwood Phase 3 SDP Evaluation of Failure of 1SI8811B to Fully Open"

Braidwood Station

Braidwood
PRA APPLICATION NOTEBOOK

BW-SDP-003

Revision 1

Braidwood Phase 3 SDP Evaluation of Failure of 1SI8811B to Fully Open

December 2009

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TABLE OF CONTENTS

1. Purpose 4

2. Background 4

3. ANALYSIS INPUTS 4

4. METHOD and DECISION CRITERIA 9

5. EVALUATION AND RESULTS 10

6. TREATMENT OF UNCERTAINTY 11

7. CONCLUSION 13

8. REFERENCES 13

APPENDIX A – HUMAN RELIABILITY ANALYSIS - LOCALLY OPENING 1SI8811B A1 – 93

APPENDIX B – MAAP THERMAL HYDRAULIC ANALYSIS TO SUPPORT TIMING FOR LOCALLY OPENING 1SI8811B B1 – 52

APPENDIX C – INTERNAL EVENT MODEL CHANGES C1 – 3

APPENDIX D – INTERNAL EVENTS EVALUATION D1 – 7

APPENDIX E – INTERNAL EVENTS SENSITIVITY ANALSYIS E1 – 8

APPENDIX F – EOP FLOWCHART F1 – 4

APPENDIX G – FIRE RISK G1 – 5

APPENDIX H – SEISMIC RISK H1 – 18

APPENDIX I – CUTSETS I1 – 1869

APPENDIX J – ADDITIONAL SENSITIVITY STUDIES TO ADDRESS NRC CONCERNS J1 – 10

REVISION HISTORY

Section	Revision	Comment
Main Report	1	Revised based on change of boundary conditions – Operators will trip RH pumps prior to closing an SI8812 valve if there is dual indication on the associated SI8811 valve. Also considers flow diversion from RWST to Sump
Appendix A	2	
Appendix B	2	
Appendix C	1	Revised to use correct alpha factor for SI8811 valves
Appendix D	1	Revised based on change of boundary conditions – Operators will trip RH pumps prior to closing an SI8812 valve if there is dual indication on the associated SI8811 valve. Also considers flow diversion from RWST to Sump
Appendix E	2	
Appendix F	1	Added for Revision 1
Appendix G	1	Added for Revision 1
Appendix H	1	Added for Revision 1
Appendix I	1	Added for Revision 1
Appendix J	0	Added for Revision 1

1. PURPOSE

This evaluation examines the risk significance associated with failure of 1SI8811B (ECCS Sump Recirculation MOV) to fully open (Reference 3).

2. BACKGROUND

On 6/24/2009, during performance of 1BwOSR 5.5.8.SI-7B "Safety Injection System Containment Sump 1SI8811B Valve Stroke Surveillance" & 1BwOSR 5.5.8.SI-2B "Train B Safety Injection System Isolation Valve Indication Surveillance" 1SI8811B failed to fully open. The 1SI8811B control board indication went dual, but never indicated full open. Locally 1SI8811B was observed approximately 30 to 40 percent open. Investigation found water in the actuator limit switch (LS) compartment, and it was determined the actuator torque switch (TS) for the 1SI8811B was corroded and non functional. The cause of the corrosion was determined to be water intrusion into the LS compartment through the conduit. The TS and LS finger bases were replaced. On June 26, 2009 at 02:42 hours, the valve was restored to operable status.

A review of past performance of the 1SI8811B valve indicated that the last time the valve was stroked successfully was September 20, 2007 (Reference 3). The exact time of the failure cannot be determined, however it can be determined that the failure occurred between the times 1SI8811B was successfully stroked and when the failure was discovered.

Based on the failure mode, the valve would have been capable of opening to the bypass LS setting of approximately 34 percent open, and the valve was capable of passing the required ECCS recirculation flow at this partial opening position.

However, failure of 1SI8811B to fully open prevented 1SI8804B, Residual Heat Removal to Safety Injection, and 1CS009B Containment Spray Pump 1B Sump Suction Valve from opening. As a result of dual indication on 1SI8811B, even though the SI8811B valve was capable of passing the required ECCS recirculation flow, it is expected that had there been an event requiring ECCS recirculation, the operators would have placed the RH pump in pull-to-lock prior to closing 1SI8812B to prevent isolation of suction sources on a running pump. In this configuration, the ability to achieve ECCS recirculation is highly dependent on the success of subsequent operator actions.

3. ANALYSIS INPUTS

Fault Exposure Time

Reference 3 documents that 1SI8811B was last successfully stroked on 9/20/07. The valve was repaired and returned to service on 6/26/09. Therefore the fault exposure time is ½ * (6/24/09 – 9/20/07) + 2 = 323.5 days. This includes the 2 days of repair time when the valve was known to be unavailable.

Impact of Partial Opening of 1SI8811B on RH Flow

Reference 4 evaluated the impact of the partial opening of 1SI8811B on the ability the B RH pump to provide flow for ECCS Recirculation. The evaluation concluded that the valve opened sufficiently to provide full flow capability. Therefore, this condition had no direct impact on the ability of the RH pumps to provide flow for ECCS recirculation. However, since the failure would have resulted in dual position indication for the valve, the operators would be expected, per their training, to put the pump in pull-to-lock prior to closing 1SI8812B. Securing the RH pump is based on operator knowledge of the potential to deprive the pump of all suction sources if 1SI8812B is closed without 1SI8811B being open. This disables the train for the purposes of ECCS recirculation until such time as the valve is locally opened and the pump is restarted. Appendix A provides more detail regarding this action.

Common Cause Analysis

A review by Plant Engineering of the design configuration of the 1SI8811A versus the 1SI8811B valve configuration showed that the A train valve was less likely to have water intrusion in the control circuitry than the B train valve. An inspection of the 1SI8811A valve found no evidence of moisture/corrosion (Reference 21). Furthermore, a test of the valve confirmed its functionality. However, there is not sufficient justification to rule out common cause failure (CCF) potential. Therefore, the impact of CCF potential between two valves was assessed in this evaluation. This is a conservative assumption.

Impact of Partial Opening of 1SI8811B on other Components

1SI8811B has 2 interlocks that are not made up unless the valve is fully open:

- 1SI8804B: Failure of the 1SI8811B from fully opening prevents 1SI8804B from being opened to support Intermediate Head ECCS Recirculation.
- 1CS009B: Failure of the 1SI8811B from fully opening prevents 1CS009B from being opened to support Containment Spray Recirculation. (CS is not modeled in the PRA as it is not required to prevent Containment Over pressurization).

Procedural Direction for Locally Opening 1SI8811A/B

Regardless of the scenario, procedural direction for locally opening the SI8811 valves is provided in 1BwCA-1.1 (Reference 10). Appendix F provides additional details regarding the expected procedure steps once the need for transfer to Cold Leg Recirculation is reached. Following a trip, safe shutdown qualified equipment operators report to the control room to be available for taking local actions required to implement the EOPs.

Quantitative Credit for Locally Opening 1SI8811A/B

The condition of the 1SI8811B valve at the time of the partial failure only precluded automatic and remote manipulation of the valve using the valve motor operator and would not have precluded local operator manipulation of valve. The ASME/ANS PRA Standard (Reference 18), as endorsed by Reg. Guide 1.200 (Reference 19), provides specific requirements for the crediting of operator recovery actions, such as the local operation of the 1SI8811A/B valves.

The ASME/ANS PRA Standard contains a high-level requirement specifically related to crediting recovery actions:

> *"Recovery actions (at the cutset or scenario level) shall be modeled only if it has been demonstrated that the action is plausible and feasible for those scenarios to which they are applied."*

In addition, the PRA Standard provides the following note to clarify what is meant by a "recovery action":

> *"Recovery actions are actions taken in addition to those normally identified in the review of emergency, abnormal, and system operating procedures, ... They are included to allow credit for recovery from failures in cutsets or scenarios when failure to take credit would distort the insights from the risk analysis".*

The applicable supporting requirements of the Standard include the following:

INCLUDE operator recovery actions that can restore the functions, systems, or components functions on an as-needed basis to provide a more realistic evaluation of significant accident sequences.

CREDIT operator recovery actions only if, on a plant-specific basis, the following occur:

a) a procedure is available and operator training has included the action as part of crew's training, or justification for the omission for one or both is provided
b) "cues" (e.g., alarms) that alert the operator to the recovery action provided procedure, training, or skill of the craft exist
c) attention is given to the relevant performance shaping factors
d) there is sufficient manpower to perform the action.

ACCOUNT for any dependency between the HFE for operator recovery and any other HFEs in the sequence, scenario, or cutset to which the recovery is applied

The Human Reliability Analysis (Appendix A) addressed the additional applicable Standard requirements including:

When estimating HEPs EVALUATE the impact of the following plant-specific and scenario-specific performance shaping factors:

a) quality [type (classroom or simulator) and frequency] of the operator training or experience
b) quality of the written procedures and administrative controls
c) availability of instrumentation needed to take corrective actions
d) degree of clarity of cues/indications
e) human-machine interface
f) time available and time required to complete the response
g) complexity of the required response
h) environment (e.g., lighting, heat, radiation) under which the operator is working
i) accessibility of the equipment requiring manipulation
j) necessity, adequacy, and availability of special tools, parts, clothing, etc.

In accordance with the requirements of the ASME/ANS PRA Standard, a series of thermal hydraulic (T-H) analyses and other engineering studies were performed to assess the cues, timelines and viability of local operator recovery actions across the spectrum of scenarios identified.

Thermal Hydraulic Analysis

The dominant risk contributors associated with failure of the 1SI8811B valve to fully open include:

- Small LOCA sequences resulting in failure to establish intermediate head ECCS recirculation.
- Medium LOCAs sequences resulting in failure to establish intermediate head ECCS recirculation.
- Bleed and Feed sequences resulting in failure to establish intermediate head ECCS recirculation. The Bleed and Feed cutsets are similar to the small LOCA sequences except that the LOCA is induced through opening the Pzr PORVs.

Regardless of the initiator, the un-recovered cutsets are of essentially two types:

1. Common cause failure of the SI8811 valves to open
2. Failure of SI8811B with random failures of A Train in the ECCS recirculation mode

These cutsets are not significant contributors to the Braidwood base PRA. Consequently, no credit is given in the base model for local manual operation of the 8811A/B valves.

An important dimension of these cutsets is that there are no additional complicating failures that would impede plant or operator response. For example, in the LOCA scenarios, operators would have been able to cooldown the RCS as directed by plant emergency operating procedures prior to reaching the point where ECCS recirculation would be required and containment heat removal is available in all scenarios via the Reactor Containment Fan Coolers (RCFCs).

The Braidwood MAAP model was used to perform sensitivity studies to determine the plant thermal hydraulic conditions and time available to locally open the 1SI8811B valve to either restore the interlock and enable 1SI8804B to be opened to allow intermediate head recirculation or utilize low pressure recirculation in instances where operator action had been taken to successfully cooldown the RCS prior to reaching the time for ECCS recirculation.

To support the HRA analysis (see Appendix A), additional T-H analyses were performed (see Appendix B) to determine the LOCA conditions under which Containment Spray would actuate. This was needed for this evaluation as CS spray actuation significantly accelerates depletion of the RWST inventory and reduces the time available to the operators to establish ECCS recirculation. For example, the base PRA model conservatively assumed that CS will always actuate for Medium LOCAs in order to simplify the PRA model and avoid the need to develop additional accident sequences and separate Human Error Probabilities (HEPs) based on the number of RCFC trains that are available. This is seen in the development of the operator action timing to establish ECCS recirculation (1SI-HPR----HSYOA) in the base model, which uses MAAP cases with no RCFCs and CS actuation for development of the HEP.

The T-H analysis described in Appendix B resulted in the following CS conditions that are used in this evaluation:

LOCA Size	# RCFC Trains Available	CS Actuation
Small LOCA (<2")	2	No
Small LOCA (<2")	1	No
Small LOCA (<2")	0	Yes
Medium LOCA (2" – 3")	2	No
Medium LOCA (2" – 3")	1	Assumed[1]
Medium LOCA (2" – 3")	0	Yes
Medium LOCA (3" – 5.2")	2	No
Medium LOCA (3" – 5.2")	1	Assumed[2]
Medium LOCA (3" – 5.2")	0	Yes

Based on these results, timelines for human failure events were developed for the dominant Small and Medium LOCA scenarios assuming CS does not actuate in the following cases:

- Small LOCA with 1 or more RCFC trains available
- Medium LOCA with Both RCFC trains available

Credit is not given for local operation of the 8811A/B valves in cases where CS is assumed to actuate:

- Small LOCA with no RCFCs available[3]
- Medium LOCA with 1 or 0 RCFC trains available

Radiation Levels during Operator Action to Locally Open 1SI8811B

The radiation levels following a Small/Medium LOCA (up to a 5.2" diameter break, i.e., the largest Medium LOCA break size) were analyzed as being acceptable for taking the action to open valves (Reference 23). Radiation levels following any large LOCA (i.e., LOCAs >5.2" diameter) are conservatively assumed to preclude local operation of the valves due to the potential for fuel failures during the RCS blowdown.

Temperature Curved Wall Area during Operator Action to Locally Open 1SI8811B

The expected temperature in the curved wall area following a Small/Medium LOCA (up to a 5.2" diameter break, i.e., the largest Medium LOCA break size) were analyzed as being acceptable for taking the action to open valves (Reference 22).

1 Actual analysis shows no CS actuation, but CS is conservatively assumed to actuate as Containment pressure is ~2 psia below the CS setpoint

2 Actual analysis shows no CS actuation, but CS is conservatively assumed to actuate as Containment pressure is ~2 psia below the CS setpoint

3 This HEP was not developed as there were no cutsets prior to crediting recovery that had this condition

RWST Flow Diversion to Containment ECCS Sump with both SI8811 and SI8812 valves open

During the swap over to ECCS recirculation, there is time at which both the SI8811 and SI8812 valves may be open. During this period, RWST inventory will be diverted from the RWST to the containment ECCS sump. This flow diversion has the effect of accelerating the depletion of the RWST thereby reducing the time available to the operators to locally recover the SI8811 valve prior to reaching RWST Lo-3 (9% level) at which point all ECCS pumps taking suction from the RWST are secured. Reference 17 provides the analysis of the impact of the flow diversion on RWST input. This information is accounted for in the T-H analysis provided in Appendix B for determining the time windows available to locally open the SI8811 valve(s).

4. ANALYSIS METHOD AND DECISION CRITERIA

Decision Criteria

In accordance with Reference 2, the following criteria are used to assess the total risk impact of the failure of 1SI8811B to fully open:

Risk Metric	Green (per year)	White (per year)	Yellow (per year)	Red (per year)
ICDP	<1E-6	1E-6 to 1E-5	1E-5 to 1E-4	>1E-4
ILERP[4]	<1E-7	1E-7 to 1E-6	1E-6 to 1E-5	>1E-5

Scope of Analysis

The scope of this assessment includes Internal Events, External Events (Fire and Seismic) and LERF (internal events only), in accordance with Reference 2.

SDP Model

The current Braidwood Base PRA model is Revision 6D (Reference 5). However, a review of the alpha factor for event 1SI8811A-B-CMVCC indicated that the value used was an alpha factor that is applied in the model for High Pressure Injection MOVs; whereas the SI8811 valve is a low pressure valve (maximum pressure would be containment pressure just before failure - ~100 psig). As described in Appendix C, this analysis uses the Braidwood Base PRA model (Rev 6D) and adjusts the alpha factor to be consistent with other RH MOVs in the model. This revised model (6D2) is used in this evaluation.

The Braidwood Fire PRA model Rev 6C[5] was used to evaluate the impact of 1SI8811B failing to fully open from a fire risk perspective. Appendix G describes the fire risk assessment.

Braidwood does not have a seismic PRA model. A bounding seismic risk evaluation is described in Appendix H.

4 ILERP is only considered if ICDP is greater than 1E-7/yr

5 The fire PRA model 6C includes two updates that make it equivalent to Rev 6D of the Braidwood PRA model for internal events.

5. EVALUATION AND RESULTS

Based on the inputs described in Section 3, a potential risk increase from the 1SI8811B failing to fully open can be determined using the following assumptions:

1. Valve 1SI8811B is assumed to be failed. This assumption is made as it effectively fails the RH pump in the recirculation mode. Though sufficient flow through 1SI8811B was available, with dual position indication, it is expected that the operators would secure the RH pump until such time as the valve was locally opened (Recovery action).
2. Although not present, it is assumed that the failure mechanism associated with 1SI8811B (corrosion of the torque switch) could have been applicable to 1SI8811A. This is treated by increasing the Common Cause Failure Probability of the SI8811 valves to open by the random failure of 1SI8811B to open, i.e., the failure probability is set to the alpha factor only.

The evaluation of the risk associated with the 1SI8811B event is documented in the following Appendices:

- Internal Events – Appendix D
- Internal Events Sensitivity Analysis – Appendix E
- Fire Risk – Appendix G
- Seismic Risk – Appendix H

The results of these evaluations are provided below:

Metric	Internal Events ICDP	Fire ICDP	Seismic ICDP	Total ICDP
CDF	7.1E-07	2.2E-07	1.9E-09	9.3E-07
LERF	8.8E-09	Not Calculated	Not Calculated	8.8E-09

6. TREATMENT OF UNCERTAINTY

Sensitivity studies were performed (see Appendix E) to determine the impact of changes to several assumptions used in this SDP evaluation.

These sensitivity studies concluded:

- **Number of PORVs Required for Bleed and Feed**
  Changing the success criteria to 2 PORVs required increases the baseline CDF but decreases the risk contribution from the failed valve.

- **HEP for Locally Opening 1SI8811B**
  The Human Error Probabilities for locally opening 1SI8811B was quantified using the EPRI HRA Calculator. A sensitivity study was performed to evaluate the impact of the HEP using the SPAR-H model on the SDP results. Use of the SPAR-H model does impact the results significantly; however, the stair step nature of the SPAR-H methodology's time based recovery credit is not well suited for the medium LOCA HEP quantification associated with this SDP. Because the time available for mitigating action (the system window) varies by several hours over the medium LOCA break spectrum, breaks on the smaller end of the medium LOCA spectrum have significantly longer system windows than those on the larger end. Use of the system window associated with the limiting medium LOCA break in the SPAR-H methodology results in the application of an HEP that is not representative of a large portion of the medium LOCA events. While the HEPs using the EPRI HRA Calculator also use a stair step time based recovery model, the recovery credit transitions do not occur at times that are critical to the results.

- **Common Cause Failure**
  It is known that there was no corrosion on the torque switch for 1SI8811A, and therefore, there was no actual common cause failure. The impact of not assuming a common cause failure potential was evaluated. With this different assumption, the SDP results are slightly reduced.

In addition to the sensitivity studies, there are still several sources of conservatism in the SDP analysis:

- **Break Sizes**
  The most limiting timing for a particular LOCA initiator is used for the spectrum of break sizes within a LOCA category. In addition, the timing for the worst case small LOCA is used as the recovery timing for long term bleed and feed scenarios, though significantly more time is available. Refinement of break sizes would reduce the calculated risk impact.

- **Injection with RH**
  For medium LOCAs and small LOCAs with successful RCS cooldown that represent the majority of the computed risk for this SDP, the operators are expected to secure the RH pumps when they have dual indication on 1SI8811B. However, if they are unsuccessful in locally opening 1SI8811B, they would eventually attempt to use an RH pump for injection, as the thermal hydraulic

calculations show that RCS pressure would be below the shutoff head of the RH pumps. As the 8811B valve was found to be open sufficiently to allow full RH flow (Reference 4), this action, though not proceduralized, would be successful in preventing core damage. Since it is not proceduralized, no credit is taken in the SDP, which provides a significant conservative bias to the results.

- **Hot Leg versus Cold Leg Breaks**
  All LOCAs are assumed to be Hot Leg Breaks to minimize the time for operator response. Cold leg breaks extend the time window for operator action by several hours with a subsequent improvement in the credit provided for local recovery of 1SI8811B.

- **Use of Shutdown Cooling Versus ECCS Recirculation**
  For Small and Medium Break LOCAs the plant operators would initiate RCS depressurization and cooldown. For a range of small and medium LOCAs, this cooldown would result in establishing Shutdown Cooling with makeup to the RCS using normal charging from the RWST. For these LOCAs, the need for ECCS recirculation may never be reached. Not modeling shutdown cooling and requiring ECCS recirculation for these sequences represents a conservative bias to the results.

- **RWST Refill**
  Though not modeled, RWST refill will provide additional time to maintain SI and CV injection for small/medium LOCA scenarios. This action is not credited in this analysis, which provides a small conservative bias to the results.

- **Injection from VCT**
  Though not modeled, injection from the VCT will provide additional time to maintain SI and CV injection for small/medium LOCA scenarios. This action is not credited in this analysis, which provides a small conservative bias to the results.

- **Containment Spray**
  No credit is taken for scenarios where containment spray is actuated. With containment spray actuation, the time available to locally open 1SI8811B will be shorter, due to the additional depletion of the RWST resulting from the use of Containment Spray. However, for a wide range of LOCAs, there would still be sufficient time to locally open the valve prior to core damage.

7. CONCLUSION

Based in this evaluation, credit for operator action is warranted because:

1. Procedures are available and training provided to locally open valve(s)
2. Cues exist to trigger local operator actions
3. Environment conditions would allow access to valve(s)
4. Sufficient resources available to support opening the valve(s)
5. Sufficient time available to locally open 1SI8811 valve(s)

Crediting Operator Action reduces the risk significance of the event to Green (low importance to safety) In addition; there is sufficient conservatism in the evaluation to account for uncertainties.

8. REFERENCES

1. T&RM ER-AA-600-1012, Rev. 8, Risk Management Documentation.
2. T&RM ER-AA-600-1041, Rev. 7, Risk Metrics – SDP & Event Analysis.
3. IR 934782
4. EC 377204, Evaluate 1SI8811B Flow At Partial Opening
5. BB PRA-014, Rev. R6D, "Byron/Braidwood PRA Quantification Notebook," December 2008.
6. 1BwEP-0, Rev 202, Reactor Trip or Safety Injection Unit 1
7. 1BwEP ES-0.1, Rev 200, Reactor Trip Response Unit 1
8. 1BwEP-1, Rev 203, Loss of Reactor or Secondary Coolant Unit 1

9. 1BwEP ES-1.3, Rev 200, Transfer to Cold Leg Recirculation Unit 1

10. 1BwCA-1.1 Rev 202 "Loss of Emergency Coolant Recirculation"

11. ER 392870, "Accessibility Of 1SI8811B Following SBLOCA - Revised For 5.2 Inch Break", 11/17/09

12. 1BwST-3, Rev 200, "Heat Sink Unit 1"

13. 1BwFR-H.1, Rev 200 "Response to Loss of Secondary Heat Sink Unit 1"

14. Input/Output Files: See Appendixes

15. Standardized Plant Analysis Risk Model for Braidwood 1 & 2 (ASP PWR B), Idaho National Laboratory, Rev 3.31, June 2007

16. Not Used

17. EC 378180 "ANALYSIS TO DETERMINE BACK FLOW FROM RWST TO ECCS RECIRCULATION SUMP WHILE 1SI8811A/B AND 1SI8812A/B ARE OPEN FOR SIX MINUTES" 12/29/09

18. RA-S-2002, "Standard for Probabilistic Risk Assessment for Nuclear Power Plant Applications," dated April 5, 2002

19. Reg Guide 1.200 Rev 1, An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities" dated January, 2007 with additional clarifications

20. U.S. Nuclear Regulatory Commission, "CCF Parameter Estimations, 2007 Update", http://nrcoe.inl.gov/results/CCF/ParamEst2007/ccfparamest.htm, September 2008

21. Work Order #1281802 Task 7 "EM REMOVE PLUG FOR INSPECTION OF 1SI8811A LIMIT SWITCH ENCL."

22. EC 378302, "EVALUATE TEMPERATURE OF THE PIPE PENETRATION CURVE WALL AREA AUX. BLDG. ELEV. 364', USING A BOUNDING CASE AND REALISTIC CASE REVISED ANALYSIS FROM EC 377814"

23. ER 393342 "ACCESSIBILITY OF 1SI8811B FOLLOWING SBLOCA – REVISED TO INCLUDE POTENTIAL ECCS TERMINATION AT RWST EMPTY"

RM DOCUMENTATION NO. BW-SDP-003	REV: 1	PAGE NO. 15 of 15

STATION: Braidwood

UNIT(S) AFFECTED: UNIT 1

TITLE:

Braidwood Phase 3 SDP Evaluation of Failure of 1SI8811B to Fully Open

SUMMARY (Include UREs Incorporated):

This document evaluates the risk significance of failure of 1SI8811B to fully open, as documented in IR 934782.

2086 RL 12/30/09

Number of pages: Total ~~2064~~ pages, including this page.
RM Document Level: Category 2, per ER-AA-600-1012 (Treated as Category 1 due to NRC preliminary Yellow SDP Results)

[ ] Review required after periodic Update

[X] Internal RM Documentation [ ] External RM Documentation

Electronic Calculation Data Files: (Program Name, Version, File Name extension/size/date/hour/min)

See the appendices for associated input/output files.

Method of Review: [X] Detailed [ ] Alternate [ ] Review of External Document
This RM documentation supersedes: BW-SDP-003, Rev 0 and Appendices in its entirety.

	Print	Sign	Date
Prepared by:	Roy Linthicum	[signature]	12-30-09
Reviewed by:	Joe Edom	[signature]	12-30-2009
Approved by:	Greg Krueger		

Linthicum, Roy R.:(GenCo-Nuc)

From: Krueger, Gregory A.:(GenCo-Nuc)
Sent: Wednesday, December 30, 2009 2:38 PM
To: Linthicum, Roy R.:(GenCo-Nuc)
Subject: RE: BW-SDP-003 Approval

Roy,

I reviewed the SDP application, BW-SDP-003, and associated files on the RM website. I also confirm that you and Joe have the appropriate qualifications as documented in LMS. I approve this SDP application via email.

Note – please date your signature line when finalizing the document.

Thanks,

Greg

From: Linthicum, Roy R.:(GenCo-Nuc)
Sent: Wednesday, December 30, 2009 3:06 PM
To: Krueger, Gregory A.:(GenCo-Nuc)
Subject: BW-SDP-003 Approval
Importance: High

Greg,

Attached is BW-SDP-003 for your electronic approval. The appendixes are on the web site.

Roy Linthicum

Corporate Risk Management

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BRAIDWOOD

PRA APPLICATION NOTEBOOK

BW-SDP-003

REVISION 1

APPENDIX A

HUMAN RELIABILITY ANALYSIS

DECEMBER 2009

REVISION SUMMARY SHEET

Revision	Date	Summary
0	11/20/09	Original Issue
1	12/11/09	Addresses RWST to sump flow diversion

1.0 HRA Overview

In order to assess the impact of the failure of the 1/2SI8811A/B valve(s) on plant risk, it is necessary to account for the actions that would be taken by the operator to recover from the failure(s). The recovery actions include those steps that are required to successfully establish cold leg recirculation mode given a failure of the 1/2SI8811A/B valve(s) to stroke.

Because the 1/2SI8811A/B valve failure(s) occurred during the performance of the action to transition to recirculation mode, the transition to cold leg recirculation mode consists of two distinct phases. The first phase consists of the operator response up to the point where they are first required to interface with the dual indication on 1/2SI8811A/B. For this evaluation, the phase one of the response is successful (inclusion of the failure to begin the transition to recirculation mode with the failed 1SI8811A/B valve would be non-minimal). The second phase consists of the operator response once the dual indication condition on the valve(s) has been encountered. Consequently, it is only necessary to model the phase two response for cases that include failure of 1SI8811A/B.

In order to account for the conditions under which the phase two response would be required, it is necessary to identify the accident scenarios in which the mitigating actions would be taken. The Braidwood PRA model and the NRC SPAR model identify a similar set of dominant contributors, which are small and medium LOCA scenarios. Because the different LOCA sizes impact the time available to perform the transition to cold leg recirculation mode, separate HEPs have been developed for these two initiating event types. The Braidwood PRA model also identifies loss of DC Bus 111 scenarios as top contributors, but because the timing of the SLOCA event is consistent with that for the loss of DC bus transient and because the actions are otherwise the same, the HEP for the 2" SLOCA event is considered to be applicable to the loss of DC bus events. Consequently, a separate HEP was not developed for those cases. The timing for the MLOCA cases is based on a 5.2" break (per the referenced case from Appendix B).

Within the Medium LOCA scenarios, there are some contributors that include the failure of one RCFC division. MAAP analysis indicates that Containment Spray should not actuate for these scenarios, but the margin to the actuation setpoint is relatively low. Because actuation of the Containment Spray pumps would reduce RWST inventory and severely limit the credit available for mitigating actions, the recovery actions are conservatively assumed to fail for these scenarios.

An additional area of interest for MLOCA scenarios is that the timing conditions vary significantly over the range of the breaks that are defined as MLOCAs. The timing for breaks on the lower end of the MLOCA break spectrum (breaks from 2" to 3") is more closely related to the 2" LOCA scenarios than for the 5.2" MLOCA events. Because the SPAR-H HEP for the MLOCA scenario is significantly impacted by the differences in the timing conditions over the full range of the

MLOCA breaks, the MLOCA events have been parsed into two ranges to more accurately represent the reliability of the operator response. The HEP for the 5.2" MLOCA is retained for use with the breaks from 3" to 5.2" (in conjunction with corresponding changes to the initiating event frequency) and an additional HEP has been developed for use with the M LOCAs in the 2" to 3" range (also accounting for the appropriate initiating event frequency).

Finally, because Exelon and the NRC quantify H EPs using different HRA methodologies, this appendix includes assessments of the HEPs using both the Exelon HRA methodology (THERP) and the SPAR-H methodology.

It should be noted that no credit is taken for any action that would be initiated based on compliance with 50.54x, even though the action to start the RH pumps to determine if flow from the sump could be established is an obvious step to take when no other alternatives are available to protect the core. In the simulator observations performed on 11/10/2009 and 11/11/2009, both crews elected to start the RH pumps when it was determined that no other alternatives were available to prevent core damage and cited 50.54x as the basis for doing so. The inability to credit this type of action is due to a limitation of the current HRA methodologies rather than the inability of the operators to take such action. In this case, this weakness precludes realistic modeling of plant risk

1.1 Human Failure Events

As identified in Section 1.0, the operator response has been separated into two phases; the first phase includes the actions up to the point where interface with the dual indication on 1/2SI8811A/B is required, and the second phase consists of the operator actions once the dual indication condition on the valve(s) has been encountered. The following outline identifies the individual operator actions that are included in each of the phases:

- Phase 1
    - Operators fail to begin the transition to cold leg recirculation (addressed by existing HFE in the PRA model)
- Phase 2
    - Failure to locally open 1SI8811A/B and complete the transition to cold leg recirculation mode

The action to begin the swap to cold leg recirculation mode is taken in response to low RWST level. The nominal action to swap to recirculation mode is applicable for the cases in which at least one train of equipment is available. For cases in which cold leg recirculation is failed by the 1SI8811A/B valve(s), a separate HFE is required.

This HFE represents the probability that the operators will fail to locally open the failed 1SI8811A/B valves and complete the transition to cold leg recirculation given that the swap to recirculation mode has been initiated.

Because the Braidwood procedures direct the operators to a success path independent of the interpretation of the dual indication on 1SI8811A/B, a diagnosis error related to the valve's position is not a failure mode for transition to cold leg circulation mode. As a result, the Phase 2 HEP includes only an execution component. Further details related to the procedure and failure mode evaluation are provided in Section 1.2.

Table 1-1 provides a summary of the HEPs that have been developed to support the SDP.

Table 1-1
Human Failure Event Summary

BEID	IE	Action Description	HRA Method	HEP
1SI8811B--BHPMOA	SLOCA	FAILURE TO OPEN VLV 1SI8811B AFTER REMOTE FAILURE (LOCAL-MANUAL, SLOCA)	Exelon	6.50E-03
1SI8811BSSBHPMOA	SLOCA	FAILURE TO OPEN VLV 1SI8811B AFTER REMOTE FAILURE (LOCAL-MANUAL, SLOCA, SPAR-H)	SPAR-H	9.90E-03
1SI8811B3SBHPMOA	3" MLOCA	FAILURE TO OPEN VLV 1SI8811B AFTER REMOTE FAILURE (LOCAL-MANUAL, 3" MLOCA, SPAR-H)	SPAR-H	9.90E-03
1SI8811BM-BHPMOA	MLOCA	FAILURE TO OPEN VLV 1SI8811B AFTER REMOTE FAILURE (LOCAL-MANUAL, MLOCA)	Exelon	6.00E-03
1SI8811BMSBHPMOA	MLOCA	FAILURE TO OPEN VLV 1SI8811B AFTER REMOTE FAILURE (LOCAL-MANUAL, MLOCA, SPAR-H)	SPAR-H	9.10E-02

1.2 Treatment of the Cognitive Component for the Response to Dual Indication on 1SI8811A/B

Typically, both execution and diagnosis errors are included as part of a post initiator HRA. In this case, however, there is no need to address the diagnosis component as explained below. This based on the guidance in NUREG/CR-6883, section 2.2.1, which states that "When considering the question "Does this task contain a significant amount of diagnosis?" one should consider whether the operator or crew has to expend mental energy to observe and interpret what information is present (or not present), determine what that means, think of possible causes and decide what to do about it."

For scenarios in which the 1SI8811A/B valve fails to completely stroke and both the "open" and "closed" lights are illuminated (dual indication), it is recognized that the operators must interpret the dual indication and make a decision about how to proceed. However, whatever they decide regarding the valve's status results in a potential success path. Consequently there is no failure associated with this diagnosis step. Once a decision has been made, the steps to be taken are clearly delineated in the corresponding procedures.

- 1SI8811A/B interpreted as "NOT OPEN": operator directed to close 1SI8812A/B, open 1SI8811A/B locally, and establish cold leg recirculation.
- 1SI8811A/B interpreted as "OPEN": The RH pumps would remain running, 1SI8812A/B directed to be closed, and injection would be provided to the RCS via the 1SI8809A/B valve(s). For transient scenarios or for SLOCAs where the transition to cold leg recirculation is attempted at the time of the 46% RWST level cue, the procedures still provide a success path as they direct local operation of the 1CV8804A/1SI8804B valves (bypasses interlock with 1SI8811A/B) and the establishment of flow using the SI/Charging pumps.

These paths are described in more detail below.

<u>Scenario 1, 1SI8811A/B considered to be "not open" in ES-1.3 step 3c:</u>

If the 1SI8811A/B valve is considered to be "not open" in ES-1.3 step 3c, the operators are transferred to Attachment A. In Attachment A, step 1 questions whether or not the 1 SI8811A valve is closed. If it is determined to be "not closed", the RNO action is to close 1SI8812A, which would terminate an "A" division flow diversion from the RWST to the sump. The RNO then transfers to step 4, which includes similar guidance for the "B" division. The RNO in step 4 transfers to Step 7, which in turn transfers to BwCA-1-1 where step 1c directs local closure of 1SI8811A/B. Once the 1SI8811A/B valve is open, cold leg recirculation can be established.

If the opposite interpretation of the 1SI8811A/B valve'(s) status is made in Attachment A, step 1 of ES-1.3 (valve is "closed"), the operators are directed through steps 2 and 3, which attempt manual, remote operation of 1SI8811A . Step 3b closes 1SI8812A, which would terminate a flow diversion, and step 3e directs 1SI8811A to be opened. Whether or not 1SI8811A is considered to be open, the procedure path leads to step 4 where a similar process is started for the "B" division. On completion of the "B" division steps, step 7 is reached where the transfer to 1BwCA-1.1 occurs and the direction to perform the local stroke of 1SI8811A/B is given.

<u>Scenario 2, 1SI8811A/B considered to be "open" in ES-1.3 step 3c:</u>

In the event that the 1SI8811A/B valve(s) is believed/considered to be "open" in ES-1.3 step 3c, step 3d directs closure of the 1SI8812A/B valves, which would terminate the flow diversion from the RWST to the sump. At this point, the RH pumps would be running with suction only aligned through the partially open 1SI8811A/B valves. For MLCOA events, this would allow injection through the 1SI8809A/B valves without further action; however, even if RCS pressure is too high for injection using only the RH pumps (e.g., in a transient scenario), the procedure continues in steps 4 and 5 to align RH to the SI/Charging system suction path. In steps 5f and 5h, the direction is given to open the 1CV8804A and 1SI8804B valves, respectively. These valves are interlocked with 1SI8811A/B and would not open with 1SI8811A/B in an intermediate position. The RNO for steps 5f and 5g direct local operation of valves 1CV8804A and 1SI8804B valves, which are smaller and more easily operated than the 1SI8811A/B valves. Locally stroking the 1CV8804A/1SI8804B valve would provide an alternate success path given that suction would be available through the partially open 1SI8811A/B valves.

In summary, from the point where dual indication on 1SI8811A/B is encountered at ES-1.3 step 3c, any procedure path taken will isolate the flow diversion path from the RWST to the containment sump by closing 1SI8812A/B and emergency coolant recirculation will be established by opening either 1SI8811A/B or 1CV8804A/1SI8804B locally. Failure to interpret the 1SI8811A/B valve as "not open" is not a failure mode for establishing cold leg recirculation and it is not included in the HEP quantification for this assessment. No other significant diagnosis is required to either close 1SI8812A/B or to open 1SI8811A/B; these actions are directed as a matter of course in a procedure path that has already been initiated.

1.3 Applicability of HEP for Local Operation of 1SI8811A/B to Scenarios Requiring Local Operation of 1CV8804A/1SI8804B

While it is expected that the operators would progress through the procedure path described in Scenario 1 (refer to Section 1.2) in the event of a mid-stroke failure of 1SI8811A/B, the path in Scenario 2 would also lead to success. Consequently, the diagnosis error for interpreting the dual indication on 1SI8811A/B has been excluded from the evaluation. In order to support the elimination of the diagnosis error, however, it is necessary to demonstrate that the probability of failing to establish cold leg recirculation in Scenario 2 is less than or equal to that for Scenario 1. Otherwise, failure to interpret the 1SI8811A/B valve as "not closed" would place the operators on a path that is more likely to fail than for the case where a correct diagnosis was made.

One way to demonstrate that the failure probability for the Scenario 2 path is less than for the Scenario 1 path would be to explicitly develop an HEP for Scenario 2. However, a more limited, qualitative discussion of the actions can accomplish this task given that the similarities of the actions facilitate a straightforward comparison.

- Isolation of 1SI8812A/B: For Scenario 2, the 1SI8812A/B valve(s) is directed to be isolated in the step 3d of ES-1.3, which immediately follows the step in which the dual indication is assessed and would result in a rapid termination of the flow diversion to the sump. For scenario 1, multiple steps are taken before reaching the step(s) to isolate

1SI8812A/B. This leaves Scenario 2 with significantly more volume in the RWST and a longer time to TAF.

- Time to direct local valve operation: The median time to reach the direction to locally open the 1CV8804A/1SI8804B valves is 5.6 minutes from 46% level in the RWST (Byron/Braidwood calculation SITH-1, Refueling Water Storage Tank (RW ST) Level Setpoints, 7/18/2007). Based on the simulator runs performed on 11/10/2009 and 11/11/2009, the median time to reach the direction to open the 1SI8811A/B valve(s) is 10.5 minutes from 46% level in the RWST (based on runs 1 & 3). The simulator runs used to develop the median response time for the 1CV8804A/1SI8804B local stroke direction did not include a mid-stroke failure of 1SI8811A/B, but simulator observations on 11/10/2009 and 11/11/2009 showed a limited time was spent addressing the dual indication (1 minute for run 1, 3 minutes for run 3).

- Valve location and accessibility: Both the 1SI8811A/B and the 1CV8804A/1SI8804B valves are located in the same general area (364' elevation, curved wall area), so travel time and access issues are essentially the same,

- Dose-rate: The dose-rates are bounded by the 1SI8811A/B valves (The dose rate from water within the 8" pipe should be less than the dose rates from the larger 24" sump outlet piping, dose from the 24" sump line reduced by distance),

- Temperature: The temperatures around the valves would be equivalent (1CV8804A located in CWA with 1SI8811A/B) (1SI8804B located in SI pump room and the temperature may be lower as the only water flowing through the SI pump room is RWST water and SX water for the pump oil coolers),

- Manipulation time: The manipulation time for the 1CV8804A/1SI8804B valve(s) is less than the 24 minutes that are required to open the 1SI8811A/B valve(s) (1CV8804A/1SI8804B are 8 inch gate valves compared to the 24" 1SI8811A/B valves),

- Ergonomics: The 1CV8804A valve can be accessed from the floor while the 1SI8804B valve must be accessed from a ladder. Both 1SI8811 valves must be accessed from a ladder. Both use handwheels that are located at about head level. The labeling is clear for both valve sets; however, the 1SI8811A/B valves are more unique in appearance.

- Actions subsequent to local valve operation: The actions to complete the transition to recirculation mode are essentially equivalent for both scenarios. The exception is that for Scenario 1, the 1CV8804A/1SI8804B valve(s) would also have to be opened. No significant diagnosis is required to complete either Scenario 1 or Scenario 2.

Based on this information, it is concluded that the failure probability of Scenario 2 is equal to or less than that for Scenario 1 and that use of the HEP to locally close 1SI8811A/B in Scenario 2 is conservative. This supports the exclusion of the diagnosis error from the HEP and its use for either Scenario 1 or Scenario 2.

1.4 Applicability of 2" SLOCA Timing to Transient Scenarios

As identified in Section 1.0, the HEP developed for the 2" SLOCA events are also applied to the transient events, which require bleed and feed for cooling in the dominant scenarios. Given that the response to the failure of the 1SI8811A/B valve includes the same action steps for both initiating event types, the potential differences in the action evaluation are essentially limited to the timing inputs or those stresses caused by the timing of the event. While the time available from top of active fuel (TAF) is shorter for the transient case than for the SLOCA event (due to drindown issues), the difference in the time is not large enough to impact either the Exelon or SPAR-H HEP quantification results.

Table 1-2 shows that the time from 46% RWST level to TAF for a 2" SLOCA (case # BBSDP17a) is 9.46 hours while it is only 6.1 hours for the transient scenario (case # BBSDP25a). The 3.36 hour reduction in the system window does not impact the shift change recovery credit for the Exelon methodology or the available time classification for SPAR-H:

- Apart from credit taken in the early time frame for self review and STA availability, the time based recovery credit taken in the Exelon methodology is static apart from shift change credit. The relevant time period considered for shift change credit is measured from the time of the action cue to the end of the system window and it is static for the 6 to 14 hour time frame. Both system windows fall within this period. Recovery factor dependence is also time dependent in the EPRI HRA Calculator's application of THERP, but zero dependence is suggested when the diagnosis time is greater than one hour (which is true for either case).
- For SPAR-H, when the execution ratio falls between 5 and 50, the timing multiplier is 0.1. The execution ratio is defined to be: (T(sw) - T(delay) - T(1/2)) / T(m). For both the SLOCA and the transient case, the multiplier would be 0.1.
    - For SLOCA this is: (12 hours – 2.58 hours – 0.133) / 0.625 = 14.86
    - For the transient this is: (14.83 – 8.77 – 0.133) / 0.625 = 9.48

In summary, the HEP developed for the SLOCA initiating events with 1SI8811A/B failure is also applied to the transient initiating event scenarios. While there is a shorter amount of time from the action cue to TAF for the transient events than for the 2" SLOCA events, the shorter time would not impact the HEP quantification. Because other aspects of the actions are the same whether they are taken for transient scenarios or for SLOCAs, use of the SLOCA HEP in transient scenarios is considered to be appropriate.

TABLE 1-2

FLOW DIVERSION ANALYSIS

CASE DESCRIPTION[1]	CASE #	RWST 46.7%[2]	RWST 9%	TAF[3]	CD[4]	46.7% TO 9%	46.7% TO TAF	FLOW DIVERSION GPM / MIN	RUN TIME
2" SLOCA, wAFW, 2CV, 2SI, Cooldown @ .75 hr, 2 RCFC trains, Flow diversion	BBSDP17a	2.54 hr	3.57 hr	12.00 hr	15.91 hr	1.03 hr	9.46 hr	11891 / 7 min	24 hr
B&F, No AFW, 1 PORV, 1 Vent, 1CV, 1SI, 1 RCFC train, Porv & Vent Closed @ 9%, Flow diversion	BBSDP25a	8.73 hr	11.94 hr	14.83 hr	16.35 hr	3.21 hr	6.10 hr	11891 / 7 min	24 hr

Notes:

1) See Appendix B for a complete case description.
2) Initial volume corresponds to Tech Spec minimum of 400500 gal
3) Top of active fuel exposure
4) Peak cladding temperature > 1800 F

1.5 Event Timeline Summary

In order to better convey the timing of the events that are key to this analysis, graphical timelines have been developed for the 2" SLOCA and 5.2" MLOCA events. These timelines are similar to those that are used in the EPRI HRA Calculator, but they include additional information and have been re-structured to more clearly depict the time available between the time CL recirculation would be established and TAF in the RCS. Figures 1-1 and 1-2 represent the 2" SLOCA and 5.2" MLOCA timelines, respectively.

Figure 1-1

Small LOCA Timeline

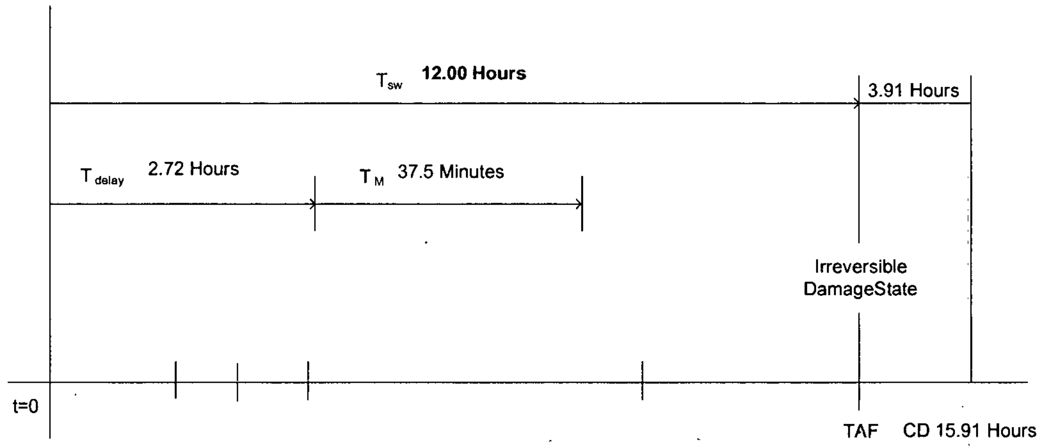
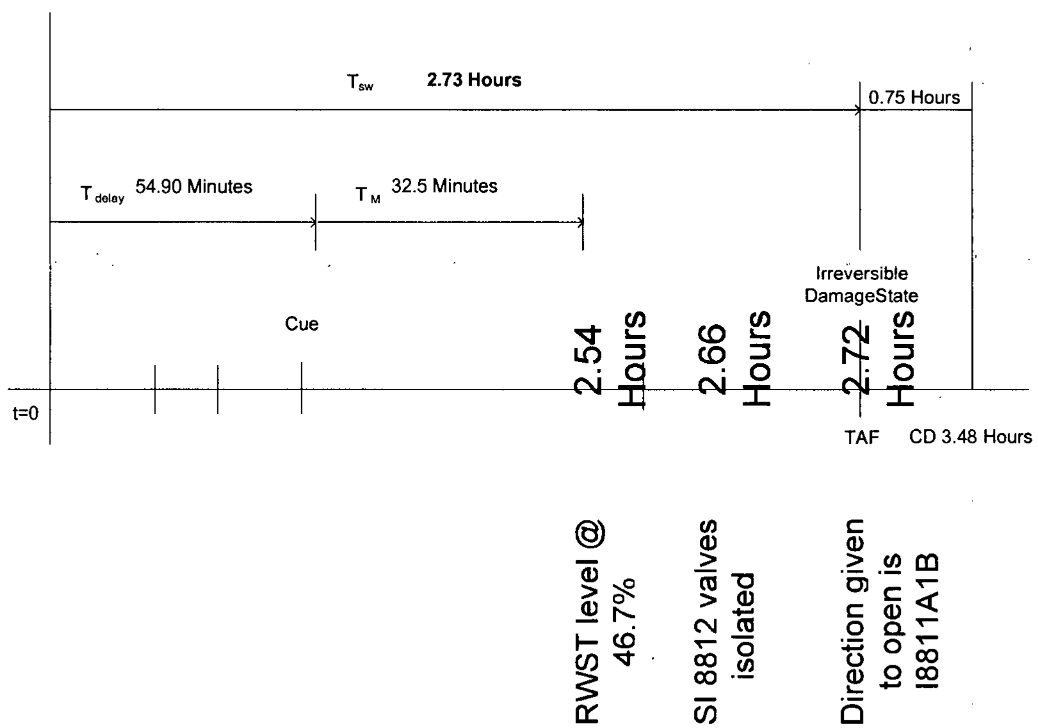


Figure 1-2

Medium LOCA Timeline



2.0 Simulator Observations and Training Input

As part of the HRA process, simulator observations were conducted on 11/10/2009 and 11/11/2009 to obtain information about how licensed Braidwood operators would interpret and respond to failures of the 1/2SI8811A/B to fully stroke during a transition to recirculation mode.

The following scenarios were used (in order) on a two separate crews over the two day observation period:

- 5.2" LOCA, all equipment available, at ECCS Recirculation, both SI8811 valves open 34% of full stroke, but have dual indication. Valves can be locally opened. Containment spray forced on (did not reach setpoint). (Run 1 (Crew 1), Run 3 (Crew 2))
- 5.2" LOCA, all equipment available, both SI8811 valves open 34% of full stroke, but have dual indication. If EO dispatched, valves are not accessible due to high rad levels. Containment spray forced on (did not reach setpoint). (Run 2 (Crew 1), Run 4 (Crew 2))

In addition to the simulator staff, the observation crew included an HRA analyst, a thermal hydraulics expert, and an Exelon risk management engineer. The results of the observations have been incorporated directly into the HRA quantification documentation.

In addition to the simulator observations, training personnel were contacted to determine how the training department addresses the issue of dual valve position indication with the operators. This information has also been documented directly in the HRA quantification documentation.

The main insights of the simulator observations and training input include the following:

1. In step 3c of ES-1.3, the operators would most likely consider valve(s) 1SI8811A/B to be "not open" when a dual indication situation exists,
2. The RH pump(s) would be tripped prior to closing 1SI8812A/B in the RNO for steps 1 and 4 of Attachment A of ES-1.3. This would be performed to protect the RH pump(s) given that closing the 1SI8812A/B valves would isolate the RH pumps from all suction sources.
3. Steps 1 and 4 of Attachment A of ES-1.3 include questions about the status of 1SI8811A/B that could be interpreted differently, but either interpretation will lead the operators to the direction to locally open 1SI8811A/B in a timely manner.
4. When a success path is not available to locally open the 1SI8811A/B valves in time to prevent fuel damage, the operators would start the RH pump and monitor it for signs of cavitation. While this is not explicitly included in BwCA-1.1 to address cases where

1SI8811A/B cannot be fully opened, the operators identified that they were bound to perform whatever actions deemed necessary to protect the core by 50.54x.

5. The operators are well trained on LOCA scenarios and the associated procedures. The general action to transition to cold leg recirculation model is extremely familiar to them.

6. The Braindwood training personnel summarized the treatment of a valve with dual indication as follows: if a statement asks if a valve is open, it is only considered open if there is clear indication that it is open. The same is true for statements that ask if the valve is closed. So with dual indication, the valve is neither open nor closed.

7. Section 2.1 provides the timing insights.

2.1 Simulator Timeline Summary

Table 2-1 provides a summary of some notable events for each of the four simulator runs that were performed. The time scale is set so that time zero = 46% RWST level.

Table 2-2: Simulator Timing Summary

Event	Run 1 Time (Crew 1)	Run 2 Time (Crew 1)	Run 3 Time (Crew 2)	Run 4 Time (Crew 2)
46% RWST Level	0 minutes	0 minutes	0 minutes	0 minutes
ES-1.3 entered	5 seconds (briefing prior to 46% prepared the crew for entry on low RWST level cue)	5 seconds (briefing prior to 46% prepared the crew for entry on low RWST level cue)	5 seconds (briefing prior to 46% prepared the crew for entry on low RWST level cue)	5 seconds (briefing prior to 46% prepared the crew for entry on low RWST level cue)
Dual indication present (assumed to exist after normal valve stroke time elapses)	98 seconds	98 seconds	98 seconds	98 seconds
Dual position indication on 1SI8811A/B	3 minutes	3 minutes	2 minutes	2 minutes

identified				
1SI8812A/B closed	7 minutes	6 minutes	7 minutes	5 minutes
Operator dispatched for local position assessment of 1SI8811A/B	11 minutes	9 minutes	3 minutes	4 minutes
Direction given to operator to open 1SI8811A/B locally	11 minutes	9 minutes	10 minutes	4 minutes
CS pumps placed in PTL	12 minutes	11 minutes	13 minutes	8 minutes
Time when CL recirc flow established	43 minutes	45 minutes (access to 1SI8811B prohibited, RH was started on increasing core exit temp)	33 minutes	12 minutes (access to 1SI8811B prohibited, so RH was started early to check viability of injection path)

3.0 Plant Walkdown of 1SI8811B

In order to gain an understanding of the physical location, orientation, and some of the demands that would be required of an equipment operator (EO)performing a manual stroke of the 1SI8811B valve, a walkdown of the valve and the route that an EO would take to the valve from the EO ready room was performed on 11/11/2009. The HRA analyst performed the walkdown in conjunction with an Exelon rad tech.

Some of the details that were collected as part of the walkdown include the following:

- Travel time to the 1SI8811B valve from the EO ready room, including the time required to obtain the key to high rad areas.
- Access requirements (keys, rad protection clothing)
- Lighting of the 1SI8811A/B area
- Labeling of the valve
- Local valve position indication
- Valve characteristic relative to other valves/equipment in the same proximity
- Valve controls, human interface issues with the handwheel, access issues related specifically to the 1SI8811 valve.

The results of the walkdown are incorporated directly in the HRA quantification documentation.

4.0 Human Error Probability Quantifications

Version 4.0 of the EPRI HRA Calculator™ was used to quantify the human failure events identified for this analysis. As identified in Section 1.0, assessments were performed for the dominant contributors to risk given failure of the 1/2SI8811A/B valve(s) to stroke, which include small and medium LOCA scenarios. The quantifications were performed using both the SPAR-H and CBDTM/THERP HRA methodologies in order to provide a robust assessment of human failure events relevant to this SDP. Specifically, this section includes the following quantifications:

- Section 4.1: 1SI8811B--BHPMOA, FAILURE TO OPEN VLV 1SI8811B AFTER REMOTE FAILURE (LOCAL-MANUAL, SLOCA)
- Section 4.2: 1SI8811BSSBHPMOA, FAILURE TO OPEN VLV 1SI8811B AFTER REMOTE FAILURE (LOCAL-MANUAL, SLOCA, SPAR-H)
- Section 4.3: 1SI8811BM-BHPMOA, FAILURE TO OPEN VLV 1SI8811B AFTER REMOTE FAILURE (LOCAL-MANUAL, MLOCA)
- Section 4.4: 1SI8811BMSBHPMOA, FAILURE TO OPEN VLV 1SI8811B AFTER REMOTE FAILURE (LOCAL-MANUAL, MLOCA, SPAR-H)
- Section 4.5: 1SI8811B3SBHPMOA, FAILURE TO OPEN VLV 1SI8811B AFTER REMOTE FAILURE (LOCAL-MANUAL, 3" MLOCA, SPAR-H)

4.1 1SI8811B--BHPMOA, FAILURE TO OPEN VLV 1SI8811B AFTER REMOTE FAILURE (LOCAL-MANUAL, SLOCA)

Analyst:	DEM
Rev. Date:	12/10/09
Reviewer:	
Cognitive Method:	CBDTM/THERP
Analysis Database:	bwd-8811-121009.HRA (12/10/09, 1675264 Bytes)

Table 1: 1SI8811B--BHPMOA SUMMARY

Analysis Results:	without Recovery	with Recovery
P_{exe}	1.4e-01	6.5e-03
Total HEP:		6.5e-03
Error Factor:		5

Related Human Interactions:

Follows success of nominal action to begin the swap to recirculation mode.

Initial Cue:

Procedure direction - CA-1.1, step 1c, RNO

Recovery Cue:

Cue:

Procedures require the operators to confirm that the 1SI8811A/B valve is open during recirculation alignment.

Degree of Clarity of Cues & Indications:

Average

Procedures:

Cognitive: Not Selected

Execution: BwCA-1.1 (Loss of Emergency Coolant Recirculation) Revision: 202

Other: Not Selected

Cognitive Procedure:

Step: Not Applicable

Instruction: Not Applicable

Procedure Notes:

Typically, both execution and diagnosis errors are included as part of a post initiator HRA. In some cases, however, there are conditions that preclude the applicability of one of these components of the HEP.

For scenarios in which the 1SI8811A/B valve fails to completely stroke and both the "open" and "closed" lights are illuminated (dual indication), it is recognized that the operators must interpret the dual indication and make a decision about how to proceed. However, their decision regarding the valve's status is unimportant given that any interpretation results in a successful outcome.

- 1SI8811A/B interpreted as "NOT OPEN": operator directed to close 1SI8812A/B, open 1SI8811A/B locally, and establish cold leg recirculation.

- 1SI8811A/B interpreted as "OPEN": The RH pumps would remain running, 1SI8812A/B directed to be closed, and injection would be provided to the RCS via the 1SI8809A/B valve(s). For transient scenarios or for SLOCAs where the transition to cold leg recirculation is attempted at the time of the 46% RWST level cue, the procedures still provide a success path as they direct local operation of the 1CV8804A/1SI8804B valves (bypasses interlock with 1SI8811A/B) and the establishment of flow using the SI/Charging pumps.

These paths are described in more detail below:

Scenario 1, 1SI8811A/B considered to be "not open" in ES-1.3 step 3c:

If the 1SI8811A/B valve is considered to be "not open" in ES-1.3 step 3c, the operators are transferred to Attachment A. In Attachment A, step 1 questions whether or not the 1SI8811A valve is closed. If it is determined to be "not closed", the RNO action is to close 1SI8812A, which would terminate an "A" division flow diversion from the RWST to the sump. The RNO then transfers to step 4, which includes similar guidance for the "B" division. The RNO is step 4 transfers to Step 7, which in turn transfers to BwCA-1-1 where step 1c directs local closure of 1SI8811A/B.

If the opposite interpretation of the 1SI8811A/B valve'(s) status is made in Attachment A, step 1 of ES-1.3 (valve is "closed"), the operators are directed through steps 2 and 3, which attempt manual, remote operation of 1SI8811A. Step 3b closes 1SI8812A, which would terminate a flow diversion, and step 3e directs 1SI8811A to be opened. Whether or not 1SI8811A is considered to be open, the procedure path leads to step 4 where a similar process is started for the "B" division. On completion of the "B" division steps, step 7 is reached where the transfer to 1BwCA-1.1 occurs and the direction to perform the local stroke of 1SI8811A/B is given.

Scenario 2, 1SI8811A/B considered to be "open" in ES-1.3 step 3c:

In the event that the 1SI8811A/B valve(s) is believed/considered to be "open" in ES-1.3 step 3c, step 3d directs closure of the 1SI8812A/B valves, which would terminate the flow diversion from the RWST to the sump. At this point, the RH pumps would be running with suction only aligned through the partially open 1SI8811A/B valves. For MLCOA events, this may allow injection through the 1SI8809A/B valves without further action; however, assuming that RCS pressure is too high for injection, the procedure continues in steps 4 and 5 to align RH to the SI/Charging system suction path. In steps 5f and 5h, the direction is given to open the 1CV8804A and 1SI8804B valves, respectively. These valves are interlocked with 1SI8811A/B and would not open with 1SI8811A/B in an intermediate position. The RNO for steps 5f and 5g direct local operation of valves 1CV8804A and 1SI8804B valves, which are smaller and more easily operated than the 1SI8811A/B valves. Locally stroking the 1CV8804A/1SI8804B valve would provide an alternate success path given that suction would be available through the partially open 1SI8811A/B valves.

If, for some reason, it was decided that there was no viable suction path for the SI/Charging pumps and that emergency coolant recirculation was lost/unavailable, the continuous action statement to transfer to BwCA-1.1 would be followed where local operation of the 1SI8811A/B valve(s) would be directed.

In summary, from the point where dual indication on 1SI8811A/B is encountered at ES-1.3 step 3c, any procedure path taken will isolate the flow diversion path from the RWST to the containment sump by closing 1SI8812A/B and emergency coolant recirculation will be established by opening either 1SI8811A/B or 1CV8804A/1SI8804B locally. No significant diagnosis is required to either close 1SI8812A/B or to open 1SI8811A/B; these actions are directed as a matter of course in a procedure path that has already been initiated.

TRAINING:

Based on simulator observations and operator interviews, scenario 1 is the expected evolution. There are a number of scenarios utilized in the simulator in both initial and continuing training that exercise these portions of the procedures.

For ILT: Scenario P-18.1 Involves failure of SI8811 valve to open and exercises _BwCA-1.1

Scenario C-2.2 Involves failure of SI8811 valve to open and exercises _BwCA-1.1

Scenario E-7.2 Involves failure of SI8811 valve to open and exercises ES-1.3, Attachment A to open valve

Scenario E-9.2 Involves failure of SI8811 valve to open and exercises ES-1.3, Attachment A to open valve

For LORT (Going back just the last few years)

Scenario 0711 Involves failure of SI8812 valve to close and exercises ES-1.3, Attachment A to close the valve

Scenario 0716 Involves NSO Only training on _BwEP ES-1.3, transfer to CL Recirc

Scenario 0765 Involves LBLOCA, transition to CL Recirc and local operation of 0SX007

Scenario 0811 Involves failure of both SI8811 valves to open and exercises _BwCA-1.1, including dispatching operators to "locally" open the valve.

Scenario 0843 Involves LBLOCA and transition to _BwEP ES-1.3, followed by sump blockage and transition to 1BwCA-1.3

Scenario 0866 Involves containment bypass and exercises _BwCA-1.1

Scenario 0916 Involves LBLOCA, and transfer to CL Recirc, transfer to HL Recirc

Scenario 0936-2 Involves NSO training on _BwEP ES-1.3, transfer to CL Recirc with failure of _SI8812 to close (Timed scenario)

Scenario 0943 Involves Involves LBLOCA, transition to CL Recirc

Scenario 0965 Involves LBLOCA, failure of 1SI8811B, transition to 1BwCA-1.1 and local opening of 1SI8811B

Scenario 0931 OOB Evaluation of DB LBLOCA and failure of 1SI8812 to close. Timed Scenario - ALL crews PASSED

Equipment Operator (EO) training on local valve operation occurs primarily in the generic fundamentals phase, Components chapter 1, which covers the construction and operation of MOVs. Various local valve operations are covered in a sampling of EOP Lesson plans but only general direction is covered.

In summary, the RO/SRO training program addresses the specific scenario in which the 8811A/B valves fail to open remotely as well as other scenarios that require local operation of the other valves. These scenarios, as well as others, are included in both initial qualification exercises and the continuing training program. EOs are trained generically to operate MOVs locally. While there is not a specific lesson plan covering 11/2SI8811A/B local operation, the generic training is applicable to those valves.

Training:

Classroom, Frequency: 0.5 per year

Simulator, Frequency: 0.5 per year

JPM Procedure:

Not Selected

Identification and Definition:

This HFE represents the probability that the operators will fail to locally open the failed 1SI8811A/B valves and complete the transition to cold leg recirculation given that the swap to recirculation mode has been initiated.

The scenario evaluated for this HFE is an SLOCA event, which is a top contributors in the NRC SPAR model. The largest contributors in the Braidwood PRA with the degraded 1SI8811A/B valves are loss of DC bus scenarios, but because the SLOCA timing is more limiting that the transient case, the SLOCA scenario is used for the evaluation of this HFE.

The following provides an additional description of the scenario for which this action is evaluated:

1. Initial Conditions: Steady state, full power operation

2. Initiating Events: Small LOCA

3. Accident sequence (preceding functional failures and successes):

Reactor trip successful

Turbine trip successful

AFW operates

Level in RCS drops due to SLOCA

ECCS initiated successfully (both divisions available)

2 trains of containment spray are available, 2 RCFCs running (4 fans).

Transition to cold leg recirculation on low RWST level is initiated, but fails due to failure of 1SI8811A/B to fully open (valve only opens approximately 34%, which fails to satisfy the interlock with the 8804 valve(s)).

4. Preceding operator error or success in sequence:

Early EP-0 actions to confirm actuations performed.

EP-1 actions to ensure adequate ECCS injection performed.

EP-1 action to depressurize and cooldown is initiated, if required.

Transition to recirculation mode started

Failure of 1SI8811A/B identified.

5. Operator action success criterion: Locally open 1SI8811A/B and establish cold leg recirculation mode prior RCS level reaching TAF.

Key Assumptions:

1) Failure of the 1SI8811A/B valve in the intermediate position is assumed to result in the shutdown of RH pump 1A/B due to lack of a positive suction source. Based on this interpretation of the valve's dual

indication, the operators would be procedurally bound to perform a local, manual stroke of the valve before restarting RH pump 1A/B and completing the transition to cold leg recirculation. 2) Exelon calculation EC#377204 indicates that if the 1SI8811B had opened approximately 34 full stroke, adequate flow would have been available to perform swap to recirculation mode without action to locally open 1SI8811B. It should be noted that with the 1SI8811A/B valve in an intermediate position, the interlock with 1CV8804A/1SI8804B would not have cleared, but because RCS pressure would be below the RH pump shutoff head by the time recirculation mode was required, the RH pumps would be able to inject directly through the 1SI8809A/B valves and the interlock's status would be inconsequential. However, no direct credit is taken for operation of the RH pumps with the 1SI8811A/B valves in the intermediate position. 3) By the time recirculation mode is required to be in operation at the end of the system window for this action, RCS pressure would be low enough that only the RH pumps would be required to inject through the 1SI8809A/B valves for the 2" SLOCAs. Because, that this has not been explicitly demonstrated for the entire range of SLOCAs, it is assumed that alignment to the Charging/SI pumps through 1CV8804A/1SI8804B is required for success in all small LOCAs.

Operator Interview Insights:

OPERATOR INTERVIEWS AND SIMULATOR OBSERVATIONS:

For cases in which both the open ("O") and the closed ("-") position indictors are simultaneously illuminated for a given valve, operator interviews performed on 11/10/2009 and 11/11/2009 universally demonstrated that it was understood this represented a condition in which the actual position of the valve is unknown and that alternative means would be required to determine the valve's position. What was also demonstrated in the interviews and during the simulator observations was that interpretation of the valve's status with regard to responding to procedures was considered to be case specific.

For example, ES-1.3, Attachment A, step 1 questions whether or not the 1SI8811A valve is closed and the two crews interpreted the dual indication differently; one crew treated it as "closed" and the other as "not closed". In the latter case, when 1SI8811A was considered "not closed" and the RNO action to close 1SI8812A was reached, it was recognized that with 1SI8811A in an undetermined state, closing 1SI8812A would potentially isolate RH pump 1A from all viable suction sources and RH pump 1A was tripped to protect it. If the valve is considered closed, the procedures attempt to manually open the valve from the control room. This path includes a step to trip RH pump 1A when 1SI8812A is closed. If 1SI8811A cannot subsequently be opened, the RH pump is left in the tripped position (same as previous case). Ultimately, either classification of the 1SI8811A valve's status ("closed" or "not closed") would lead to step 7 of Attachment A, where the operators are directed to CA-1.1 and instructed to locally open valve(s) 1SI8811A/B.

While a divergence of opinion appeared to exist on the classification a valve with dual indication in ES-1.3, Attachment A, step 1, what was clear was that the indeterminate status of the valve was consistently treated in a conservative manner. ES-1.3, Attachment A, step 1 is not directly questioning whether or not the position of the valve can lead to a success or failure of a particular function and as a result, a difference in the classification of the valve's status was noted. However, for the cases where the status for the valve was directly related to whether or not it could fulfill a required function, the valves was not considered to be capable of supporting that function. For example,

- Step 3c of ES-1.3 questions whether or not the containment sump valves (1SI8811A/B) are open with the obvious intent of determining whether or not the RH pumps can draw water from the containment sump. Both crews interpreted the sump valve as not being open given the presence of dual indication on the 1SI8811A/B valve(s).

- In the RNO step of ES-1.3, Attachment A, step 1, the 1SI8811A was not considered to be capable of providing an adequate suction source for RH pump 1A even though it was considered not to be closed in ES-1.3, Attachment A, step 1. Consequently, RH pump 1A was tripped before 1SI8812A was closed.

- In ES-1.3, Attachment A, step 3e, 1SI8811A was considered to not be open such that it could not support cold leg recirculation mode.

- In ES-1.3, Attachment A, step 6e, 1SI8811B was considered to not be open such that it could not support cold leg recirculation mode.

- In ES-1.3, Attachment A, step 7, both 1SI8811A and B were considered to not be open such that they could not support cold leg recirculation mode.

- In CA-1.1, step 1c, both 1SI8811A and B were considered to not be open such that they could not support cold leg recirculation mode.

Based on the information obtained from the operator interviews and the simulator observations, the conclusion is that a dual indication condition on 1SI8811A/B will result in the interpretation that the valve cannot necessarily support cold leg recirculation mode and that the procedures will ultimately drive them to CA-1.1 where local action to open the valve will be directed.

All of the above is based on the pre-condition that the operators have no information about the actual position of 1SI8811A/B and that the reactor core is not yet threatened. Simulator runs 1 and 3, which were performed on 11/10/2009 and 11/11/2009, demonstrated that while local operation of the 1SI8811A/B valves offered a potential success path to restore cold leg recirculation, the RH pump would not be started until it was verified that 1SI8811A/B was full open. For simulator runs 2 and 4, which were run on the same days, a local check of the 1SI8811A/B valve(s) position was allowed, but a manual stroke of the valve(s) was prohibited due to high rad levels. These scenarios placed the operators in a situation where the only success path was to run the RH pump with the 1SI8811A/B valves in a partially open condition. Both crews dispatched equipment operators to perform a local assessment of the valve's position and when it became obvious to them that they could not prevent core damage without operating the RH pump(s), they elected to start the pumps. Both crews cited the 50.54x guidance that binds them to protect the core even if clear procedure guidance does not exist to direct them to do so. No credit is taken for operating the RH pumps with the 1SI8811A/B valves in a partially open condition even though plant engineering calculations indicate that such an operation would be successful.

Manpower Requirements:

Operations:	Shift Manager	1	1
	Shift Supervisor:	1	0
	STA:	1	0
	Reactor operators:	2	1
	Plant operators:	2	1
Maintenance:	Mechanics:	2	0
	Electricians:	2	0
	I&C Technicians:	2	0
Health Physics:	Technicians:	2	1
Chemistry:	Technicians:	1	0

Execution Performance Shaping Factors:

Environment:	Lighting	Normal
	Heat/Humidity	Hot / Humid
	Radiation	Yellow

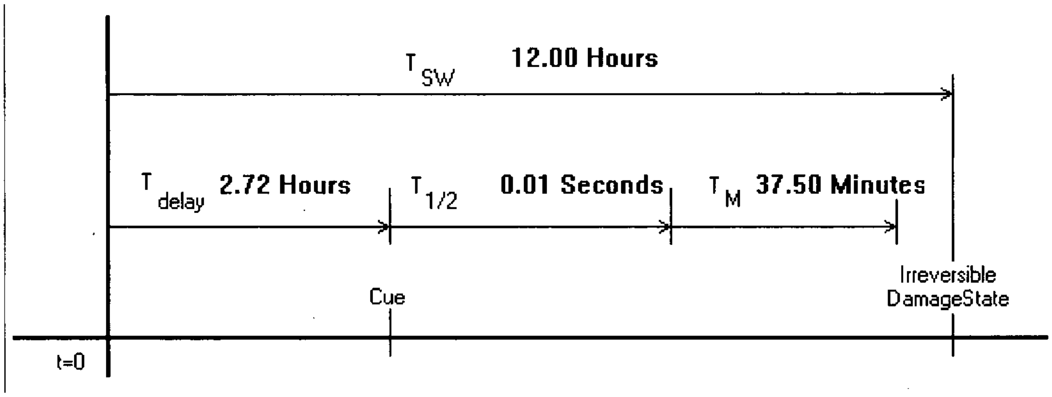
	Atmosphere	Normal
Special Requirements:		
Complexity of Response:	Cognitive	Complex
	Execution	Complex
Equipment Accessibility:	Main Control Room	Accessible
	Unit 1 Containment Pipe Penetration Area	Accessible
Stress:	**High**	
	Plant Response As Expected:	No
	Workload:	N/A
	Performance Shaping Factors:	N/A

Performance Shaping Factor Notes:

Failure of the 1SI8811A/B valve(s) presents an unexpected condition in the plant (plant response is NOT as expected).

With regard to rad levels at the valve and access considerations, Exelon calc ECR 392870 indicates that the expected dose rate for a medium LOCA would be 1,444 mRem/hr. With a potential exposure time of up to 30 minutes, which is greater than the manipulation time for the local action, the accumulated dose would be below the administrative dose limit of 2000 m/Rem established in RP-AA-203. While this would not prevent local valve action, entering a potentially high rad area with elevated temperatures is considered to contribute to a high stress environment.

Timing:



Timing Analysis: While diagnosis contribution for this HFE has been excluded, the timing information related to the diagnosis of the need to transition to recirculation mode is required to establish the time available for local operation of the 1SI8811A/B valves and any applicable recovery factors. The timeline for this action has been constructed based on the successful diagnosis and interpretation of the dual indication on the 1SI8811A/B valves.

The timing for this action is complicated by the fact that a failure occurs in the equipment that is being used to carry out an action that has already been successfully diagnosed. The diagnosis tasks for the action to swap to recirculation mode and to identify the failure of the 1SI8811B valve to fully open during recirculation alignment are sequential and cannot occur during the same period of time. By definition, the diagnosis of the failed 1SI8811A/B valve(s) occurs only after successful diagnosis of the need to swap to recirculation. This is accounted for in the system window, manipulation time, and cue definitions for this action. For THERP, timing considerations are limited beyond the assessment that sufficient time is available to perform the action, but the dependence levels assignments of the recovery actions are potentially impacted by the timing.

T(m): The time required to manually stroke the 8811B valve from 34% open to full open has been determined to be 24 minutes. This time is based on an actual stroke of the valve performed by the Braidwood operators during the week of 11/02/2009. In addition, 7.5 minutes has been added to account for the time required to travel to the valve location. The travel time is based on a walkdown performed by the HRA analyst on 11/11/2009 and accounts for the time to travel from the EO ready room to the MCR to obtain a key for high rad area access (30 seconds travel, 30 seconds assumed to get key), the time to travel to the Auxiliary Building entrance (3 minutes), the time to travel from the Auxiliary Building entrance to valve 1SI8811B (3 minutes), and the time to climb the ladder to reach the handwheel on 1SI8811B (30 seconds). The time required for completing the steps to initiate cold leg recirculation mode is assumed to be 6 minutes based on operator interviews performed on 5/23/2007. This time includes all nominal steps to transition to recirculation mode, which may be required in a SLOCA. The total manipulation time is, therefore, 37.5 minutes (7.5 minutes of travel time, 24 minutes for valve stroke, 6 minutes for the steps to complete swap to recirc).

T(sw): The time for RCS level to reach TAF is used as the end of the system window for this action. B/B MAAP run BBSDP17a indicates that 12.00 hours are available to reach TAF in a small LOCA scenario from the initiating event.

T(delay) = time to 46% RWST level (cue to start transition to swap to recirc mode) + time to reach the command to open the 1SI8811A/B valve locally (accounts for completion of the action to begin the swap to recirc and respond to the dual indication on 1SI8811A/B). In this case, that time includes the time to reach 46% RWST level and the time required to reach step 1c of BwCA-1.1. B/B MAAP run BBSDP17a indicates that the time to reach 46.7% RWST level is 2.54 hours, which is the initial cue to swap to cold leg recirculation mode. Based on simulator runs performed on 11/10/2009 and 11/11/2009, 4 data points were obtained for the time to reach the point where the direction was given to locally stroke the 1SI8811A/B valve: Run 1= 11 minutes, Run 2 = 9 minutes, Run 3 = 10 minutes, Run 4 = 4 minutes. Because 2 crews were used to perform 4 simulator runs and the second run for each crew was highly similar to the first, it was expected that some degree of anticipation of the upcoming events would occur. As a result, the T(1/2) estimate for this case is based on the average of runs 1 and 3, the first run of the scenarios for each crew. T(1/2) = 10.5 minutes ((11 min + 10 min) / 2 = 10.5 min). The time T(delay), therefore, is 2.54 hr + 0.18 hr = 2.72 hr.

T(1/2): The HRAC uses the median response time in the assessment of recovery dependence levels, but this is accounted for by the cue structure here. T(1/2) has been set to 0.01 seconds (to prevent an HRAC error message).

Time available for recovery: 519.30 Minutes

SPAR-H Available time (cognitive): 519.30 Minutes

SPAR-H Available time (execution) ratio: 14.85

Minimum level of dependence for recovery: ZD

Execution Unrecovered

1SI8811B--BHPMOA

Table 2: 1SI8811B--BHPMOA EXECUTION UNRECOVERED

Procedure: BwCA-1.1, Loss of Emergency Coolant Recirculation		Comment				Stress Factor	Over Ride
Step No.	Instruction/Comment	Error Type	THERP		HEP		
			Table	Item			
ES-1.3, step 3a	Place control switches for SVAG valves 480V bus feeds at 1PM06J in - CLOSE	The "A" and "B" divisions are completely dependent.				5	
	–	EOM	20-7b	2	1.3E-3		
		EOC	20-12	5	1.3E-3		
		EOC	20-12	4	1.3E-3		
						Total Step HEP	2.0e-02
ES1.3, At A, s1 RNO	Perform the following: a. Manually or locally close RH Pump 1A suction from RWST isol valve: 1SI8812A	The operators Step 4 of ES-1.3, Attachment A directs the same action for the "B" division. The "A" and "B" divisions are completely dependent.				5	
	–	EOM	20-7b	2	1.3E-3		
		EOC	20-12	4	1.3E-3		
		EOC	20-12	5	1.3E-3		
						Total Step HEP	2.0e-02

CA-1.1, Step 1.c-RNO	Dispatch an operator to open at least one valve: -1SI8811A (364' U13 CWA), -1SI8811B (364' X13 CWA)					5	
	--	EOM	20-7b	1	4.3E-4		
		EOC	20-13	1	1.3E-3		
						Total Step HEP	8.7e-03
CA-1.1, Step 1.e RNO	When one train is restored, then return to procedure and step in effect.	CA-1.1, Step 1.e RNO is a continuous action statement that will send the operators back to ES-1.3, Attachment A, Step 7, which requires the operators to confirm the status of the valve via the direction "check at least 1 CNMT sump recirc flowpath established". Because the entire focus of the MCR is on the progress of opening the 1SI8811A/B valve, the continuous action statement would not be overlooked.				5	
	--	EOM	20-7b	1	4.3E-4		
						Total Step HEP	2.2e-03
ES-1.3 Step 5	ALIGN SI AND CENT CHG PUMPS FOR COLD LEG RECIRCULATION					5	
	--	EOM	20-7b	2	1.3E-3		
	OPEN RH to CCP isol valves - selection error	EOC	20-12	5	1.3E-3		
	CLOSE SI pump miniflow isolation valves - selection error	EOC	20-12	4	1.3E-3		
	CLOSE SI pump miniflow isolation valves -manipulation error	EOC	20-12	5	1.3E-3		
	CLOSE RH HX discharge crosstie valves - selection error	EOC	20-12	4	1.3E-3		
	CLOSE RH HX discharge crosstie valves - selection error	EOC	20-12	5	1.3E-3		
	OPEN SI and CCP suction header crosstie valves - selection	EOC	20-12	4	1.3E-3		
	OPEN SI and CCP suction header crosstie valves - manipulation	EOC	20-12	5	1.3E-3		
	OPEN RH to CCP isol valves - selection error	EOC	20-12	4	1.3E-3		

						Total Step HEP	5.7e-02
ES-1.3 STEP 6	START ECCS PUMPS AS NECESSARY	CD assigned between cent charging pumps. CD assigned between SI pumps.				5	
	--	EOM	20-7b	2	1.3E-3		
	CCP - selection	EOC	20-12	4	1.3E-3		
	CCP - manipulation	EOC	20-12	5	1.3E-3		
	SI - selection	EOC	20-12	4	1.3E-3		
	Si - manipulation	EOC	20-12	5	1.3E-3		
						Total Step HEP	3.3e-02
EXEC RECOV - ICR	EXEC RECOV - ICR	See Section 4.4 of the HRA Notebook for further information. This execution recovery factor is applied to the individual execution steps with a dependence factor based on the time available for recovery. Note that the execution stress factors applied to the execution subtasks are not applied to the execution recovery factor.				5	5e-2
	--	EOM	20-7b	2	1.3E-3		
						Total Step HEP	5.0e-02

Execution Recovery

1SI8811B--BHPMOA

Table 3: 1SI8811B--BHPMOA EXECUTION RECOVERY

Critical Step No.	Recovery Step No.	Action	HEP (Crit)	HEP (Rec)	Dep.	Cond. HEP (Rec)	Total for Step
ES-1.3, step 3a		**Place control switches for SVAG valves 480V bus feeds at 1PM06J in - CLOSE**	**2.0e-02**				**1.0e-03**
	EXEC RECOV - ICR	EXEC RECOV - ICR		5.0e-02	ZD	5.0e-02	
ES1.3, At A, s1 RNO		**Perform the following: a. Manually or locally close RH Pump 1A suction from RWST isol valve: 1SI8812A**	**2.0e-02**				**1.0e-03**
	EXEC RECOV - ICR	EXEC RECOV - ICR		5.0e-02	ZD	5.0e-02	
CA-1.1, Step 1.c-RNO		**Dispatch an operator to open at least one valve: -1SI8811A (364' U13 CWA), -1SI8811B (364' X13 CWA)**	**8.7e-03**				**1.9e-05**
	CA-1.1, Step 1.e RNO	When one train is restored, then return to procedure and step in effect.		2.2e-03	ZD	2.2e-03	
ES-1.3 Step 5		**ALIGN SI AND CENT CHG PUMPS FOR COLD LEG RECIRCULATION**	**5.7e-02**				**2.9e-03**
	EXEC RECOV - ICR	EXEC RECOV - ICR		5.0e-02	ZD	5.0e-02	
ES-1.3 STEP 6		**START ECCS PUMPS AS NECESSARY**	**3.3e-02**				**1.7e-03**
	EXEC RECOV - ICR	EXEC RECOV - ICR		5.0e-02	ZD	5.0e-02	
		Total Unrecovered:	**1.4e-01**			**Total Recovered:**	**6.5e-03**

4.2 1SI8811BSSBHPMOA, FAILURE TO OPEN VLV 1SI8811B AFTER REMOTE FAILURE (LOCAL-MANUAL, SLOCA, SPAR-H)

Analyst:	DEM
Rev. Date:	12/10/09
Reviewer:	
Cognitive Method:	SPAR-H
Analysis Database:	bwd-8811-121009.HRA (12/10/09, 1675264 Bytes)

Table 4: 1SI8811BSSBHPMOA SUMMARY

Analysis Results:	**Cognitive**	**Execution**
Failure Probability	0.0e+00	9.9e-03
Total HEP		9.9e-03

Plant:

Braidwood

Initiating Event:

SLOCA

Basic Event Context:

Typically, both execution and diagnosis errors are included as part of a post initiator HRA. In some cases, however, there are conditions that preclude the applicability of one of these components of the HEP.

For scenarios in which the 1SI8811A/B valve fails to completely stroke and both the "open" and "closed" lights are illuminated (dual indication), it is recognized that the operators must interpret the dual indication and make a decision about how to proceed. However, their decision regarding the valve's status is unimportant given that any interpretation results in a successful outcome.

- 1SI8811A/B interpreted as "NOT OPEN": operator directed to close 1SI8812A/B, open 1SI8811A/B locally, and establish cold leg recirculation.

- 1SI8811A/B interpreted as "OPEN": The RH pumps would remain running, 1SI8812A/B directed to be closed, and injection would be provided to the RCS via the 1SI8809A/B valve(s). For transient scenarios or for SLOCAs where the transition to cold leg recirculation is attempted at the time of the 46% RWST level cue, the procedures still provide a success path as they direct local operation of the 1CV8804A/1SI8804B valves (bypasses interlock with 1SI8811A/B) and the establishment of flow using the SI/Charging pumps.

These paths are described in more detail below:

Scenario 1, 1SI8811A/B considered to be "not open" in ES-1.3 step 3c:

If the 1SI8811A/B valve is considered to be "not open" in ES-1.3 step 3c, the operators are transferred to Attachment A. In Attachment A, step 1 questions whether or not the 1SI8811A valve is closed. If it is determined to be "not closed", the RNO action is to close 1SI8812A, which would terminate an "A" division flow diversion from the RWST to the sump. The RNO then transfers to step 4, which includes similar guidance for the "B" division. The RNO is step 4 transfers to Step 7, which in turn transfers to BwCA-1-1 where step 1c directs local closure of 1SI8811A/B.

If the opposite interpretation of the 1SI8811A/B valve'(s) status is made in Attachment A, step 1 of ES-1.3 (valve is "closed"), the operators are directed through steps 2 and 3, which attempt manual, remote operation of 1SI8811A. Step 3b closes 1SI8812A, which would terminate a flow diversion, and step 3e directs 1SI8811A to be opened. Whether or not 1SI8811A is considered to be open, the procedure path leads to step 4 where a similar process is started for the "B" division. On completion of the "B" division steps, step 7 is reached where the transfer to 1BwCA-1.1 occurs and the direction to perform the local stroke of 1SI8811A/B is given.

Scenario 2, 1SI8811A/B considered to be "open" in ES-1.3 step 3c:

In the event that the 1SI8811A/B valve(s) is believed/considered to be "open" in ES-1.3 step 3c, step 3d directs closure of the 1SI8812A/B valves, which would terminate the flow diversion from the RWST to the sump. At this point, the RH pumps would be running with suction only aligned through the partially open 1SI8811A/B valves. For MLCOA events, this may allow injection through the 1SI8809A/B valves without further action; however, assuming that RCS pressure is too high for injection, the procedure continues in steps 4 and 5 to align RH to the SI/Charging system suction path. In steps 5f and 5h, the direction is given to open the 1CV8804A and 1SI8804B valves, respectively. These valves are interlocked with

1SI8811A/B and would not open with 1SI8811A/B in an intermediate position. The RNO for steps 5f and 5g direct local operation of valves 1CV8804A and 1SI8804B valves, which are smaller and more easily operated than the 1SI8811A/B valves. Locally stroking the 1CV8804A/1SI8804B valve would provide an alternate success path given that suction would be available through the partially open 1SI8811A/B valves.

If, for some reason, it was decided that there was no viable suction path for the SI/Charging pumps and that emergency coolant recirculation was lost/unavailable, the continuous action statement to transfer to BwCA-1.1 would be followed where local operation of the 1SI8811A/B valve(s) would be directed.

In summary, from the point where dual indication on 1SI8811A/B is encountered at ES-1.3 step 3c, any procedure path taken will isolate the flow diversion path from the RWST to the containment sump by closing 1SI8812A/B and emergency coolant recirculation will be established by opening either 1SI8811A/B or 1CV8804A/1SI8804B locally. No significant diagnosis is required to either close 1SI8812A/B or to open 1SI8811A/B; these actions are directed as a matter of course in a procedure path that has already been initiated.

EXPERIENCE/TRAINING:

There are a number of scenarios utilized in the simulator in both initial and continuing training that exercise these portions of the procedures.

For ILT: Scenario P-18.1 Involves failure of SI8811 valve to open and exercises _BwCA-1.1

Scenario C-2.2 Involves failure of SI8811 valve to open and exercises _BwCA-1.1

Scenario E-7.2 Involves failure of SI8811 valve to open and exercises ES-1.3, Attachment A to open valve

Scenario E-9.2 Involves failure of SI8811 valve to open and exercises ES-1.3, Attachment A to open valve

For LORT (Going back just the last few years)

Scenario 0711 Involves failure of SI8812 valve to close and exercises ES-1.3, Attachment A to close the valve

Scenario 0716 Involves NSO Only training on _BwEP ES-1.3, transfer to CL Recirc

Scenario 0765 Involves LBLOCA, transition to CL Recirc and local operation of 0SX007

Scenario 0811 Involves failure of both SI8811 valves to open and exercises _BwCA-1.1, including dispatching operators to "locally" open the valve.

Scenario 0843 Involves LBLOCA and transition to _BwEP ES-1.3, followed by sump blockage and transition to 1BwCA-1.3

Scenario 0866 Involves containment bypass and exercises _BwCA-1.1

Scenario 0916 Involves LBLOCA, and transfer to CL Recirc, transfer to HL Recirc

Scenario 0936-2 Involves NSO training on _BwEP ES-1.3, transfer to CL Recirc with failure of _SI8812 to close (Timed scenario)

Scenario 0943 Involves Involves LBLOCA, transition to CL Recirc

Scenario 0965 Involves LBLOCA, failure of 1SI8811B, transition to 1BwCA-1.1 and local opening of 1SI8811B

Scenario 0931 OOB Evaluation of DB LBLOCA and failure of 1SI8812 to close. Timed Scenario - ALL crews PASSED

Equipment Operator (EO) training on local valve operation occurs primarily in the generic fundamentals phase, Components chapter 1, which covers the construction and operation of MOVs. Various local valve operations are covered in a sampling of EOP Lesson plans but only general direction is covered.

In summary, the RO/SRO training program addresses the specific scenario in which the 8811A/B valves fail to open remotely as well as other scenarios that require local operation of the other valves. These scenarios, as well as others, are included in both initial qualification exercises and the continuing training program. EOs are trained generically to operate MOVs locally. While there is not a specific lesson plan covering 11/2SI8811A/B local operation, the generic training is applicable to those valves. While this level of training may not be considered to be as high as what is performed for the standard action to initiate cold leg recirculation, it is considered to be adequate to maintain a reasonable level of proficiency in addressing failure of the 1SI8811A/B valves. Addressing the dual indication on 1SI8811A/B is not specifically addressed, but general training covers this particular mode of failure for the valve. Treated as a "nominal training" case.

OPERATOR INTERVIEWS AND SIMULATOR OBSERVATIONS:

For cases in which both the open ("O") and the closed ("-") position indictors are simultaneously illuminated for a given valve, operator interviews performed on 11/10/2009 and 11/11/2009 universally demonstrated that it was understood this represented a condition in which the actual position of the valve is unknown and that alternative means would be required to determine the valve's position. What was

also demonstrated in the interviews and during the simulator observations was that interpretation of the valve's status with regard to responding to procedures was considered to be case specific.

For example, ES-1.3, Attachment A, step 1 questions whether or not the 1SI8811A valve is closed and the two crews interpreted the dual indication differently; one crew treated it as "closed" and the other as "not closed". In the latter case, when 1SI8811A was considered "not closed" and the RNO action to close 1SI8812A was reached, it was recognized that with 1SI8811A in an undetermined state, closing 1SI8812A would potentially isolate RH pump 1A from all viable suction sources and RH pump 1A was tripped to protect it. If the valve is considered closed, the procedures attempt to manually open the valve from the control room. This path includes a step to trip RH pump 1A when 1SI8812A is closed. If 1SI8811A cannot subsequently be opened, the RH pump is left in the tripped position (same as previous case). Ultimately, either classification of the 1SI8811A valve's status ("closed" or "not closed") would lead to step 7 of Attachment A, where the operators are directed to CA-1.1 and instructed to locally open valve(s) 1SI8811A/B.

While a divergence of opinion appeared to exist on the classification a valve with dual indication in ES-1.3, Attachment A, step 1, what was clear was that the indeterminate status of the valve was consistently treated in a conservative manner. ES-1.3, Attachment A, step 1 is not directly questioning whether or not the position of the valve can lead to a success or failure of a particular function and as a result, a difference in the classification of the valve's status was noted. However, for the cases where the status for the valve was directly related to whether or not it could fulfill a required function, the valves was not considered to be capable of supporting that function. For example,

- Step 3c of ES-1.3 questions whether or not the containment sump valves (1SI8811A/B) are open with the obvious intent of determining whether or not the RH pumps can draw water from the containment sump. Both crews interpreted the sump valve as not being open given the presence of dual indication on the 1SI8811A/B valve(s).

- In the RNO step of ES-1.3, Attachment A, step 1, the 1SI8811A was not considered to be capable of providing an adequate suction source for RH pump 1A even though it was considered not to be closed in ES-1.3, Attachment A, step 1. Consequently, RH pump 1A was tripped before 1SI8812A was closed.

- In ES-1.3, Attachment A, step 3e, 1SI8811A was considered to not be open such that it could not support cold leg recirculation mode.

- In ES-1.3, Attachment A, step 6e, 1SI8811B was considered to not be open such that it could not support cold leg recirculation mode.

- In ES-1.3, Attachment A, step 7, both 1SI8811A and B were considered to not be open such that they could not support cold leg recirculation mode.

- In CA-1.1, step 1c, both 1SI8811A and B were considered to not be open such that they could not support cold leg recirculation mode.

Based on the information obtained from the operator interviews and the simulator observations, the conclusion is that a dual indication condition on 1SI8811A/B will result in the interpretation that the valve cannot necessarily support cold leg recirculation mode and that the procedures will ultimately drive them to CA-1.1 where local action to open the valve will be directed.

All of the above is based on the pre-condition that the operators have no information about the actual position of 1SI8811A/B and that the reactor core is not yet threatened. Simulator runs 1 and 3, which were performed on 11/10/2009 and 11/11/2009, demonstrated that while local operation of the 1SI8811A/B valves offered a potential success path to restore cold leg recirculation, the RH pump would not be started until it was verified that 1SI8811A/B was full open. For simulator runs 2 and 4, which were run on the same days, a local check of the 1SI8811A/B valve(s) position was allowed, but a manual stroke of the valve(s) was prohibited due to high rad levels. These scenarios placed the operators in a situation where the only success path was to run the RH pump with the 1SI8811A/B valves in a partially open condition. Both crews dispatched equipment operators to perform a local assessment of the valve's position and when it became obvious to them that they could not prevent core damage without operating the RH pump(s), they elected to start the pumps. Both crews cited the 50.54x guidance that binds them to protect the core even if clear procedure guidance does not exist to direct them to do so. No credit is taken for operating the RH pumps with the 1SI8811A/B valves in a partially open condition even though plant engineering calculations indicate that such an operation would be successful.

SCENARIO DEFINITION

The scenario investigated is based on the NRC SPAR model's dominant CDF contributor for cases when the 1SI8811B valve fails to open, which are small LOCA initiating events with AFW and RCFCs available for heat removal .

The following provides an additional description of the scenario for which this action is evaluated:

1. Initial Conditions: Steady state, full power operation

2. Initiating Events: Small LOCA

3. Accident sequence (preceding functional failures and successes):

Reactor trip successful

Turbine trip successful

AFW operates

Level in RCS drops due to SLOCA

ECCS initiated successfully (both divisions available)

2 trains of containment spray are available, 2 RCFCs running

Transition to cold leg recirculation on low RWST level is initiated, but fails due to failure of 1SI8811A/B to fully open (valve only opens approximately 34%, which fails to satisfy the interlock with the 8804 valve(s)).

4. Preceding operator error or success in sequence:

Early EP-0 actions to confirm actuations performed.

EP-1 actions to ensure adequate ECCS injection performed.

EP-1 action to depressurize and cooldown is initiated, if required.

Transition to recirculation mode started

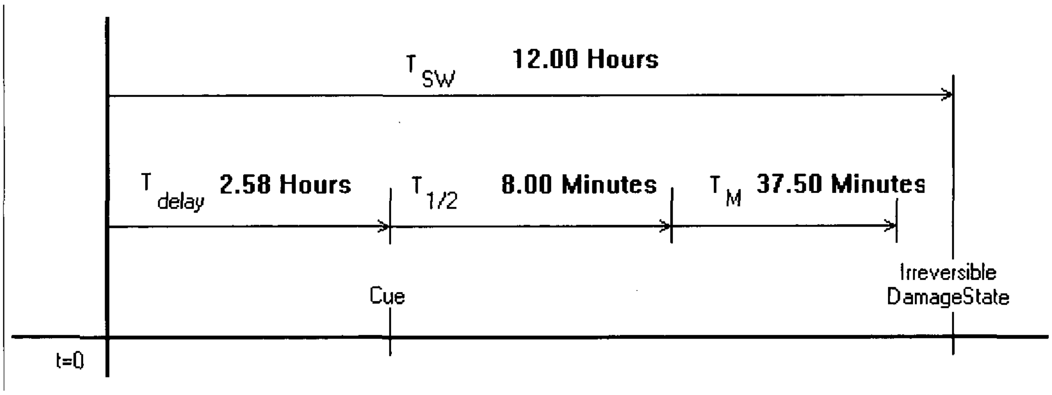
Failure of 1SI8811A/B identified.

5. Operator action success criterion: Locally open 1SI8811A/B and establish cold leg recirculation mode prior RCS level reaching TAF.

6. Key Assumptions: 1) Failure of the 1SI8811A/B valve in the intermediate position is assumed to result in the shutdown of RH pump 1A/B due to lack of a positive suction source when the 1SI8812A/B vavle(s) are closed. Based on this interpretation of the valve's dual indication, the operators would be procedurally bound to perform a local, manual stroke of the valve before restarting RH pump 1A/B and completing the transition to cold leg recirculation. 2) Exelon calculation EC#377204 indicates that if the 1SI8811B had opened approximately 34 full stroke, adequate flow would have been available to perform swap to recirculation mode without action to locally open 1SI8811B. It should be noted that with the 1SI8811A/B valve in an intermediate position, the interlock with 1CV8804A/1SI8804B would not have cleared, but because RCS pressure would be below the RH pump shutoff head by the time recirculation mode was required, the RH pumps would be able to inject directly through the 1SI8809A/B valves and the interlock's status would be inconsequential. However, no direct credit is taken for operation of the RH

pumps with the 1SI8811A/B valves in the intermediate position. 3) By the time recirculation mode is required to be in operation at the end of the system window for this action, RCS pressure would be low enough that only the RH pumps would be required to inject through the 1SI8809A/B valves for the 2" SLOCAs. Because, that this has not been explicitly demonstrated for the entire range of SLOCAs, it is assumed that alignment to the Charging/SI pumps through 1CV8804A/1SI8804B is required for success in all small LOCAs.

Timing:



Timing Analysis: While diagnosis contribution for this HFE has been excluded, the timing information related to the diagnosis of the need to transition to recirculation mode is required to establish the time available for local operation of the 1SI8811A/B valves and any applicable recovery factors. The timeline for this action has been constructed based on the successful diagnosis and interpretation of the dual indication on the 1SI8811A/B valves.

The timing for this action is complicated by the fact that a failure occurs in the equipment that is being used to carry out an action that has already been successfully diagnosed. The diagnosis tasks for the action to swap to recirculation mode and to identify the failure of the 1SI8811B valve to fully open during recirculation alignment are sequential and cannot occur during the same period of time. By definition, the diagnosis of the failed 1SI8811A/B valve(s) occurs only after successful diagnosis of the need to swap to recirculation. This is accounted for in the system window, manipulation time, and cue definitions for this action. Because the availability of time for the local operation of 1SI8811A/B is a factor which can directly impact an HEP, it is necessary to define the timeline for the HEP quantification:

For the SPAR-H execution ratio, the following is assumed: Execution Ratio = T(sw) - T(delay) - T(1/2) / T(m)

Where:

T(delay) = time to 46% RWST level (cue to start transition to swap to recirc mode) + time to reach step 3c of ES-1.3 (accounts for completion of the action to begin the swap to recirc). In this case, that time includes the time to reach 46% RWST level and the time required to reach step 3c of ES-1.3. B/B MAAP run BBSDP17a indicates that the time to reach 46.7% RWST level is 2.54 hours, which is the initial cue to swap to cold leg recirculation mode. Based on simulator runs performed on 11/10/2009 and 11/11/2009, 4 data points were obtained for the time to reach step 3c of ES-1.3: Run 1= 3 minutes, Run 2 = 3 minutes, Run 3 = 2 minutes, Run 4 = 2 minutes. The median time is the average of the two central data points of the even number of trials, or 2.5 minutes ((2+3)/2=2.5). The time T(delay), therefore, is 2.54 hr + 0.04 hr = 2.58 hr.

T(m): The time required to manually stroke the 8811B valve from 34% open to full open has been determined to be 24 minutes. This time is based on an actual stroke of the valve performed by the Braidwood operators during the week of 11/02/2009. In addition, 7.5 minutes has been added to account for the time required to travel to the valve location. The travel time is based on a walkdown performed by the HRA analyst on 11/11/2009 and accounts for the time to travel from the EO ready room to the MCR to obtain a key for high rad area access (30 seconds travel, 30 seconds assumed to get key), the time to travel to the Auxiliary Building entrance (3 minutes), the time to travel from the Auxiliary Building entrance to valve 1SI8811B (3 minutes), and the time to climb the ladder to reach the handwheel on 1SI8811B (30 seconds). The time required for completing the steps to initiate cold leg recirculation mode is assumed to be 6 minutes based on operator interviews performed on 5/23/2007. This time includes all nominal steps to transition to recirculation mode, which may be required in SLOCA cases. The total manipulation time is, therefore, 37.5 minutes (7.5 minutes of travel time, 24 minutes for valve stroke, 6 minutes for the steps to complete swap to recirc).

T(sw): The time for RCS level to reach TAF is used as the end of the system window for this action. B/B MAAP run BBSDP17a indicates that 12.00 hours are available to reach TAF in a small LOCA scenario from the initiating event.

T(1/2): Based on simulator runs performed on 11/10/2009 and 11/11/2009, 4 data points were obtained for the time to begin the response (command to open valve, not just check the valves status) from the time that step 3c of ES-1.3 was reached. The results of the simulator runs showed the following: Run 1= 8 minutes, Run 2 = 6 minutes, Run 3 = 8.minutes, Run 4 = 2 minutes. Because 2 crews were used to perform 4 simulator runs and the second run for each crew was highly similar to the first, it was expected that some degree of anticipation of the upcoming events would occur. As a result, the T(1/2) estimate for this case is based on the average of runs 1 and 3, the first run of the scenarios for each crew. T(1/2) = 8 minutes ((8 min + 8 min) / 2 = 8 min).

Time available for recovery: 519.70 Minutes

SPAR-H Available time (cognitive): 527.70 Minutes

SPAR-H Available time (execution) ratio: 14.86

Minimum level of dependence for recovery: ZD

PART I. DIAGNOSIS

No Part I

Diagnosis HEP:

0.0e+00

PART II. ACTION

PSFs	PSF Levels		Multiplier for Diagnosis
Available Time **(recommended choice based on timing information in bold)**	Inadequate Time		P(failure) = 1.0
	Time available is ~ the time required		10
	Nominal time		1
	Time available >= 5x the time required	X	0.1
	Time available >= 50x the time required		0.01
	Insufficient Information		1
	Refer to the timing analysis.		
Stress/Stressors	Extreme	X	5
	High		2
	Nominal		1
	Insufficient Information		1
	The scenario to which this action is applied is a Small LOCA event for which high pressure injection is successful. After injecting for about 2.5 hours, the RWST low level alarm would be reached.		

	While the LOCA event is a high stress scenario, the successful control of the plant over the 2 to 3 hour cooldown time is considered to significantly reduce the level of stress. At the time the swap to recirculation mode would occur, the work load would be relatively low, the diagnosis of the need to swap to recirculation mode would have been successfully made, and the transition would be proceeding in an orderly manner until the 8811A/B valves are actuated. The failure of the 1SI8811A/B valve(s) to stroke would introduce an additional level of stress given that a suction path from the containment sump to the RH pumps is required to maintain the reactor in a stable state. The equipment operators would be required to enter the Auxiliary Building to manually operate the valve, which is potentially a high rad/high temperature area. Exelon calc ECR 392870 indicates that the expected dose rate for a medium LOCA, which would bound the SLOCA case, would be 1,444 mRem/hr. With a potential exposure time of up to 30 minutes, which is greater than the manipulation time for the local action, the accumulated dose would be below the administrative dose limit of 2000 m/Rem established in RP-AA-203. While the accumulated dose would not preclude this action from being performed, "extreme" stress is chosen to account for the difficult working conditions, even though many hours would be available to perform the manipulation before the core would be jeopardized.		
Complexity	Highly complex		5
	Moderately complex	X	2
	Nominal		1
	Insufficient Information		1
	Manual operation of a valve is a straightforward task with which the operators are familiar through training and similar tasks performed as part of normal plant operations, but the physical requirements of opening the valve are potentially challenging. In order to manually stroke the valve, it is necessary to stand on top of the valve's enclosure in a semi confined area and turn a handwheel that is located at face level. Elevated temperatures in the area during a LOCA evolution could contribute to some discomfort during the operation, but it is not expected to be prohibitive in any way for the SLOCA scenario. The valve area is well lit and the open stem design provides a clear indication of the valve's position. With regard to valve identification, the valve is tagged with a label that is easy to read, but more importantly, it is highly unique and could not be mistaken for any other valve in the area. The"A" and "B" 1SI8811 valves are on the same elevation, but they are separated by at least 30 yards and are accessed by turning different directions upon entry into the curved wall area. While the action		

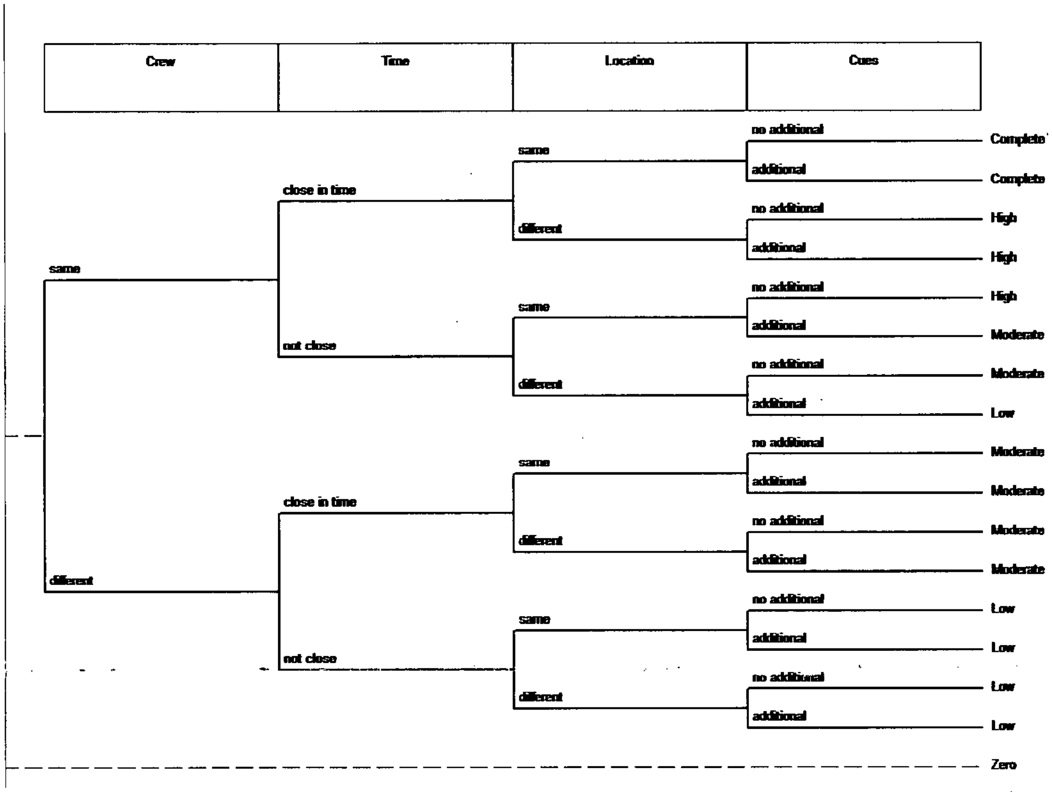
	itself is a straightforward manipulation on a highly unique valve, the action is considered to be "moderately complex" due to the position the equipment operator must be in to perform the valve stroke and the length of time that is required to complete the stroke (24 minutes from 34%). Once the valve is open, the remainder of the task is a highly trained action and is not considered to significantly contribute to difficulty of the action.		
Experience/Training	Low		3
	Nominal	X	1
	High		0.5
	Insufficient Information		1
	Refer to the "Experience/Training" portion of the "Basic Event Context" discussion.		
Procedures	Not available		50
	Incomplete		20
	Available, but poor		5
	Nominal	X	1
	Insufficient Information		1
	Step 1c RNO of CA-1.1 directs local operation of 1SI8811A/B to be performed once it has been determined that it cannot be opened remotely. No additional procedures are required for a valve manipulation. Assessed as "nominal".		
Ergonomics/HMI	Missing/Misleading		50
	Poor	X	10
	Nominal		1
	Good		0.5
	Insufficient Information		1
	As identified in the "complexity" discussion for the execution task, the valve is highly unique such that mistaking it for another valve is a negligible concern, but the position the operator has to be in to stroke the valve is challenging. The footing is narrow (about 2.5 feet), semi-confined, and the handwheel is at face level, which makes operation slow and difficult relative to a floor mounted valve with the handwheel at waist level. During an accident, the area may be at elevated temperature and radiation levels. While these		

	factors may be a cause for some discomfort and stress, they are not expected to be prohibitive or even a large concern for small LOCA scenarios. Overall, this is considered to be an example of relatively "poor" human-machine interface conditions.		
Fitness for Duty	Unfit		P(failure) = 1.0
	Degraded Fitness		5
	Nominal	X	1
	Insufficient Information		1
	No fitness for duty issues have been identified. The nominal case is used.		
Work Processes	Poor		5
	Nominal	X	1
	Good		0.5
	Insufficient Information		0.5
	For emergency situations, operator interviews performed on 11/10/2009 and 11/11/2009 indicate that there would be no requirement to "dress-out" before entering the Auxiliary Building to perform the manual valve stroke, which is well known to the operators. With regard to access to the Auxiliary Building (high rad area), the equipment operators would be required to obtain a key from the MCR for entry. This is not an unusual situation and given the proximity of the equipment operator ready room to the MCR, it does not significantly impact the manipulation time for valve operation. Radio communication would be available between the MCR and the equipment operator. No work process issues have been identified that would impact the performance of the manual stroke of 1SI8811A/B.		

Action Probability:

9.9e-03 [Adjustment applied: 1.0E-3 * 1.0e+01 / (1.0E-3 * (1.0e+01 - 1) + 1)]

PART III. DEPENDENCY



Task Failure WITHOUT Formal Dependence:

9.9e-03

Task Failure WITH Formal Dependence:

9.9e-03

4.3 1SI8811BM-BHPMOA, FAILURE TO OPEN VLV 1SI8811B AFTER REMOTE FAILURE (LOCAL-MANUAL, MLOCA)

Analyst:	DEM
Rev. Date:	12/10/09
Reviewer:	
Cognitive Method:	CBDTM/THERP
Analysis Database:	bwd-8811-121009.HRA (12/10/09, 1675264 Bytes)

Table 5: 1SI8811BM-BHPMOA SUMMARY

Analysis Results:	**without Recovery**	**with Recovery**
P_{exe}	6.7e-02	6.0e-03
Total HEP		6.0e-03
Error Factor		5

Related Human Interactions:

Follows success of nominal action to begin the swap to recirculation mode.

Initial Cue:

Procedure direction - CA-1.1, step 1c, RNO

Recovery Cue:

Cue:

Procedures require the operators to confirm that the SI8811A/B valve is open during recirculation alignment.

Degree of Clarity of Cues & Indications:

Average

Procedures:

Cognitive: Not Selected

Execution: BwCA-1.1 (Loss of Emergency Coolant Recirculation) Revision: 202

Other: Not Selected

Cognitive Procedure:

Step: Not Applicable

Instruction:

Procedure Notes:

Typically, both execution and diagnosis errors are included as part of a post initiator HRA. In some cases, however, there are conditions that preclude the applicability of one of these components of the HEP.

For scenarios in which the 1SI8811A/B valve fails to completely stroke and both the "open" and "closed" lights are illuminated (dual indication), it is recognized that the operators must interpret the dual indication and make a decision about how to proceed. However, their decision regarding the valve's status is unimportant given that any interpretation results in a successful outcome.

- 1SI8811A/B interpreted as "NOT OPEN": operator directed to close 1SI8812A/B, open 1SI8811A/B locally, and establish cold leg recirculation.

- 1SI8811A/B interpreted as "OPEN": The RH pumps would remain running, 1SI8812A/B directed to be closed, and injection would be provided to the RCS via the 1SI8809A/B valve(s). For transient scenarios or for SLOCAs where the transition to cold leg recirculation is attempted at the time of the 46% RWST level cue, the procedures still provide a success path as they direct local operation of the 1CV8804A/1SI8804B valves (bypasses interlock with 1SI8811A/B) and the establishment of flow using the SI/Charging pumps.

These paths are described in more detail below:

Scenario 1, 1SI8811A/B considered to be "not open" in ES-1.3 step 3c:

If the 1SI8811A/B valve is considered to be "not open" in ES-1.3 step 3c, the operators are transferred to Attachment A. In Attachment A, step 1 questions whether or not the 1SI8811A valve is closed. If it is determined to be "not closed", the RNO action is to close 1SI8812A, which would terminate an "A" division flow diversion from the RWST to the sump. The RNO then transfers to step 4, which includes similar guidance for the "B" division. The RNO is step 4 transfers to Step 7, which in turn transfers to BwCA-1-1 where step 1c directs local closure of 1SI8811A/B.

If the opposite interpretation of the 1SI8811A/B valve'(s) status is made in Attachment A, step 1 of ES-1.3 (valve is "closed"), the operators are directed through steps 2 and 3, which attempt manual, remote operation of 1SI8811A. Step 3b closes 1SI8812A, which would terminate a flow diversion, and step 3e directs 1SI8811A to be opened. Whether or not 1SI8811A is considered to be open, the procedure path leads to step 4 where a similar process is started for the "B" division. On completion of the "B" division steps, step 7 is reached where the transfer to 1BwCA-1.1 occurs and the direction to perform the local stroke of 1SI8811A/B is given.

Scenario 2, 1SI8811A/B considered to be "open" in ES-1.3 step 3c:

In the event that the 1SI8811A/B valve(s) is believed/considered to be "open" in ES-1.3 step 3c, step 3d directs closure of the 1SI8812A/B valves, which would terminate the flow diversion from the RWST to the sump. At this point, the RH pumps would be running with suction only aligned through the partially open 1SI8811A/B valves. For MLCOA events, this may allow injection through the 1SI8809A/B valves without further action; however, assuming that RCS pressure is too high for injection, the procedure continues in steps 4 and 5 to align RH to the SI/Charging system suction path. In steps 5f and 5h, the direction is given to open the 1CV8804A and 1SI8804B valves, respectively. These valves are interlocked with 1SI8811A/B and would not open with 1SI8811A/B in an intermediate position. The RNO for steps 5f and 5g direct local operation of valves 1CV8804A and 1SI8804B valves, which are smaller and more easily operated than the 1SI8811A/B valves. Locally stroking the 1CV8804A/1SI8804B valve would provide an alternate success path given that suction would be available through the partially open 1SI8811A/B valves.

If, for some reason, it was decided that there was no viable suction path for the SI/Charging pumps and that emergency coolant recirculation was lost/unavailable, the continuous action statement to transfer to BwCA-1.1 would be followed where local operation of the 1SI8811A/B valve(s) would be directed.

In summary, from the point where dual indication on 1SI8811A/B is encountered at ES-1.3 step 3c, any procedure path taken will isolate the flow diversion path from the RWST to the containment sump by closing 1SI8812A/B and emergency coolant recirculation will be established by opening either 1SI8811A/B or 1CV8804A/1SI8804B locally. No significant diagnosis is required to either close

1SI8812A/B or to open 1SI8811A/B; these actions are directed as a matter of course in a procedure path that has already been initiated.

TRAINING:

Based on simulator observations and operator interviews, scenario 1 is the expected evolution. There are a number of scenarios utilized in the simulator in both initial and continuing training that exercise these portions of the procedures.

For ILT: Scenario P-18.1 Involves failure of SI8811 valve to open and exercises _BwCA-1.1

Scenario C-2.2 Involves failure of SI8811 valve to open and exercises _BwCA-1.1

Scenario E-7.2 Involves failure of SI8811 valve to open and exercises ES-1.3, Attachment A to open valve

Scenario E-9.2 Involves failure of SI8811 valve to open and exercises ES-1.3, Attachment A to open valve

For LORT (Going back just the last few years)

Scenario 0711 Involves failure of SI8812 valve to close and exercises ES-1.3, Attachment A to close the valve

Scenario 0716 Involves NSO Only training on _BwEP ES-1.3, transfer to CL Recirc

Scenario 0765 Involves LBLOCA, transition to CL Recirc and local operation of 0SX007

Scenario 0811 Involves failure of both SI8811 valves to open and exercises _BwCA-1.1, including dispatching operators to "locally" open the valve.

Scenario 0843 Involves LBLOCA and transition to _BwEP ES-1.3, followed by sump blockage and transition to 1BwCA-1.3

Scenario 0866 Involves containment bypass and exercises _BwCA-1.1

Scenario 0916 Involves LBLOCA, and transfer to CL Recirc, transfer to HL Recirc

Scenario 0936-2 Involves NSO training on _BwEP ES-1.3, transfer to CL Recirc with failure of _SI8812 to close (Timed scenario)

Scenario 0943 Involves Involves LBLOCA, transition to CL Recirc

Scenario 0965 Involves LBLOCA, failure of 1SI8811B, transition to 1BwCA-1.1 and local opening of 1SI8811B

Scenario 0931 OOB Evaluation of DB LBLOCA and failure of 1SI8812 to close. Timed Scenario - ALL crews PASSED

Equipment Operator (EO) training on local valve operation occurs primarily in the generic fundamentals phase, Components chapter 1, which covers the construction and operation of MOVs. Various local valve operations are covered in a sampling of EOP Lesson plans but only general direction is covered.

In summary, the RO/SRO training program addresses the specific scenario in which the 8811A/B valves fail to open remotely as well as other scenarios that require local operation of the other valves. These scenarios, as well as others, are included in both initial qualification exercises and the continuing training program. EOs are trained generically to operate MOVs locally. While there is not a specific lesson plan covering 11/2SI8811A/B local operation, the generic training is applicable to those valves.

Training:

Classroom, Frequency: 0.5 per year

Simulator, Frequency: 0.5 per year

JPM Procedure:

Not Selected

Identification and Definition:

This HFE represents the probability that the operators will fail to locally open the failed 1SI8811A/B valves and complete the transition to cold leg recirculation given that the swap to recirculation mode has been initiated.

The scenario evaluated for this HFE is an MLOCA event, which is a top contributors in both the Braidwood PRA and the NRC SPAR model. The following provides an additional description of the scenario for which this action is evaluated:

The following provides an additional description of the scenario for which this action is evaluated:

1. Initial Conditions: Steady state, full power operation

2. Initiating Events: Medium LOCA

3. Accident sequence (preceding functional failures and successes):

Reactor trip successful

Turbine trip successful

AFW operates

Level in RCS drops due to MLOCA

ECCS initiated successfully (both divisions available)

2 trains of containment spray are available, 2 divisions of RCFCs running (4 fans).

Transition to cold leg recirculation on low RWST level fails due to failure of 1SI8811B to fully open (valve only opens approximately 34%, which fails to satisfy the interlock with the 8804 valve(s)).

4. Preceding operator error or success in sequence:

Early EP-0 actions to confirm actuations performed.

EP-1 actions to ensure adequate ECCS injection performed.

EP-1 action to depressurize and cooldown not required due to impact of break

Transition to recirculation mode started

Failure of 1SI8811A/B identified.

5. Operator action success criterion: Locally open 1SI8811A/B and establish cold leg recirculation mode prior RCS level reaching TAF.

Key Assumptions:

1) Failure of the 1SI8811B valve in the intermediate position is assumed to result in the shutdown of RH pump 1B due to lack of a positive suction source. Based on this interpretation of the valve's dual indication, the operators would be procedurally bound to perform a local, manual stroke of the valve before restarting RH pump 1B and completing the transition to cold leg recirculation. 2) Exelon calculation EC#377204 indicates that if the 1SI8811B had opened approximately 34 full stroke, adequate flow would have been available to perform swap to recirculation mode without action to locally open 1SI8811B. It should be noted that with the 1SI8811A/B valve in an intermediate position, the interlock with 1CV8804A/1SI8804B would not have cleared, but because RCS pressure would be below the RH pump shutoff head by the time recirculation mode was required, the RH pumps would be able to inject directly through the 1SI8809A/B valves and the interlock's status would be inconsequential. However, no direct credit is taken for operation of the RH pumps with the 1SI8811A/B valves in the intermediate position.

Operator Interview Insights:

OPERATOR INTERVIEWS AND SIMULATOR OBSERVATIONS:

For cases in which both the open ("O") and the closed ("-") position indictors are simultaneously illuminated for a given valve, operator interviews performed on 11/10/2009 and 11/11/2009 universally demonstrated that it was understood this represented a condition in which the actual position of the valve is unknown and that alternative means would be required to determine the valve's position. What was also demonstrated in the interviews and during the simulator observations was that interpretation of the valve's status with regard to responding to procedures was considered to be case specific.

For example, ES-1.3, Attachment A, step 1 questions whether or not the 1SI8811A valve is closed and the two crews interpreted the dual indication differently; one crew treated it as "closed" and the other as "not closed". In the latter case, when 1SI8811A was considered "not closed" and the RNO action to close 1SI8812A was reached, it was recognized that with 1SI8811A in an undetermined state, closing 1SI8812A would potentially isolate RH pump 1A from all viable suction sources and RH pump 1A was tripped to protect it. If the valve is considered closed, the procedures attempt to manually open the valve from the control room. This path includes a step to trip RH pump 1A when 1SI8812A is closed. If 1SI8811A cannot subsequently be opened, the RH pump is left in the tripped position (same as previous case). Ultimately, either classification of the 1SI8811A valve's status ("closed" or "not closed") would lead to step 7 of Attachment A, where the operators are directed to CA-1.1 and the direction to locally open valve(s) 1SI8811A/B.

While a divergence of opinion appeared to exist on the classification a valve with dual indication in ES-1.3, Attachment A, step 1, what was clear was that the indeterminate status of the valve was consistently treated in a conservative manner. ES-1.3, Attachment A, step 1 is not directly questioning whether or not the position of the valve can lead to a success or failure of a particular function and as a result, a difference in the classification of the valve's status was noted. However, for the cases where the status for the valve was directly related to whether or not it could fulfill a required function, the valves was not considered to be capable of supporting that function. For example,

- Step 3c of ES-1.3 questions whether or not the containment sump valves (1SI8811A/B) are open with the obvious intent of determining whether or not the RH pumps can draw water from the containment sump. Both crews interpreted the sump valve as not being open given the presence of dual indication on the 1SI8811A/B valve(s).

- In the RNO step of ES-1.3, Attachment A, step 1, the 1SI8811A was not considered to be capable of providing an adequate suction source for RH pump 1A even though it was considered not to be closed in ES-1.3, Attachment A, step 1. Consequently, RH pump 1A was tripped before 1SI8812A was closed.

- In ES-1.3, Attachment A, step 3e, 1SI8811A was considered to not be open such that it could not support cold leg recirculation mode.

- In ES-1.3, Attachment A, step 6e, 1SI8811B was considered to not be open such that it could not support cold leg recirculation mode.

- In ES-1.3, Attachment A, step 7, both 1SI8811A and B were considered to not be open such that they could not support cold leg recirculation mode.

- In CA-1.1, step 1c, both 1SI8811A and B were considered to not be open such that they could not support cold leg recirculation mode.

Based on the information obtained from the operator interviews and the simulator observations, the conclusion is that a dual indication condition on 1SI8811A/B will result in the interpretation that the valve cannot necessarily support cold leg recirculation mode and that the procedures will ultimately drive them to CA-1.1 where local action to open the valve will be directed.

All of the above is based on the pre-condition that the operators have no information about the actual position of 1SI8811A/B and that the reactor core is not yet threatened. Simulator runs 1 and 3, which were performed on 11/10/2009 and 11/11/2009, demonstrated that while local operation of the 1SI8811A/B valves offered a potential success path to restore cold leg recirculation, the RH pump would not be started until it was verified that 1SI8811A/B was full open. For simulator runs 2 and 4, which were run on the same days, a local check of the 1SI8811A/B valve(s) position was allowed, but a manual stroke of the valve(s) was prohibited due to high rad levels. These scenarios placed the operators in a situation where the only success path was to run the RH pump with the 1SI8811A/B valves in a partially open condition. Both crews dispatched equipment operators to perform a local assessment of the valve's position and when it became obvious to them that they could not prevent core damage without operating the RH pump(s), they elected to start the pumps. Both crews cited the 50.54x guidance that binds them to protect the core even if clear procedure guidance does not exist to direct them to do so. No credit is taken for operating the RH pumps with the 1SI8811A/B valves in a partially open condition even though plant engineering calculations indicate that such an operation would be successful.

Manpower Requirements:

Operations:	Shift Manager	1	1
	Shift Supervisor:	1	0
	STA:	1	0
	Reactor operators:	2	1
	Plant operators:	2	1
Maintenance:	Mechanics:	2	0
	Electricians:	2	0
	I&C Technicians:	2	0
Health Physics:	Technicians:	2	1
Chemistry:	Technicians:	1	0

Execution Performance Shaping Factors:

Environment:	Lighting	Normal
	Heat/Humidity	Hot / Humid
	Radiation	Yellow
	Atmosphere	Normal

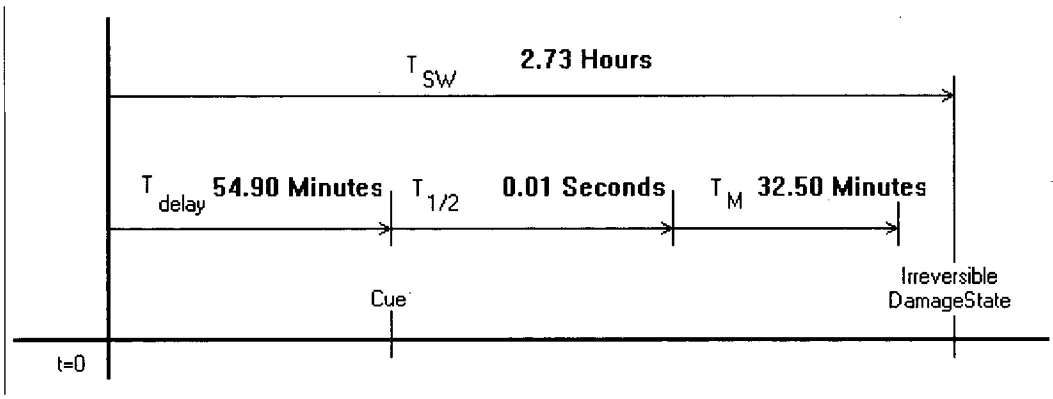
Special Requirements:		
Complexity of Response:	Cognitive	Complex
	Execution	Complex
Equipment Accessibility:	Main Control Room	Accessible
	Unit 1 Containment Pipe Penetration Area	Accessible
Stress:	**High**	
	Plant Response As Expected:	No
	Workload:	N/A
	Performance Shaping Factors:	N/A

Performance Shaping Factor Notes:

Failure of the 1SI8811A/B valve(s) presents an unexpected condition in the plant (plant response is NOT as expected).

With regard to rad levels at the valve and access considerations, Exelon calc ECR 392870 indicates that the expected dose rate for a medium LOCA would be 1,444 mRem/hr. With a potential exposure time of up to 30 minutes, which is greater than the manipulation time for the local action, the accumulated dose would be below the administrative dose limit of 2000 m/Rem established in RP-AA-203. While this would not prevent local valve action, entering a potentially high rad area with elevated temperatures is considered to contribute to a high stress environment.

Timing:



Timin
g Analysis: While diagnosis contribution for this HFE has been excluded, the timing information related to the diagnosis of the need to transition to recirculation mode is required to establish the time available for local operation of the 1SI8811A/B valves and any applicable recovery factors. The timeline for this action has been constructed based on the successful diagnosis and interpretation of the dual indication on the 1SI8811A/B valves.

The timing for this action is complicated by the fact that a failure occurs in the equipment that is being used to carry out an action that has already been successfully diagnosed. The diagnosis tasks for the action to swap to recirculation mode and to identify the failure of the 1SI8811B valve to fully open during recirculation alignment are sequential and cannot occur during the same period of time. By definition, the diagnosis of the failed 1SI8811A/B valve(s) occurs only after successful diagnosis of the need to swap to recirculation. This is accounted for in the system window, manipulation time, and cue definitions for this action. For THERP, timing considerations are limited beyond the assessment that sufficient time is available to perform the action, but the dependence levels assignments of the recovery actions are potentially impacted by the timing.

T(m): The time required to manually stroke the 8811B valve from 34% open to full open has been determined to be 24 minutes. This time is based on an actual stroke of the valve performed by the Braidwood operators during the week of 11/02/2009. In addition, 7.5 minutes has been added to account for the time required to travel to the valve location. The travel time is based on a walkdown performed by the HRA analyst on 11/11/2009 and accounts for the time to travel from the EO ready room to the MCR to obtain a key for high rad area access (30 seconds travel, 30 seconds assumed to get key), the time to travel to the Auxiliary Building entrance (3 minutes), the time to travel from the Auxiliary Building entrance to valve 1SI8811B (3 minutes), and the time to climb the ladder to reach the handwheel on 1SI8811B (30 seconds). The time required for completing the steps to initiate cold leg recirculation mode is less than 1 minute based on simulator runs observed on 11/10/2009 and 11/11/2009. Once the 1SI8811A/B valve is open, the operators are returned to ES-1.3, Attachment A, Step 7, which directs the operators to check that a train of recirculation has been established. This requires the start of the RH pump corresponding to the 1SI8811 valve that was successfully opened. Start of the RH pump will result in flow from the sump, to the pump, through the Hx, and to the cold leg through valve 1SI8809A/B because the MLOCA has depressurized the RCS below the RH shutoff head. The total manipulation time is, therefore, 32.5 minutes (7.5 minutes of travel time, 24 minutes for valve stroke, 1 minute for the step to complete swap to recirc).

T(sw): The time for RCS level to reach TAF is used as the end of the system window for this action. B/B MAAP run BBSDP15a indicates that 2.73 hours are available to reach TAF in a medium LOCA scenario from the initiating event.

T(delay) = time to 46% RWST level (cue to start transition to swap to recirc mode) + time to reach the command to open the 1SI8811A/B valve locally (accounts for completion of the action to begin the swap to recirc and respond to the dual indication on 1SI8811A/B). In this case, that time includes the time to reach 46% RWST level and the time required to reach step 1c of BwCA-1.1. B/B MAAP run BBSDP15a indicates that the time to reach 46.7% RWST level is 44.4 minutes, which is the initial cue to swap to cold leg recirculation mode. Based on simulator runs performed on 11/10/2009 and 11/11/2009, 4 data points were obtained for the time to reach the point where the direction was given to locally stroke the 1SI8811A/B valve: Run 1= 11 minutes, Run 2 = 9 minutes, Run 3 = 10 minutes, Run 4 = 4 minutes. Because 2 crews were used to perform 4 simulator runs and the second run for each crew was highly similar to the first, it was expected that some degree of anticipation of the upcoming events would occur. As a result, the T(1/2) estimate for this case is based on the average of runs 1 and 3, the first run of the scenarios for each crew. T(1/2) = 10.5 minutes ((11 min + 10 min) / 2 = 10.5 min). The time T(delay), therefore, is 44.4 minutes + 10.5 minutes = 54.9 minutes

T(1/2): The HRAC uses the median response time in the assessment of recovery dependence levels, but this is accounted for by the cue structure here. T(1/2) has been set to 0.01 seconds (to prevent an HRAC error message).

Time available for recovery: 76.40 Minutes

SPAR-H Available time (cognitive): 76.40 Minutes

SPAR-H Available time (execution) ratio: 3.35

Minimum level of dependence for recovery: ZD

Execution Unrecovered

1SI8811BM-BHPMOA

Table 6: 1SI8811BM-BHPMOA EXECUTION UNRECOVERED

Procedure: BwCA-1.1, Loss of Emergency Coolant Recirculation		Comment				Stress Factor	Over Ride
Step No.	Instruction/Comment	Error Type	THERP Table	THERP Item	HEP		
ES-1.3, step 3a	Place control switches for SVAG valves 480V bus feeds at 1PM06J in - CLOSE	The "A" and "B" divisions are completely dependent.				5	
	--	EOM	20-7b	2	1.3E-3		
		EOC	20-12	5	1.3E-3		
		EOC	20-12	4	1.3E-3		
						Total Step HEP	2.0e-02
ES1.3, At A, s1 RNO	Perform the following: a: Manually or locally close RH Pump 1A suction from RWST isol valve: 1SI8812A	The operators Step 4 of ES-1.3, Attachment A directs the same action for the "B" division. The "A" and "B" divisions are completely dependent.				5	
	--	EOM	20-7b	2	1.3E-3		
		EOC	20-12	4	1.3E-3		
		EOC	20-12	5	1.3E-3		
						Total Step HEP	2.0e-02

CA-1.1, Step 1.c-RNO	Dispatch an operator to open at least one valve: -1SI8811A (364' U13 CWA), -1SI8811B (364' X13 CWA)					5	
	--	EOM	20-7b	1	4.3E-4		
		EOC	20-13	1	1.3E-3		
						Total Step HEP	8.7e-03
CA-1.1, Step 1.e RNO	When one train is restored, then return to procedure and step in effect.	CA-1.1, Step 1.e RNO is a continuous action statement that will send the operators back to ES-1.3, Attachment A, Step 7, which requires the operators to confirm the status of the valve via the direction "check at least 1 CNMT sump recirc flowpath established". Because the entire focus of the MCR is on the progress of opening the 1SI8811A/B valve, the continuous action statement would not be overlooked.				5	
	--	EOM	20-7b	1	4.3E-4		
						Total Step HEP	2.2e-03
ES-1.3, ATT A Step 7	CHECK AT LEAST ONE CNMT SUMP RECIRC FLOWPATH ESTABLISHED	When CA-1.1 returns the operators to ES-1.3 after 1SI8811A/B is opened, this step would result in the start of an RH pump. Because the MLOCA depressurizes the reactor below the RH pump shutoff head, this is the only step required to initiate CL recirculation.				5	
	--	EOM	20-7b	2	1.3E-3		
		EOC	20-12	3	1.3E-3		
		EOC	20-12	5	1.3E-3		
						Total Step HEP	2.0e-02
EXEC RECOV - ICR	EXEC RECOV - ICR	See Section 4.4 of the HRA Notebook for further information. This execution recovery factor is applied to the individual execution steps with a dependence factor based on the time available for recovery. Note that the execution stress factors applied to the execution subtasks are not applied to the execution				5	0.1

		recovery factor.					
	–	EOM	20-7b	2	1.3E-3		
						Total Step HEP	1.0e-01

Execution Recovery

1SI8811BM-BHPMOA

Table 7: 1SI8811BM-BHPMOA EXECUTION RECOVERY

Critical Step No.	Recovery Step No.	Action	HEP (Crit)	HEP (Rec)	Dep.	Cond. HEP (Rec)	Total for Step
ES-1.3, step 3a		**Place control switches for SVAG valves 480V bus feeds at 1PM06J in - CLOSE**	**2.0e-02**				**2.0e-03**
	EXEC RECOV - ICR	EXEC RECOV - ICR		1.0e-01	ZD	1.0e-01	
ES1.3, At A, s1 RNO		**Perform the following: a. Manually or locally close RH Pump 1A suction from RWST isol valve: 1SI8812A**	**2.0e-02**				**2.0e-03**
	EXEC RECOV - ICR	EXEC RECOV - ICR		1.0e-01	ZD	1.0e-01	
CA-1.1, Step 1.c-RNO		**Dispatch an operator to open at least one valve: -1SI8811A (364' U13 CWA), -1SI8811B (364' X13 CWA)**	**8.7e-03**				**1.9e-05**
	CA-1.1, Step 1.e RNO	When one train is restored, then return to procedure and step in effect.		2.2e-03	ZD	2.2e-03	
ES-1.3, ATT A Step 7		**CHECK AT LEAST ONE CNMT SUMP RECIRC FLOWPATH ESTABLISHED**	**2.0e-02**				**2.0e-03**
	EXEC RECOV - ICR	EXEC RECOV - ICR		1.0e-01	ZD	1.0e-01	
		Total Unrecovered:	**6.7e-02**			**Total Recovered:**	**6.0e-03**

4.4 1SI8811BMSBHPMOA, FAILURE TO OPEN VLV 1SI8811B AFTER REMOTE FAILURE (LOCAL-MANUAL, MLOCA, SPAR-H)

Analyst:	DEM
Rev. Date:	12/10/09
Reviewer:	
Cognitive Method:	SPAR-H
Analysis Database:	bwd-8811-121009.HRA (12/10/09, 1675264 Bytes)

Table 8: 1SI8811BMSBHPMOA SUMMARY

Analysis Results:	**Cognitive**	**Execution**
Failure Probability	0.0e+00	9.1e-02
Total HEP		9.1e-02

Plant:

Braidwood

Initiating Event:

MLOCA

Basic Event Context:

Typically, both execution and diagnosis errors are included as part of a post initiator HRA. In some cases, however, there are conditions that preclude the applicability of one of these components of the HEP.

For scenarios in which the 1SI8811A/B valve fails to completely stroke and both the "open" and "closed" lights are illuminated (dual indication), it is recognized that the operators must interpret the dual indication and make a decision about how to proceed. However, their decision regarding the valve's status is unimportant given that any interpretation results in a successful outcome.

- 1SI8811A/B interpreted as "NOT OPEN": operator directed to close 1SI8812A/B, open 1SI8811A/B locally, and establish cold leg recirculation.

- 1SI8811A/B interpreted as "OPEN": The RH pumps would remain running, 1SI8812A/B directed to be closed, and injection would be provided to the RCS via the 1SI8809A/B valve(s). For transient scenarios or for SLOCAs where the transition to cold leg recirculation is attempted at the time of the 46% RWST level cue, the procedures still provide a success path as they direct local operation of the 1CV8804A/1SI8804B valves (bypasses interlock with 1SI8811A/B) and the establishment of flow using the SI/Charging pumps.

These paths are described in more detail below:

Scenario 1, 1SI8811A/B considered to be "not open" in ES-1.3 step 3c:

If the 1SI8811A/B valve is considered to be "not open" in ES-1.3 step 3c, the operators are transferred to Attachment A. In Attachment A, step 1 questions whether or not the 1SI8811A valve is closed. If it is determined to be "not closed", the RNO action is to close 1SI8812A, which would terminate an "A" division flow diversion from the RWST to the sump. The RNO then transfers to step 4, which includes similar guidance for the "B" division. The RNO is step 4 transfers to Step 7, which in turn transfers to BwCA-1-1 where step 1c directs local closure of 1SI8811A/B.

If the opposite interpretation of the 1SI8811A/B valve'(s) status is made in Attachment A, step 1 of ES-1.3 (valve is "closed"), the operators are directed through steps 2 and 3, which attempt manual, remote operation of 1SI8811A. Step 3b closes 1SI8812A, which would terminate a flow diversion, and step 3e directs 1SI8811A to be opened. Whether or not 1SI8811A is considered to be open, the procedure path leads to step 4 where a similar process is started for the "B" division. On completion of the "B" division steps, step 7 is reached where the transfer to 1BwCA-1.1 occurs and the direction to perform the local stroke of 1SI8811A/B is given.

Scenario 2, 1SI8811A/B considered to be "open" in ES-1.3 step 3c:

In the event that the 1SI8811A/B valve(s) is believed/considered to be "open" in ES-1.3 step 3c, step 3d directs closure of the 1SI8812A/B valves, which would terminate the flow diversion from the RWST to the sump. At this point, the RH pumps would be running with suction only aligned through the partially open 1SI8811A/B valves. For MLCOA events, this may allow injection through the 1SI8809A/B valves without further action; however, assuming that RCS pressure is too high for injection, the procedure continues in steps 4 and 5 to align RH to the SI/Charging system suction path. In steps 5f and 5h, the direction is given to open the 1CV8804A and 1SI8804B valves, respectively. These valves are interlocked with

1SI8811A/B and would not open with 1SI8811A/B in an intermediate position. The RNO for steps 5f and 5g direct local operation of valves 1CV8804A and 1SI8804B valves, which are smaller and more easily operated than the 1SI8811A/B valves. Locally stroking the 1CV8804A/1SI8804B valve would provide an alternate success path given that suction would be available through the partially open 1SI8811A/B valves.

If, for some reason, it was decided that there was no viable suction path for the SI/Charging pumps and that emergency coolant recirculation was lost/unavailable, the continuous action statement to transfer to BwCA-1.1 would be followed where local operation of the 1SI8811A/B valve(s) would be directed.

In summary, from the point where dual indication on 1SI8811A/B is encountered at ES-1.3 step 3c, any procedure path taken will isolate the flow diversion path from the RWST to the containment sump by closing 1SI8812A/B and emergency coolant recirculation will be established by opening either 1SI8811A/B or 1CV8804A/1SI8804B locally. No significant diagnosis is required to either close 1SI8812A/B or to open 1SI8811A/B; these actions are directed as a matter of course in a procedure path that has already been initiated.

EXPERIENCE/TRAINING:

There are a number of scenarios utilized in the simulator in both initial and continuing training that exercise these portions of the procedures.

For ILT: Scenario P-18.1 Involves failure of SI8811 valve to open and exercises _BwCA-1.1

Scenario C-2.2 Involves failure of SI8811 valve to open and exercises _BwCA-1.1

Scenario E-7.2 Involves failure of SI8811 valve to open and exercises ES-1.3, Attachment A to open valve

Scenario E-9:2 Involves failure of SI8811 valve to open and exercises ES-1.3, Attachment A to open valve

For LORT (Going back just the last few years)

Scenario 0711 Involves failure of SI8812 valve to close and exercises ES-1.3, Attachment A to close the valve

Scenario 0716 Involves NSO Only training on _BwEP ES-1.3, transfer to CL Recirc

Scenario 0765 Involves LBLOCA, transition to CL Recirc and local operation of 0SX007

Scenario 0811 Involves failure of both SI8811 valves to open and exercises _BwCA-1.1, including dispatching operators to "locally" open the valve.

Scenario 0843 Involves LBLOCA and transition to _BwEP ES-1.3, followed by sump blockage and transition to 1BwCA-1.3

Scenario 0866 Involves containment bypass and exercises _BwCA-1.1

Scenario 0916 Involves LBLOCA, and transfer to CL Recirc, transfer to HL Recirc

Scenario 0936-2 Involves NSO training on _BwEP ES-1.3, transfer to CL Recirc with failure of _SI8812 to close (Timed scenario)

Scenario 0943 Involves Involves LBLOCA, transition to CL Recirc

Scenario 0965 Involves LBLOCA, failure of 1SI8811B, transition to 1BwCA-1.1 and local opening of 1SI8811B

Scenario 0931 OOB Evaluation of DB LBLOCA and failure of 1SI8812 to close. Timed Scenario - ALL crews PASSED

Equipment Operator (EO) training on local valve operation occurs primarily in the generic fundamentals phase, Components chapter 1, which covers the construction and operation of MOVs. Various local valve operations are covered in a sampling of EOP Lesson plans but only general direction is covered.

In summary, the RO/SRO training program addresses the specific scenario in which the 8811A/B valves fail to open remotely as well as other scenarios that require local operation of the other valves. These scenarios, as well as others, are included in both initial qualification exercises and the continuing training program. EOs are trained generically to operate MOVs locally. While there is not a specific lesson plan covering 11/2SI8811A/B local operation, the generic training is applicable to those valves. While this level of training may not be considered to be as high as what is performed for the standard action to initiate cold leg recirculation, it is considered to be adequate to maintain a reasonable level of proficiency in addressing failure of the 1SI8811A/B valves. Addressing the dual indication on 1SI8811A/B is not specifically addressed, but general training covers this particular mode of failure for the valve. Treated as a "nominal training" case.

OPERATOR INTERVIEWS AND SIMULATOR OBSERVATIONS:

For cases in which both the open ("O") and the closed ("-") position indictors are simultaneously illuminated for a given valve, operator interviews performed on 11/10/2009 and 11/11/2009 universally demonstrated that it was understood this represented a condition in which the actual position of the valve is unknown and that alternative means would be required to determine the valve's position. What was

also demonstrated in the interviews and during the simulator observations was that interpretation of the valve's status with regard to responding to procedures was considered to be case specific.

For example, ES-1.3, Attachment A, step 1 questions whether or not the 1SI8811A valve is closed and the two crews interpreted the dual indication differently; one crew treated it as "closed" and the other as "not closed". In the latter case, when 1SI8811A was considered "not closed" and the RNO action to close 1SI8812A was reached, it was recognized that with 1SI8811A in an undetermined state, closing 1SI8812A would potentially isolate RH pump 1A from all viable suction sources and RH pump 1A was tripped to protect it. If the valve is considered closed, the procedures attempt to manually open the valve from the control room. This path includes a step to trip RH pump 1A when 1SI8812A is closed. If 1SI8811A cannot subsequently be opened, the RH pump is left in the tripped position (same as previous case). Ultimately, either classification of the 1SI8811A valve's status ("closed" or "not closed") would lead to step 7 of Attachment A, where the operators are directed to CA-1.1 and instructed to locally open valve(s) 1SI8811A/B.

While a divergence of opinion appeared to exist on the classification a valve with dual indication in ES-1.3, Attachment A, step 1, what was clear was that the indeterminate status of the valve was consistently treated in a conservative manner. ES-1.3, Attachment A, step 1 is not directly questioning whether or not the position of the valve can lead to a success or failure of a particular function and as a result, a difference in the classification of the valve's status was noted. However, for the cases where the status for the valve was directly related to whether or not it could fulfill a required function, the valves was not considered to be capable of supporting that function. For example,

- Step 3c of ES-1.3 questions whether or not the containment sump valves (1SI8811A/B) are open with the obvious intent of determining whether or not the RH pumps can draw water from the containment sump. Both crews interpreted the sump valve as not being open given the presence of dual indication on the 1SI8811A/B valve(s).

- In the RNO step of ES-1.3, Attachment A, step 1, the 1SI8811A was not considered to be capable of providing an adequate suction source for RH pump 1A even though it was considered not to be closed in ES-1.3, Attachment A, step 1. Consequently, RH pump 1A was tripped before 1SI8812A was closed.

- In ES-1.3, Attachment A, step 3e, 1SI8811A was considered to not be open such that it could not support cold leg recirculation mode.

- In ES-1.3, Attachment A, step 6e, 1SI8811B was considered to not be open such that it could not support cold leg recirculation mode.

- In ES-1.3, Attachment A, step 7, both 1SI8811A and B were considered to not be open such that they could not support cold leg recirculation mode.

- In CA-1.1, step 1c, both 1SI8811A and B were considered to not be open such that they could not support cold leg recirculation mode.

Based on the information obtained from the operator interviews and the simulator observations, the conclusion is that a dual indication condition on 1SI8811A/B will result in the interpretation that the valve cannot necessarily support cold leg recirculation mode and that the procedures will ultimately drive them to CA-1.1 where local action to open the valve will be directed.

All of the above is based on the pre-condition that the operators have no information about the actual position of 1SI8811A/B and that the reactor core is not yet threatened. Simulator runs 1 and 3, which were performed on 11/10/2009 and 11/11/2009, demonstrated that while local operation of the 1SI8811A/B valves offered a potential success path to restore cold leg recirculation, the RH pump would not be started until it was verified that 1SI8811A/B was full open. For simulator runs 2 and 4, which were run on the same days, a local check of the 1SI8811A/B valve(s) position was allowed, but a manual stroke of the valve(s) was prohibited due to high rad levels. These scenarios placed the operators in a situation where the only success path was to run the RH pump with the 1SI8811A/B valves in a partially open condition. Both crews dispatched equipment operators to perform a local assessment of the valve's position and when it became obvious to them that they could not prevent core damage without operating the RH pump(s), they elected to start the pumps. Both crews cited the 50.54x guidance that binds them to protect the core even if clear procedure guidance does not exist to direct them to do so. No credit is taken for operating the RH pumps with the 1SI8811A/B valves in a partially open condition even though plant engineering calculations indicate that such an operation would be successful.

SCENARIO DEFINITION

The scenario evaluated for this HFE is an MLOCA event, which is a top contributors in both the Braidwood PRA and the NRC SPAR model. The following provides an additional description of the scenario for which this action is evaluated:

1. Initial Conditions: Steady state, full power operation

2. Initiating Events: Medium LOCA

3. Accident sequence (preceding functional failures and successes):

Reactor trip successful

Turbine trip successful

AFW operates

Level in RCS drops due to MLOCA

ECCS initiated successfully (both divisions available)

2 trains of containment spray are available, 2 divisions of RCFCs running (4 fans).

Transition to cold leg recirculation on low RWST level fails due to failure of 1SI8811B to fully open (valve only opens approximately 34%, which fails to satisfy the interlock with the 8804 valve(s)). Train A fails due to CCF or random equipment failures.

4. Preceding operator error or success in sequence:

Early EP-0 actions to confirm actuations performed.

EP-1 actions to ensure adequate ECCS injection performed.

EP-1 action to depressurize and cooldown not required due to impact of break

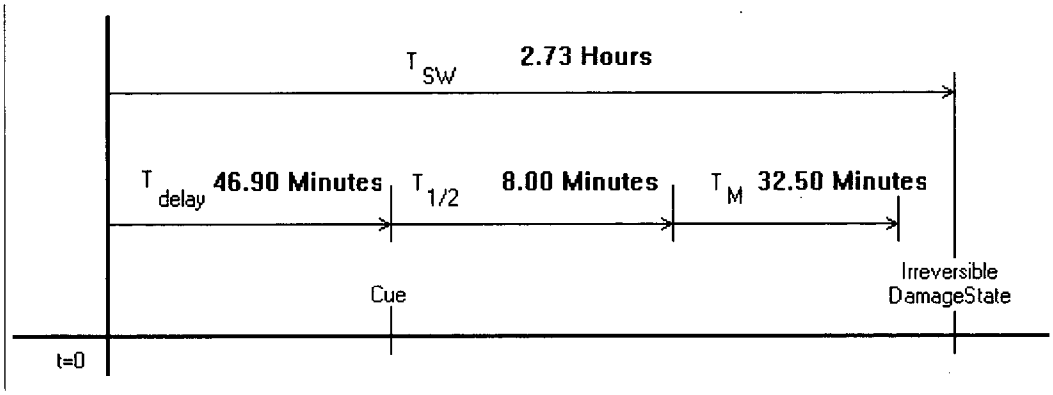
Transition to recirculation mode started

Failure of 1SI8811A/B identified.

5. Operator action success criterion: Locally open 1SI8811A/B and establish cold leg recirculation mode prior RCS level reaching TAF.

6. Key Assumptions: 1) Failure of the 1SI8811A/B valve in the intermediate position is assumed to result in the shutdown of RH pump 1A/B due to lack of a positive suction source when the 1SI8812A/B vavle(s) are closed. Based on this interpretation of the valve's dual indication, the operators would be procedurally bound to perform a local, manual stroke of the valve before restarting RH pump 1A/B and completing the transition to cold leg recirculation. 2) Exelon calculation EC#377204 indicates that if the 1SI8811B had opened approximately 34 full stroke, adequate flow would have been available to perform swap to recirculation mode without action to locally open 1SI8811B. It should be noted that with the 1SI8811A/B valve in an intermediate position, the interlock with 1CV8804A/1SI8804B would not have cleared, but because RCS pressure would be below the RH pump shutoff head by the time recirculation mode was required, the RH pumps would be able to inject directly through the 1SI8809A/B valves and the interlock's status would be inconsequential. However, no direct credit is taken for operation of the RH pumps with the 1SI8811A/B valves in the intermediate position.

Timing:



Timing Analysis: While diagnosis contribution for this HFE has been excluded, the timing information related to the diagnosis of the need to transition to recirculation mode is required to establish the time available for local operation of the 1SI8811A/B valves and any applicable recovery factors. The timeline for this action has been constructed based on the successful diagnosis and interpretation of the dual indication on the 1SI8811A/B valves.

The timing for this action is complicated by the fact that a failure occurs in the equipment that is being used to carry out an action that has already been successfully diagnosed. The diagnosis tasks for the action to swap to recirculation mode and to identify the failure of the 1SI8811B valve to fully open during recirculation alignment are sequential and cannot occur during the same period of time. By definition, the diagnosis of the failed 1SI8811A/B valve(s) occurs only after successful diagnosis of the need to swap to recirculation. This is accounted for in the system window, manipulation time, and cue definitions for this action. Because the availability of time for the local operation of 1SI8811A/B is a factor which can directly impact an HEP, it is necessary to define the timeline for the HEP quantification:

For the SPAR-H execution ratio, the following is assumed: Execution Ratio = T(sw) - T(delay) - T(1/2) / T(m)

Where:

T(delay) = time to 46% RWST level (cue to start transition to swap to recirc mode) + time to reach step 3c of ES-1.3 (accounts for completion of the action to begin the swap to recirc). In this case, that time includes the time to reach 46% RWST level and the time required to reach step 3c of ES-1.3. B/B MAAP run BBSDP15a indicates that the time to reach 46.7% RWST level is 44.4 minutes, which is the initial cue to swap to cold leg recirculation mode. Based on simulator runs performed on 11/10/2009 and 11/11/2009, 4 data points were obtained for the time to reach step 3c of ES-1.3: Run 1= 3 minutes, Run 2 = 3 minutes, Run 3 = 2 minutes, Run 4 = 2 minutes. The median time is the average of the two central data points of the even number of trials, or 2.5 minutes ((2+3)/2=2.5). The time T(delay), therefore, is 44.4 min + 2.5 min = 46.9 min.

T(m): The time required to manually stroke the 8811B valve from 34% open to full open has been determined to be 24 minutes. This time is based on an actual stroke of the valve performed by the Braidwood operators during the week of 11/02/2009. In addition, 7.5 minutes has been added to account for the time required to travel to the valve location. The travel time is based on a walkdown performed by the HRA analyst on 11/11/2009 and accounts for the time to travel from the EO ready room to the MCR to obtain a key for high rad area access (30 seconds travel, 30 seconds assumed to get key), the time to travel to the Auxiliary Building entrance (3 minutes), the time to travel from the Auxiliary Building entrance to valve 1SI8811B (3 minutes), and the time to climb the ladder to reach the handwheel on 1SI8811B (30 seconds). The time required for completing the steps to initiate cold leg recirculation mode is less than 1 minute based on simulator runs observed on 11/10/2009 and 11/11/2009. Once the 1SI8811A/B valve is open, the operators are returned to ES-1.3, Attachment A, Step 7, which directs the operators to check that a train of recirculation has been established. This requires the start of the RH pump corresponding to the 1SI8811 valve that was successfully opened. Start of the RH pump will result in flow from the sump, to the pump, through the Hx, and to the cold leg through valve 1SI8809A/B because the MLOCA has depressurized the RCS below the RH shutoff head. The total manipulation time is, therefore, 32.5 minutes (7.5 minutes of travel time, 24 minutes for valve stroke, 1 minute for the step to complete swap to recirc).

T(sw): The time for RCS level to reach TAF is used as the end of the system window for this action. B/B MAAP run BBSDP15a indicates that 2.73 hours are available to reach TAF in a medium LOCA scenario from the initiating event.

T(1/2): Based on simulator runs performed on 11/10/2009 and 11/11/2009, 4 data points were obtained for the time to begin the response (command to open valve, not just check the valves status) from the time that step 3c of ES-1.3 was reached. The results of the simulator runs showed the following: Run 1= 8 minutes, Run 2 = 6 minutes, Run 3 = 8 minutes, Run 4 = 2 minutes. Because 2 crews were used to perform 4 simulator runs and the second run for each crew was highly similar to the first, it was expected that some degree of anticipation of the upcoming events would occur. As a result, the T(1/2) estimate for this case is based on the average of runs 1 and 3, the first run of the scenarios for each crew. T(1/2) = 8 minutes ((8 min + 8 min) / 2 = 8 min).

Time available for recovery: 76.40 Minutes

SPAR-H Available time (cognitive): 84.40 Minutes

SPAR-H Available time (execution) ratio: 3.35

Minimum level of dependence for recovery: ZD

PART I. DIAGNOSIS

No Part I

Diagnosis HEP:

0.0e+00

PART II. ACTION

PSFs	PSF Levels		Multiplier for Diagnosis
Available Time **(recommended choice based on timing information in bold)**	Inadequate Time		P(failure) = 1.0
	Time available is ~ the time required		10
	Nominal time	X	1
	Time available >= 5x the time required		0.1
	Time available >= 50x the time required		0.01
	Insufficient Information		1
	Refer to the timing analysis.		
Stress/Stressors	Extreme	X	5
	High		2
	Nominal		1

	Insufficient Information		1
	The scenario to which this action is applied is a Medium LOCA event for which high pressure injection is successful. The depressurization process occurs as a result of the RCS break in conjunction with some cooling, which is supplemented by heat removal through the SGs. At the time the swap to recirculation mode would occur (RWST low level alarm at about 45 mintues), the work load would be relatively low and the transition would be proceeding in an orderly manner until the status of the SI8811A/B valves is checked. The failure of the 1SI8811A/B valve(s) to stroke would introduce an additional level of stress given that a suction path from the containment sump to the RH pumps is required to maintain the reactor in a stable state. The equipment operators would be required to enter the Auxiliary Building to manually operate the valve, but given that about two hours would be available to perform the manipulation before the TAF would be reached in the RCS, time stress would not be a major factor. The presence of elevated temperatures and radiation levels, however, would be a potential concern. Exelon calc ECR 392870 indicates that the expected dose rate for a medium LOCA would be 1,444 mRem/hr. With a potential exposure time of up to 30 minutes, which is greater than the manipulation time for the local action, the accumulated dose would be below the administrative dose limit of 2000 m/Rem established in RP-AA-203. While the accumulated dose would not preclude this action from being performed, "extreme" stress is chosen to account for the difficult working conditions.		
Complexity	Highly complex		5
	Moderately complex	X	2
	Nominal		1
	Insufficient Information		1
	Manual operation of a valve is a straightforward task with which the operators are familiar through training and similar tasks performed as part of normal plant operations, but the physical requirements of opening the valve are potentially challenging. In order to manually stroke the valve, it is necessary to stand on top of the valve's enclosure in a semi confined area and turn a handwheel that is located at face level. Elevated temperatures in the area during a LOCA evolution could contribute to some discomfort during the operation, but it is not expected to be prohibitive in any way for the MLOCA scenario. The valve area is well lit and the open stem design provides a clear indication of the valve's position. With regard to valve identification, the valve is tagged with a label that is easy to read, but more importantly, it is highly unique and could not		

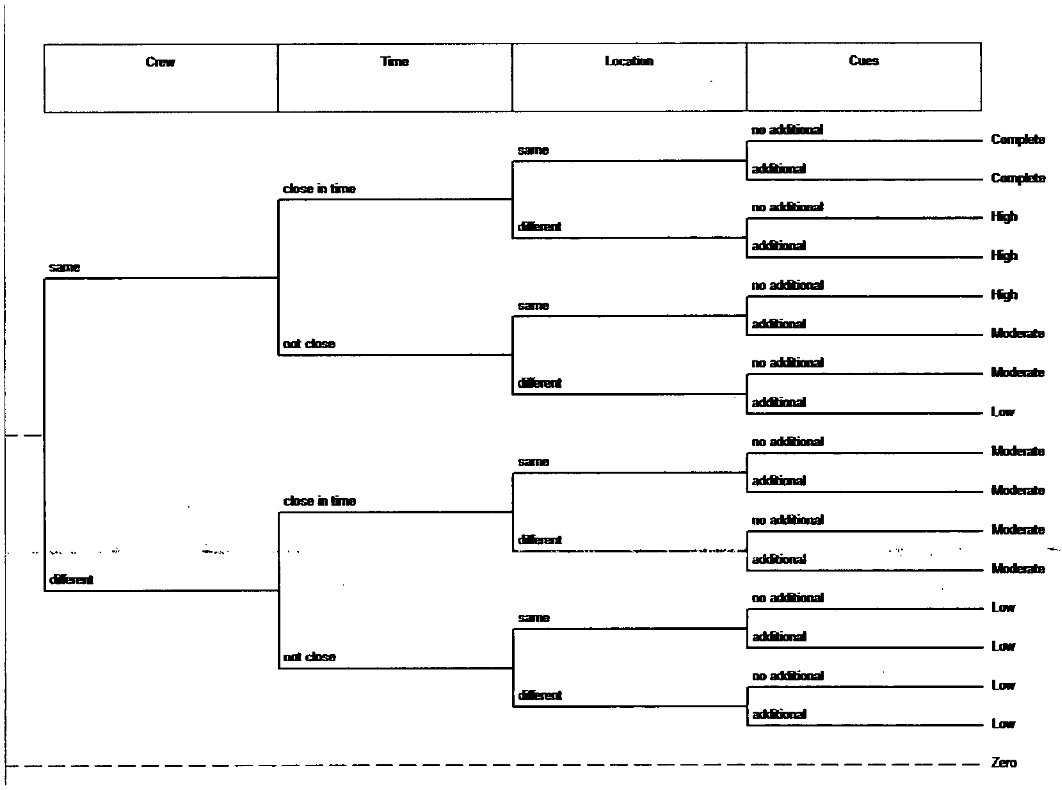
	be mistaken for any other valve in the area. The"A" and "B" 1SI8811 valves are on the same elevation, but they are separated by at least 30 yards and are accessed by turning different directions upon entry into the curved wall area. While the action itself is a straightforward manipulation on a highly unique valve, the action is considered to be "moderately complex" due to the position the equipment operator must be in to perform the valve stroke and the length of time that is required to complete the stroke (24 minutes from 34%). Once the valve is open, the remainder of the task is a highly trained action and is not considered to significantly contribute to difficulty of the action.		
Experience/Training	Low		3
	Nominal	X	1
	High		0.5
	Insufficient Information		1
	Refer to the "Experience/Training" portion of the "Basic Event Context" discussion.		
Procedures	Not available		50
	Incomplete		20
	Available, but poor		5
	Nominal	X	1
	Insufficient Information		1
	Step 1c RNO of CA-1.1 directs local operation of 1SI8811A/B to be performed once it has been determined that it cannot be opened remotely. No additional procedures are required for a valve manipulation. Assessed as "nominal".		
Ergonomics/HMI	Missing/Misleading		50
	Poor	X	10
	Nominal		1
	Good		0.5
	Insufficient Information		1
	As identified in the "complexity" discussion for the execution task, the valve is highly unique such that mistaking it for another valves is a negligible concern, but the position the operator has to be in to stroke the valve is challenging. The footing is narrow (about 2.5		

	feet), semi-confined, and the handwheel is at face level, which makes operation slow and difficult relative to a floor mounted valve with the handwheel at waist level. During an accident, the area may be at elevated temperature and radiation levels. While these factors may be a cause for some discomfort and stress, they are not expected to be prohibitive for medium LOCA scenarios. Overall, this is considered to be an example of relatively "poor" human-machine interface conditions.		
Fitness for Duty	Unfit		P(failure) = 1.0
	Degraded Fitness		5
	Nominal	X	1
	Insufficient Information		1
	No fitness for duty issues have been identified. The nominal case is used.		
Work Processes	Poor		5
	Nominal	X	1
	Good		0.5
	Insufficient Information		0.5
	For emergency situations, operator interviews performed on 11/10/2009 and 11/11/2009 indicate that there would be no requirement to "dress-out" before entering the Auxiliary Building to perform the manual valve stroke, which is well known to the operators. With regard to access to the Auxiliary Building (high rad area), the equipment operators would be required to obtain a key from the MCR for entry. This is not an unusual situation and given the proximity of the equipment operator ready room to the MCR, it does not significantly impact the manipulation time for valve operation. Radio communication would be available between the MCR and the equipment operator. No work process issues have been identified that would impact the performance of the manual stroke of 1SI8811A/B.		

Action Probability:

9.1e-02 [Adjustment applied: 1.0E-3 * 1.0e+02 / (1.0E-3 * (1.0e+02 - 1) + 1)]

PART III. DEPENDENCY



Task Failure WITHOUT Formal Dependence:

9.1e-02

Task Failure WITH Formal Dependence:

9.1e-02

4.5 1SI8811B3SBHPMOA, FAILURE TO OPEN VLV 1SI8811B AFTER REMOTE FAILURE (LOCAL-MANUAL, 3" MLOCA, SPAR-H)

Analyst:	DEM
Rev. Date:	12/10/09
Reviewer:	
Cognitive Method:	SPAR-H
Analysis Database:	bwd-8811-121009.HRA (12/10/09, 1675264 Bytes)

Table 9: 1SI8811B3SBHPMOA SUMMARY

Analysis Results:	Cognitive	Execution
Failure Probability	0.0e+00	9.9e-03
Total HEP		9.9e-03

Plant:

Braidwood

Initiating Event:

3" MLOCA

Basic Event Context:

Typically, both execution and diagnosis errors are included as part of a post initiator HRA. In some cases, however, there are conditions that preclude the applicability of one of these components of the HEP.

For scenarios in which the 1SI8811A/B valve fails to completely stroke and both the "open" and "closed" lights are illuminated (dual indication), it is recognized that the operators must interpret the dual indication and make a decision about how to proceed. However, their decision regarding the valve's status is unimportant given that any interpretation results in a successful outcome.

- 1SI8811A/B interpreted as "NOT OPEN": operator directed to close 1SI8812A/B, open 1SI8811A/B locally, and establish cold leg recirculation.

- 1SI8811A/B interpreted as "OPEN": The RH pumps would remain running, 1SI8812A/B directed to be closed, and injection would be provided to the RCS via the 1SI8809A/B valve(s). For transient scenarios or for SLOCAs where the transition to cold leg recirculation is attempted at the time of the 46% RWST level cue, the procedures still provide a success path as they direct local operation of the 1CV8804A/1SI8804B valves (bypasses interlock with 1SI8811A/B) and the establishment of flow using the SI/Charging pumps.

These paths are described in more detail below:

Scenario 1, 1SI8811A/B considered to be "not open" in ES-1.3 step 3c:

If the 1SI8811A/B valve is considered to be "not open" in ES-1.3 step 3c, the operators are transferred to Attachment A. In Attachment A, step 1 questions whether or not the 1SI8811A valve is closed. If it is determined to be "not closed", the RNO action is to close 1SI8812A, which would terminate an "A" division flow diversion from the RWST to the sump. The RNO then transfers to step 4, which includes similar guidance for the "B" division. The RNO is step 4 transfers to Step 7, which in turn transfers to BwCA-1-1 where step 1c directs local closure of 1SI8811A/B.

If the opposite interpretation of the 1SI8811A/B valve'(s) status is made in Attachment A, step 1 of ES-1.3 (valve is "closed"), the operators are directed through steps 2 and 3, which attempt manual, remote operation of 1SI8811A. Step 3b closes 1SI8812A, which would terminate a flow diversion, and step 3e directs 1SI8811A to be opened. Whether or not 1SI8811A is considered to be open, the procedure path leads to step 4 where a similar process is started for the "B" division. On completion of the "B" division steps, step 7 is reached where the transfer to 1BwCA-1.1 occurs and the direction to perform the local stroke of 1SI8811A/B is given.

Scenario 2, 1SI8811A/B considered to be "open" in ES-1.3 step 3c:

In the event that the 1SI8811A/B valve(s) is believed/considered to be "open" in ES-1.3 step 3c, step 3d directs closure of the 1SI8812A/B valves, which would terminate the flow diversion from the RWST to the sump. At this point, the RH pumps would be running with suction only aligned through the partially open 1SI8811A/B valves. For MLCOA events, this may allow injection through the 1SI8809A/B valves without further action; however, assuming that RCS pressure is too high for injection, the procedure continues in steps 4 and 5 to align RH to the SI/Charging system suction path. In steps 5f and 5h, the direction is given to open the 1CV8804A and 1SI8804B valves, respectively. These valves are interlocked with

1SI8811A/B and would not open with 1SI8811A/B in an intermediate position. The RNO for steps 5f and 5g direct local operation of valves 1CV8804A and 1SI8804B valves, which are smaller and more easily operated than the 1SI8811A/B valves. Locally stroking the 1CV8804A/1SI8804B valve would provide an alternate success path given that suction would be available through the partially open 1SI8811A/B valves.

If, for some reason, it was decided that there was no viable suction path for the SI/Charging pumps and that emergency coolant recirculation was lost/unavailable, the continuous action statement to transfer to BwCA-1.1 would be followed where local operation of the 1SI8811A/B valve(s) would be directed.

In summary, from the point where dual indication on 1SI8811A/B is encountered at ES-1.3 step 3c, any procedure path taken will isolate the flow diversion path from the RWST to the containment sump by closing 1SI8812A/B and emergency coolant recirculation will be established by opening either 1SI8811A/B or 1CV8804A/1SI8804B locally. No significant diagnosis is required to either close 1SI8812A/B or to open 1SI8811A/B; these actions are directed as a matter of course in a procedure path that has already been initiated.

EXPERIENCE/TRAINING:

There are a number of scenarios utilized in the simulator in both initial and continuing training that exercise these portions of the procedures.

For ILT: Scenario P-18.1 Involves failure of SI8811 valve to open and exercises _BwCA-1.1

Scenario C-2.2 Involves failure of SI8811 valve to open and exercises _BwCA-1.1

Scenario E-7.2 Involves failure of SI8811 valve to open and exercises ES-1.3, Attachment A to open valve

Scenario E-9.2 Involves failure of SI8811 valve to open and exercises ES-1.3, Attachment A to open valve

For LORT (Going back just the last few years)

Scenario 0711 Involves failure of SI8812 valve to close and exercises ES-1.3, Attachment A to close the valve

Scenario 0716 Involves NSO Only training on _BwEP ES-1.3, transfer to CL Recirc

Scenario 0765 Involves LBLOCA, transition to CL Recirc and local operation of 0SX007

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Scenario 0843 Involves LBLOCA and transition to _BwEP ES-1.3, followed by sump blockage and transition to 1BwCA-1.3

Scenario 0866 Involves containment bypass and exercises _BwCA-1.1

Scenario 0916 Involves LBLOCA, and transfer to CL Recirc, transfer to HL Recirc

Scenario 0936-2 Involves NSO training on _BwEP ES-1.3, transfer to CL Recirc with failure of _SI8812 to close (Timed scenario)

Scenario 0943 Involves Involves LBLOCA, transition to CL Recirc

Scenario 0965 Involves LBLOCA, failure of 1SI8811B, transition to 1BwCA-1.1 and local opening of 1SI8811B

Scenario 0931 OOB Evaluation of DB LBLOCA and failure of 1SI8812 to close. Timed Scenario - ALL crews PASSED

Equipment Operator (EO) training on local valve operation occurs primarily in the generic fundamentals phase, Components chapter 1, which covers the construction and operation of MOVs. Various local valve operations are covered in a sampling of EOP Lesson plans but only general direction is covered.

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OPERATOR INTERVIEWS AND SIMULATOR OBSERVATIONS:

For cases in which both the open ("O") and the closed ("-") position indictors are simultaneously illuminated for a given valve, operator interviews performed on 11/10/2009 and 11/11/2009 universally demonstrated that it was understood this represented a condition in which the actual position of the valve is unknown and that alternative means would be required to determine the valve's position. What was

also demonstrated in the interviews and during the simulator observations was that interpretation of the valve's status with regard to responding to procedures was considered to be case specific.

For example, ES-1.3, Attachment A, step 1 questions whether or not the 1SI8811A valve is closed and the two crews interpreted the dual indication differently; one crew treated it as "closed" and the other as "not closed". In the latter case, when 1SI8811A was considered "not closed" and the RNO action to close 1SI8812A was reached, it was recognized that with 1SI8811A in an undetermined state, closing 1SI8812A would potentially isolate RH pump 1A from all viable suction sources and RH pump 1A was tripped to protect it. If the valve is considered closed, the procedures attempt to manually open the valve from the control room. This path includes a step to trip RH pump 1A when 1SI8812A is closed. If 1SI8811A cannot subsequently be opened, the RH pump is left in the tripped position (same as previous case). Ultimately, either classification of the 1SI8811A valve's status ("closed" or "not closed") would lead to step 7 of Attachment A, where the operators are directed to CA-1.1 and instructed to locally open valve(s) 1SI8811A/B.

While a divergence of opinion appeared to exist on the classification a valve with dual indication in ES-1.3, Attachment A, step 1, what was clear was that the indeterminate status of the valve was consistently treated in a conservative manner. ES-1.3, Attachment A, step 1 is not directly questioning whether or not the position of the valve can lead to a success or failure of a particular function and as a result, a difference in the classification of the valve's status was noted. However, for the cases where the status for the valve was directly related to whether or not it could fulfill a required function, the valves was not considered to be capable of supporting that function. For example,

- Step 3c of ES-1.3 questions whether or not the containment sump valves (1SI8811A/B) are open with the obvious intent of determining whether or not the RH pumps can draw water from the containment sump. Both crews interpreted the sump valve as not being open given the presence of dual indication on the 1SI8811A/B valve(s).

- In the RNO step of ES-1.3, Attachment A, step 1, the 1SI8811A was not considered to be capable of providing an adequate suction source for RH pump 1A even though it was considered not to be closed in ES-1.3, Attachment A, step 1. Consequently, RH pump 1A was tripped before 1SI8812A was closed.

- In ES-1.3, Attachment A, step 3e, 1SI8811A was considered to not be open such that it could not support cold leg recirculation mode.

- In ES-1.3, Attachment A, step 6e, 1SI8811B was considered to not be open such that it could not support cold leg recirculation mode.

- In ES-1.3, Attachment A, step 7, both 1SI8811A and B were considered to not be open such that they could not support cold leg recirculation mode.

- In CA-1.1, step 1c, both 1SI8811A and B were considered to not be open such that they could not support cold leg recirculation mode.

Based on the information obtained from the operator interviews and the simulator observations, the conclusion is that a dual indication condition on 1SI8811A/B will result in the interpretation that the valve cannot necessarily support cold leg recirculation mode and that the procedures will ultimately drive them to CA-1.1 where local action to open the valve will be directed.

All of the above is based on the pre-condition that the operators have no information about the actual position of 1SI8811A/B and that the reactor core is not yet threatened. Simulator runs 1 and 3, which were performed on 11/10/2009 and 11/11/2009, demonstrated that while local operation of the 1SI8811A/B valves offered a potential success path to restore cold leg recirculation, the RH pump would not be started until it was verified that 1SI8811A/B was full open. For simulator runs 2 and 4, which were run on the same days, a local check of the 1SI8811A/B valve(s) position was allowed, but a manual stroke of the valve(s) was prohibited due to high rad levels. These scenarios placed the operators in a situation where the only success path was to run the RH pump with the 1SI8811A/B valves in a partially open condition. Both crews dispatched equipment operators to perform a local assessment of the valve's position and when it became obvious to them that they could not prevent core damage without operating the RH pump(s), they elected to start the pumps. Both crews cited the 50.54x guidance that binds them to protect the core even if clear procedure guidance does not exist to direct them to do so. No credit is taken for operating the RH pumps with the 1SI8811A/B valves in a partially open condition even though plant engineering calculations indicate that such an operation would be successful.

SCENARIO DEFINITION

The scenario evaluated for this HFE is a 3" MLOCA event, which is a top contributors in both the Braidwood PRA and the NRC SPAR model. The following provides an additional description of the scenario for which this action is evaluated:

1. Initial Conditions: Steady state, full power operation

2. Initiating Events: 3" Medium LOCA

3. Accident sequence (preceding functional failures and successes):

Reactor trip successful

Turbine trip successful

AFW operates

Level in RCS drops due to 3" MLOCA

ECCS initiated successfully (both divisions available)

2 trains of containment spray are available, 2 divisions of RCFCs running (4 fans).

Transition to cold leg recirculation on low RWST level fails due to failure of 1SI8811B to fully open (valve only opens approximately 34%, which fails to satisfy the interlock with the 8804 valve(s)). Train A fails due to CCF or random equipment failures.

4. Preceding operator error or success in sequence:

Early EP-0 actions to confirm actuations performed.

EP-1 actions to ensure adequate ECCS injection performed.

EP-1 action to depressurize and cooldown not required due to impact of break

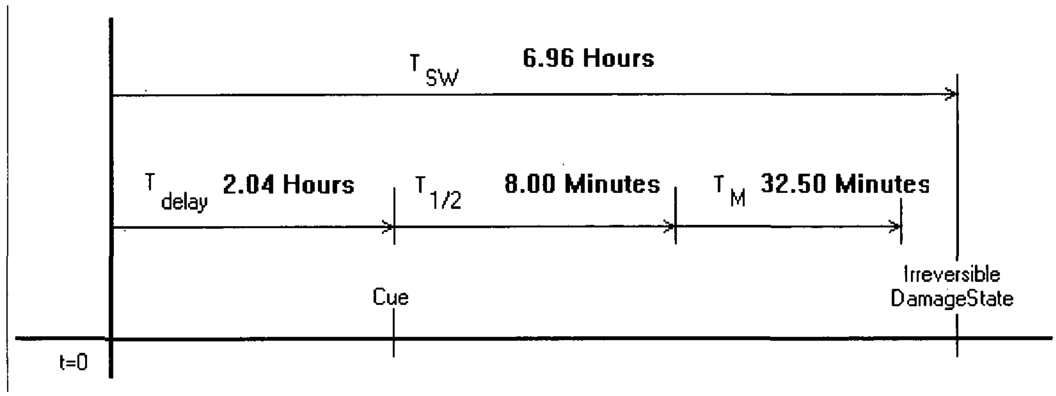
Transition to recirculation mode started

Failure of 1SI8811A/B identified.

5. Operator action success criterion: Locally open 1SI8811A/B and establish cold leg recirculation mode prior RCS level reaching TAF.

6. Key Assumptions: 1) Failure of the 1SI8811A/B valve in the intermediate position is assumed to result in the shutdown of RH pump 1A/B due to lack of a positive suction source when the 1SI8812A/B vavle(s) are closed. Based on this interpretation of the valve's dual indication, the operators would be procedurally bound to perform a local, manual stroke of the valve before restarting RH pump 1A/B and completing the transition to cold leg recirculation. 2) Exelon calculation EC#377204 indicates that if the 1SI8811B had opened approximately 34 full stroke, adequate flow would have been available to perform swap to recirculation mode without action to locally open 1SI8811B. It should be noted that with the 1SI8811A/B valve in an intermediate position, the interlock with 1CV8804A/1SI8804B would not have cleared, but because RCS pressure would be below the RH pump shutoff head by the time recirculation mode was required, the RH pumps would be able to inject directly through the 1SI8809A/B valves and the interlock's status would be inconsequential. However, no direct credit is taken for operation of the RH pumps with the 1SI8811A/B valves in the intermediate position.

Timing:



Timing Analysis: While diagnosis contribution for this HFE has been excluded, the timing information related to the diagnosis of the need to transition to recirculation mode is required to establish the time available for local operation of the 1SI8811A/B valves and any applicable recovery factors. The timeline for this action has been constructed based on the successful diagnosis and interpretation of the dual indication on the 1SI8811A/B valves.

The timing for this action is complicated by the fact that a failure occurs in the equipment that is being used to carry out an action that has already been successfully diagnosed. The diagnosis tasks for the action to swap to recirculation mode and to identify the failure of the 1SI8811B valve to fully open during recirculation alignment are sequential and cannot occur during the same period of time. By definition, the diagnosis of the failed 1SI8811A/B valve(s) occurs only after successful diagnosis of the need to swap to recirculation. This is accounted for in the system window, manipulation time, and cue definitions for this action. Because the availability of time for the local operation of 1SI8811A/B is a factor which can directly impact an HEP, it is necessary to define the timeline for the HEP quantification:

For the SPAR-H execution ratio, the following is assumed: Execution Ratio = T(sw) - T(delay) - T(1/2) / T(m)

Where:

T(delay) = time to 46% RWST level (cue to start transition to swap to recirc mode) + time to reach step 3c of ES-1.3 (accounts for completion of the action to begin the swap to recirc). In this case, that time includes the time to reach 46% RWST level and the time required to reach step 3c of ES-1.3. B/B MAAP run BBSDP16a indicates that the time to reach 46.7% RWST level is 2.00 hours, which is the initial cue to swap to cold leg recirculation mode. Based on simulator runs performed on 11/10/2009 and 11/11/2009, 4 data points were obtained for the time to reach step 3c of ES-1.3: Run 1= 3 minutes, Run 2 = 3 minutes, Run 3 = 2 minutes, Run 4 = 2 minutes. The median time is the average of the two central data points of the even number of trials, or 2.5 minutes ((2+3)/2=2.5). The time T(delay), therefore, is 2.00 hr + 0.04 hr = 2.04 hr.

T(m): The time required to manually stroke the 8811B valve from 34% open to full open has been determined to be 24 minutes. This time is based on an actual stroke of the valve performed by the Braidwood operators during the week of 11/02/2009. In addition, 7.5 minutes has been added to account for the time required to travel to the valve location. The travel time is based on a walkdown performed by the HRA analyst on 11/11/2009 and accounts for the time to travel from the EO ready room to the MCR to obtain a key for high rad area access (30 seconds travel, 30 seconds assumed to get key), the time to travel to the Auxiliary Building entrance (3 minutes), the time to travel from the Auxiliary Building entrance to valve 1SI8811B (3 minutes), and the time to climb the ladder to reach the handwheel on 1SI8811B (30 seconds). The time required for completing the steps to initiate cold leg recirculation mode is less than 1 minute based on simulator runs observed on 11/10/2009 and 11/11/2009. Once the 1SI8811A/B valve is open, the operators are returned to ES-1.3, Attachment A, Step 7, which directs the operators to check that a train of recirculation has been established. This requires the start of the RH pump corresponding to the 1SI8811 valve that was successfully opened. Start of the RH pump will result in flow from the sump, to the pump, through the Hx, and to the cold leg through valve 1SI8809A/B because the MLOCA has depressurized the RCS below the RH shutoff head. The total manipulation time is, therefore, 32.5 minutes (7.5 minutes of travel time, 24 minutes for valve stroke, 1 minute for the step to complete swap to recirc).

T(sw): The time for RCS level to reach TAF is used as the end of the system window for this action. B/B MAAP run BBSDP16a indicates that 6.96 hours are available to reach TAF in a 3" MLOCA scenario from the initiating event.

T(1/2): Based on simulator runs performed on 11/10/2009 and 11/11/2009, 4 data points were obtained for the time to begin the response (command to open valve, not just check the valves status) from the time that step 3c of ES-1.3 was reached. The results of the simulator runs showed the following: Run 1= 8 minutes, Run 2 = 6 minutes, Run 3 = 8 minutes, Run 4 = 2 minutes. Because 2 crews were used to perform 4 simulator runs and the second run for each crew was highly similar to the first, it was expected that some degree of anticipation of the upcoming events would occur. As a result, the T(1/2) estimate for this case is based on the average of runs 1 and 3, the first run of the scenarios for each crew. T(1/2) = 8 minutes ((8 min + 8 min) / 2 = 8 min).

Time available for recovery: 254.70 Minutes

SPAR-H Available time (cognitive): 262.70 Minutes

SPAR-H Available time (execution) ratio: 8.84

Minimum level of dependence for recovery: ZD

PART I. DIAGNOSIS

No Part I

Diagnosis HEP:

0.0e+00

PART II. ACTION

PSFs	PSF Levels		Multiplier for Diagnosis
Available Time **(recommended choice based on timing information in bold)**	Inadequate Time		P(failure) = 1.0
	Time available is ~ the time required		10
	Nominal time		1
	Time available >= 5x the time required	X	0.1
	Time available >= 50x the time required		0.01
	Insufficient Information		1
	Refer to the timing analysis.		
Stress/Stressors	Extreme	X	5
	High		2
	Nominal		1

	Insufficient Information		1
	The scenario to which this action is applied is a 3" LOCA event for which high pressure injection is successful. After injecting for about 2 hours, the RWST low level alarm would be reached. While the LOCA event is a high stress scenario, the successful control of the plant over the 2 cooldown time is considered to significantly reduce the level of stress. At the time the swap to recirculation mode would occur, the work load would be relatively low, the diagnosis of the need to swap to recirculation mode would have been successfully made, and the transition would be proceeding in an orderly manner until the 8811A/B valves are actuated. The failure of the 1SI8811A/B valve(s) to stroke would introduce an additional level of stress given that a suction path from the containment sump to the RH pumps is required to maintain the reactor in a stable state. The equipment operators would be required to enter the Auxiliary Building to manually operate the valve, which is potentially a high rad/high temperature area. Exelon calc ECR 392870 indicates that the expected dose rate for a medium LOCA, which would bound the SLOCA case, would be 1,444 mRem/hr. With a potential exposure time of up to 30 minutes, which is greater than the manipulation time for the local action, the accumulated dose would be below the administrative dose limit of 2000 m/Rem established in RP-AA-203. While the accumulated dose would not preclude this action from being performed, "extreme" stress is chosen to account for the difficult working conditions, even though many hours would be available to perform the manipulation before the core would be jeopardized.		
Complexity	Highly complex		5
	Moderately complex	X	2
	Nominal		1
	Insufficient Information		1
	Manual operation of a valve is a straightforward task with which the operators are familiar through training and similar tasks performed as part of normal plant operations, but the physical requirements of opening the valve are potentially challenging. In order to manually stroke the valve, it is necessary to stand on top of the valve's enclosure in a semi confined area and turn a handwheel that is located at face level. Elevated temperatures in the area during a LOCA evolution could contribute to some discomfort during the operation, but it is not expected to be prohibitive in any way for the 3" MLOCA scenario. The valve area is well lit and the open stem design provides a clear indication of the valve's position. With regard to valve identification, the valve is tagged with a label that is easy to read, but more importantly, it is highly unique and could not		

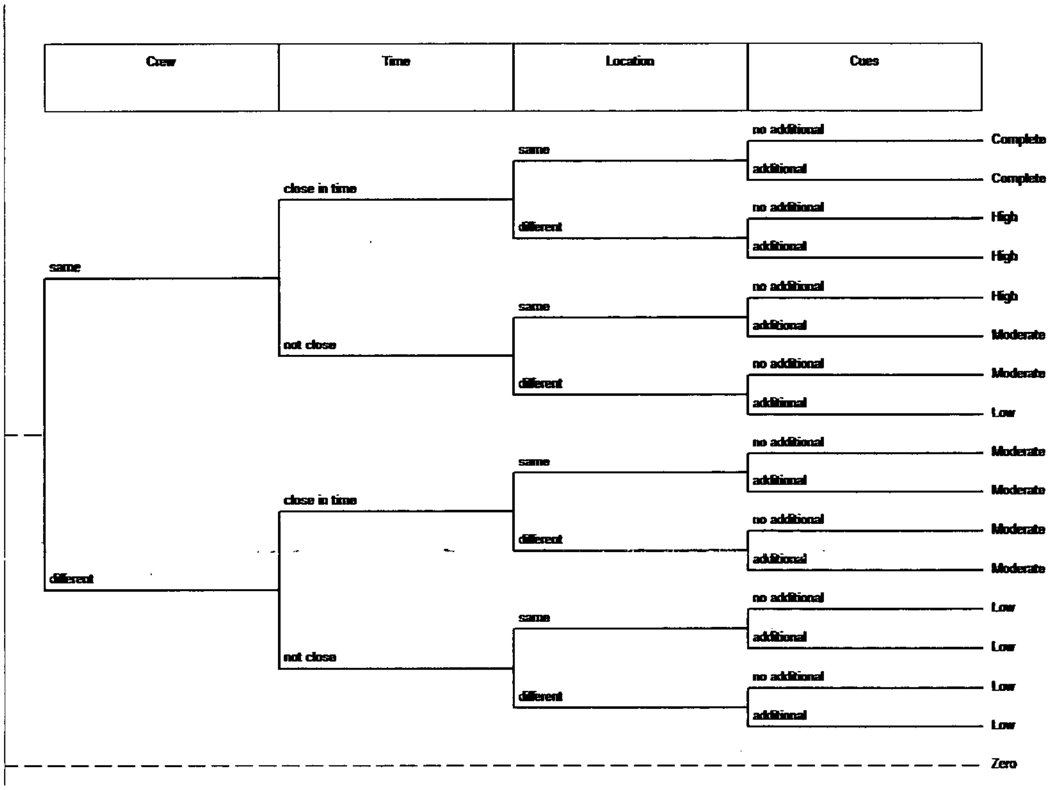
	be mistaken for any other valve in the area. The"A" and "B" 1SI8811 valves are on the same elevation, but they are separated by at least 30 yards and are accessed by turning different directions upon entry into the curved wall area. While the action itself is a straightforward manipulation on a highly unique valve, the action is considered to be "moderately complex" due to the position the equipment operator must be in to perform the valve stroke and the length of time that is required to complete the stroke (24 minutes from 34%). Once the valve is open, the remainder of the task is a highly trained action and is not considered to significantly contribute to difficulty of the action.		
Experience/Training	Low		3
	Nominal	X	1
	High		0.5
	Insufficient Information		1
	Refer to the "Experience/Training" portion of the "Basic Event Context" discussion.		
Procedures	Not available		50
	Incomplete		20
	Available, but poor		5
	Nominal	X	1
	Insufficient Information		1
	Step 1c RNO of CA-1.1 directs local operation of 1SI8811A/B to be performed once it has been determined that it cannot be opened remotely. No additional procedures are required for a valve manipulation. Assessed as "nominal".		
Ergonomics/HMI	Missing/Misleading		50
	Poor	X	10
	Nominal		1
	Good		0.5
	Insufficient Information		1
	As identified in the "complexity" discussion for the execution task, the valve is highly unique such that mistaking it for another valve is a negligible concern, but the position the operator has to be in to stroke the valve is challenging. The footing is narrow (about 2.5		

	feet), semi-confined, and the handwheel is at face level, which makes operation slow and difficult relative to a floor mounted valve with the handwheel at waist level. During an accident, the area may be at elevated temperature and radiation levels. While these factors may be a cause for some discomfort and stress, they are not expected to be prohibitive or even a large concern for 3" MLOCA scenarios. Overall, this is considered to be an example of relatively "poor" human-machine interface conditions.		
Fitness for Duty	Unfit		P(failure) = 1.0
	Degraded Fitness		5
	Nominal	X	1
	Insufficient Information		1
	No fitness for duty issues have been identified. The nominal case is used.		
Work Processes	Poor		5
	Nominal	X	1
	Good		0.5
	Insufficient Information		0.5
	For emergency situations, operator interviews performed on 11/10/2009 and 11/11/2009 indicate that there would be no requirement to "dress-out" before entering the Auxiliary Building to perform the manual valve stroke, which is well known to the operators. With regard to access to the Auxiliary Building (high rad area), the equipment operators would be required to obtain a key from the MCR for entry. This is not an unusual situation and given the proximity of the equipment operator ready room to the MCR, it does not significantly impact the manipulation time for valve operation. Radio communication would be available between the MCR and the equipment operator. No work process issues have been identified that would impact the performance of the manual stroke of 1SI8811A/B.		

Action Probability:

9.9e-03 [Adjustment applied: 1.0E-3 * 1.0e+01 / (1.0E-3 * (1.0e+01 - 1) + 1)]

PART III. DEPENDENCY



Task Failure WITHOUT Formal Dependence:

9.9e-03

Task Failure WITH Formal Dependence:

9.9e-03

RM DOCUMENTATION NO. BW-SDP-003 Appendix A REV: 2 PAGE NO. A93 of A93

STATION: Braidwood

UNIT(S) AFFECTED: UNIT 1

TITLE: Braidwood Phase 3 SDP Evaluation of Failure of 1SI8811B to Fully Open

Appendix A – Human Reliability Analysis

SUMMARY (Include UREs incorporated):

This Appendix documents the human reliability analysis performed to evaluate the operator actions required to establish cold leg recirculation given failure of the 1/2SI8811A/B valve(s) to fully stroke.

Number of pages: **Total 93 pages, including this page.**

RM Document Level: **Category 2, per ER-AA-600-1012**

[ ] Review required after periodic Update

[X] Internal RM Documentation **[ ] External RM Documentation**

Electronic Calculation Data Files: (EPRI HRA Calculator, Version 4.0, bwd-8811-121809.HRA/1,636kb/12/18/2009/09:36)

See Section 5 for Data Files

Method of Review: **[X] Detailed [ ] Alternate [ ] Review of External Document**
This RM documentation supersedes: N/A in its entirety.

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BRAIDWOOD
PRA APPLICATION NOTEBOOK

BW-SDP-003

APPENDIX B
REVISION 2

MAAP4 THERMAL HYDRAULIC ANALYSIS TO SUPPORT TIMING FOR LOCALLY OPENING 1SI8811B

DECEMBER 2009

REVISION SUMMARY SHEET

Revision	Date	Summary
0	9/2009	Original Issue
1	11/2009	Updated results to include simulator observations and comparison
2	12/2009	Updated results to include RWST flow diversion sensitivities and uncertainty analysis.

TABLE OF CONTENTS

Section **Page**

1.0 PURPOSE & SCOPE 3
2.0 ACCEPTANCE CRITERIA 3
2.1 PURPOSE OF USING DETERMINISTIC ANALYSIS 3
2.2 DESCRIPTION OF MAAP 4
2.3 PWR PRIMARY SYSTEM THERMAL HYDRAULICS 5
2.4 PWR PRESSURIZER THERMAL HYDRAULICS 7
2.5 CORE 7
2.6 CONTAINMENT AND REACTOR / AUXILIARY BUILDING 8
2.7 FISSION PRODUCTS 9
2.8 COMPUTATIONAL STRUCTURE AND DESIGN PHILOSOPHY 10
2.9 MAAP4 DOCUMENTATION 12
2.10 CODE VALIDATION 13
2.11 CODE LIMITATIONS 15
3.0 METHODOLOGY 17
3.1 CONTAINMENT SPRAY SENSITIVITY 18
3.2 RWST DEPLETION SENSITIVITY 18
3.3 5.2" LOCA RWST DEPLETION UNCERTAINTY SENSITIVITIES 22
3.4 2" LOCA RWST DEPLETION UNCERTAINTY SENSITIVITIES 24
4.0 RESULTS 26
5.0 CONCLUSIONS 30
6.0 REFERENCES 31

ATTACHMENT 1 CASE DEFINITION REFERENCES A1-1

1.0 PURPOSE & SCOPE

The purpose of this analysis is to evaluate the plant thermal hydraulic response and the timing of key events following small and medium LOCAs with AFW available and transients with concurrent loss of AFW. Four sets of accident sequences were simulated with MAAP4.0.6 and the corresponding Byron/Braidwood MAAP4 parameter file: containment spray sensitivity cases, RWST depletion analysis and 2 sets of uncertainty analyses. The accident sequence initiators are a small LOCA, a medium LOCA, and a transient with different configurations of ECCS, containment cooling and AFW availability. This assessment determines RWST depletion timings and other important key timings which are inputs to the human reliability analysis for this SDP and evaluates alternative success paths such as low pressure recirculation for LOCAs where RCS cooldown is successful.

2.0 ACCEPTANCE CRITERIA

2.1 PURPOSE OF USING DETERMINISTIC ANALYSIS

The assessment of plant response under postulated severe accident scenarios is a complex integrated evaluation. The primary system and containment responses are sensitive to the calculated pressures, temperatures, flows, and event timings. These parameters also affect the operator action timings, the radionuclide release timings, and the mitigating system performance assessments. Therefore, the proper plant-specific characterization of the severe accident progression is important to the realistic representation of the plant and highly desirable for the PRA assessment. These deterministic calculations provide the following information:

- The time for core coolant boiloff;
- The time for core damage and RPV breach;
- The pressures and temperatures for various accident scenarios in the pressurizer, steam generator, and containment;
- The times to reach these pressures and temperatures which are key to the assessment of potential success paths and recovery actions.

2.2 DESCRIPTION OF MAAP

The Modular Accident Analysis Program (MAAP), an integral systems analysis computer code for assessing severe accidents, was initially developed during the Industry Degraded Core Rule-Making (IDCOR) Program. At the completion of IDCOR, ownership of MAAP was transferred to EPRI. Subsequently, the code evolved into a major analytical tool (MAAP 3.0B) for supporting the plant specific Individual Plant Examinations (IPEs) requested by NRC Generic Letter 88-20. Furthermore, MAAP 3.0B was used as the basis to model the Ontario Hydro CANDU designs. As the attention of plant-specific analyses was expanded to include accident management evaluations, the scope of MAAP (its design basis) was expanded to include the necessary models for accident management assessments. Through support by the U.S. Department of Energy (DOE), the MAAP4 design basis was further extended to include the Advanced Light Water Reactor (ALWR) designs currently being developed by the reactor vendors. MAAP4 has also been expanded to represent the VVER designs used in Finland and central Europe.

MAAP is a computer code that simulates light water reactor system response to accident initiation events. The code is currently the primary tool used by all US utilities to support their PRA analysis needs. MAAP4 is currently being maintained by EPRI with a users group that represents over 50 organizations. In addition, there have been substantial interactions with the NRC to familiarize them with MAAP, its capabilities and limitations, in order to minimize any questions relating to the use of the code for future applications.

Again, the purpose of MAAP4 is to provide an accident analysis code that can be used with confidence by the nuclear industry in all phases of severe accident studies, including accident management, for current reactor/containment designs and for ALWRs. MAAP4 includes models for the important accident phenomena that might occur within the primary system, in the containment, and/or in the auxiliary/reactor building. For a specified reactor and containment system, MAAP4 calculates the progression of the postulated accident sequence, including the disposition of the fission products, from a set of initiating events to either a safe, stable state or to an impaired containment condition (by overpressure or over temperature) and the possible release of fission products to the environment.

2.3 PWR PRIMARY SYSTEM THERMAL HYDRAULICS

The PWR primary system model calculates the thermal hydraulic conditions in the reactor pressure vessel, the hot legs, the cold legs and the primary side of the steam generators. (The pressurizer is treated in a separate model.) The primary system is divided into two loops, the "broken" loop and the "unbroken" loop. The user specifies how many actual loops are in each loop in the model, and which loop contains the surge line to the pressurizer. (The terms "broken" and "unbroken" are misnomers in that breaks can be modeled in either or both of the loops; they are carryovers from earlier, more restrictive versions of the code.)

There are sixteen gas nodes in the model: the core, upper plenum, broken and unbroken hot legs, broken and unbroken hot and cold leg tubes for U-tube steam generators, broken and unbroken candy cane and tubes for once-through steam generators (OTSGs), broken and unbroken cross-over (intermediate) legs, broken and unbroken cold legs, downcomer and reactor dome. There are six water pools: the core, broken and unbroken cold leg tubes, broken and unbroken cross-over legs and downcomer. In addition, there are nineteen primary system structural heat sinks, which are modeled as two-dimensional slabs. Because the number of gas volumes is larger than the number of water pools, a pool can occupy several gas volumes.

When steam first forms in the reactor coolant loops during a MAAP4 calculation, the two phases are assumed to be homogeneously mixed. If the main (reactor) coolant pumps are operating, water flow rates between the primary system pools are adjusted so that the individual void fractions match the system average void fraction, and energy is transferred between the pools so that the water and gas are all at a uniform temperature and pressure. The same treatment is used if the internal gas velocities are sufficiently high to cause water entrainment, as occurs during the early phase of a large break loss-of-coolant accident (LOCA).

Once the pumps have stopped running and the void fraction is less than a user-specified criterion for phase separation, the same well-mixed treatment is used to model natural circulation in a simple manner. Because the PWR thermal-hydraulic model does not explicitly account for the conservation of momentum, which would require a substantially more complex model, it does not calculate natural circulation flow rates. Hence, during this phase the heat transfer from the primary system to the steam generators is based on a user-supplied heat transfer coefficient.

When the void fraction exceeds the user-specified criterion for phase separation, the gas and water pools are no longer assumed to be intimately mixed, and are treated separately in a gas-over-water configuration. For these conditions the gas in each node can have a unique temperature, distinct from the pool temperature. When the water level is above the elevation of the reactor pressure vessel (RPV) inlet and outlet nozzles, it is assumed that there is enough water in the primary system to permit free communication between the core, intermediate leg and downcomer pools, with a common collapsed water level. As the water level continues to drop, the pools are uncoupled and water spills from one pool to another.

The thermal-hydraulic model calculates water transport, gas transport, steaming, and heat transfer to the structures that interface with the secondary side and the containment. Condensation is modeled in certain circumstances: steam can condense on cold emergency core cooling system (ECCS) water injected into the cold leg and onto the inside surface of steam generator tubes if the secondary side still contains water. Once the accident progresses to core uncovery, the level of detail in the calculations increases, and the modeling includes such phenomena as natural circulation of superheated gases in the vessel and in the hot leg (counter-current flow).

At each time step, the code calculates the influx of water through makeup flow, accumulator flow, and high pressure, low pressure and charging pump injection systems, as appropriate. It also calculates water and gas flow from the primary system through breaks, steam generator tube ruptures (SGTRs) and other user-specified openings, as well as fluid transport between the primary system and the pressurizer via the surge line.

2.4 PWR PRESSURIZER THERMAL HYDRAULICS

The pressurizer is modeled as a single control volume, with one water pool and one gas node. The water and gas can be at different temperatures (which are also distinct from the primary system fluid temperatures). Calculations of the thermal-hydraulic conditions in the pressurizer account for evaporation, condensation, steam stripping due to steam and non-condensable gases sparging through the water pool, and water and gas exchange with the primary system via the surge line and with the containment through relief valves and safety valves. Mass and energy contributions from pressurizer sprays and heaters, and heat transfer to structures are also included.

2.5 CORE

The core model predicts the thermal-hydraulic behavior of the core and the water and gas contained within the core boundary and the response of core components during all phases of a sequence. The calculations are performed on a nodal basis. Users can specify up to fifty axial rows and seven radial rings (channels); typically thirteen to thirty-three axial rows (ten to thirty for the active core, two below the active core for the core support plate and the lower tie plate and lower gas plenum, and one above the active core for the upper tie plate and upper gas plenum) and five to seven radial rings provide adequate resolution.

The code tracks the mass, energy and temperature of the following constituents in each node:

- Fuel (UO_2)
- Cladding (Zr, ZrO_2, stainless steel, steel oxide)
- Fuel canister (Zr, ZrO_2)

- Control blade (B4C, stainless steel, steel oxide)
- Control rod or water rod (Ag-In-Cd or B4C, stainless steel, steel oxide, Zr, ZrO2)
- Structural materials (Zr, ZrO2, stainless steel, steel oxide)

Input quantities include the initial masses of the different materials, the geometry of the constituents, and axial and radial peaking factors.

The initial core power is specified by the user. Decay power is determined from the ANSI/ANS decay heat correlation [1].

Consistent with the models in the rest of the primary system, a single temperature is calculated for the entire water pool contained in the core, but individual gas temperatures and steam and hydrogen fractions are calculated for each core node. Auxiliary calculations are used to estimate the elevation where the coolant reaches saturation.

The dominant intra-nodal heat transfer processes between the fuel, cladding, fuel canisters, control blades, control or water rods, structural materials and coolant are calculated. The code also calculates conduction and convection heat transfer between nodes (axially and radially), radial thermal radiation between neighboring nodes and radiation to vessel internal structures.

In addition to calculating water flow into the bottom of the core from the lower plenum and water and steam out of the top of the core, the code models upper head injection systems.

MAAP4 contains a diverse and detailed set of models for calculating the oxidation of core constituents and their melting and subsequent transport. Detailed information about these models can be found in the MAAP4 User's Manual [2].

2.6 CONTAINMENT AND REACTOR / AUXILIARY BUILDING

The same model is used for the containment and the reactor/auxiliary building. It is a generalized node and junction model The user can specify a maximum of 40 compartment nodes, 200 distributed heat sinks, 200 lumped heat sinks and 200 flow junctions. Five different types of flow junctions can be defined:

- A normally open flow path
- A normally closed flow path designed to fail open on a pressure differential
- A flow path that simulates a vacuum breaker or a check valve
- A loop seal flow path
- A normally closed flow path designed to fail when core debris in the containment erodes the concrete more than a specified distance

Starting with the masses and energies of gas constituents and water in each compartment, the code calculates thermodynamic properties. It then computes gas and water flows between the compartments, heat transfer to internal and boundary heat sinks, condensation and evaporation, and other phenomena using semi-implicit methods to account for inter-dependencies in a stable fashion. An optional subnodal physics model can be employed to account for stratification due to non-homogeneous gas properties within a compartment and for buoyant plume dispersion between compartments. An unusual feature of the flow calculations is that they account not only for unidirectional natural circulation of gas and water, but also for counter-current flow of gas and water through large junctions.

Containment engineered safeguards systems are modeled, including sprays, gas coolers, water heat exchangers, and hydrogen igniters and recombiners. Normally closed flow paths are used to represent containment vulnerabilities, which can then fail open based on user-defined criteria. Leakage in or out of the containment is modeled with normally open flow paths.

2.7 FISSION PRODUCTS

MAAP4 contains models that calculate the release of fission products from the core and relocated core material in-vessel, and from core debris ex-vessel. It also calculates the transport and deposition of fission products in the primary system and in the containment, and the release of fission products to the reactor/auxiliary building and the environment through containment leakage and failure paths. The code sorts the initial masses of twenty-two fission product elements into thirteen groups and then tracks the mass of each group in each of four physical states (vapor, aerosol, deposited on surfaces and contained in corium) in the various components of the primary system and containment. It also calculates the decay energy generated by each group in each location. The fission product models are only applicable to Level 2 PRA calculations, so they are not discussed further here. Detailed information about these models can be found in the MAAP4 User's Manual [2].

2.8 COMPUTATIONAL STRUCTURE AND DESIGN PHILOSOPHY

The MAAP4 code is written primarily in Fortran, and can be run on a variety of computer platforms, most commonly PCs. The format of the input and output files is tailored to plant engineers. Users can control phenomena through flags and uncertainty parameters. The calculations are done in SI units; users have the option of specifying that the input and/or output quantities be in either SI or British units.

The code is modular, consisting of several hundred subroutines and functions which fall into four categories. The high level routines include the main program, input and output routines, data storage and retrieval routines and numerical integration routines. The system and region routines set the flags that define the status of the various systems and contain the differential equations for the conservation of the state variables, principally the masses and energies of the constituents in the individual volumes. The phenomenological routines contain the equations for determining the rates-of-change of the state variables within and between the individual volumes; these routines are the core of the code. The property and utility routines generate physical properties and perform mathematical operations. There is an overlying parallel structure between the thermal-hydraulic routines and the fission product routines in the code architecture.

The equations in MAAP4 are essentially lumped parameter, non-linear, ordinary differential equations in time. The overall calculation scheme proceeds as follows. First, quantities such as pressure and temperature are calculated given the current values of the state variables (e.g., masses and internal energies). Next, the rates-of-change of the state variables are determined by summing the contributions of each modeled phenomenon. Then, new values of the state variables are obtained by integrating their rates-of-change using a prospective time step. Finally, the fractional changes of key state variables are assessed; if any exceed input criteria the time step is reduced and the rates-of-change and integration calculations are repeated. The last step is performed because some rates-of-change, e.g., those that are based on assumed quasi-steady behavior, depend explicitly on the time step.

The models in MAAP4 have been designed so that the code is fast running. This is a hallmark of MAAP. The primary means of achieving this objective are the use of quasi-steady modeling wherever appropriate, relatively coarse nodalization, and the largest possible time step consistent with the level of detail desired. Smaller values of the time step are used when key quantities are rapidly changing and larger values are used when conditions are relatively stable. The code also uses smaller time steps in some of the localized primary system thermal-hydraulic calculations, eliminating the need for the bulk of the calculations to be run with the smaller time steps. Other features that contribute to the code's speed are the use of tabularized results and correlations from other computations rather than the incorporation of specific detailed calculations, and non-uniform levels of nodalization that reflect the magnitudes of the potential gradients. The result is that the code execution time is generally several orders of magnitude faster than problem time on a typical PC, and considerably faster than most comparable codes.

In conjunction with designing the code so that it is fast running, the level of detail in the models is commensurate with the level of precision required for anticipated PRA applications. Furthermore, a central feature of the code's design philosophy is that the level of detail in the models tends to increase as conditions in the plant become more severe. To balance these characteristics, many of the key models incorporate input parameters that allow users to investigate the sensitivity of the results to variations in the calculations as a way of evaluating the potential impact on the results if more complex, detailed models had been used. Examples of such parameters are the void fraction above which the phases separate in the PWR primary system (discussed above), and a flag that indicates whether or not steam and water flows from the primary system to the containment are assumed to be intimately mixed. The bulk of the parameters that are used for uncertainty and sensitivity studies are in the Model and Control sections of the parameter file.

2.9 MAAP4 DOCUMENTATION

The MAAP4 code is documented in the MAAP4 User's Manual [2], the Users Guide's (i.e., the six sample parameter files) and the MAAP 4.0.6 Transmittal Document [3].

The User's Manual contains detailed information on how to prepare input files and execute the code, and detailed descriptions of the models in the code, including descriptions of the individual subroutines and functions. It is currently distributed in hardcopy form, and is undergoing a transition into electronic form. Components of the manual are updated in conjunction with updates to the code. The manual is divided into four volumes:

Volume I User Guidance

- Code installation and operation
- Input and output files

Volume II Code Structure and Theory

- Summary of models
- Subroutine and function descriptions

Volume III Benchmarking

- Key benchmarks
- Plant benchmarks
- Integral experiment benchmarks
- Separate effects benchmarks

Volume IV Optional Features

- MAAP4-GRAAPH graphical interface

- MAAP4-DOSE code for radiological calculations

The User's Guides contain detailed descriptions and default values and ranges of the input parameters included in the parameter file. The guides are essentially sample parameter files, and can be used as templates for plant-specific parameter files. They are distributed electronically.

A transmittal document accompanies each revision of the code. It contains information on code installation and execution, summaries of the changes made to the code since the previous revision, and discussions of the impact of the changes on the code results. It is distributed electronically. The current version of the code is MAAP 4.0.6.

The source code is an additional documentation resource. It is available electronically on an as-needed basis.

2.10 CODE VALIDATION

As mentioned above, MAAP was developed as part of the IDCOR Program. The purpose of MAAP is to simulate the behavior of a light water reactor to a wide range of accident conditions. Initial applications of the code were focused on modeling severe accident progression in support of the Individual Plant Examinations (IPE). Later, MAAP has been used to assess Level 1 PRA success criteria and general accident timing.

In 1992, EPRI completed the MAAP Thermal Hydraulic Qualification and Application project (TR-100741). This effort identified the accident sequences of interest, important thermal-hydraulic phenomena, and the MAAP parameters which control these phenomena.

Data from separate effects tests, integral effects tests, actual plant data, and plant predictions by other codes were all compared against MAAP. This project then used the insights from the benchmark activity to provide utilities with application guidelines for using MAAP.

The following comparisons were included in the evaluation:

PWR Data Predictions

- Westinghouse 4-loop, LOOP
- Westinghouse 4-loop, reactor trip

Code Comparisons

- PWR-RETRAN
  - Westinghouse 4-loop, loss of feedwater
  - Westinghouse 4-loop, failed PORV
  - Westinghouse 4-loop, SGTR
  - Westinghouse 4-loop, SGTR with stuck secondary PORV
  - Westinghouse 4-loop, reactor trip
  - Westinghouse 4-loop, steam line break
- PWR-RELAP
  - Westinghouse 4-loop, small LOCA
  - Westinghouse 4-loop, small LOCA with loss of injection
- BWR-SAFE
  - BWR/4, Stuck open relief valve w/o injection
  - BWR/4, Stuck open relief valve with injection
  - BWR/4, Loss of feedwater with injection

Integral Test Predictions

- PWR - Semiscale
  - 0.5%, 2.1% and 5% small break LOCAs
  - 5% small LOCA
  - SBO w and w/o stuck open PORV
  - SGTR (several cases)
- BWR - Full Scale Integral Simulation Test (FIST)
  - Intermediate break LOCA w injection
  - Failure to maintain level w/o injection at decay power
  - Failure to maintain level w/o power shutdown

Separate Effect Test Predictions

- GE Vessel Blowdown Experiment
- EPRI PWR Safety Valve tests

Close agreement was obtained for the variety of comparisons. The study resulted in several enhancements to MAAP and the development of application guidelines to assist the users of the code.

The Applications Guidelines:

- Allow users to determine if MAAP is appropriate for sequence under consideration
- Identify initiating events and accident scenarios
- Describe relevant MAAP models
- Provide guidance on setting up the calculation, sensitivity analysis, and interpretation of results
- Identify limitations

The development of MAAP has also included other benchmarks to validate the phenomenological models. The current MAAP Users Manual includes the following comparisons:

- Hydrogen mixing experiments at HDR reactor in Germany
- CORA test facility at Karlsruhe, Germany
- TMI-2
- 1985 Davis-Besse Loss of main and auxiliary feedwater
- 1979 Oyster Creek trip with loss of feedwater
- 1979 Prairie Island Unit 1 SGTR
- Hydrogen mixing experiments at the Hanford Containment Systems Test Facility (CSTF)
- Direct Containment Heating Integral Effects Tests (IET) in the Containment Technology Test Facility
- Pacific Northwest Laboratory Ice Condenser Aerosol Tests
- Waltz Mill Test Facility

2.11 CODE LIMITATIONS

The overall conclusion from the EPRI MAAP Thermal-Hydraulic Qualification Studies was that MAAP had a wide range of applicability; however, a few limitations were identified. In many instances, code limitations can be addressed with proper sensitivity analysis to assure that the results are insensitive to any modeling deficiencies. The current position on MAAP code limitations can be found on the secure MAAP4 web site. That list of code limitations has been provided in Table 2-1.

Relative to Braidwood, this means that the minimum systems required to mitigate a large break LOCA should be based on a source other than MAAP. In this case, plant design basis analysis forms the basis for that success criteria.

The MAAP4 Applications Guidance Document to be released later in 2009 will include a more detailed description of code limitations and methods to address them.

TABLE 2-1
USE OF MAAP TO REPRESENT LEVEL 1 SUCCESS CRITERIA FOR THE CORE

ACCIDENT DEFINITION	COMMENT
Double Ended Guillotine Cold Leg Break	Since the accident causes the flow to reverse initially, do not use MAAP until reflood is complete. Use DBA codes during this interval. After reflood MAAP will track the accident sequences.
Double Ended Hot Leg Rupture	Flow in the core does not reverse and MAAP can be used.
Large Break Cold Leg LOCA but Less Than a DECL Break (Leak-Before-Break)	If the flow within the core is not reversed, MAAP will calculate the appropriate heat up and potential shutdown of the nuclear reaction; benchmark with LOFT FP-2 demonstrates the code capabilities.
Medium LOCA	Since the flow does not reverse within the core, MAAP can be used for such success criteria.
Small Break LOCA	MAAP treats the behavior under small break LOCAs quite well. This is evidenced by the successful benchmark with the TMI-2 accident behavior. Also, the MAAP model has been successfully benchmarked with the Prairie Island steam generator tube rupture.
Loss of Heat Sink Accidents	MAAP represents the behavior of the core under these conditions quite well. This is best evidenced by the benchmarks with the Davis-Besse Loss-of-feedwater event (PWR) and the Oyster Creek loss-of-feedwater event (BWR).
Main Steam Line Break	This is a rare initiating event for severe core damage, but the MAAP model has been benchmarked with the Westinghouse MB-2 experiments for steam generator response to loss-of-feedwater, MSLB, etc.

3.0 METHODOLOGY

An analysis was performed with MAAP4.0.6 using the existing Byron/Braidwood parameter file [4, 5]. This version of the code and the plant parameter file are currently used to support the Byron and Braidwood PRA. Multiple cases were performed to investigate containment spray initiation and timing (Section 3.1). These were followed by a set of cases to determine RWST depletion timing for specific LOCA and bleed and feed scenarios (Section 3.2). A third and fourth set of cases were performed to determine uncertainty with respect to modeling input (Section 3.3 and 3.4). References for the case definitions are defined in Attachment 1.

3.1 CONTAINMENT SPRAY SENSITIVITY

Containment spray sensitivities were performed to determine initiation times and maximum containment pressures for varying sized breaks with 0, 1 and 2 trains of RCFCs. Table 4-1 includes LOCA sizes and RCFCs configurations for cases BBSDP08 thru BBSDP14b. Information is reported for spray initiation and maximum containment pressure for each case.

The features of the containment spray cases are as follows:

- LOCA initiated at time = 0
- RCPs tripped on RCS pressure < 1425 psig
- Containment spray initiated @ 20 psig containment pressure
- 2 CS pumps available and secured below 9% RWST level
- 0, 1 or 2 RCFC Trains available
- No containment leakage modeled
- 2 RH, 2 SI and 2 CV available
- Cooldown of 100° F initiated @ 45 minutes

3.2 RWST DEPLETION SENSITIVITY

After feedback from observations of the simulator runs at Braidwood and review of the Refueling Water Storage Tank Setpoints calculation [8] it was determined that the affects of flow diversion through the 8812 valves should be explicitly accounted for in the scenario timelines. The Braidwood design is such that the RWST water can be diverted to the containment ECCS sump commencing when 8811 valves are opened on low RWST level (level < 46.7%) and until the 8812 valves are closed. The diversion rate is a function of a variety of factors including ECCS pump flows and containment pressure. Such diversion can occur even with 8811 valves partially open. The flow diversion rates from the RWST to the sump were developed separately [9] and incorporated into the MAAP thermal hydraulic analyses for the LOCA and bleed and feed cases. The RWST flow diversion calculation determined sump flows through the 8812 valves for a period of 6 minutes following the RWST reaching a level of 46.7%

with ECCS injecting. RWST depletion results were compiled for varying sized LOCAs and the bleed and feed case.

Initial cases were run with MAAP4 to determine the time to 46.7% RWST level without flow diversion. That timing was used as the 46.7% timing for each subsequent case. The flow diversion from the PIPE-FLO analysis [9] was added to the subsequent cases by reducing the initial RWST inventory to simulate additional inventory loss past 46.7%. The cases that were performed to simulate closing the 8812 valves terminated the flow diversion at 7 minutes after reaching an RWST level of 46.7%.

The features of the RWST depletion cases are as follows. Results are presented in Table 4-2.

Medium 5.2" LOCA - BBSDP15a

- Medium 5.2" LOCA (0.148 ft^2) located in the hot leg
- Initial RWST inventory = 400500 gal (Tech Spec Minimum)
- RWST flow diversion of 5236.5 gpm for 7 min after RWST reaches 46.7%
- Cooldown of 100°F per hour initiated @ 45 minutes
- RCPs tripped on RCS pressure < 1425 psig
- 3 Accumulators available
- 2 RH, 2 SI and 2 CV available
- RHR available for injection below shutoff head (~190 psia) and secured 7 minutes after RWST reaches 46.7%
- 2 CS pumps available and secured below 9% RWST level
- All ECCS secured below 9% RWST level
- AFW modeled with 1 train (2 trains not needed)
- 2 RCFC trains (4 fan coolers) available

Small 2" LOCA - BBSDP17a

- Small 2" LOCA (0.022 ft^2) located in the hot leg
- Initial RWST inventory = 400500 gal (Tech Spec Minimum)
- RWST flow diversion of 11891 gpm for 7 min after RWST reaches 46.7% (PIPE-FLO analysis for 2" break assumed RH operation.

Since this results in a smaller flow diversion, the larger flow diversion for a 0.86" break was conservatively used.)

- Cooldown of 100°F per hour initiated @ 45 minutes
- RCPs tripped on RCS pressure < 1425 psig
- No Accumulators available
- 2 RH, 2 SI and 2 CV available
- RHR available for injection below shutoff head (~190 psia) and secured 7 minutes after RWST reaches 46.7%
- 2 CS pumps available and secured below 9% RWST level
- All ECCS secured below 9% RWST level
- AFW modeled with 1 train (2 trains not needed)
- 2 RCFC trains (4 fan coolers) available

Medium 3" LOCA - BBSDP16a

- Medium 3" LOCA (0.049 ft^2) located in the hot leg
- Initial RWST inventory = 400500 gal (Tech Spec Minimum)
- RWST flow diversion of 7310 gpm for 7 min after RWST reaches 46.7% (PIPE-FLO results were not generated for a 3" break, the 2" break flow diversion was conservatively assumed.)
- Cooldown of 100°F per hour initiated @ 45 minutes
- RCPs tripped on RCS pressure < 1425 psig
- No Accumulators available
- 2 RH, 2 SI and 2 CV available
- RHR available for injection below shutoff head (~190 psia) and secured 7 minutes after RWST reaches 46.7%
- 2 CS pumps available and secured below 9% RWST level
- All ECCS secured below 9% RWST level
- AFW modeled with 1 train (2 trains not needed)
- 2 RCFC trains (4 fan coolers) available

Small 0.86" LOCA - BBSDP18a

- Small 0.86" LOCA (0.004 ft^2) located in the hot leg
- Initial RWST inventory = 400500 gal (Tech Spec Minimum)

- RWST flow diversion of 11891 gpm for 7 min after RWST reaches 46.7%
- Cooldown of 100°F per hour initiated @ 45 minutes
- RCPs tripped on RCS pressure < 1425 psig
- No Accumulators available
- 2 RH, 2 SI and 2 CV available
- RHR available for injection below shutoff head (~190 psia) and secured 7 minutes after RWST reaches 46.7%
- 2 CS pumps available and secured below 9% RWST level
- All ECCS secured below 9% RWST level
- AFW modeled with 1 train (2 trains not needed)
- 2 RCFC trains (4 fan coolers) available

Bleed & Feed - BBSDP25a

- Bleed and Feed, 1 Porv & 1 Reactor Head Vent (secured @ 9% RWST Level)
- Initial RWST inventory = 400500 gal (Tech Spec Minimum)
- RWST flow diversion of 11891 gpm for 7 min after RWST reaches 46.7% (Since PIPE-FLO results were generated for bleed and feed with a combined 2" LOCA, the flow diversion for the 0.86" case was conservatively assumed for the bleed and feed case.)
- RCPs tripped on RCS pressure < 1425 psig
- No Accumulators available
- 1 SI and 1 CV available
- RHR available for injection below shutoff head (~190 psia) and secured 7 minutes after RWST reaches 46.7%
- 2 CS pumps available and secured below 9% RWST level
- All ECCS secured below 9% RWST level
- No AFW available
- 1 RCFC train (2 fan coolers) available

3.3 5.2" LOCA RWST DEPLETION UNCERTAINTY SENSITIVITIES

Multiple cases were developed to determine the sensitivity of the timing results to the uncertainty of the MAAP input. Sensitivities identified in previous MAAP4 benchmark studies included changes to the break flow, primary system void fraction, steam generator natural circulation heat transfer coefficient, and the break location. Results are presented in Table 4-3.

The changes and basis for each sensitivity case are as follows:

BBSDP15a

See Section 3.2 for base case description

BBSDP15a1 - Break Size Sensitivity

Same as **BBSDP15a** except:

- 10% increase in LOCA break size

From Reference 6: Section 2.3.2 Sensitivity Study Results for "Variation in Break Area". The investigation to critical flow uncertainty recommends a change to break flow area of 10%.

BBSDP15a2 - Primary System Void Fraction Sensitivity

Same as **BBSDP15a** except:

- VFSEP = 0.6 (base case = 0.5)

VFSEP is the void fraction in the primary system above which the two-phase mixture characteristics no longer lead to the carrying of water over the highest point in the reactor coolant system. Typically this is the top of the steam generators for the inverted U-tube designs and the top of the hot legs for the B&W designs. As a result, the phases separate to a large degree. Two-phase natural circulation can still continue but in a different manner, e.g., countercurrent reflux cooling between the steam generators and the core. This parameter influences the time at which the core is uncovered. It also affects the void fraction of the break flow for primary system LOCA sequences. In addition, the heat transfer to the secondary side is somewhat influenced by this parameter. Values between 0.4 and 0.6 are typical of the Flecht-Seaset tests (EPRI Report NP-3497 - Flecht-Seaset experiment).

From Reference 7: The sensitivity of the primary system response to the value of VFSEP should be evaluated routinely, as suggested in Section 4 (Uncertainty and Sensitivity Analysis) of this document. And from Reference 1 (parameter file guidance): Adjust for sequences and sensitivity in conjunction with VFSEP for Level 1 and Level 2 sequences.

Values for the parameter were verified from 0.4 to 0.6 and the 0.6 resulted in the greatest RWST deletion times.

BBSDP15a3 - Steam Generator Natural Circulation Heat Transfer Coefficient Sensitivity

Same as **BBSDP15** except:

- HTSTAG adjusted to 500 W/M**2-C (base case = 850.0 W/M**2-C)

HTSTAG is the natural circulation (reactor coolant pumps off) steam generator primary side heat transfer coefficient when single- or two-phase natural circulation is occurring in the coolant loops. Note that the coolant velocity and void fraction distribution are not computed under these conditions.

From Reference 4 (parameter file guidance): It is suggested that users assess the sensitivity of the results to the value of HTSTAG for Level 1 sequences, using values between 425 and 2500 W/m**2-C. It has the potential to have a limited affect on heat transfer to the steam generator.

The lower end of the applicable range was selected to minimize secondary side heat transfer and maximize ECCS demand resulting in a more rapid RWST depletion.

BBSDP15a4 - Break Location Sensitivity

Same as **BBSDP15a** except:

- Changed break location from hot leg to cold leg

3.4 2" LOCA RWST DEPLETION UNCERTAINTY SENSITIVITIES

Multiple cases were developed to determine the sensitivity of the timing results to the uncertainty of the MAAP input. Sensitivities included changes to the break flow, primary system void fraction, steam generator natural circulation heat transfer coefficient, and the break location. Results are presented in Table 4-4.

The changes and basis for each sensitivity case are as follows:

BBSDP17a

See Section 3.2 for base case description

BBSDP17a1 - Break Size Sensitivity

Same as **BBSDP17a** except:

- 10% increase in LOCA break size

Refer to Section 3.3 for parameter description.

BBSDP17a2 - Primary System Void Fraction Sensitivity

Same as **BBSDP17a** except:

- VFSEP = 0.6 (base case = 0.5)

Refer to Section 3.3 for parameter description.

BBSDP17a3 - Steam Generator Natural Circulation Heat Transfer Coefficient Sensitivity

Same as **BBSDP17a** except:

- HTSTAG adjusted to 500 W/M**2-C (was 850.0 W/M**2-C)

Refer to Section 3.3 for parameter description.

BBSDP17a4 - Break Location Sensitivity

Same as **BBSDP17a** except:

- Changed break location from hot leg to cold leg

4.0 RESULTS

TABLE 4-1
CONTAINMENT SPRAY SENSITIVITY

CASE #	LOCA SIZE[1]	RCFC TRAINS[2]	CONT SPRAYS INITIATE	MAX CONT PRESSURE[3]	SIMULATION TIME
BBSDP08	5.2"	2	NA	30.7 psia	1 HR
BBSDP08a	5.2"	1	NA	33.4 psia	1 HR
BBSDP08b	5.2"	0	14 min	35.1 psia	1 HR
BBSDP09	4.5"	2	NA	30.1 psia	1 HR
BBSDP09a	4.5"	1	NA	33.3 psia	1 HR
BBSDP09b	4.5"	0	17 min	35.1 psia	1 HR
BBSDP10	4.0"	2	NA	29.5 psia	1 HR
BBSDP10a	4.0"	1	NA	33.1 psia	1 HR
BBSDP10b	4.0"	0	21 min	35.1 psia	1 HR
BBSDP11a	3.5"	1	NA	32.8 psia	1 HR
BBSDP11b	3.5"	0	26 min	35.1 psia	1 HR
BBSDP12	3.0"	2	NA	27.9 psia	1 HR
BBSDP12a	3.0"	1	NA	32.4 psia	1 HR
BBSDP12b	3.0"	0	33 min	35.1 psia	1 HR
BBSDP13b	2.5"	0	48 min	35.1 psia	1 HR
BBSDP14	2.0"	2	NA	22.8 psia	2 HR
BBSDP14a	2.0"	1	NA	25.6 psia	2 HR
BBSDP14b	2.0"	0	1.7 hr	34.9 psia	2 HR

Notes:
1. LOCA area is increased by 10% to account for uncertainty (e.g. 5.2" is set to 5.45")
2. *Each train contains 2 fan coolers with cooling water temperature of 100F*
3. Spray set point is 20 psig = 34.7 psia

TABLE 4-2
RWST DEPLETION ANALYSIS

CASE DESCRIPTION[1]	CASE #	RWST 46.7%[2]	RWST 9%	TAF[3]	CD[4]	46.7% TO 9%	46.7% TO TAF	FLOW DIVERSION GPM / MIN	SIMULATION TIME
5.2" MLOCA, wAFW, 2CV, 2SI, Cooldown @ .75 hr, 2 RCFC trains, flow diversion for 7 min.	BBSDP15a	44 min	1.86 hr	2.73 hr	3.48 hr	1.12 hr	1.99 hr	5237 / 7 min	6 hr
3" MLOCA, wAFW, 2CV, 2SI, Cooldown @ .75 hr, 2 RCFC trains, flow diversion for 7 min.	BBSDP16a	2.00 hr	3.08 hr	6.96 hr	8.74 hr	1.08 hr	4.96 hr	7310 / 7 min	12 hr
2" SLOCA, wAFW, 2CV, 2SI, Cooldown @ .75 hr, 2 RCFC trains, flow diversion for 7 min.	BBSDP17a	2.54 hr	3.57 hr	12.00 hr	15.91 hr	1.03 hr	9.46 hr	11891 / 7 min	24 hr
.86" SLOCA, wAFW, 2CV, 2SI, Cooldown @ .75 hr, 2 RCFC trains, flow diversion for 7 min.	BBSDP18a	5.23 hr	8.00 hr	28.21 hr	30.45 hr	2.77 hr	22.98 hr	11891 / 7 min	36 hr
B&F, No AFW, 1 PORV, 1 Vent, 1CV, 1SI, 1 RCFC train, Porv & Vent Closed @ 9%, flow diversion for 7 min.	BBSDP25a	8.73 hr	11.94 hr	14.83 hr	16.35 hr	3.21 hr	6.10 hr	11891 / 7 min	24 hr

Notes:
1) See Section 3.2 for complete case description
2) Initial volume corresponds to Tech Spec minimum of 400500 gal
3) Top of active fuel exposure
4) Peak cladding temperature > 1800 F

TABLE 4-3
5.2" LOCA WITH RWST DEPLETION UNCERTAINTY SENSITIVITY

CASE DESCRIPTION[1]	CASE #	RWST 46.7%[2]	RWST 9%	TAF[3]	CD[4]	46.7% TO 9%	46.7% TO TAF	FLOW DIVERSION GPM / MIN	SIMULATION TIME
5.2" MLOCA, wAFW, 2CV, 2SI, 2CS, Cooldown @ .75 hr, 2 RCFC train, flow diversion for 7 min	BBSDP15a	45 min	1.86 hr	2.73 hr	3.48 hr	1.12 hr	1.99 hr	5236.5 / 7 min	6 hr
10% LOCA increase	BBSDP15a1	41 min	1.76 hr	2.50 hr	3.20 hr	1.07 hr	1.81 hr	5236.5 / 7 min	6 hr
VFSEP/ VFCIRC	BBSDP15a2	45 min	1.86 hr	2.73 hr	3.48 hr	1.12 hr	1.99 hr	5236.5 / 7 min	6 hr
HTSTAG	BBSDP15a3	45 min	1.85 hr	2.72 hr	3.46 hr	1.11 hr	1.98 hr	5236.5 / 7 min	6 hr
Cold Leg	BBSDP15a4	1.58 hr	2.68 hr	5.46 hr	6.28 hr	1.10 hr	3.88 hr	5236.5 / 7 min	12 hr

Notes:
1) See Section 3.3 for variable description
2) Initial volume corresponds to Tech Spec minimum of 400500 gal
3) Top of active fuel exposure
4) Peak cladding temperature > 1800 F

TABLE 4-4
2" LOCA WITH RWST DEPLETION UNCERTAINTY SENSITIVITY

CASE DESCRIPTION[1]	CASE #	RWST 46.7%[2]	RWST 9%	TAF[3]	CD[4]	46.7% TO 9%	46.7% TO TAF	FLOW DIVERSION GPM / MIN	SIMULATION TIME
2" MLOCA, wAFW, 2CV, 2SI, 2CS, Cooldown @ .75 hr, 2 RCFC train, flow diversionfor 7 min	BBSDP17a	2.54 hr	3.57 hr	12.00 hr	15.91 hr	1.03 hr	9.46 hr	11891 / 7 min	24 hr
10% LOCA increase	BBSDP17a1	2.50 hr	3.53 hr	11.11 hr	14.62 hr	1.03 hr	8.61 hr	11891 / 7 min	24 hr
VFSEP/ VFCIRC	BBSDP17a2	2.54 hr	3.58 hr	12.21 hr	16.14 hr	1.04 hr	9.67 hr	11891 / 7 min	24 hr
HTSTAG	BBSDP17a3	2.54 hr	3.58 hr	11.94 hr	15.83 hr	1.04 hr	9.40 hr	11891 / 7 min	24 hr
Cold Leg	BBSDP17a4	2.54 hr	3.58 hr	22.85 hr	27.00 hr	1.04 hr	20.31 hr	11891 / 7 min	36 hr

Notes:
1) See Section 3.3 for variable description
2) Initial volume corresponds to Tech Spec minimum of 400500 gal
3) Top of active fuel exposure
4) Peak cladding temperature > 1800 F

5.0 CONCLUSIONS

Results from Table 4-1 demonstrate that containment sprays will not actuate if two trains of RCFCs are available following small or medium LOCAs. Also, containment sprays will not actuate for the small LOCA when a single train of RCFCs are available.

The RWST depletion cases in Table 4-2 model medium LOCAs with successful RCS cooldown, loss of recirculation, all trains of ECCS available, and an RWST flow diversion for 7 minutes. For the medium LOCA's, there is over 2 hours available from 46.7% (Lo-2) RWST level and a core water level at TAF. For small LOCAs with the same configuration of ECCS and flow diversion, there is at least 9.5 hours available from 46.7% (Lo-2) RWST level and a core water level at TAF.

6.0 REFERENCES

1. Decay Heat Power in Light Water Reactors. American National Standards Institute, Washington, D.C., 1979. Revised American National Standard ANSI/ANS-5.1-1979.
2. MAAP4 Modular Accident Analysis Program for LWR Power Plants User's Manual. EPRI, Palo Alto, CA: 1994–2005. RP3131-02.
3. Transmittal Document for MAAP4 Code Revision MAAP 4.0.6. Fauske & Associates, LLC, Burr Ridge, IL: 2005. FAI/05-47.
4. MAAP4 Parameter File Notebook, BB PRA-009, Rev 2, Jan 2008.
5. Level 1 MAAP Thermal-Hydraulic Calculation Notebook, BB PRA-007, Rev 0, Jan 2008.
6. MAAP Thermal-Hydraulic Qualification Studies, EPRI TR-100741, Final Report, June 1992.
7. MAAP Applications Guidance, "Desktop Reference for Using MAAP4 Software", EPRI 101675, Revision 1, Nov 2008.
8. Refueling Water Storage Tank Setpoints, SITH-1, Revision 7, Sept 2007.
9. Analysis of RWST Back Flow to the Containment Sumps, Evaluation 2009-13491, Revision 0.

Attachment 1

REFERENCES FOR CASE DEFINITIONS

INDEX	CASE DEFINITION	REFERENCE
1	Initial RWST Volume - 400500 gallons	Tech Spec SR 3.5.4.3, Amendment 98.
2	Charging Pump Curves	PSA-B-98-08, Rev. 2, 8/30/99. 1 Charging Pump : Table 25 2 Charging Pumps : Table 27
3	SI Pump Curves	PSA-B-98-08, Rev. 2, 8/30/99, 1 SI : Table 21, 2 SI : Table 23
4	RH Pump Curves	MAAP4 Parameter File Notebook, BB PRA-009, Rev 2, Jan 2008. 1 RH Pump : Parameter File 2 RH Pumps: Double Parameter File Flow
5	RCP Trip @ Primary System Pressure of 1425 psig	1BwEP-0, Step 20, Rev. 202, WOG2.
6	Steam Generator Cool Down Cooldown @ 100°F after 45 minutes	1BwEP-ES-1.2, Step 8a, Rev. 202, WOG2.
7	Containment Spray initiated @ 20 psig	MAAP4 Parameter File Notebook, BB PRA-009, Rev 2, Jan 2008. Parameter File
8	All ECCS Secured Below 9% RWST Level	1BwFEP-F:1.3, Rev. 200, WOG2.
9	RWST flow diversion Flows	Analysis of RWST Back Flow to the Containment Sumps, Evaluation 2009-13491, Revision 0.
10	1" Reactor Vent	DWG M-60, Sheet 1B, Rev BE.
11	Service Water for RCFCs - 100°F	FSAR Table 6.2-56, Rev 11, Dec 2006.
12	46.7% RWST Level	Refueling Water Storage Tank Setpoints, SITH-1, Rev 7, Sept 2007.
13	9% RWST Level	Refueling Water Storage Tank Setpoints, SITH-1, Rev 7, Sept 2007.
14	LPI (RH) Secured 7 minutes Past 46.7%	Simulator runs observed on 11/10/2009 and 11/11/2009.
15	PORV and Reactor Vent Secured Below 9% RWST Level	1BwFR-C.1, Step 8, Rev. 200, WOG2.

STATION: Braidwood

UNIT(S) AFFECTED: UNIT 1

TITLE:

Braidwood Phase 3 SDP Evaluation of Failure of 1SI8811B to Fully Open

MAAP4 THERMAL HYDRAULIC ANALYSIS TO SUPPORT TIMING FOR LOCALLY OPENING 1SI8811B

SUMMARY (Include UREs incorporated):

This document utilized MAAP4.0.6 to evaluate the timing associated with locally opening 1SI8811B

Number of pages: **Total 35 pages, including this page.**

RM Document Level: **Category 2, per ER-AA-600-1012**

[ ] Review required after periodic Update

[X] Internal RM Documentation **[ ] External RM Documentation**

Electronic Calculation Data Files: (Program Name, Version, File Name extension/size/date/hour/min)

See Section 5 for Data Files

Method of Review: *[X] Detailed* *[ ] Alternate* *[ ] Review of External Document*

This RM documentation supersedes: *N/A* *in its entirety.*

	Name		Signature		Date
Prepared by:	Mark T. Cursey	/	[signature]	/	12/16/09
Reviewed by:	Alex J. Huning	/	[signature]	/	12/16/09
Approved by:	N/A	/		/	

Braidwood
PRA APPLICATION NOTEBOOK

BW-SDP-003

Appendix C

Revision 1

Internal Events Model Changes

November 2009

CONTACTS	BYRON	Braidwood
Site Risk Mgmt Engineer	N/A	Mark Melnicoff (815-417-4020)
Corp. Risk Mgmt Engineer	Roy Linthicum (630-657-3846) Young H. In (630-657-3858)	

1. INCORRECT ALPHA FACTOR FOR 1SI8811 VALVES

A review of the alpha factor for event 1SI8811A-B-CMVCC indicated that the value used was a alpha factor that is applied in the model for High Pressure Injection MOVs; whereas the SI8811 valve is a low pressure valve (maximum pressure would be containment pressure just before failure - ~100 psig). Therefore, the alpha factor for this event was changed to 1.58E-02, which is the value used in the 6D model for other RH valves based on Reference 1.

- These changes were made to the Rev 6D reliability database (A6D.RR) and saved as file A6D2.RR. The database was then loaded into the A6D cutset files and saved as file A6D2.cut.
- Note that the current version of the NRC CCF database (Reference 2) has different CCF parameters for RH valves. The impact of this is investigated as sensitivity in Appendix E.

New Baseline Values

The new baseline CDF and LERF values are provided below:

Configuration	6D2	6D
A11 CDF	2.08E-5/yr	2.11E-5/yr
A12 CDF	2.11E-5/yr	2.13E-5/yr
A11 LERF	2.41E-6/yr	2.41E-6/yr
A12 LERF	2.42E-6/yr	2.42E-6/yr

2. Model Review Requirements

Given the limited changes that were made to the model, the model review can be limited to a review of the data change made in Section 1.

3. SOFTWARE USED

- CAFTA 5.3 (EX0007572)
- PRAQUANT 5.0a (EX0007583)
- QRECOVER 2.3c (EX0007637)
- FORTE 2.2f (EX0003553)
- BW-SDP-003 App C Files R1.zip 1,393 KB, 11/23/09 12:10PM

6. REFERENCES

1. U.S. Nuclear Regulatory Commission, "CCF Parameter Estimations, 2003 Update", http://nrcoe.inl.gov/results/CCF/ParamEst2003/ccfparamest.htm, May 2006.
2. U.S. Nuclear Regulatory Commission, "CCF Parameter Estimations, 2007 Update", http://nrcoe.inl.gov/results/CCF/ParamEst2007/ccfparamest.htm, September 2008.

RM DOCUMENTATION NO. BW-SDP-003 Appendix C REV: 1 PAGE NO. C3 of 3

STATION: Braidwood

UNIT(S) AFFECTED: UNIT 1

TITLE:

Braidwood Phase 3 SDP Evaluation of Failure of 1SI8811B to Fully Open
Appendix C - Internal Events Model Changes

SUMMARY (Include UREs incorporated):

This Appendix documents the model changes required to evaluate the risk significance of failure of 1SI8811B to fully open, as documented in IR 934782.

Number of pages: Total 3 pages, including this page.
RM Document Level: Category 2, per ER-AA-600-1012

[ ] **Review required after periodic Update**

[X] Internal RM Documentation [ ] External RM Documentation

Electronic Calculation Data Files: (Program Name, Version, File Name extension/size/date/hour/min)

See Section 5 for Data Files

Method of Review: [X] Detailed [ ] Alternate [ ] Review of External Document
This RM documentation supersedes: N/A in its entirety.

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Prepared by:	Roy Linthicum	[signature]	11/23/09
Reviewed by:	Leo Shanley	[signature]	11/23/09
Approved by:	N/A		

Braidwood
PRA APPLICATION NOTEBOOK

BW-SDP-003

Revision 1

Braidwood Phase 3 SDP Evaluation of Failure of 1SI8811B to Fully Open

Appendix D

Internal Events Evaluation

December 2009

CONTACTS	BYRON	Braidwood
Site Risk Mgmt Engineer	N/A	Mark Melnicoff (815-417-4020)
Corp. Risk Mgmt Engineer	Roy Linthicum (630-657-3846) Young H. In (630-657-3858)	

1. PURPOSE

This evaluation examines the risk significance from internal events associated with failure of 1SI8811B (ECCS Sump Recirculation MOV) to fully open.

2. EVALUATION

Impact of failure with No Recovery

The SDP evaluation was performed assuming that 1SI8811B opened sufficiently to pass adequate flow to the RH pump; however, based on dual position indication, it is further assumed that the control room staff would secure the pump to prevent the possibility of pump damage, in accordance with their training. This was modeled by replacing basic event 1SI8811B----MVCC with event 1SI8811BFAILED (probability = 1.0). In addition, as the potential for common cause failure can not be ruled out, basic event 1SI8811A-B-CMVCC was replaced with basic event 1SI8811ABCCF (probability = 1.58E-02; the basic event probability divided by the random failure rate). [Replacements were performed by modifying the base model flag files. The flag files were renamed A11D_1SI8811BFAILED.caf and A11D_1SI8811BFAILED.caf]. Model revision 6D2 (see Appendix C), which is the 6D model of record (MOR) modified to reflect a correction to the SI8811 common cause failure alpha factor, was then quantified to determine the instantaneous change in CDF and LERF[1].

The results are provided below.

SDP Base Case - 1SI8811B Failed with NO credit for Local Opening[2]			
Case	Truncation	Frequency	Delta (SDP Base Case – Rev 6D2 Base Case)
A11C_SDP	1.00E-10	1.66E-04	1.45E-04
A12D_SDP	1.00E-10	1.67E-04	1.46E-04
A11L_SDP	1.00E-11	4.28E-06	1.87E-06
A12L_SDP	1.00E-11	4.30E-06	1.88E-06

Rev 6D2 Base Case			
A11C	1.00E-10	2.08E-05	
A12C	1.00E-10	2.11E-05	
A11L	1.00E-11	2.41E-06	
A12L	1.00E-11	2.42E-06	

[1] Although a newer model of record, 6E1 is now in effect, the new MOR includes the AF cross-tie mod, which was not operational during the time frame of interest to this evaluation.
[2] See Files 1SI8811B SDP R1, Sheet "SDP-No Credit for Recovery", R6D1_1SI8811BR1-NO RECOVERY.qnt and R6D1_1SI8811BR1 - No Recovery.CUT

Metric	Exposure Period		Internal Events	
	Days	Fraction[3]	ΔCDF (/year)[4]	ICDP
CDF	323.5[5]	8.86E-01	1.46E-04	1.29E-04
LERF	323.5	8.86E-01	1.87E-06	1.66E-06

Recovery – Small LOCA and Long Term Bleed and Feed Only

A review of the dominant cutsets from the non-recovere d case (Appendix I) identified that the major risk contributors were Long Term Bleed and Feed (with 1 Train of ECCS failed), Small LOCAs with either all equipment available or 1 train ECCS failed and Medium LOCAs with either all equipment available or 1 train ECCS failed. Since there is procedural direction in 1BwCA-1.1 to locally open the sump recirculation valves (SI8811), local recovery can be credited. Appendix A documents the human error probability (HEP) associated with this action. Basic event 1SI8811B-SBHPMOA in the non-recovered cutsets was assigned the HEP of 6.5E-03. Based on the results developed in Appendix B, however, containment spray would only be expected to actuate for a 2" diameter break if no RCFCs are available. One train of RCFCs is sufficient for small LOCAs to prevent CS actuation. The un-recovered cutsets were reviewed and it was determined that there were no sequences with failure of either SI8811 valve that would result in failure of both trains of RCFCs. Therefore, these sequences are considered negligible and an HEP was not developed for these cutsets.

This was accomplished using recovery file QRX-1SI8811BFAILED.txt and then changing the probability of event 1SI8811B-SBHPMOA to 6.5E-03 in the recovered cutset file.

The cutsets were then reviewed to determine if the were any new dependencies introduces through the addition of the recovery action. With one exception, all other operator actions with the recovered cutsets were actions sufficient removed in time and also occurred prior to the operator action to transition to ECCS recirculation. Therefore, these actions have zero dependency on the action to locally open 1SI8811B. The one exception was 1SISUMPVLV-HMVOA, which is the action to manual open the valves from the control room do to failure of the open signal to the valve. Failure of this action is assumed to have complete dependence with the local action to open the valve. As a result, local recovery was removed from this cutset.

---

[3] See Section 3.0, Main Report, for calculation of the exposure days that includes 2 days repair time.
[4] Average between A11 and A22 configurations
[5] See Section 3.0, Main Report, for calculation of the exposure days that includes 2 days repair time.

The results are provided below.

SDP Base Case - 1SI8811B Failed with credit for Local Opening during Small LOCA and B&F Only[6]			
Case	Truncation	Frequency	Delta
A11C_SDP	1.00E-10	3.66E-05	1.57E-05
A12D_SDP	1.00E-10	3.68E-05	1.58E-05
A11L_SDP	1.00E-11	2.54E-06	1.29E-07
A12L_SDP	1.00E-11	2.55E-06	1.29E-07

Metric	Exposure Period		Internal Events	
	Days	Fraction [2]	ΔCDF (/year)[7]	ICDP
CDF	323.5[8]	8.86E-01	1.58E-05	1.40E-05
LERF	323.5	8.86E-01	1.29E-07	1.14E-07

Recovery – Medium LOCA, Small LOCA and Long Term Bleed and Feed

With failure of the 1SI8811B (with no credit for local recovery), medium LOCAs become a significant contributor to CDF. Additional T-H analyses were performed (see Appendix B) to determine the LOCA conditions under which Containment Spray would actuate. This was needed for this evaluation as CS spray actuation significantly accelerates depletion of the RWST inventory and reduces the time available to the operators to establish ECCS recirculation. For example, the base PRA model conservatively assumed that CS will always actuate for Medium LOCAs in order to simplify the PRA model and avoid the need to develop additional accident sequences and separate Human Error Probabilities (HEPs) based on the number of RCFC trains that are available. This is seen in the development of the operator action timing to establish ECCS recirculation (1SI-HPR----HSYOA) in the base model, which uses MAAP cases with no RCFCs and CS actuation for development of the HEP.

Therefore, additional modeling detail for medium LOCAs was considered to determine how many RCFCs are required to prevent CS actuation. However, if only 1 Train of RCFCs (2 individual units) operates, CS is expected to actuate, especially for the large end of the break size. For break sizes in the 2" – 3" diameter range, CS spray may or may not actuate with 1 Train of RCFCs. If neither train of RCFCs is available, then CS actuation is expected to occur. Therefore, the SDP evaluation includes this additional modeling detail by using different HEPs, depending on the status of the RCFCs.

To support the HRA analysis, additional T-H analysis were performed (see Appendix B) to determine the LOCA conditions under which Containment Spray would actuate. This

[6] See Files 1SI8811B SDP R1, Sheet "SDP-SLOCA Recovery Only", R6D1_1SI8811BR1-SLOCA RECOVERY ONLY.qnt and R6D1_1SI8811BR1 - SLOCA Recovery Only.CUT.

[7] Average between A11 and A12 configurations

[8] See Section 3.0, Main Report, for calculation of the exposure days that includes 2 days repair time.

was needed for this evaluation as CS spray actuation significantly reduces the time available to the operators to establish ECCS recirculation. The base PRA model conservatively assumed that CS would always actuate for Medium LOCAs to simplify the model to avoid developing separate Human Error Probabilities (HEPs) dependant on the number of RCFC trains that are available. The T-H analysis performed in Appendix B resulted in the following conditions that are used in this evaluation:

LOCA Size	# RCFC Trains Available	CS Actuation
Small LOCA (<2")	2	No
Small LOCA (<2")	1	No
Small LOCA (<2")	0	Yes
Medium LOCA (2" – 3")	2	No
Medium LOCA (2" – 3")	1	Assumed[9]
Medium LOCA (2" – 3")	0	Yes
Medium LOCA (3" – 5.2")	2	No
Medium LOCA (3" – 5.2")	1	Assumed[10]
Medium LOCA (3" – 5.2")	0	Yes

Based on these results, potential timelines for human failure events were developed based on time available to take the action:

- Small LOCA with 1 or more RCFC trains available
- Medium LOCA with Both RCFC trains available
-

Credit is not given for local operation of the 8811A/B valves in cases where CS is assumed to actuate:

- Small LOCA with no RCFCs available[11]
- Medium LOCA with 1 or 0 RCFC trains available

The HEP for medium LOCAs without CS spray actuation are developed in Appendix A. With CS spray actuation and the draining of RWST inventory to the sump during the time when both the SI8811 and SI8812 valves are open, it is conservatively assumed that there is insufficient time to locally open the SI8811A/B valves. These conditions are applied based on cutset review to the action 1SI8811B-MBHPMOA as follows:

Medium LOCA with both RCFC trains available (No CS actuation) – 6.0E-03
Medium LOCA with 1 or 0 RCFC trains available (CS actuation) – 1.0

This was accomplished by adding event 1SI8811B-MBHPMOA (probability = 6.0E-3) to all medium LOCA cutsets with failure of 1SI8811. Then event 1SI11B-MLADJUST (probability = 1.0/6.0E-03 = 166.7) was added to those cutsets with 1SI8811B-MBHPMOA that also fail 1 train of RCFCs (i.e., cutsets with loss of a DC or AC train or loss of 1 train of RCFC actuation). This eliminates credit for the action to locally open 1SI8811A/B for these cutsets.

[9] Actual analysis shows no CS actuation, but CS is assumed to actuate as Containment pressure is ~2 psia below the CS setpoint

[10] Actual analysis shows no CS actuation, but CS is assumed to actuate as Containment pressure is within ~2 psia psia of the setpoint

[11] This HEP was not developed as there were no cutsets prior to crediting recovery that had this condition

The results are provided below.

SDP Base Case - 1SI8811B Failed with credit for Local Opening Following MLOCA, SLOCA, and B&F[12]			
Case	**Truncation**	**Frequency**	**Delta**
A11C_SDP	1.00E-10	2.16E-05	7.90E-07
A12D_SDP	1.00E-10	2.19E-05	8.19E-07
A11L_SDP	1.00E-11	2.42E-06	9.90E-09
A12L_SDP	1.00E-11	2.43E-06	9.90E-09

	Exposure Period		Internal Events	
Metric	**Days**	**Fraction [2]**	**ΔCDF (/year)[13]**	**ICDP**
CDF	323.5[14]	8.86E-01	8.05E-07	7.13E-07
LERF	323.5	8.86E-01	9.90E-09	8.77E-09

The following files were used in this evaluation:

BW-SDP-003 App D Files R1.zip, 3,586kb, 12/17/09, 10:57am

3. SOFTWARE USED

- CAFTA 5.3 (EX0007572)
- PRAQUANT 5.0a (EX0007583)
- QRECOVER 2.3c (EX0007637)
- FORTE 2.2f (EX0003553)

[12] See File 1SI8811B SDP R1, Sheet "SDP-Full Recovery", R6D1_1SI8811BR1-LOCA & B&F.qnt and R6D1_1SI8811BR1 - R6D1_1SI8811BR1 - LOCA & B&F Recovery.CUT

[13] Average between A11 and A12 configurations

[14] See Section 3.0, Main Report, for calculation of the exposure days that includes 2 days repair time.

RM DOCUMENTATION NO. BW-SDP-003 REV: 1 PAGE NO. D7 of 7

STATION: Braidwood

UNIT(S) AFFECTED: UNIT 1

TITLE:

Braidwood Phase 3 SDP Evaluation of Failure of 1SI8811B to Fully Open

Appendix D – Internal Events Evaluation

SUMMARY (Include UREs incorporated):

This document evaluates the risk significance of failure of 1SI8811B to fully open, as documented in IR 934782.

Number of pages: Total 7 pages, including this page.
RM Document Level: Category 2, per ER-AA-600-1012

[ ] **Review required after periodic Update**

[X] Internal RM Documentation [ ] External RM Documentation

Electronic Calculation Data Files: (Program Name, Version, File Name extension/size/date/hour/min)

See Section 2 for Data Files.

Method of Review: **[X] Detailed [ ] Alternate [ ] Review of External Document**

This RM documentation supersedes: ____________N/A________________________in its entirety.

	Print	Sign	Date
Prepared by:	**Roy Linthicum**	[signature]	12/11/09
Reviewed by:	**Young In**	[signature]	12/11/09
Approved by:	**N/A**		

Braidwood
PRA APPLICATION NOTEBOOK

BW-SDP-003

Revision 2

Braidwood Phase 3 SDP Evaluation of Failure of 1SI8811B to Fully Open

Appendix E

Sensitivity Studies

December 2009

CONTACTS	BYRON	Braidwood
Site Risk Mgmt Engineer	N/A	Mark Melnicoff (815-417-4020)
Corp. Risk Mgmt Engineer	Roy Linthicum (630-657-3846) Young H. In (630-657-3858)	

1. PURPOSE

This Appendix evaluates the impact of different assumptions used in the SDP evaluation. The scope of these evaluations are:

- Success Criteria for the number of Pzr PORVs required for Bleed and Feed Cooling
- Use of the SPAR-H model versus the HRA Calculator for determining credit for recovery of 1SI8811B.
- Impact of not assuming common cause failure potential between 1SI8811A/B

2. SUCCESS CRITERIA FOR THE NUMBER OF PZR PORVS REQUIRED FOR BLEED AND FEED COOLING

The risk impacts of failure of 1SI8811B to fully open include a significant contribution from Loss of DC Bus 111 initiating events with random failures of the B AF pump followed by successful Bleed and Feed using 1 Pzr PORV. A review of the NRC SPAR model for Braidwood (Reference E2) identified a different assumption related to Bleed and Feed, specifically, that 2 Pzr PORVs are required for success.

For this sensitivity study, the R6D2 Fault tree (Master6D_1PORV.caf) was revised by changing gate 1RC-PORV-1-RQD to 1RC-PORV-2-RQD for all Bleed and Feed scenarios that credit only 1 PORV for success.

The results of the SDP analysis using the revised requirement for requiring 2 Pzr PORVs for Bleed and Feed is provided below:

2 PORVs Required Sensitivity Case - 1SI8811B Partially open with credit for Local Opening			
Case	Truncation	Frequency	Delta
A11C	1.00E-10	8.50E-05	5.66E-07
A12C	1.00E-10	8.56E-05	5.68E-07
A11L	1.00E-11	5.24E-06	9.80E-09
A12L	1.00E-11	5.26E-06	9.90E-09

2 PORV Require Base Case		
A11C	1.00E-10	8.44E-05
A12C	1.00E-10	8.51E-05
A11L	1.00E-11	5.23E-06
A12L	1.00E-11	5.25E-06

Unit	Exposure Period		Internal Events	
	Days	Fraction[1]	ΔCDF (/year)	ICDP
CDF	323.5	8.86E-01	5.67E-07	5.02E-07
LERF	323.5	8.86E-01	9.85E-09	8.72E-09

[1] Fraction = # days divided by 365.25 days/year, including 2 days repair time

The results of this sensitivity study show that with the revised Pzr PORV success criterion, the risk impact of the 1SI8811B failure is less than the impact using the base Braidwood PRA model. This lower risk impact with this assumption can be explained by recognizing that the risk impact with the current success criteria includes a significant contribution from the Loss of DC Bus 111 Initiating Event. With the change in Pzr PORV success criteria, the Loss of DC Bus 111 fails one Pzr PORV, and hence Bleed and Feed. As a result, further failure of the 1SI8811B valve has no impact on these scenarios as they go to core damage due to failure create a bleed path, regardless of the status of the SI8811 valves.

Files Used:
BW-SDP-003 App E 2PORV Files.zip 3,104,784B, 12/11/09, 7:55pm

3. USE OF THE SPAR-H MODEL VERSUS THE HRA CALCULATOR

A sensitivity study was done to determine the impact of using a different human reliability probability methodology (SPAR-H) rather the EPRI HRA Calculator which is the methodology used in the Braidwood PRA. This different methodology was only applied to the action to locally open the SI8811 valves. Appendix A provides HEP values using the SPAR-H methodology. These values were substituted into the SDP result file as shown below:

Basic Event	Applied	HRA Calc	SPAR-H
1SI8811B-SBHPMOA	Small LOCAs	6.5E-03	9.9E-03
1SI8811B-MBHPMOA	Medium LOCAs – All RCFCs Available	6.0E-03	9.1E-02
1SI11B-MLADJUST	Medium LOCAs – Multiplier when 1 or more RCFC trains unavailable	166.7	11.0 (1/9.1E-02)

The results of this sensitivity study are provided below:

SPAR Model versus HRAC			
Case	Truncation	Frequency	Delta
A11C_SDP	1.00E-10	2.33E-05	2.50E-06
A12D_SDP	1.00E-10	2.36E-05	2.53E-06
A11L_SDP	1.00E-11	2.44E-06	2.53E-08
A12L_SDP	1.00E-11	2.44E-06	2.38E-08

Rev 6D2 Base Case			
A11D1_CDF	1.00E-10	4042	2.08E-05
A12D1_CDF	1.00E-10	4221	2.11E-05
A11D1_LERF	1.00E-11	5162	2.41E-06
A12D1_LERF	1.00E-11	5355	2.42E-06

	Exposure Period		Internal Events	
Unit	Days	Fraction[2]	ΔCDF (/year)	ICDP/ILERP
CDF	323.5	8.86E-01	2.52E-06	2.23E-06
LERF	323.5	8.86E-01	2.46E-08	2.17E-08

Use of the SPAR-H model results in slightly higher SDP results than the EPRI HRA calculator.

Files Used:
BW-SDP-003 App E SPAR-H Files.zip 883,719B, 12/11/09, 8:16pm

[2] Fraction = # days divided by 365.25 days/year, including 2 days repair time

4. NO COMMON CAUSE FAILURE

As it is known that the 1SI8811A valve was not failed due to corrosion of the torque switch, a sensitivity study was done to determine the impact of the assumption that a common cause failure potential existed. This was done by setting the probability for common cause failure of both SI8811 valves back to its original value. The results are presented below:

SDP Case – No Common Cause Failure			
Case	Truncation	Frequency	Delta
A11C_SDP	1.00E-10	2.13E-05	5.10E-07
A12D_SDP	1.00E-10	2.16E-05	4.80E-07
A11L_SDP	1.00E-11	2.42E-06	1.00E-08
A12L_SDP	1.00E-11	2.43E-06	1.00E-08

Rev 6D1 Base Case			
A11D1_CDF	4042	2.08E-05	
A12D1_CDF	4221	2.11E-05	
A11D1_LERF	5162	2.41E-06	
A12D1_LERF	5355	2.42E-06	

Unit	Exposure Period		Internal Events	
	Days	Fraction[3]	ΔCDF (/year)	ICDP
CDF	323.5	8.86E-01	4.95E-07	4.36E-07
LERF	323.5	8.86E-01	1.00E-08	8.80E-09

The assumption that there is a common cause failure potential for 1SI8811A introduces a significant conservatism (a factor of 2) to the results.

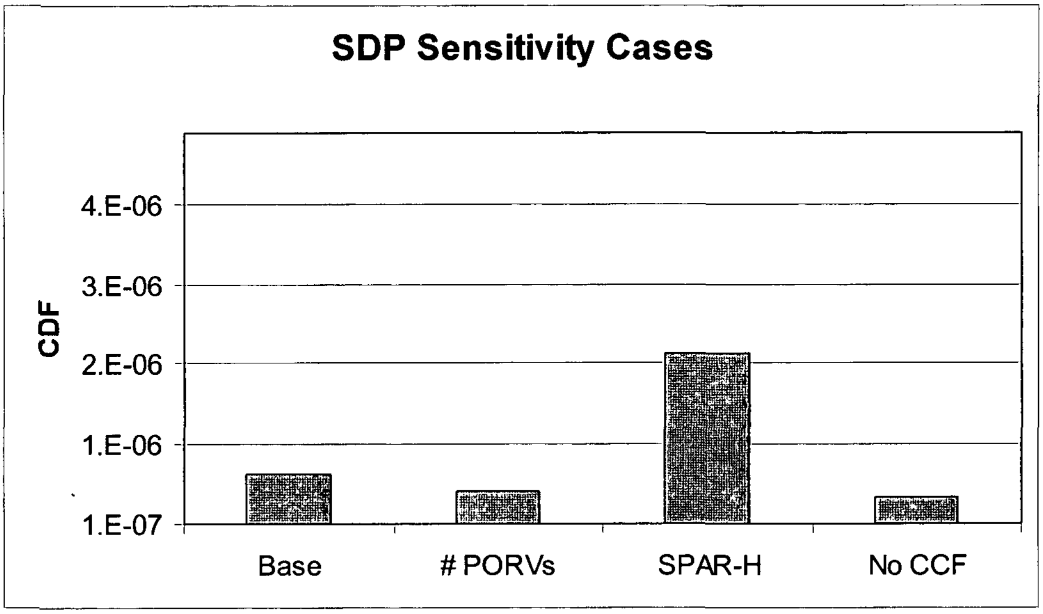
Files Used:
BW-SDP-003 App E No CCF.zip 882,226B, 12/12/09, 6:34am

5. CONCLUSIONS

The table below summarizes the results of the sensitivity analysis.

Case	IE SDP Result	% Change
Base	7.13E-07	N/A
# PORVs	5.02E-07	-30%
SPAR-H	2.23E-06	213%
No CCF	4.36E-07	-39%

[3] Fraction = # days divided by 365.25 days/year, including 2 days repair time



The following conclusions can be made from these sensitivity studies:

- **Number of PORVs Required for Bleed and Feed**
  The number of PORVs required for Bleed and Feed in NOT a Key assumption. Changing the success criteria to 2 PORVs required increases the baseline CDF but decreases the risk contribution from the failed valve.

- **SPAR-H versus HRA Calculator**
  The Human Error Probabilities for locally opening 1SI8811B was quantified using the EPRI HRA Calculator. A sensitivity study was performed to evaluate the impact of the HEP using the SPAR-H model on the SDP results. Use of the SPAR-H model does impact the results significantly; however, the stair step nature of the SPAR-H methodology's time based recovery credit is not well suited for the medium LOCA HEP quantification associated with this SDP. Because the time available for mitigating action (the system window) varies by several hours over the medium LOCA break spectrum, breaks on the smaller end of the medium LOCA spectrum have significantly longer system windows than those on the larger end. Use of the system window associated with the limiting medium LOCA break in the SPAR-H methodology results in the application of an HEP that is not representative of a large portion of the medium LOCA events. While the HEPs using the EPRI HRA Calculator also use a stair step time based recovery model, the recovery credit transitions do not occur at times that are critical to the results.

- **No Common Cause Failure**
  It is known that there was no corrosion on the torque switch for 1SI8811A, and therefore, there was no actual common cause failure. The impact of not assuming a common cause failure potential was evaluated. With this different assumption, the SDP results are slightly reduced.

Taking into account the sensitivity evaluations, the internal events contribution to the SDP should be Green.

6. SOFTWARE & FILES USED

- CAFTA 5.3 (EX0007572)
- PRAQUANT 5.0a (EX0007583)
- QRECOVER 2.3c (EX0007637)
- FORTE 2.2f (EX0003553)
- BW-SDP-003 App E Files R1.ZIP, 4,758Kb, 12/17/09, 10:10am

7. REFERENCES

E1). U.S. Nuclear Regulatory Commission, "CCF Parameter Estimations, 2007 Update", http://nrcoe.inl.gov/results/CCF/ParamEst2007/ccfparamest.htm, September 2008.

E2). Standardized Plant Analysis Risk Model for Braidwood 1 & 2 (ASP PWR B), Idaho National Laboratory, Rev 3.31, June 2007

STATION: Braidwood

UNIT(S) AFFECTED: UNIT 1

TITLE:

Braidwood Phase 3 SDP Evaluation of Failure of 1SI8811B to Fully Open

Appendix E - Sensitivity Studies

SUMMARY (Include UREs incorporated):

This document evaluates the risk significance of failure of 1SI8811B to fully open, as documented in IR 934782.

Number of pages: Total 9 pages, including this page.
RM Document Level: Category 2, per ER-AA-600-1012

[ ] Review required after periodic Update

[X] Internal RM Documentation [ ] External RM Documentation

Electronic Calculation Data Files: (Program Name, Version, File Name extension/size/date/hour/min)

See Section 9 for Data Files

Method of Review: [X] Detailed [ ] Alternate [ ] Review of External Document

This RM documentation supersedes: N/A in its entirety.

	Print	Sign	Date
Prepared by:	Roy Linthicum	[signature]	12-30-09
Reviewed by:	Joe Edom	[signature]	12-30-2009
Approved by:	N/A		

Braidwood
PRA APPLICATION NOTEBOOK

BW-SDP-003

Revision 1

Braidwood Phase 3 SDP Evaluation of
Failure of 1SI8811B to Fully Open

Appendix F

EOP Flow Chart

December 2009

CONTACTS	BYRON	Braidwood
Site Risk Mgmt Engineer	N/A	Mark Melnicoff (815-417-4020)
Corp. Risk Mgmt Engineer	**Roy Linthicum (630-657-3846)** **Young H. In (630-657-3858)**	

RM DOCUMENTATION NO. BW-SDP-003 Appdendix F REV: 1 PAGE NO. F2of 4

STATION: Braidwood

UNIT(S) AFFECTED: UNIT 1

TITLE:

Braidwood Phase 3 SDP Evaluation of Failure of 1SI8811B to Fully Open

Appendix F – EOP Flowchart

SUMMARY (Include UREs incorporated):

This document evaluates the risk significance of failure of 1SI8811B to fully open, as documented in IR 934782.

Number of pages: Total 4 pages, including this page.
RM Document Level: Category 2, per ER-AA-600-1012

[ ] Review required after periodic Update

[X] Internal RM Documentation **[ ] External RM Documentation**

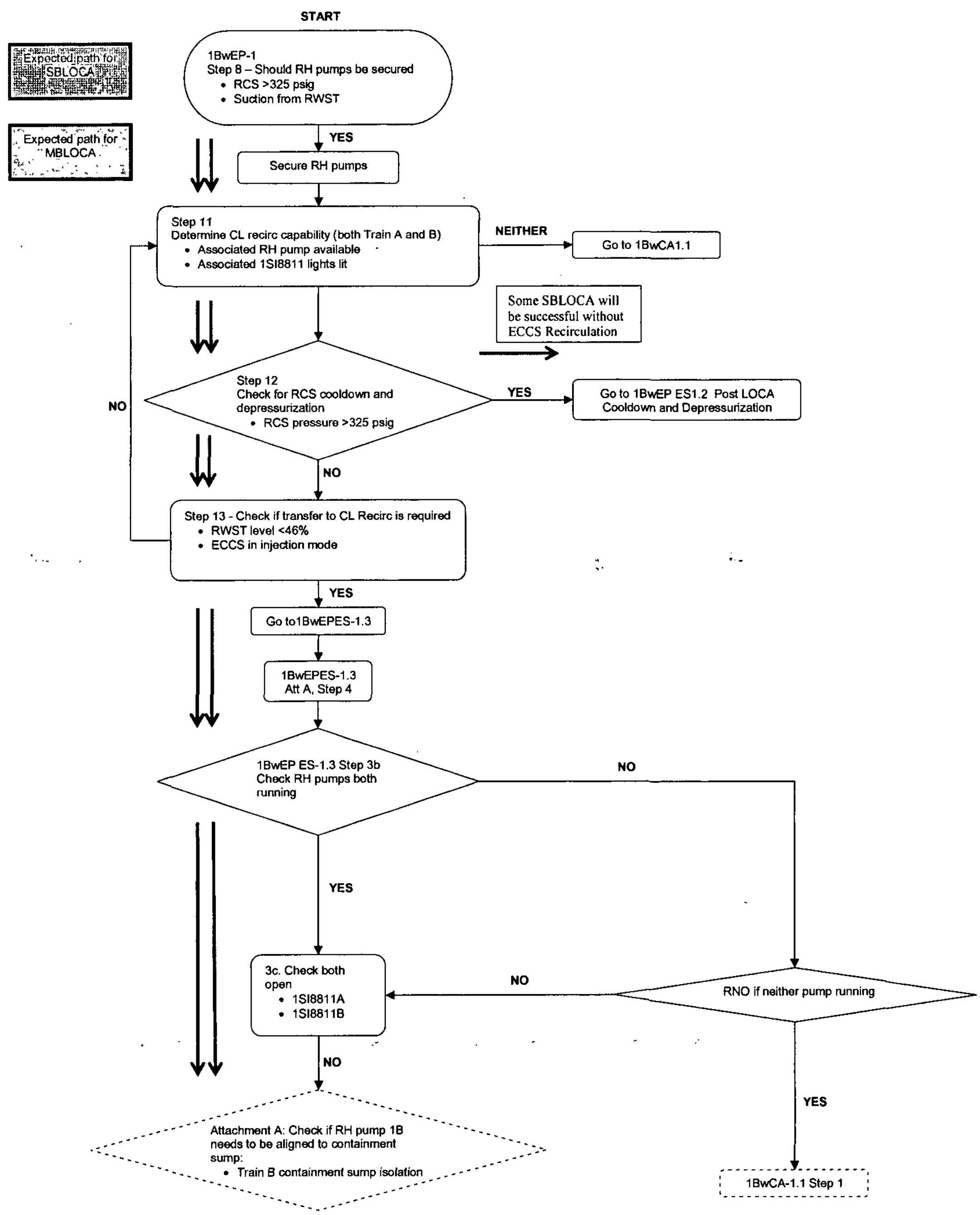
Electronic Calculation Data Files: (Program Name, Version, File Name extension/size/date/hour/min)

N/A

Method of Review: **[X] Detailed [ ] Alternate [ ] Review of External Document**
This RM documentation supersedes: ____________N/A____________________in its entirety.

	Print		Sign		Date
Prepared by:	Roy Linthicum	/	[signature]	/	12/2/09
Reviewed by:	Young In	/	[signature]	/	12/3/09
Approved by:	N/A	/		/	

Operator Action Decision Tree



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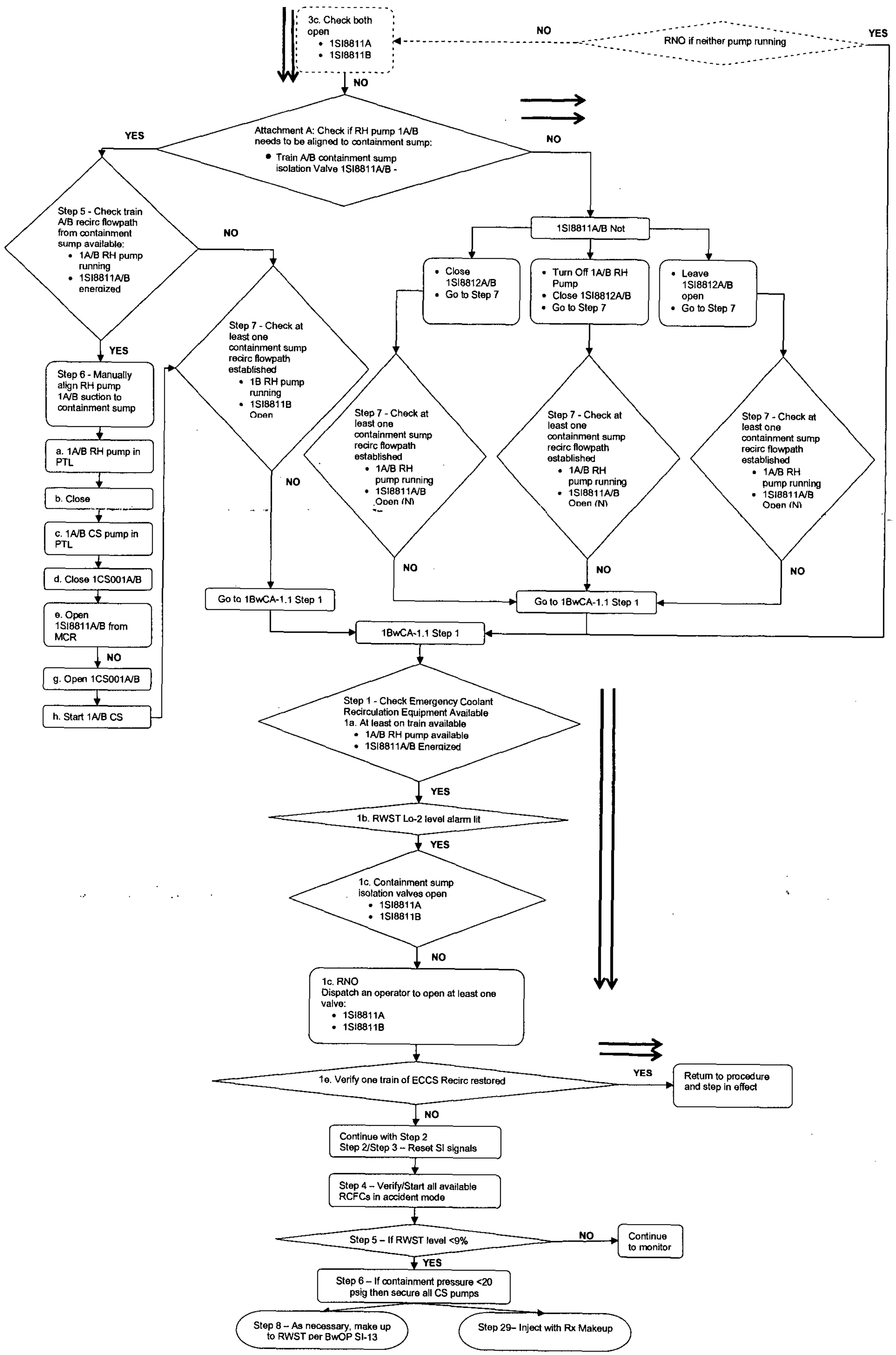


Braidwood
PRA APPLICATION NOTEBOOK

BW-SDP-003

Revision 1

Braidwood Phase 3 SDP Evaluation of Failure of 1SI8811B to Fully Open

Appendix G

Fire Evaluation

December 2009

CONTACTS	BYRON	Braidwood
Site Risk Mgmt Engineer	N/A	Mark Melnicoff (815-417-4020)
Corp. Risk Mgmt Engineer	Roy Linthicum (630-657-3846) Young H. In (630-657-3858)	

1. PURPOSE

This Appendix evaluates the impact of the failure of 1SI8811B on risk associated with fires at Braidwood Unit 1.

2. FIRE EVALUATION

The fire risk impact was evaluated using the Braidwood Fire PRA model Revision 6C, with two updates (Reference G2):

- The seal LOCA flag was set to a probability of 0.21 and
- The 'OR' gate under event 2AF-RCTRIP-INFLOW was changed to an 'AND' gate.

The following change was made to the base model prior to performing the evaluation:

- The probability of CCF of the 1SI8811 valves (1SI8811A-B-CMVCC) was changed to 4.11E-5 to account for the correct alpha factor, as noted in Appendix C.

The following additional refinements were made to the fire scenario quantifications to eliminate conservatism in the quantification of the scenarios which contribute to the delta CDF associated with this SDP:

- 1-1 (Containment Fire, bounding fire): A manual action to open RHR to CV pump valve 1CV8804A is credited using the HEP for the 1SI8811B valve (6.5E-3) which is bounding for an operator action for valve 1CV8804A, as discussed in Appendix A.
- 5.6-1-E (DC Bus 1DC05E Fire) and 5.6-2-D (DC Buses 2DC03E AND 2DC05E Fire, which causes loss of U2 to U1 DC crosstie): A non suppression probability of 3.65E-2 was included based on the panel being a vented low voltage panel (using the same factor employed for low voltage panels elsewhere in the fire PRA, per reference G2).
- 11.3-1-B (MCC 1AP21E Fire) and 11.5A-1-B (MCC 1AP25E Fire): these scenarios are split into two scenarios, one to represent scenarios where spurious operations within the MCC would occur (all potential spurious actuations are assumed to occur simultaneously in this scenario) the other scenario addresses the more likely situation where the fire causes the MCC to deenergize. A 0.1 split fraction is conservatively applied to the spurious operation scenario and a 0.9 split fraction is applied for the complement scenario where the MCCs deenergize. For the 0.1 split fraction scenarios for 11.3-1-B a circuit failure probability has been applied for basic events associated with valves 1SI8811A (0.67 on spurious close and 0.33 on spurious open), 1CV112B (0.67 on fails to close and 0.33 on spurious close) and 1CC9413A (0.33 on spurious close). For the 0.1 split fraction scenario for 11.5A-1-B the failure probability was set at 0.1 for valves 1AF005A and 1AF005B representing a screening value failure probability for an operator action to position each valve.

This resulted in the following baseline fire CDF:

Configuration	Base CDF	Modified CDF
A11	6.32E-5	5.21E-5
A12	6.17E-5	4.96E-5
Average	6.25E-5	5.09E-5

The impact of the 1SI8811B failure was evaluated by making the following changes in the fire model:

- Basic event 1SI8811B----MVCC was revised to be 6.5E-03, except for cases where it was already failed due to the fire. This value is based on:
  - The HEP for Small LOCAs developed in Appendix A. This represents failure (1.0) times failure to locally recover the valve (6.5E-03)
  - LOCAs associated with fires are limited to Small LOCA or Bleed and Feed scenarios, with Small LOCA being the more time limiting.
  - Since ECCS recirculation is reached several hours into the event, the fire would be extinguished prior to the need to locally open the valve. Therefore, additional performance shaping factors are not used.
- For fires in the curved wall area which may prevent access to the 1SI8811B, the fire would also fail 1SI8811B due to fire damage, therefore the recovery is not credited for this area.
- Basic event 1SI8811A-B-CMVCC was revised to be 1.03E-04. This value is based on:
  - The alpha factor (1.58E-02) times the failure to locally recover the valves (6.5E-3).
- The quantification results for the fire scenarios with significant contributions to the delta CDF were reviewed to confirm that the cutsets contributing to the delta CDF were not associated with configurations where all containment fan coolers were lost consistent with the assumption in the development of the 1SI8811B recovery factor that at least one fan cooler is available for a small LOCA.

The results of the Fire SDP evaluation are provided below:

Fire			
Case	Truncation	Frequency	Delta
A11C_SDP	1E-09	5.25E-5	4.0E-7
A12C_SDP	1E-09	4.97E-5	1.0E-7
Average		5.11E-5	2.5E-7

Rev 6C Base Case		
A11C1_CDF	1E-09	5.21E-5
A12C1_CDF	1E-09	4.96E-5

	Exposure Period		Internal Events	
Unit	**Days**	**Fraction**[1]	**ΔCDF (/year)**	**ICDP/ILERP**
CDF	323.5	8.84E-01	2.5E-7	2.21E-7

Files Used:
1SI8811B_SDP_final.zip 5,168kb, 12/13/09, 4:09pm

3. SOFTWARE USED

- CAFTA 5.2 (EX0007196)
- PRAQUANT 4.0a (EX0000197)
- FORTE 2.2f (EX0003553)
- FRANC32 3.0d (EX0006621)

4. REFERENCES

G1) Braidwood Fire PRA Model Revision 6C, Dated 5/22/08.

G2) Braidwood Fire Modeling Analysis, 6389-400-4, Rev 4 1/15/09

[1] Fraction = # days divided by 365.25 days/year

RM DOCUMENTATION NO. BW-SDP-003 Appdendix G REV: 1	PAGE NO. G5of 55

STATION: Braidwood
UNIT(S) AFFECTED: UNIT 1

TITLE:

Braidwood Phase 3 SDP Evaluation of Failure of 1SI8811B to Fully Open

Appendix G - Fire Evaluation

SUMMARY (Include UREs incorporated):
This document evaluates the risk significance of failure of 1SI8811B to fully open, as documented in IR 934782.

Number of pages: Total 5 pages, including this page.
RM Document Level: Category 2, per ER-AA-600-1012

[ ] Review required after periodic Update

[X] Internal RM Documentation [ ] External RM Documentation
Electronic Calculation Data Files: (Program Name, Version, File Name extension/size/date/hour/min)
See Section 2 for Data Files

Method of Review: [X] Detailed [ ] Alternate [ ] Review of External Document
This RM documentation supersedes: N/A in its entirety.

	Print	Sign	Date
Prepared by:	Usama Farradj/ Thomas Sarver	[signature] / [signature]	12-17-09 / 2009/12/17
Reviewed by:	Roy Linthicum	[signature]	12/30/09
Approved by:	N/A		

Braidwood
PRA APPLICATION NOTEBOOK

BW-SDP-003

Revision 1

Braidwood Phase 3 SDP Evaluation of Failure of 1SI8811B to Fully Open

Appendix H

Seismic Evaluation

December 2009

CONTACTS	BYRON	Braidwood
Site Risk Mgmt Engineer	N/A	Mark Melnicoff (815-417-4020)
Corp. Risk Mgmt Engineer	Roy Linthicum (630-657-3846) Young H. In (630-657-3858)	

1. PURPOSE

This Appendix performs a bounding evaluation of the impact of the failure of 1SI8811B on risk associated with seismic events at Braidwood Unit 1.

2. SEISMIC EVALUATION

Braidwood station does not have a seismic PRA model. To evaluate the risk from seismic events, a bounding evaluation (based on Reference H1 and H2) was performed by assuming that all seismic induced LOCAs will result in core damage as a result of the failed 1SI8811B valve. This is considered bounding for the following reasons:

- For failure of 1SI8811B to result in a risk increase due to a seismic event, the RH train must be available following the event. In this case, there is still the potential to locally open the valve. Though the seismic event may increase the failure probability of this recovery action, it should not be 1.0. Given that there is at least 2 hours available to open the valve (see Appendix B), the HEP values calculated in Appendix A for internal events were multiplied by a factor of 10 for use in this bounding evaluation.
- Given a seismic event, if the seismic event is sufficient to fail the RWST, the impact of the partial opening of 1SI8811A/B will have no impact on the risk assessment, as there will not be sufficient inventory for ECCS injection to mitigate a seismically induced LOCA. This is accounted for in the seismic evaluation.
- Given a seismic event, if the seismic event is sufficient to cause a loss of offsite power and fail the EDGs, the impact of the partial opening of 1SI8811A/B will have no impact on the risk assessment, as there will not be power available for ECCS injection/recirculation. This is accounted for in the seismic evaluation.

The bounding seismic risk impact is calculated in "Seismic Event Tree - 1SI8811B.xls" in the file specified below.

This resulted in a bounding seismic ICDP of 1.9E-09.

Files Used:
BW-SDP-003 App H R1 Seismic.zip, 17KB, 12/15/09, 10:24am

3. REFERENCES

H1) NUREG-1488, "Revised Livermore Seismic Hazard Estimates for 69 Nuclear Power Plant Sites East of the Rocky Mountains," April 1994.

H2) NUREG/CR-4550 "Analysis of Core Damage Frequency from Internal Events," U.S. Nuclear Regulatory Commission, (Vol. 3, Rev. 1) April 1990

H3) NUREG/CR-6544 "A Methodology for Analysing Precursors to Earthquake-Initiated and Fire-Initiated Accident Sequences" March 1998

RM DOCUMENTATION NO. BW-SDP-003 Appdendix H	REV: 1	PAGE NO. H3of 3

STATION: Braidwood

UNIT(S) AFFECTED: UNIT 1

TITLE:

Braidwood Phase 3 SDP Evaluation of Failure of 1SI8811B to Fully Open

Appendix H - Seismic Evaluation

SUMMARY **(Include UREs incorporated):**

This document evaluates the risk significance of failure of 1SI8811B to fully open, as documented in IR 934782.

Number of pages: Total 18 pages, including this page.
RM Document Level: Category 2, per ER-AA-600-1012

[ ] **Review required after periodic Update**

[X] Internal RM Documentation [ ] External RM Documentation

Electronic Calculation Data Files: (Program Name, Version, File Name extension/size/date/hour/min)

See Section 2 for Data Files

Method of Review: **[X] Detailed [ ] Alternate [ ] Review of External Document**

This RM documentation supersedes: N/A in its entirety.

	Print	Sign	Date
Prepared by:	Roy Linthicum	[signature]	12/14/09
Reviewed by:	Joe Edom	[signature]	12/15/09
Approved by:	N/A		

RESULTS SUMMARY FOR BOUNDING SEISMIC RISK CONTRIBUTION FROM 1SI8811B FAILURE

Delta CDF CONTRIBUTION BY EARTHQUAKE INTERVAL

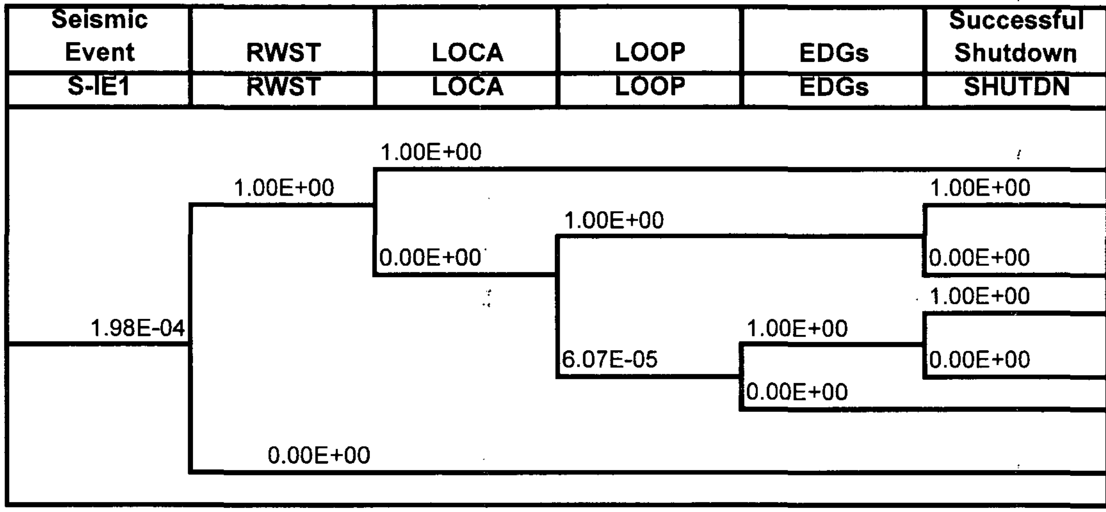
		EARTHQUAKE INTERVAL (cm/s/s)											% of Total
		S-IE1	S-IE2	S-IE3	S-IE4	S-IE5	S-IE6	S-IE7	S-IE8	S-IE9	S-IE10	CDF	
Seq.	Description	50 - 75	75 - 150	150 -250	250 - 300	300 - 400	400 - 500	500 - 650	650 - 800	800 - 1000	> 1000	CDF	
Seq. 3	Seismic induced LOCA, common cause failure of 1SI8811A/B w/ Failure to recover 1SI8811A/B	0.00E+00	0.00E+00	3.41E-11	3.02E-11	4.31E-11	1.47E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.22E-10	5.7%
Seq 5	Seismic induced Loop/LOCA, common cause failure of 1SI8811A/B w/ Failure to recover 1SI8811A/B	0.00E+00	0.00E+00	1.34E-11	5.09E-11	2.30E-10	3.20E-10	5.07E-10	3.79E-10	2.95E-10	2.27E-10	2.02E-09	94.3%
	Total ΔCDF	0.00E+00	0.00E+00	4.75E-11	8.11E-11	2.73E-10	3.34E-10	5.07E-10	3.79E-10	2.95E-10	2.27E-10	**2.14E-09**	
	Fraction of Total CDF	0%	0%	2%	4%	13%	16%	24%	18%	14%	11%		

Exposure Window (days): 323.5 *(inlcuded in delta CCDP*

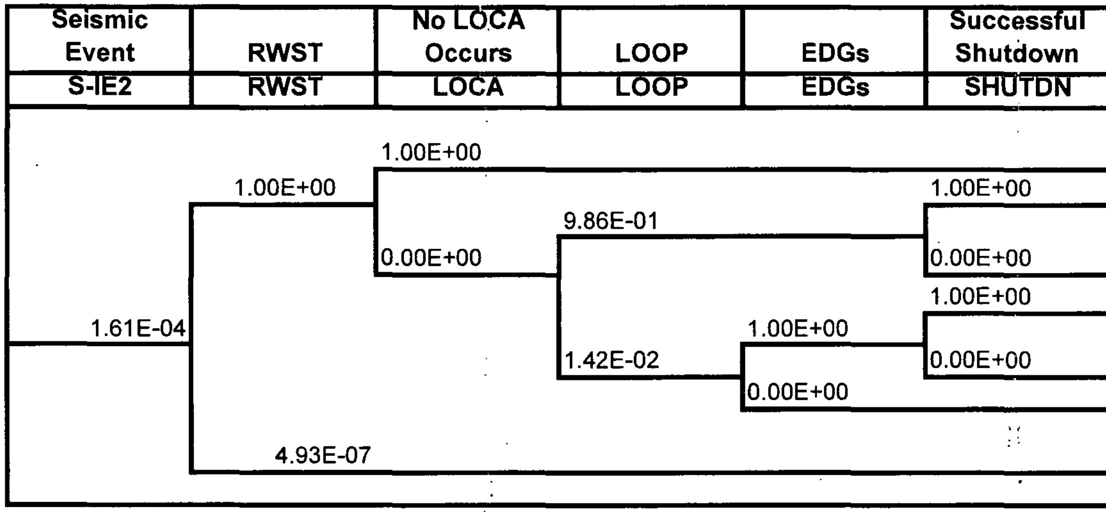
ICDP = 1.90E-09 GREEN

ASSUMPTIONS

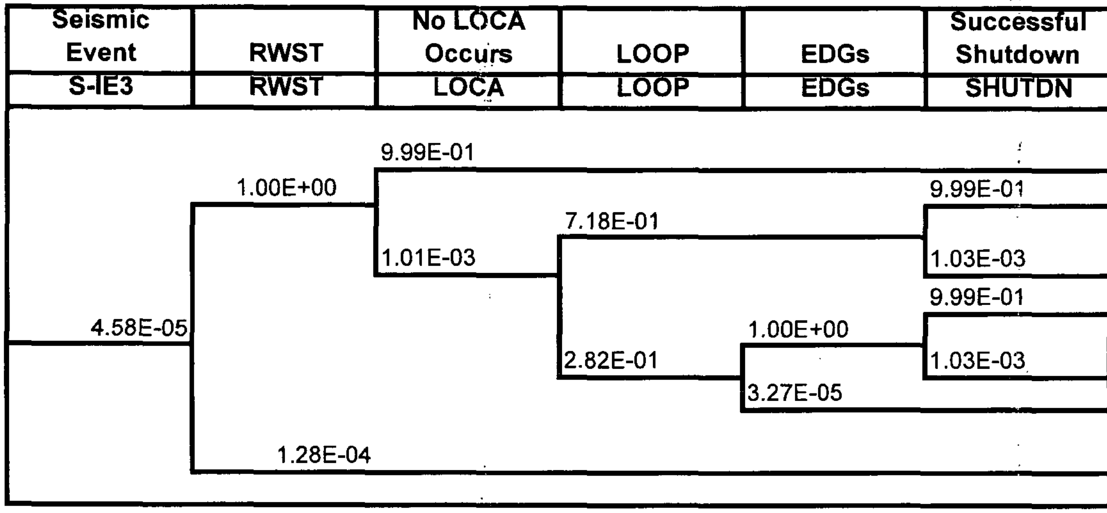
1) *Only concerned about the delta risk, not total seismic risk*
2) Recovery is assumed to be x10 IE HEP, based on decreased accessibility but significant time (at least 2 hours) to restore valve



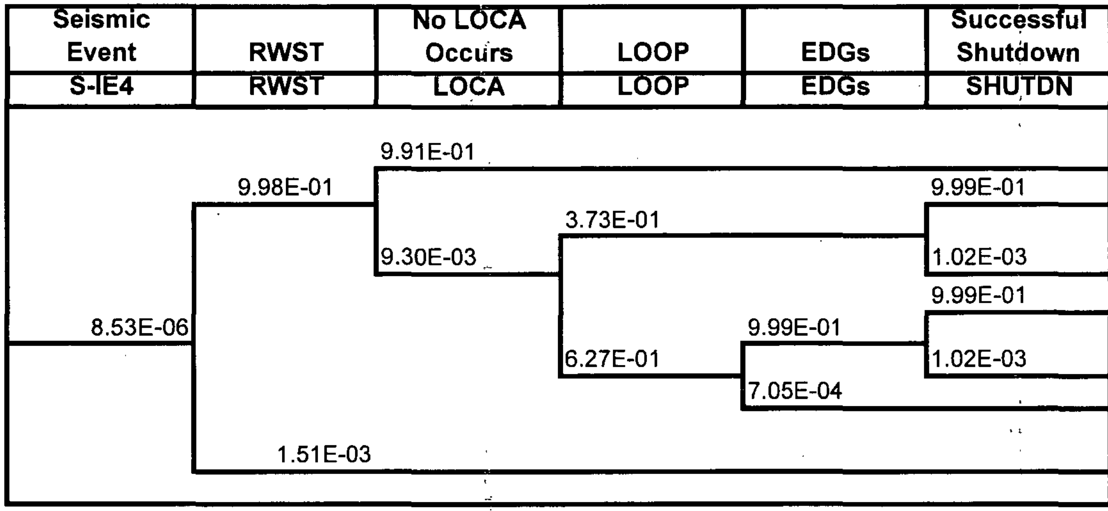
Sequence Number	Endstate	Frequency
Seq. 1	No Change	—
Seq. 2	No Change	—
Seq. 3	CD	0.00E+00
Seq. 4	No Change	—
Seq. 5	CD	0.00E+00
Seq. 6	No Change	—
Seq. 7	No Change	—
	Total delta CDF	0.00E+00



Sequence Number	Endstate	Frequency
Seq. 1	No Change	---
Seq. 2	No Change	---
Seq. 3	CD	0.00E+00
Seq. 4	No Change	---
Seq. 5	CD	0.00E+00
Seq. 6	No Change	---
Seq. 7	No Change	---
	Total delta CDF	0.00E+00



Sequence Number	Endstate	Frequency
Seq. 1	No Change	—
Seq. 2	No Change	—
Seq. 3	CD	3.41E-11
Seq. 4	No Change	—
Seq. 5	CD	1.34E-11
Seq. 6	No Change	—
Seq. 7	No Change	—
	Total delta CDF	4.75E-11



Sequence Number	Endstate	Frequency
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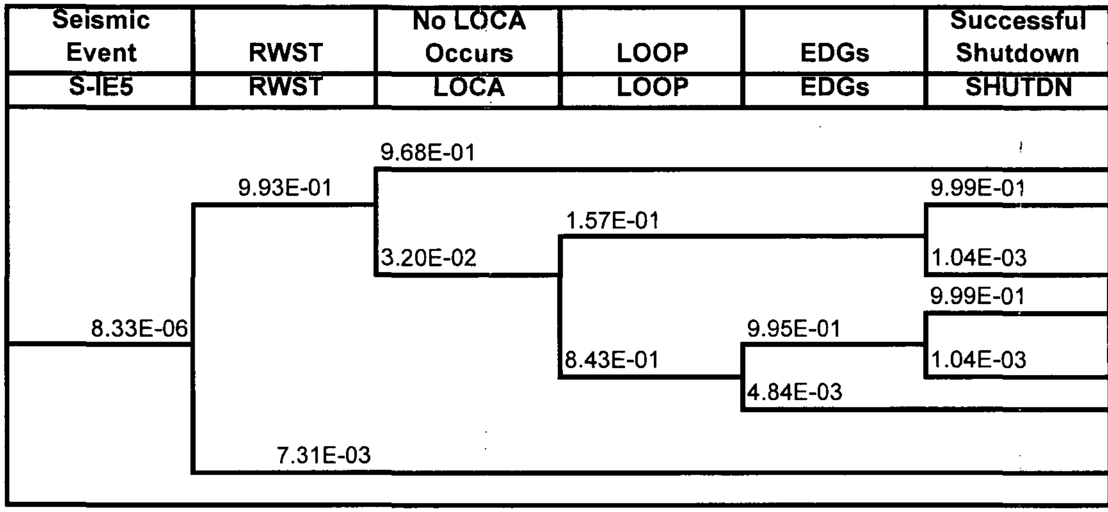
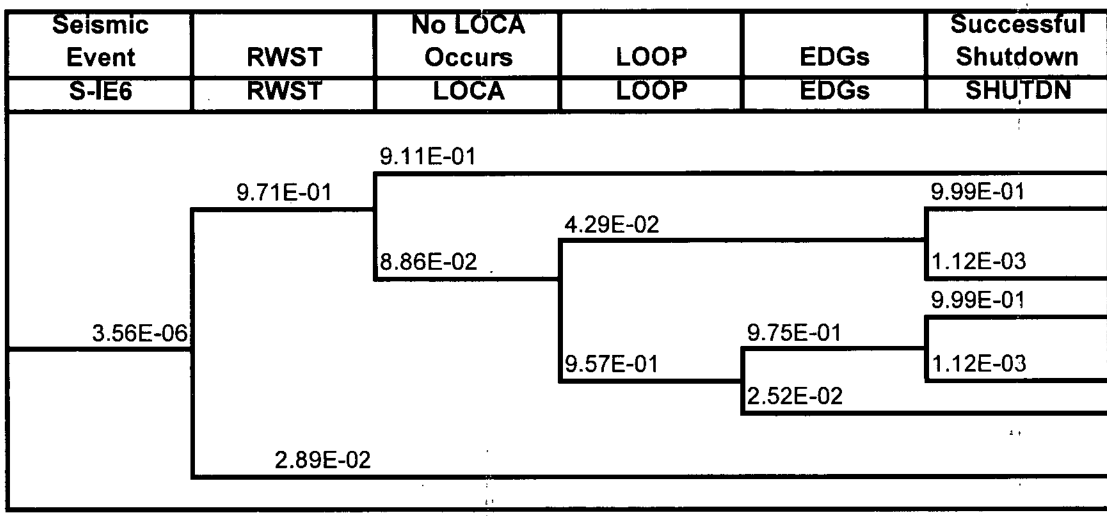
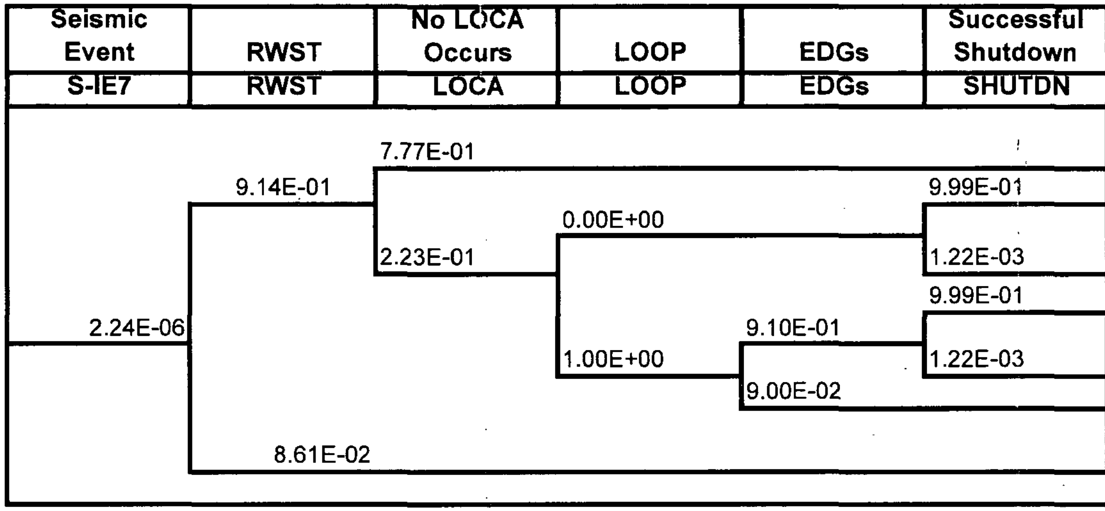
Seq. 2	No Change	—
Seq. 3	CD	3.02E-11
Seq. 4	No Change	—
Seq. 5	CD	5.09E-11
Seq. 6	No Change	—
Seq. 7	No Change	—
	Total delta CDF	8.11E-11



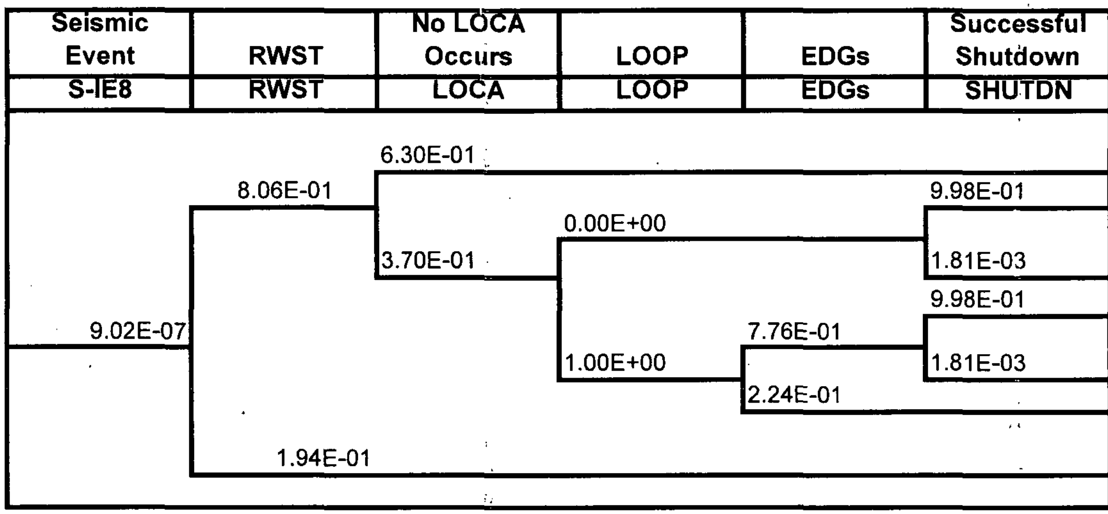
Sequence Number	Endstate	Frequency
Seq. 1	No Change	—
Seq. 2	No Change	—
Seq. 3	CD	4.31E-11
Seq. 4	No Change	—
Seq. 5	CD	2.30E-10
Seq. 6	No Change	—
Seq. 7	No Change	—
	Total delta CDF	2.73E-10



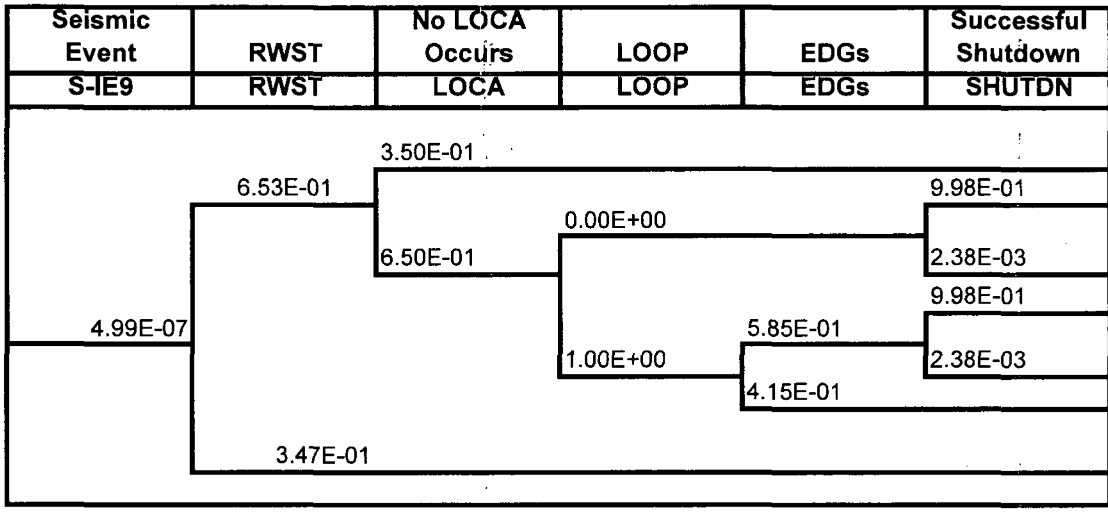
Sequence Number	Endstate	Frequency
Seq. 1	No Change	—
Seq. 2	No Change	—
Seq. 3	CD	1.47E-11
Seq. 4	No Change	—
Seq. 5	CD	3.20E-10
Seq. 6	No Change	—
Seq. 7	No Change	—
	Total delta CDF	3.34E-10



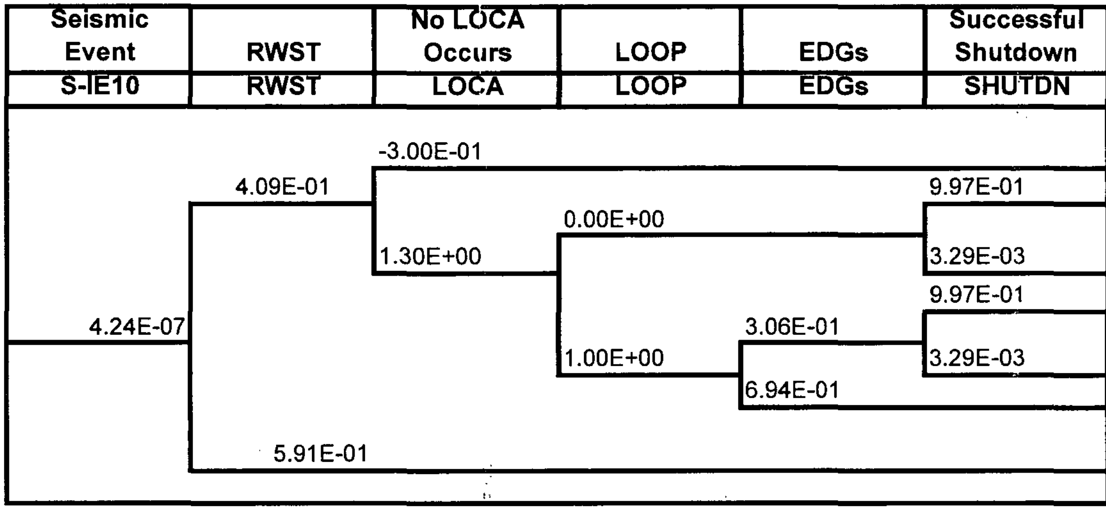
Sequence Number	Endstate	Frequency
Seq. 1	No Change	—
Seq. 2	No Change	—
Seq. 3	CD	0.00E+00
Seq. 4	No Change	—
Seq. 5	CD	5.07E-10
Seq. 6	No Change	—
Seq. 7	No Change	—
	Total delta CDF	5.07E-10



Sequence Number	Endstate	Frequency
Seq. 1	No Change	—
Seq. 2	No Change	—
Seq. 3	CD	0.00E+00
Seq. 4	No Change	—
Seq. 5	CD	3.79E-10
Seq. 6	No Change	—
Seq. 7	No Change	—
	Total delta CDF	3.79E-10



Sequence Number	Endstate	Frequency
Seq. 1	No Change	—
Seq. 2	No Change	—
Seq. 3	CD	0.00E+00
Seq. 4	No Change	—
Seq. 5	CD	2.95E-10
Seq. 6	No Change	—
Seq. 7	No Change	—
	Total delta CDF	2.95E-10



Sequence Number	Endstate	Frequency
Seq. 1	No Change	—
Seq. 2	No Change	—
Seq. 3	CD	0.00E+00
Seq. 4	No Change	—
Seq. 5	CD	2.27E-10
Seq. 6	No Change	—
Seq. 7	No Change	—
	Total delta CDF	2.27E-10

BRAIDWOOD SEISMIC HAZARD CURVE
(Ref. NUREG-1488)

Seismic Interval (cm/s/s)	Seismic Interval Exceedance Frequency (1/yr)	Interval
50 - 75	1.98E-04	S-IE1
75 - 150	1.61E-04	S-IE2
150 -250	4.58E-05	S-IE3
250 - 300	8.53E-06	S-IE4
300 - 400	8.33E-06	S-IE5
400 - 500	3.56E-06	S-IE6
500 - 650	2.24E-06	S-IE7
650 - 800	9.02E-07	S-IE8
800 - 1000	4.99E-07	S-IE9
> 1000	4.24E-07	S-IE10

SEISMIC-INDUCED LOCA PROBABILITIES BY SEISMIC INTERVAL

Seismic Interval (cm/s/s)	Magnitude For Fragility Calculation (cm/s/s)	(g)	RVR (Notes 1, 2, 3)	Large LOCA	Medium LOCA	Small LOCA	Total LOCA Probability	Recovery with SI8811 (Notes 4, 5)	Interval
50 - 75	63	0.064	Negligible	Negligible	Negligible	Negligible	0E+00	0E+00	S-IE1
75 - 150	113	0.115	Negligible	Negligible	Negligible	Negligible	0E+00	0E+00	S-IE2
150 -250	200	0.204	Negligible	Negligible	1E-05	1E-03	1E-03	1.0E-03	S-IE3
250 - 300	275	0.280	Negligible	Negligible	3E-04	9E-03	9E-03	1.0E-03	S-IE4
300 - 400	350	0.357	Negligible	3E-05	2E-03	3E-02	3E-02	1.0E-03	S-IE5
400 - 500	450	0.459	3E-05	6E-04	8E-03	8E-02	9E-02	1.1E-03	S-IE6
500 - 650	575	0.586	3E-04	3E-03	2E-02	2E-01	2E-01	1.2E-03	S-IE7
650 - 800	725	0.739	2E-03	2E-02	5E-02	3E-01	4E-01	1.8E-03	S-IE8
800 - 1000	900	0.918	1E-02	6E-02	9E-02	5E-01	7E-01	2.4E-03	S-IE9
> 1000	1200	1.224	7E-02	2E-01	2E-01	9E-01	1E+00	3.3E-03	S-IE10

NOTES:

1. Values less than 1E-5 considered "Negligible"
2. Based on NUREG/CR-4550 V3, Rev 1, Part 3, Figure 4.26
3. Based on NUREG/CR-4550 V3, Rev 1, Part 3, Figure 4.27
4. Recovery is assumed to be x10 IE HEP, based on decreased accessibility but significant time (at least 2 hours) to restore valve
5. Recovery includes probability that 1SI8811A fails to fully open, given that 1SI8811B fails to fully open (alpha factor)

OFFSITE POWER & EDG SEISMIC FRAGILITIES BY SEISMIC INTERVAL

Seismic Interval (cm/s/s)	Magnitude For Fragility Calculation		Offsite Power Fragility	EDG Fragility	Interval
	(cm/s/s)	(g)			
50 - 75	63	0.064	6.07E-05	0.00E+00	S-IE1
75 - 150	113	0.115	1.42E-02	0.00E+00	S-IE2
150 -250	200	0.204	2.82E-01	3.27E-05	S-IE3
250 - 300	275	0.280	6.27E-01	7.05E-04	S-IE4
300 - 400	350	0.357	8.43E-01	4.84E-03	S-IE5
400 - 500	450	0.459	9.57E-01	2.52E-02	S-IE6
500 - 650	575	0.586	1.00E+00	9.00E-02	S-IE7
650 - 800	725	0.739	1.00E+00	2.24E-01	S-IE8
800 - 1000	900	0.918	1.00E+00	4.15E-01	S-IE9
> 1000	1200	1.224	1.00E+00	6.94E-01	S-IE10

Ceramic Insulator seismic capacity data from NUREG/CR-4550

Mf (g)	Br	Bu	HCLPF
0.25	0.25	0.25	0.110

EDG seismic capacity data from NUREG/CR-4550

Am (g)	Br	Bu	HCLPF
1	0.25	0.31	0.397
2.73E-08	1		
	0.25	0.31	

NOTES:

1. Fragility (i.e., failure probability) = Φ [ln(A/A_m)/ßc]. A is the g level in question. A_m is the median seismic capacity. ßc = (ßu^2 + ßr^2)^0.5.
2. seismic fragility less than or equal to 1E-7 set to 0.0
3. At a calculated value of >=0.99, the value 1.00 is printed by the cell equation.

RWST SEISMIC FRAGILITIES BY SEISMIC INTERVAL

Seismic Interval (cm/s/s)	Magnitude For Fragility Calculation (cm/s/s)	(g)	RWST Fragility	Interval
50 - 75	63	0.064	0.00E+00	S-IE1
75 - 150	113	0.115	4.93E-07	S-IE2
150 -250	200	0.204	1.28E-04	S-IE3
250 - 300	275	0.280	1.51E-03	S-IE4
300 - 400	350	0.357	7.31E-03	S-IE5
400 - 500	450	0.459	2.89E-02	S-IE6
500 - 650	575	0.586	8.61E-02	S-IE7
650 - 800	725	0.739	1.94E-01	S-IE8
800 - 1000	900	0.918	3.47E-01	S-IE9
> 1000	1200	1.224	5.91E-01	S-IE10

RWST seismic capacity based on NUREG/CR-6544

Am (g)	Br	Bu	HCLPF
1.1	0.3	0.35	0.376

NOTES:

1. Fragility (i.e., failure probability) = Φ [ln(A/A_m)/ßc]. A is the g level in question. A_m is the median seismic capacity. ßc = (ßu^2 + ßr^2)^0.5.
2. seismic fragility less than or equal to 1E-7 set to 0.0
3. At a calculated value of >=0.99, the value 1.00 is printed by the cell equation.

Braidwood
PRA APPLICATION NOTEBOOK

BW-SDP-003

Revision 0

Braidwood Phase 3 SDP Evaluation of Failure of 1SI8811B to Fully Open

Appendix J

Additional Sensitivity Studies to Address NRC Concerns

December 2009

CONTACTS	BYRON	Braidwood
Site Risk Mgmt Engineer	N/A	Mark Melnicoff (815-417-4020)
Corp. Risk Mgmt Engineer	Roy Linthicum (630-657-3846) Young H. In (630-657-3858)	

1. PURPOSE

Based on interactions with the NRC Senior Reactor Analysts, this Appendix evaluates the impact of different assumptions used in the SDP evaluation. The scope of these evaluations are:

- Impact of using Alpha Factors for "Pooled MOVs" versus "RH MOVs" for the 1SI8811 Valves.
- Impact of requiring 10 minutes to close 1SI8812 valves versus 7 minutes
- Impact of different assumed cool down rates
- Impact of doubling the time it takes to local open 1SI8811B
- Impact of using time to RWST 9% versus core uncovery (Top of Active Fuel) for determining time available to open 1SI8811B.

2. IMPACT OF USING ALPHA FACTORS FOR "POOLED MOVS" VERSUS "RH MOVS" FOR THE 1SI8811 VALVES

The NRC SPAR model uses the "Pooled MOV" common cause failure data for all MOVs. This sensitivity study investigates the impact of changing the alpha factor for the SI8811 valves to use the Pooled MOV alpha factor (2.28E-02) [Reference J1].

For this sensitivity study, the alpha factor for the SI8811 valves was changed to 2.28E-2 in both the base internal events model and the SDP case.

The results of the sensitivity analysis using the revised alpha factors are provided below:

Use of Pooled MOV Alpha Factor			
Case	**Truncation**	**Frequency**	**Delta**
A11C	1.00E-10	2.20E-05	1.10E-06
A12C	1.00E-10	2.22E-05	1.13E-06
A11L	1.00E-11	2.42E-06	1.20E-08
A12L	1.00E-11	2.43E-06	1.40E-08

Base Case – Pooled MOV CCF		
A11C	1.00E-10	2.09E-05
A12C	1.00E-10	2.11E-05
A11L	1.00E-11	2.41E-06
A12L	1.00E-11	2.42E-06

Unit	Exposure Period		Internal Events	
	Days	**Fraction[1]**	**ΔCDF (/year)**	**ICDP**
CDF	323.5	8.86E-01	1.12E-06	9.88E-07
LERF	323.5	8.86E-01	1.30E-08	1.15E-08

The results of this sensitivity study show that using the Pooled MOV alpha factors rather than the RH MOV alpha factor for the 1SI8811 valves results in a slightly higher SDP

[1] Fraction = # days divided by 365.25 days/year, including 2 days repair time

result. Though the internal events SDP is still below the Green/White Threshold of 1E-06, the addition of fire and seismic risk would result in a value slightly greater than 1E-06. It should be noted, however, that use of the RH MOV values is considered the appropriate value to use as the 1SI8811 valves see system conditions representative of the RH system.

Files Used:
BW-SDP-003 App J Alpha Factor Files.zip 1,658,630B, 12/26/09, 9:48pm

3. IMPACT OF REQUIRING 10 MINUTES VERSUS 7MINUTES TO CLOSE 1SI8812 VALVES

This sensitivity investigates the impact of assuming it takes 10 minutes for the control room staff to close the 1SI8812 valves (stopping the flow diversion to Containment Sump).

The HEPs for the local opening of 1SI8811B were changed as follows:

Initiator	Base HEP		Sensitivity	
	Time Available	HEP	Time Available	HEP
Small LOCA (BBSDP15a10)	9.46 hours	6.5E-03	8.64 hours	6.5E-03
Medium LOCA (BBSDP17a10)	1.99 hours	6.0E-03	1.79 hours	6.0E-03

Use of 10 minutes versus 7 minutes as the time assumed to close the 1SI8812 valves to stop the flow diversion from the RWST to the Containment Sump does not result in a change to the HEP used. This is a result of the step function of the HEP methodology which uses discrete time intervals to adjust the HEPs. As the impact of the time windows is small, there is no impact on the HEPs. Therefore, requiring 10 minutes versus 7 minutes to close the 1SI8812 valves has no impact on the SDP results.

Files Used:
MAAP Case BBSDP15a10
MAAP Case BBSDP17a10

4. IMPACT OF DIFFERENT ASSUMED RCS COOLDOWN RATES

Sensitivity analyses were performed to investigate different assumptions for the RCS cooldown rate. The base case analyses all assumed a prescribed cooldown rate of 100 °F/hr. The following sensitivity cases were executed:

Case BBSDP17aNC: 2" SLOCA with AFW, 2CV, 2SI, 2 RCFC trains, flow diversion for 7 minutes, and without cooldown

Case BBSDP18a50: .86" SLOCA with AFW, 2CV, 2SI, 2 RCFC trains, flow diversion for 7 minutes, and 50 F/hr cooldown initiated at 45 minutes

The following provides the results of the selected sensitivity analyses:

CASE DESCRIPTION[1]	CASE #	RWST 46.7%[2]	RWST 9%	TAF[3]	CD[4]	46.7% TO 9%	46.7% TO TAF
2" SLOCA, wAFW, 2CV, 2SI, Cooldown @ .75 hr, 2 RCFC trains, flow diversion for 7 min.	BBSDP17a	2.54 hr	3.57 hr	12.00 hr	15.91 hr	1.03 hr	9.46 hr
No cooldown	BBSDP17aNC	2.54 hr	3.66 hr	5.45 hr	6.21 hr	1.12 hr	2.91 hr
.86" SLOCA, wAFW, 2CV, 2SI, Cooldown @ .75 hr, 2 RCFC trains, flow diversion for 7 min.	BBSDP18a	5.23 hr	8.00 hr	28.21 hr	30.45 hr	2.77 hr	22.98 hr
50F HR	BBSDP18a50	5.23 hr	8.32 hr	28.82 hr	31.10 hr	3.09 hr	23.59 hr

Notes:
1) See Appendix B, Section 3.2 for complete case description
2) Initial volume corresponds to Tech Spec minimum of 400,500 gal
3) Top of active fuel exposure
4) Peak cladding temperature > 1800 °F

In both cases, a reduction in the cooldown rate results in a slightly longer time period to reach 9% RWST level. This is due to slightly higher RCS pressures yielding smaller ECCS flow rates and a corresponding slower RWST depletion rate.

For the 5.2" break, no additional cooldown was assumed in the original analysis as the break flow provided a cooldown rate in excess of 100 °F/hr.

As a result, use of a 100 °F/hr cooldown rate is conservative with respect to RWST flow diversion and time available to locally open 1SI8811B.

<u>Files Used:</u>
MAAP Case BBSDP17aNC
MAAP Case BBSDP18a50

5. IMPACT OF DOUBLING THE TIME IT TAKES TO LOCALLY OPEN 1SI8811B

This sensitivity study investigates the impact of doubling the time required (48 minutes versus 24 minutes) to determine the sensitivity to adverse temperature conditions on the SDP evaluation. Reference J3 notes that the temperature in area is expected to be less than 90F based on realistic assumptions in the area. In the worse case, design basis assumptions would result in temperatures being less than 115F. Since the timing estimates for manually stroking the valve were down at ~75F, this sensitivity investigates the impact of the higher temperatures resulting in a longer time being required to stroke the valve open. Based on engineering judgment, it is not expected that these temperatures would result in more than doubling the time required to locally stroke the valve open.

The HEPs for the local opening of 1SI8811B were changed as follows:

Initiator	Base HEP		Sensitivity	
	Time Available	HEP	Time Available	HEP
Small LOCA	9.46 hours	6.5E-03	9.06 hours	6.5E-03
Medium LOCA	1.99 hours	6.0E-03	1.59 hours	6.5E-03

The results of this sensitivity study are provided below:

x2 Time to Locally Open 1SI8811B			
Case	Truncation	Frequency	Delta
A11C_SDP	1.00E-10	2.16E-05	8.01E-07
A12D_SDP	1.00E-10	2.19E-05	8.41E-07
A11L_SDP	1.00E-11	2.42E-06	1.03E-08
A12L_SDP	1.00E-11	2.43E-06	1.38E-08

Rev 6D2 Base Case			
A11D1_CDF	1.00E-10		2.08E-05
A12D1_CDF	1.00E-10		2.11E-05
A11D1_LERF	1.00E-11		2.41E-06
A12D1_LERF	1.00E-11		2.42E-06

Unit	Exposure Period		Internal Events	
	Days	Fraction[2]	**ΔCDF (/year)**	**ICDP/ILERP**
CDF	323.5	8.86E-01	8.21E-07	7.27E-07
LERF	323.5	8.86E-01	1.21E-08	1.07E-08

The impact of doubling the time required to locally open 1SI8811B is negligible and will not impact the conclusions of the SDP evaluation.

Files Used:
BW-SDP-003 App J – x2 Local time.zip 863KB, 12/28/09, 8:37am
bwd-8811-121009-48minsens.HRA 1,675,264B, 12/29/09, 8:51pm

[2] Fraction = # days divided by 365.25 days/year, including 2 days repair time

6. IMPACT OF USEING TIME TO RWST 9% VERSUS CORE UNCOVERY (TOP OF ACTIVE FUEL) FOR DETERMINING TIME AVAILABLE TO OPEN 1SI8811B.

This sensitivity study investigates the impact of using the time to RWST 9% versus the time to core uncovery for the time available in the HEP calculations.

The HEPs for the local opening of 1SI8811B were changed as follows:

Initiator	Base HEP		Sensitivity	
	Time Available	HEP	Time Available	HEP
Small LOCA	9.46 hours	6.5E-03	1.03 hours	7.6E-02
Medium LOCA	1.99 hours	6.0E-03	1.12 hours	1.5E-02

The results of this sensitivity study are provided below:

Time Limited by RWST 9%			
Case	Truncation	Frequency	Delta
A11C_SDP	1.00E-10	3.08E-05	1.00E-05
A12D_SDP	1.00E-10	3.12E-05	1.02E-05
A11L_SDP	1.00E-11	2.54E-06	1.29E-07
A12L_SDP	1.00E-11	2.55E-06	1.34E-07

Rev 6D2 Base Case			
A11D1_CDF	1.00E-10		2.08E-05
A12D1_CDF	1.00E-10		2.11E-05
A11D1_LERF	1.00E-11		2.41E-06
A12D1_LERF	1.00E-11		2.42E-06

Unit	Exposure Period		Internal Events	
	Days	Fraction[3]	**ΔCDF (/year)**	**ICDP/ILERP**
CDF	323.5	8.86E-01	1.01E-05	8.94E-06
LERF	323.5	8.86E-01	1.32E-07	1.17E-07

Basing the time available on the time required to reach 9% in the RWST has a significant impact on the SDP. However, as noted in Reference J2, no adverse environment conditions are expected as a result of terminating all ECCS injection until the core becomes uncovered. Therefore, it is appropriate to use time to core uncovery, rather than the time to RWST 9% as the time window for locally opening 1SI8811B.

Files Used:
RD61_1SI8811BR1 – RWST 9.zip 1,187,794B, 12/29/09, 4:25pm
bwd-8811-121009-9%sens.HRA 1,675,264B, 12/29/09, 8:51pm

[3] Fraction = # days divided by 365.25 days/year, including 2 days repair time

7. SUMMARY

The table below summarizes the results of the sensitivity analysis.

Case	IE SDP Result	% Change
Base	7.13E-07	N/A
Pooled MOV CCF	9.88E-07	39%
10 minutes to Close 1SI8812 Valves	7.13E-07	0%
RCS Cooldown Rates	7.13E-07	0%
2x Time to Locally Open 1SI8811B	7.27E-07	2%
Time Available based on RWST 9%	8.94E-06	1154%

8. SOFTWARE & FILES USED

- CAFTA 5.3 (EX0007572)
- BW-SDP-003 App J Files R0.ZIP, 3,722Kb, 12/29/09, 8:53pm

9. REFERENCES

J1). U.S. Nuclear Regulatory Commission, "CCF Parameter Estimations, 2005 Update", http://nrcoe.inl.gov/results/CCF/ParamEst2005/ccfparamest.htm, September 2008.

J2). ER 393342 "ACCESSIBILITY OF 1SI8811B FOLLOWING SBLOCA – REVISED TO INCLUDE POTENTIAL ECCS TERMINATION AT RWST EMPTY"

J3) EC 378302, "EVALUATE TEMPERATURE OF THE PIPE PENETRATION CURVE WALL AREA AUX. BLDG. ELEV. 364', USING A BOUNDING CASE AND REALISTIC CASE REVISED ANALYSIS FROM EC 377814"

J

RM DOCUMENTATION NO. BW-SDP-003 Appdendix J REV: 0 PAGE NO. E10 of 10

AU 12/30/09

STATION: Braidwood

UNIT(S) AFFECTED: UNIT 1

TITLE:

Braidwood Phase 3 SDP Evaluation of Failure of 1SI8811B to Fully Open

Appendix J – Additional Sensitivity Studies to Address NRC Concerns

SUMMARY (Include UREs incorporated):

This Appendix performs several sensitivity studies to address NRC concerns regarding the SDP for the 1SI8811B valve failure to fully open

Number of pages: Total 10 pages, including this page.
RM Document Level: Category 2, per ER-AA-600-1012

[ ] Review required after periodic Update

[X] Internal RM Documentation [ ] External RM Documentation

Electronic Calculation Data Files: (Program Name, Version, File Name extension/size/date/hour/min)

See Sections 2 – 6, 8 for Data Files

Method of Review: [X] Detailed [ ] Alternate [ ] Review of External Document

This RM documentation supersedes: N/A in its entirety.

	Print	Sign	Date
Prepared by:	Roy Linthicum	[signature]	12/30/09
Prepared by: MAAP	Jeff Gabor	[signature]	12/30/09
Reviewed by:	Young In	See Attached	
Approved by:	N/A		

Linthicum, Roy R.:(GenCo-Nuc)

From: In, Young H.:(GenCo-Nuc)
Sent: Wednesday, December 30, 2009 9:12 AM
To: Linthicum, Roy R.:(GenCo-Nuc)
Subject: RE: BW-SDP-003 Appendix J, Rev 0

Roy,

I reviewed the BW-SDP-003 Appendix J, Rev 0, and this email provides my electronic approval.

Young

-----Original Message-----
From: Linthicum, Roy R.:(GenCo-Nuc)
Sent: Wed 12/30/2009 6:29 AM
To: In, Young H.:(GenCo-Nuc)
Subject: BW-SDP-003 Appendix J, Rev 1

Young,

Your comments BW-SDP-003 Appendix J, Rev 0 have been incorporated. Please respond with your electronic concurrence.
Roy Linthicum

Corporate Risk Management

630-657-3846 (Cantera)

630-926-3034 (Cell)

Text Messages: 6309263034@messaging.sprintpcs.com

ATTACHMENT 2

EC #377204, "Evaluate 1SI8811B Flow at Partial Opening"

Braidwood Station

Engineering Change

EC Number :	0000377204 000
Status/Date :	CLOSED 10/12/2009
Facility :	BRW
Type/Sub-type:	EVAL PROG

Print Date: 12/30/2009

Exelon

Page: 1

EC Title: EVALUATE 1SI8811B FLOW AT PARTIAL OPENING

Mod Nbr : 0000377204 KW1: SR KW2: KW3: KW4: KW5:

Master EC :	N	Work Group :		Temporary :	N
Outage :	N	Alert Group:	A8951NESPR	Aprd Reqd Date:	
WO Required :	N	Image Addr :		Exp Insvc Date:	
Adv Wk Appvd:		Alt Ref. :		Expires On :	07/02/2012
Auto-Advance:	Y	Priority :	CL	Auto-Asbuild :	N
Caveat Outst:		Department :		Discipline :	
Resp Engr :	ROBERT	C BEDFORD			
Location :					

Milestone	Date	PassPort	Name		Req By
030-DAR CONCUR	10/07/2009	BRWGB	BAL	GARY	CANCELED
110-PREPARE EC	10/01/2009	BRWZB	BEDFORD	ROBERT	APPROVED
120-REVIEW EC	10/06/2009	BRZZC	COLE	THOMAS	APPROVED
see topic notes					
200-DISC RVW-M	10/07/2009	PWR69	SHAH	SHASHIKANT	APPROVED
210-DEPT RVW-01	10/07/2009	CSCTT	THYGESEN	THEODORE	APPROVED
Corporate Engineering Review As an experienced valve engineer, and holder of certification by Exelon Certification Guide N-AN-ENG-CERT-DG02, I have performed an independent review of this Engineering Evaluation, and find it to be thorough and accurate. Ted Thygesen Exelon Corporate Valve Engineer					
240-ITPR-EPR	10/07/2009	BRWGB	BAL	GARY	APPROVED
HU-AA-1212 was utilized to perform a pre-job brief. This review determined a Risk Consequence Severity Level of Low, and a Low Probability of error yielding a risk rank of 1 (Existing Process Reviews).					
300-APPROVE EC	10/07/2009	BRWGB	BAL	GARY	APPROVED
900-ARCHIVE EC	10/12/2009	BRZEF	RIORDAN	GAIL	CLOSED

Units

Fac	Unit	Description
BRW	01	UNIT ONE

Systems

Fac	System	Description
BRW	SI	SAFETY INJECTION

Engineering Change	
EC Number :	0000377204 000
Status/Date :	CLOSED 10/12/2009
Facility :	BRW
Type/Sub-type:	EVAL PROG

Affected Equipment List

Fac	Unit	Op Sys	Division	Area	System	Class
BRW	01				SI	

Equipment : MOVA 8811B Minor Rev:
Component : V20 < Major Rev:
Equip. Tag: 1SI8811B
State: Reviewed? Y Inst/Rm: Rev Trackable: Y Inc: N
Name : CNMT SUMP 1B ISOL VLV

Reference Documents List

Facility	Type	SubType	Document	Sheet
BRW	DWGV		77920	
Title: VALVE ASSY 24" MOT OP GATE				
BRW	DWGC		M-61	4
Title: DIAGRAM OF SAFETY INJECTION UNIT 1 (CRITICAL CONTROL ROOM DRAWING)				

Planning/Scheduling Information

Planning Start : Level of Effort:

Planning Event	From Date	Thru Date
100-PREP EVAL		

Cross References

Ref. Type	Number	Sub-Number	Description
AR	00934782		1SI8811B FAILED TO STROKE FULL OPEN DURING SUR
EC	0000376161		EVALUATE 1SI8811B FLOW AT PARTIAL OPENING
ER	0000392325		DETERMINE ACCESSIBILITY OF 1SI8811B FOLLOWING

Engineering Change Comments

Comments Last Updated By: **BRWZB** Last Updated Date: **10/07/2009**

1. REASON FOR EVALUATION / SCOPE

In accordance with Issue Report #934782 valve 1SI8811B, Containment Sump Isolation Valve, failed to fully stroke open during surveillance testing. Valve 1SI8811B was being stroked in accordance with Operating Surveillance procedures 1BwOSR 5.5.8.SI-7B, Safety Injection System Containment Sump 1SI8811B Valve Stroke Surveillance, and 1BwOSR 5.5.8.SI-2B, Train B Safety Injection System Isolation Valve Indication Surveillance. During the open stroke the valve opened approximately 35 percent and stopped as indicated by valve stem position. Control Room valve position indicating lights were both lit (dual indication), indicating the breaker was not in a tripped condition. Troubleshooting in accordance with work order #1245941 found that the torque switch inside the limit switch compartment was no longer functional due to corrosion. The corrosion was due to water intrusion into the limit switch compartment that was apparent after the actuator limit switch compartment cover was removed.

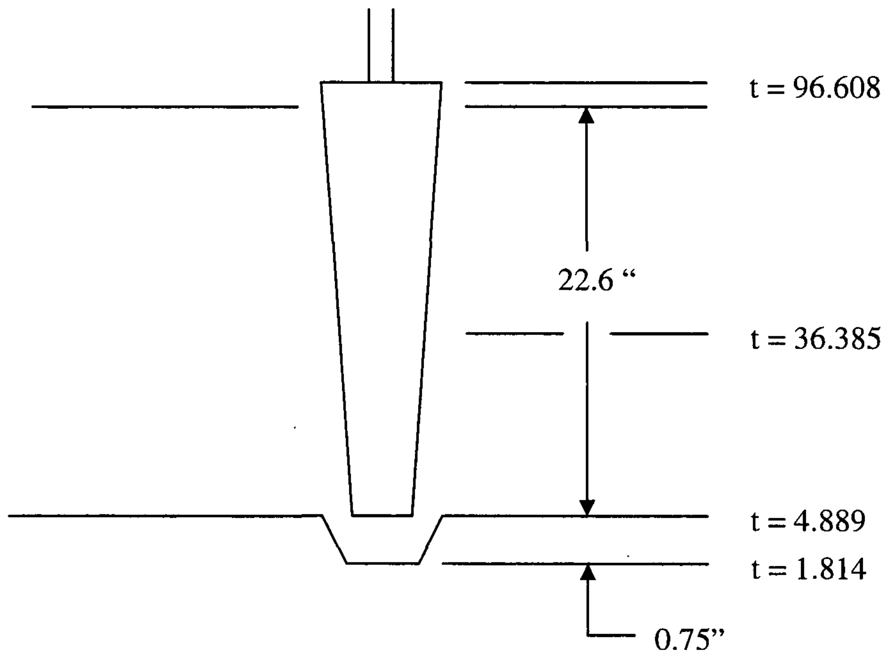
Based on the nature of the torque switch failure the 1SI8811B valve traveled open until the open torque switch bypass circuit transferred from the torque switch. Due to the stuck open side torque switch contacts the valve stopped at approximately 35 percent open. The open bypass limit switch is set during diagnostic testing and is required to be set anywhere between 30 and 40 percent.

The 1SI8811B valve is normally closed and required to open during the recirculation phase of Emergency Core Cooling to provide water from the containment sump to the Residual Heat Removal (RHR) and Containment Spray (CS) pumps. The 1SI8811B valve is safety related and seismic category I. The valve is required to open to maintain adequate flow and NPSH for the RHR and CS pumps. This evaluation will determine whether the valve could pass design RHR pump flow at the actual opening percentage for the valve.

This EC supercedes EC#376161 in its entirety. This EC removes Containment Spray flow and incorporates conservative assumptions for flow and head loss through the 1SI8811B valve.

2. DETAILED EVALUATION

The first step is to determine the actual percentage the 1SI8811B valve opened based on the open bypass setting. The last diagnostic test was performed 05/17/06 in accordance with work order #695341. The following information was taken from the diagnostic test review, the design drawing (reference 5) and the MIDAS Data Sheet (reference 7):



The time (t=) values were taken from the diagnostic testing data. The internal actuator limit switch assembly and valve stem are driven from the actuator gearing and the open bypass and open limit contacts are controlled from this assembly. Due to being driven from actuator gearing these contacts actuate at exactly the same stem position from stroke to stroke. The only variation in these times from stroke to stroke is the time related to contact wipe that is measured in thousandths of a second.

When the actuator is demanded to open the motor starts (t=0) and the actuator gearing starts to move. After hammer blow occurs and stem thread lash is taken up the stem starts to move taking up disk t-head clearance prior to disk unwedging. At t=1.814 the disk unwedges from the valve seat and starts to travel open. At t=4.889 the disk travels approximately 0.75 inches and starts to uncover the port allowing flow to occur. At t=96.608 the valve disk has traveled to the full open (backseated) position. Although the disk will be out of the flow stream prior to contacting the backseat the backseat stem position was conservatively chosen. The 1SI8811B open limit was set at 97 percent of the full backseat stroke therefore the open limit time was adjusted to account for the stem traveling to the backseat position.

Disk Unwedging Time (diagnostic label O9) t = 1.814 seconds (Reference 4)

Contactor Dropout at Full Open (diagnostic label O17) t = 93.709 seconds (Reference 4)
Open Bypass Time t= 36.385 seconds (diagnostic label O12) (Reference 4)
Open limit setting (percent of stroke) = 97% (Reference 4)

Internal valve diameter = 22.6 inches (Reference 5)
Stroke time (seat to backseat) = 93.709 / 0.97 = 96.608 seconds
Stroke length = 23.56 inches (Reference 7)
Stem speed = 23.56 inches / 96.608 seconds = 0.2439 inches/sec
Stroke length to start uncovering port = 0.75 inches (conservative value based on reference 9)
Time to start uncovering port = 0.75 inches / 0.2439 inches / sec = 3.075 seconds

Stem travel time after uncovering port t = 96.608 – 3.075 - 1.814 = 91.719 seconds
Open bypass travel time t = 36.385 –3.075 – 1.814 = 31.496 seconds

Bypass as a percent of full stroke = 31.496 / 91.719 = 34.34 percent

The second step is to determine the head loss through the 1SI8811B at 34.34 percent open during the maximum expected flow rate scenario. Only the RH pump flow will be considered due to the CS pump flowpath interlocks not being made up at a partial opening position.

RH Pump Flow = 5000 gpm (Reference 2, Maximum)
Lowest RHR NPSH Margin = 3.7 ft (Reference 2)

Cv of Valve at approximately 30 percent open = 5000 (Reference 3, conservative value based on actual open percentage of 34.34%)

Total Maximum Flow (Q) = 5000 gpm

Resistance Coefficient $K = 891\ (d)^4 / Cv^2 = 891\ (22.60)^4 / (5000)^2 = 9.298$ (Reference 1, Equation 3-16)

d = Valve internal diameter = 22.60 in (Reference 5)

Head Loss $h_L = 0.00259\ K\ Q^2 / d^4 = 0.00259\ (9.298)\ (5000)^2 / 22.60^4 = 2.308$ ft (Reference 1, Equation 3-14)

Therefore, comparing the RHR NPSH margin of 3.7 ft with the head loss through a partially open valve of 2.31 ft indicates there is margin to ensure adequate

NPSH with 1SI8811B partially open at approximately 34.34 percent. Additional margin is available however not included in this evaluation as follows:

1. The original Net Positive Suction Head (NPSH) analysis (Reference 2) calculates the head loss through the containment sump piping. This piping contains valve 1SI8811B and therefore, the portion of the loss attributed to 1SI8811B may be subtracted from the loss calculated based on a partially open valve yielding slightly greater margin.

2. The original Net Positive Suction Head (NPSH) analysis (Reference 2) utilizes NPSH required values based on conservative max pump flow values vs those flow values utilized in reference 6. This yields higher required NPSH values and decreases the margin between required and available NPSH. Using the lower flow rates (RHR only) will lower the required NPSH decreasing the required NPSH and increasing the margin between the required and available NPSH.

3. Residual Heat Removal pump flow of 5000 gpm used in this analysis is conservative relative to actual maximum flow rate determined during preoperational testing (Reference 2).

4. The Cv value vs percent open for 1SI8811B was obtained from the manufacturer (reference 3). Discussions with the manufacturer determined that this Cv chart was constructed from testing performed on two gate valves of different sizes and configurations and was not a specific Cv chart for the 1SI8811B model valve. A Cv of approximately 5000 was chosen from this chart to conservatively bound the Cv value at 34.34 percent. This value was compared with gate valve Cv values determined using two other sources. The calculations using the referenced sources provided below determined that the Cv provided by the manufacturer is conservative.

<u>Cv calculation utilizing reference #1</u>

Utilizing methodology for gate valve with wedge disk and Equivalent Length In Pipe Diameters (Page A-30)

One half open (50%) L/D = 160
One-quarter open (25%) L/D = 900

Equivalent Lengths L and L/D and Resistance Coefficient K (Page A-31)

One half open (50%) K = 1.8
One–quarter open (25%) K = 10.3

Equivalents of Resistance Coefficient K and Flow Coefficient Cv (Page A-32)

One half open (50%) Cv = 11382
One –quarter open (25%) Cv = 4758

Cv at approximately 34.34 percent open = 7249

It should be noted that the Cv value above falls between 25 and 50 percent and due to the shape of the Cv curve the actual value at 34.34% would be slightly lower than this value.

Cv calculation utilizing reference #8

Utilizing the attached curve labeled "Hydraulic (Tau) Characteristics of Valves" the Tau value at 34.34% open yields a Tau value of approximately 0.15.

Tau = Cv / Cvu

Cv = Tau x Cvu

Cv = Flow coefficient at partial opening of 34.34%
Cvu = Flow coefficient at full open of 39836 (Reference 5)

Cv = 0.15 x 39836 = 5975

3. CONCLUSIONS/FINDINGS

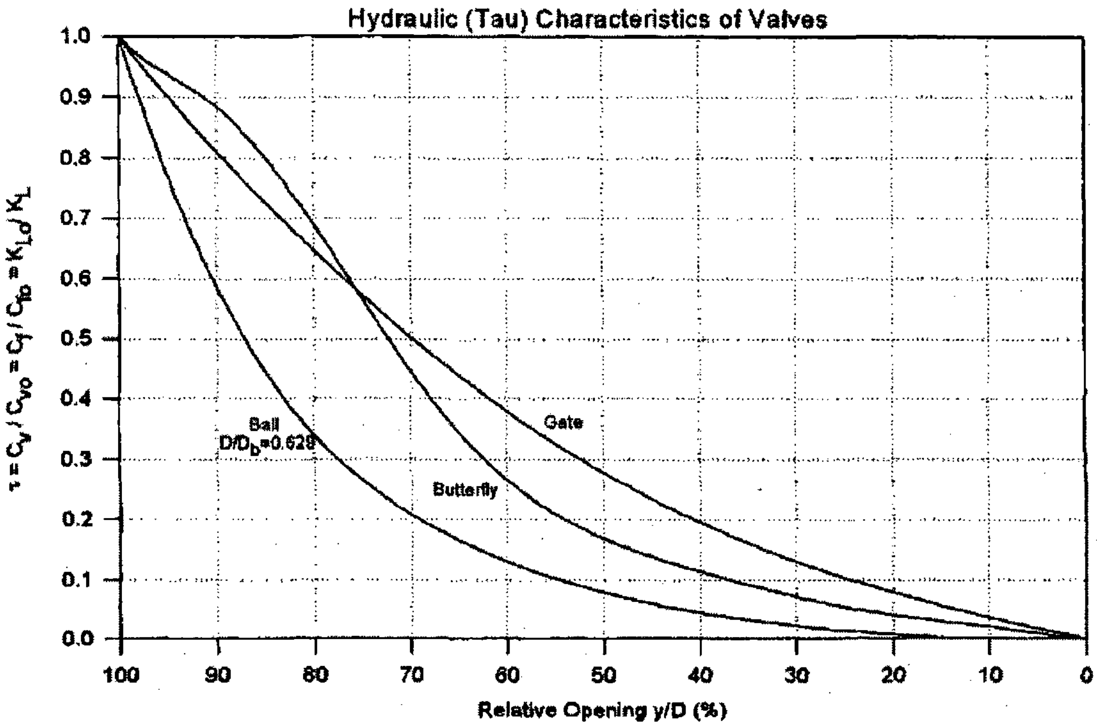
The results of this evaluation indicate that NPSH margin exists with a partially open 1SI8811B valve ensuring that adequate accident flows (RHR) can be provided during the recirculation phase of a design basis Loss of Coolant Accident.

4. REFERENCES

1. Crane Technical Paper 410, Flow of Fluids through Valves, Fittings, and Pipe, 1969
2. Design Analysis BYR06-058 / BRW-06-0035-M, NPSHA for RHR & CS During Post LOCA Recirculation, Revision 1A
3. Vendor Contact Form dated 07/09/09, Flowserve Corporation Chart of Approximate Flow Coefficient (Cv) vs. Percent (%) Open, Size 24, Pressure Class 300 Flex Wedge Gate Valve, Drawing 77920.

4. Work order # 695341 Diagnostic Test dated 05/17/06 and file E:\MIDAS on Ksqzkfs01 \ Quicklook Data \ Braidwood \ Unit 1 \ 1SI \ 1SI8812B \ 06a0arew (Opened with Quicklook software)
5. Vendor Design Drawing 77920, Revision F
6. Design Analysis BYR06-029 / BRW-06-0016-M, SI/RHR/CS/CV System Hydraulic Analysis in Support of GSI-191, Revision 3
7. MIDAS Data Sheet BRA-1SI8811B Revision 3
8. Hydraulic Design Handbook, McGraw-Hill, Copyright 1999
9. Vendor Contact Form dated 10/05/09, reference dimension from disk fully seated to point of just uncovering valve port, Size 24, Pressure Class 300 Flex Wedge Gate Valve, Drawing 77920.

HU-AA-1212 Technical pre-job brief performed 07/9/09 for EC#376161. ITP review is not required.


Hydraulic (Tau) Characteristics of Valves
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
τ = Cv / Cvo = Cf / Cfo = KLo / KL
Ball
D/Db=0.629
Gate
Butterfly
100
90
80
70
60
50
40
30
20
10
0
Relative Opening y/D (%)

ATTACHMENT 2
VENDOR CONTACT FORM
Page 1 of 2

Vendor Contact Form

Instructions:

1. [illegible]
2. [illegible]
3. [illegible]

Purpose of Contact (Problem Description):

Valve 1SI8811B failed to fully open during surveillance testing and an evaluation is being performed to determine the flow that could pass through the valve in a partially open state. To determine the flow through a partially open valve a flow coefficient (Cv) vs percent open curve is required.

Assistance Requested:

Provide an approximate flow coefficient (Cv) vs percent open curve for Borg Warner Valve, Size 24 inch, Pressure Class 300 Flex Wedge Gate Valve, NVD - Drawing 77920.

Guidance Provided (attach additional sheets as needed):

The attached curve of approximate flow coefficient (Cv) vs percent open provides the Cv at various percentages of valve opening for the valve listed on drawing 77920.

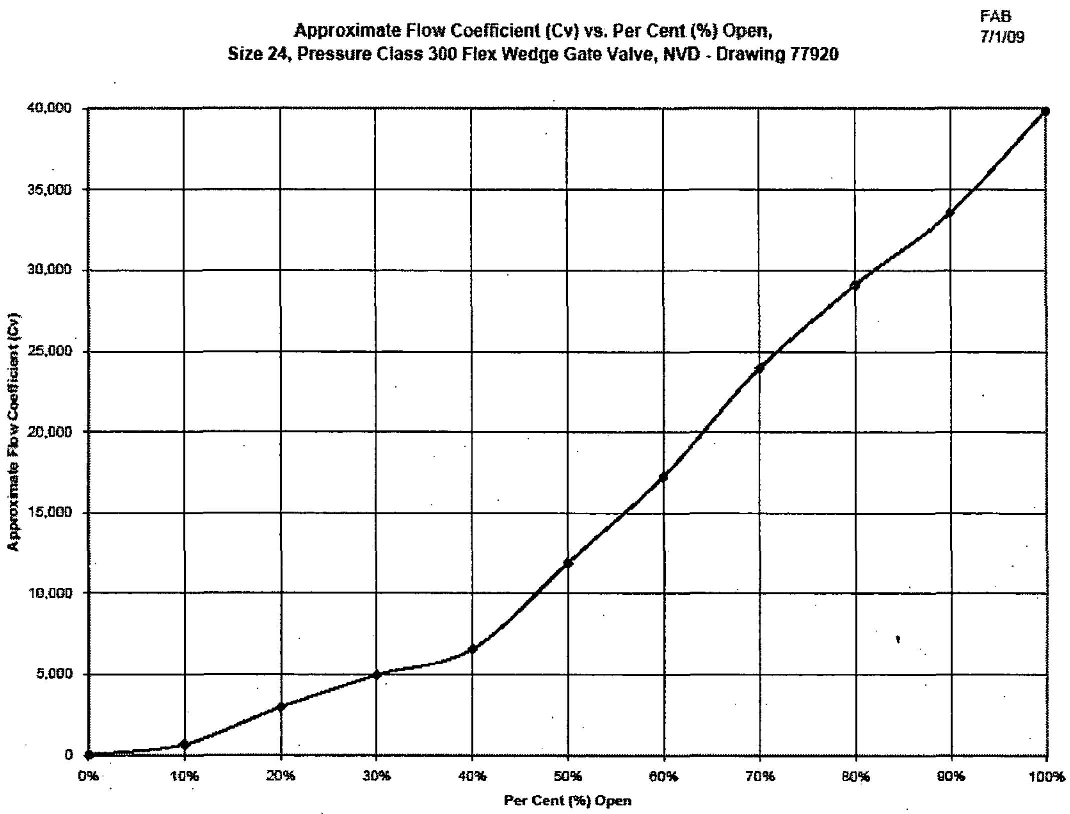
Recommendation Provided (attach additional sheets as needed):

Utilize the attached curve for approximate flow coefficient (Cv) vs percent open for Borg Warner Valve, Size 24 inch, Pressure Class 300 Flex Wedge Gate Valve, Drawing 77920.

Prepared by: Floyd Bensinger / [signature] **Date:** 07/09/09
Printed Name / Signature

Organization: Flowserve Corp.

Phone/Fax: 919-831-3200 / 919-831-3369


Approximate Flow Coefficient (Cv) vs. Per Cent (%) Open,
Size 24, Pressure Class 300 Flex Wedge Gate Valve, NVD - Drawing 77920
FAB
7/1/09
Approximate Flow Coefficient (Cv)
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
Per Cent (%) Open

ATTACHMENT 2
VENDOR CONTACT FORM
Page 1 of 2

Vendor Contact Form

Instructions:
1. Exelon Engineer to complete Sections 1 through 4 and forward to Vendor.
2. Vendor to complete last section and promptly return (via fax) to Exelon Engineer.
3. Exelon Engineer to submit completed form to VETIP per CC-AA-204 & CC-MW-204-1001.

Purpose of Contact (Problem Description):

Valve 1SI8811B failed to fully open during surveillance testing and an evaluation is being performed to determine the flow that could pass through the valve in a partially open state. To determine the amount of port uncovered with a partially open valve the amount of disk travel to move from the fully seated position to a position of just starting to uncover the port is requested. This information with the distance traveled after uncovering the port will be used to determine the percent of valve opening.

Assistance Requested:

Provide an approximate distance from a full closed/seated position to a position of just starting to uncover the port for Borg Warner Valve, Size 24 inch, Pressure Class 300 Flex Wedge Gate Valve, NVD - Drawing 77920.

Guidance Provided (attach additional sheets as needed):

The distance from a full closed/seated position to a position of just starting to uncover the port for Borg Warner Valve, Size 24 inch, Pressure Class 300 Flex Wedge Gate Valve, NVD - Drawing 77920 is approximately 5/8 inch.

Recommendation Provided (attach additional sheets as needed):

See guidance provided above.

Prepared by:	Floyd Bensinger / [signature] 10/6/09 Printed Name / Signature	**Date:**	10/06/09
Organization:	Flowserve Corp.		
Phone/Fax:	919-831-3200 / 919-831-3369		

ATTACHMENT 3

EC #377329, "Post SBLOCA Dose Rate Assessment For 1SI8811A/B Accessibility"

Braidwood Station

Engineering Change

Print Date: 12/30/2009

Exelon

Page: 1

EC Number : 0000377329 000
Status/Date : CLOSED 11/04/2009
Facility : BRW
Type/Sub-type: EVAL MECH

EC Title: POST SBLOCA DOSE RATE ASSESSMENT FOR 1SI8811A/B ACCESSIBILITY

Mod Nbr : KW1: SR KW2: KW3: KW4: KW5:

Master EC :	N	Work Group :		Temporary :	N
Outage :	N	Alert Group:	A8952DER	Aprd Reqd Date:	
WO Required :	N	Image Addr :		Exp Insvc Date:	
Adv Wk Appvd:		Alt Ref. :		Expires On :	07/04/2012
Auto-Advance:	Y	Priority :		Auto-Asbuild :	N
Caveat Outst:		Department :		Discipline :	
Resp Engr :	THOMAS	COLE			
Location :					

Milestone	Date	PassPort	Name		Req By
110-PREPARE EC	10/09/2009	BRZZC	COLE	THOMAS	APPROVED

Evaluation prepared by Thomas Mscisz (see PDF file in Evaluation Details for signature)

120-REVIEW EC	10/09/2009	ZIOCM	MOKIJEWSKI	CHARLES	APPROVED

Detailed, Independent Review of the dose assessment by Jessica DeLaRosa (see PDF file in Evaluation Details for signature).

.

A detailed, independent review of the EC for administrative requirements was performed by C. Mokijewski, Braidwood Site Engineering.

240-ITPR-EPR	10/09/2009	BRZRB	BELAIR	RAYMOND	APPROVED

The Consequence Risk Factors in Attachment 2 of HU-AA-1212 have been reviewed for applicability and all were of LOW or N/A severity level. Therefore, this EC will be prepared, reviewed, and approved using existing process reviews.

300-APPROVE EC	10/09/2009	BRZRB	BELAIR	RAYMOND	APPROVED

Evaluation approved by Jeffrey Esterman (see PDF file in Evaluation Details
for signature)

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Per CC-AA-309-101, documenting a DAR review in a Technical Evaluation is at
the discretion of the approving Manager. No DAR was included with the evaluation performed by Corporate Engineering. However, based on a review of the evaluation, all appropriate topics have been covered. Thus, no DAR will be included with this EC.

900-ARCHIVE EC	11/04/2009	BRZEF	RIORDAN	GAIL	CLOSED

Units

Fac	Unit	Description
BRW	NA	NOT APPLICABLE

Systems

Fac	System	Description
BRW	--	NO SYSTEM IMPACT

Planning/Scheduling Information

Planning Start : Level of Effort:

Planning Event	From Date	Thru Date
100-PREP EVAL		

Cross References

Ref. Type	Number	Sub-Number	Description
ER	0000392325		DETERMINE ACCESSIBILITY OF 1SI8811B FOLLOWING
ER	0000391371		REQUEST ECR TO VALIDATE ACCESSIBILITY OF 1SI88
AS	00946391	0100	REQUEST ECR TO VALIDATE ACCESSIBILITY OF 1SI88
AS	00946391	0300	Document Exelon Review of Applicability of Wes
AR	00934782		1SI8811B FAILED TO STROKE FULL OPEN DURING SUR

Engineering Change Comments

Comments Last Updated By: **ZIOCM** Last Updated Date: **10/09/2009**

Originator: JAMES T PETTY Supv Contacted: Smith, Panici, Graves
Condition Description:
Request is to validate accessibility of 1SI8811A/B (from a dose perspective
when attempting to transfer to cold leg recirc following a SBLOCA, a small medium break LOCA, or an event that essentially equates to a SBLOCA (e.g., RCP Seal failure or stuck open PORV).
Immediate actions taken:
Discussed with Engineering Director and other engineering personnel.
Recommended Actions:
ECR
Operable Basis:
Reportable Basis:
Reviewed by: RANDALL L RAHRIG 07/27/2009 21:21:09 CDT
Reviewer Comments:
This is an administrative issue that does not identify an equipment deficiency on installed plant equipment.
++++++++++++++++++++++
(7/30/09 DL) Per MRC, Engineering to present completed ECR/EC to MRC for review.
+++++++++++++++++++++++

(Text excerpt from Dose Rate Assessment PDF file attached. Westinghouse LTR-LIS-09-597 PDF file attached.)

Technical Evaluation

Braidwood Station

Determine Local Dose Rates for Manual Operation of Valve 1SI8811B During a Small Break LOCA

Reason For Evaluation / Scope:

This Technical Evaluation is performed to demonstrate acceptable local area dose rates if plant personnel are required to access the area in order to manually operate the 1SI8811B valve after a small break LOCA (SBLOCA).

This evaluation is applicable to both Byron and Braidwood Stations.

Detailed Evaluation:

The 1SI8811B valve (ECCS Sump Recirculation MOV) is attached to a 24" OD schedule 40 pipe. The valve is enclosed in a "can" made of 3/8" thick steel (Drawing M- 195). However, since the can has openings in it, credit for this shielding is not taken. Lead blankets are wrapped around sections of the pipe. However, since these are temporary (with limited weight restrictions), shielding credit is not taken. From Drawing M-230, the center of the valve is situated on the pipe at approximately 4 feet after the pipe exits the wall. At a distance of approximately 10 feet from the center of the valve on the other side, the pipe curves 90 degrees to the right, with 14 feet of pipe angled back towards the valve area before dropping below the floor elevation. Therefore, the geometry is broken into two cases for MicroShield. Case I calculates a dose rate at the valve operator due to the piping on either side of the valve (pipe sections corresponding to 4 feet to the left and 10 feet to the right of the valve center). Case 2 calculates the dose rate due to the 14 feet of pipe that is angled back towards the valve (see sketch excerpted from Drawing M-230, Sheet 1). The dose receptor location was chosen at 1 foot from the outside of the pipe. This corresponds to the typical definition of a general area dose rate. Note that the Unit 2 valve is situated in a similar (albeit reverse) location with respect to the piping. Therefore, this evaluation also pertains to Unit 2.

The source term assumed inside the pipe is due to the maximum activity allowed by Technical Specifications. This activity is 60 uCi/gm Dose Equivalent Iodine-131 and 603 uCi/gm Dose Equivalent Xenon-133 (TS 3.4.16 from TSTF-490 Submittal using DEX-133). This is a reasonable assumption since no fuel damage is expected during a SBLOCA (Westinghouse LTR-LIS-09-597).

MicroShield Results:

Case 1: 1323 mR/hr

Case 2: 121 mR/hr

TOTAL: 1444 mR/hr

As a sensitivity study, Case 1 was re-performed without the noble gas contribution (Case 3). The resultant dose rate was only 1 mR/hr less. Therefore, it can be said that noble gas activity is not a significant contributor to the total dose rate from this piping carrying ECCS water during a SBLOCA.

Conclusion:

The total dose rate at the valve operator is calculated to be 1444 mR/hr. The metal "can" surrounding the valve and lead blanket shielding on the pipe, although not credited, will result in dose rates less than those calculated here.

References:

1. Drawing M-195, Rev. AK
2. Drawing M-230, Sheet 1, Rev. U
3. Technical Specification 3.4.16 (from TSTF-490 Submittal using DEX-133)
4. Westinghouse LTR-LIS-09-597

Attachments:

Attachment A: MicroShield Output for Case 1 (2 pages)
Attachment B: MicroShield Output for Case 2 (2 pages)
Attachment C: Sketch Excerpted from Drawing M-230, Sheet 1 (1 page)
Attachment D: MicroShield Output for Sensitivity Study Case 3 (2 pages)

"BRW Tech Eval 377329.pdf"

CCE-09-97.pdf

Westinghouse

Westinghouse Electric Company
Nuclear Services
P.O. Box 355
Pittsburgh, Pennsylvania 15230-0355
USA

Ms. Annie Wong
Exelon Nuclear
4300 Winfield Road
Warrenville, IL 60555

Direct tel: 412-374-4901
Direct fax: 412-374-3257
e-mail: garofafd@westinghouse.com

Our ref: CCE-09-97

September 25, 2009

EXELON NUCLEAR
BRAIDWOOD UNIT 1
Transmittal of LTR-LIS-09-597: "Small Break LOCA (SBLOCA) Rod Burst Evaluation Supporting Justification of Past Operation (JPO) of Braidwood Unit 1 (CCE)"

Dear Ms. Wong:

Per Reference 1, Exelon Nuclear has requested Westinghouse to perform an evaluation to determine the maximum number of rods that would burst following a Small Break Loss of Coolant Accident (SBLOCA) at Braidwood Unit 1. Per discussion with A. Wong of Exelon, a sump suction valve was stuck in the closed position earlier in the current operating cycle; if the signal to switchover to cold leg recirculation would have been generated, an operator would have had to manually open the valve to ensure adequate emergency core cooling system (ECCS) flow. For a SBLOCA transient in this scenario, assuming that all rods in the core burst would result in unacceptable radiological dose. Exelon has therefore requested Westinghouse to determine the maximum number of rods that would burst following a SBLOCA in order to support a Justification of Past Operation (JPO) determination with respect to radiological dose for Braidwood Unit 1. The SBLOCA scenario to be considered is a break size up to 2 inch equivalent diameter with a failure of one train of ECCS.

SBLOCA Evaluation

The current SBLOCA analysis-of-record (AOR) for Braidwood Unit 1 is documented in References 2 and 3. A SBLOCA evaluation of reduced ECCS flow was performed in Reference 4, with additional qualitative evaluations documented in References 5 and 6. Hot rod and hot assembly average rod burst was observed to occur for a 1.75-inch break in the Reference 4 supporting calculations.

Since this effort is intended to support a JPO, a qualitative evaluation based on References 2 to 6 is performed herein to show that using more realistic assumptions would result in no rod burst following a SBLOCA less than or equal to 2-inches in diameter.

In order for hot rod or hot assembly average rod burst to occur during a SBLOCA (for fuel with ZIRLO™ cladding), the cladding temperature must reach a specific burst temperature, which varies with time as a function of the differential pressure across the cladding. By crediting more realistic assumptions, the SBLOCA cladding temperatures can be reduced, minimizing the likelihood for rod burst to occur.

ANS-5.1-1979 + 2σ Uncertainty Decay Heat

The NOTRUMP Evaluation Model (EM) uses the ANS-5.1-1971 + 20% decay heat model consistent with 10 CFR 50 Appendix K requirements. A more realistic decay heat model (ANS-5.1-1979 + 2σ uncertainty) would result in less core boil-off and shorter, shallower core uncoveries. This would significantly lower cladding temperatures, thereby reducing the likelihood that burst temperatures would be reached at any point during the SBLOCA transient.

Cycle-Specific Core Design Data

The SBLOCA analyses documented in References 2-4 were performed assuming a conservatively high axial offset and maximum peaking factor and assembly average power values.

Per Reference 7, the maximum axial offset predicted to occur for the current Braidwood Unit 1 operating cycle (Cycle 15) is +3.23%, significantly lower than the value of +13% used in the Braidwood Unit 1 SBLOCA analyses (see p. 6.1.1-2 of Reference 2). Modeling a reduced axial offset would result in lower power generation in the upper part of the core, resulting in lower calculated cladding temperatures and a lower likelihood for burst to occur.

A review of the Braidwood Unit 1 calculations performed in support of the Reference 4 evaluation shows that rod burst is only observed to occur for burnups greater than 45 GWD/MTU. Per the most conservative $F_{\Delta H}$ Burndown Credit Limit provided by the Westinghouse Core Engineering (CE) group in Reference 8 (extra 10%), the $F_{\Delta H}$ burndown credit at 45 GWD/MTU would be calculated as follows:

$F_{\Delta H}$ (45 GWD/MTU) = 1.160 – 6.00E-06 * 45000 MWD/MTU = 0.89, or an 11% reduction in $F_{\Delta H}$.

Since the 1.04 minimum ratio of $F_{\Delta H} / P_{HA}$ still applies, this 11% reduction could also be directly applied to P_{HA}. The $F_{\Delta H}$ and P_{HA} values assumed in the SBLOCA analysis are 1.7 and 1.514 (see Table 6.1.1-1 of Reference 2), respectively, and when reduced by 11% results in $F_{\Delta H}$ and P_{HA} values of 1.513 and 1.347. Like the reduction in axial offset, this reduction in $F_{\Delta H}$ and P_{HA} would result in lower calculated cladding temperatures and a lower likelihood for burst to occur.

Realistic ECCS Flows

The ECCS flows used in the Braidwood Unit 1 SBLOCA analyses are minimum safeguards flows, and reflect maximum pump degradation, maximum resistances, etc.; these flows were also conservatively reduced in References 2-4 by 5% or 7% per Exelon's request. These minimum safeguards flows are appropriate for Appendix K SBLOCA analysis purposes, but do not reflect realistic ECCS flows. Additional ECCS flow would result in better core cooling, shorter core uncovery periods and lower cladding temperature results.

Additionally, it is noted that the ECCS recirculation phase flows used in the Reference 4 supporting calculations were superseded by higher flows evaluated in References 4 and 5. An examination of the recirculation phase intact loop flows evaluated in Reference 5 reveals that they are actually higher than the original flows used in the AOR. Therefore, the cladding temperature transients are more reasonably portrayed by the results presented in References 2 and 3, which did not exhibit rod burst for any of the beginning-of-life (BOL) cases described therein. Burnup studies were not performed for the limiting break size(s) from References 2 and 3 since the PCTs were below 1700°F; at cladding temperatures below 1700°F, PCTs for rod burst cases would not be expected to exceed those observed at BOL. While completion of burnup studies may show rod burst at higher burnups when using standard Appendix K NOTRUMP EM assumptions, if the conservatisms described above were replaced with more realistic treatments of decay heat, core design parameters and ECCS performance, PCTs would be sufficiently reduced to prevent rod burst.

Conclusion

Based on the evaluation performed herein, elimination of conservatisms in the Braidwood Unit 1 SBLOCA analysis such as use of realistic decay heat, cycle-specific core design data and more realistic ECCS flows would result in significantly reduced cladding temperature results and lower likelihood for hot rod and/or hot assembly rod burst to occur. Therefore, it can be concluded that for the purposes of a JPO safety significance determination, zero rods would burst following a SBLOCA for Braidwood Unit 1.

References

1. Exelon TSD, "SBLOCA Rod Burst Evaluation," September 21, 2009.
2. CAE-00-125 / CCE-00-125, "Commonwealth Edison Company, Byron and Braidwood Units 1 and 2, Power Uprate Project, Transmittal of Documents," May 10, 2000.
3. CAE-01-009 / CCE-01-008, "Exelon Nuclear, Byron and Braidwood Units 1 and 2, Transmittal of Revised License Report and UFSAR Markups for SBLOCA Analysis," January 25, 2001.
4. CAE-07-49 / CCE-07-48, "Exelon Nuclear, Byron and Braidwood Units 1 & 2, Phase 2 Evaluation of Reduced SI Flow During Recirculation Phase of ECCS," April 16, 2007.
5. CAE-08-49 / CCE-08-91, "Exelon Nuclear, Byron and Braidwood Units 1 & 2, Transmittal of Evaluations for Final Reduced ECCS Flows (LTR-CRA-08-130 Attachments 1 and 2; LTR-LIS-08-374 Attachment 1)," July 17, 2008.
6. CAE-09-27 / CCE-09-43, "Exelon Nuclear, Braidwood and Byron Units 1 and 2, Maximum ECCS Flow Increase Evaluation," June 17, 2009.
7. NF-CB-09-32, Revision 2, "Exelon Nuclear, Byron/Braidwood Nuclear Power Plants, Braidwood Unit 1 Cycle 15 Curvebook, NDR and POP – Revision 2," April 1, 2009.
8. CE-09-109, "Peaking Factor Burndown Limits for Byron/Braidwood Units' Updated BELOCA Analysis," February 27, 2009.

If you have any questions, please contact me at 412-374-4901.

Very truly yours,

Jeff Stepanic for

Frank D. Garofalo
Customer Projects Manager
Exelon Nuclear

cc:	T. Cole	Exelon
	R. Linthicum	Exelon
	J. Rommel	Exelon
	T. Mattson	Exelon
	L. Livingston	Westinghouse / Cantera
	G. P. Bundick	Westinghouse / Byron
	F. D. Garofalo	Westinghouse
	J. A. Stepanic	Westinghouse
	C. Boyd	Westinghouse
	D. Crytzer	Westinghouse
	N. Andreycheck	Westinghouse
	K. Shearer	Westinghouse
	K. Hollenback	Westinghouse
	Exelon Project Letter File	

Technical Evaluation
Braidwood Station

Determine Local Dose Rates for Manual Operation of Valve 1SI8811B
During a Small Break LOCA

Reason For Evaluation / Scope:

This Technical Evaluation is performed to demonstrate acceptable local area dose rates if plant personnel are required to access the area in order to manually operate the 1SI8811B valve after a small break LOCA (SBLOCA).

This evaluation is applicable to both Byron and Braidwood Stations.

Detailed Evaluation:

The 1SI8811B valve (ECCS Sump Recirculation MOV) is attached to a 24" OD schedule 40 pipe. The valve is enclosed in a "can" made of 3/8" thick steel (Drawing M-195). However, since the can has openings in it, credit for this shielding is not taken. Lead blankets are wrapped around sections of the pipe. However, since these are temporary (with limited weight restrictions), shielding credit is not taken. From Drawing M-230, the center of the valve is situated on the pipe at approximately 4 feet after the pipe exits the wall. At a distance of approximately 10 feet from the center of the valve on the other side, the pipe curves 90 degrees to the right, with 14 feet of pipe angled back towards the valve area before dropping below the floor elevation. Therefore, the geometry is broken into two cases for MicroShield. Case 1 calculates a dose rate at the valve operator due to the piping on either side of the valve (pipe sections corresponding to 4 feet to the left and 10 feet to the right of the valve center). Case 2 calculates the dose rate due to the 14 feet of pipe that is angled back towards the valve (see sketch excerpted from Drawing M-230, Sheet 1). The dose receptor location was chosen at 1 foot from the outside of the pipe. This corresponds to the typical definition of a general area dose rate. Note that the Unit 2 valve is situated in a similar (albeit reverse) location with respect to the piping. Therefore, this evaluation also pertains to Unit 2.

The source term assumed inside the pipe is due to the maximum activity allowed by Technical Specifications. This activity is 60 uCi/gm Dose Equivalent Iodine-131 and 603 uCi/gm Dose Equivalent Xenon-133 (TS 3.4.16 from TSTF-490 Submittal using DEX-133). This is a reasonable assumption since no fuel damage is expected during a SBLOCA (Westinghouse LTR-LIS-09-597).

MicroShield Results:

Case 1: 1323 mR/hr
Case 2: 121 mR/hr
TOTAL: 1444 mR/hr

As a sensitivity study, Case 1 was re-performed without the noble gas contribution (Case 3). The resultant dose rate was only 1 mR/hr less. Therefore, it can be said that noble gas activity is not a significant contributor to the total dose rate from this piping carrying ECCS water during a SBLOCA.

Conclusions / Findings:

The total dose rate at the valve operator is calculated to be 1444 mR/hr. The metal "can" surrounding the valve and lead blanket shielding on the pipe, although not credited, will result in dose rates less than those calculated here.

References:

1. Drawing M-195, Rev. AK
2. Drawing M-230, Sheet 1, Rev. U
3. Technical Specification 3.4.16 (from TSTF-490 Submittal using DEX-133)
4. Westinghouse **LTR-LIS-09-597**

Attachments:

Attachment A: MicroShield Output for Case 1 (2 pages)
Attachment B: MicroShield Output for Case 2 (2 pages)
Attachment C: Sketch Excerpted from Drawing M-230, Sheet 1 (1 page)
Attachment D: MicroShield Output for Sensitivity Study Case 3 (2 pages)

Preparer: Thomas J. Mscisz Date: 10/06/2009

Independent Reviewer: Jessica DeLaRosa Date: 10/07/2009

Approved: for John Rommel — John Rommel Date: 10/08/2009

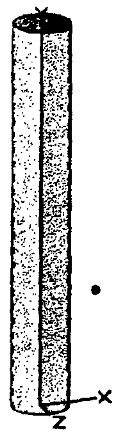
MicroShield v5.03 (5.03-00095)
PECO Energy

Page : 1
DOS File: 8811B-1.MS5
Run Date: October 6, 2009
Run Time: 4:15:01 PM
Duration: 00:00:02

Tech Eval EC 377329
Attachment A

File Ref: ______
Date: ______
By: ______
Checked: ______

Case Title: 1SI8811B Case 1
Description: 14 ft of Pipe With Valve on it
Geometry: 7 - Cylinder Volume - Side Shields



Source Dimensions

Height	426.72 cm	14 ft 0.0 in
Radius	28.735 cm	11.3 in

Dose Points

	X	Y	Z
# 1	60.96 cm	121.92 cm	0 cm
	2 ft	4 ft	0.0 in

Shields

Shield Name	Dimension	Material	Density
Source	39.09 ft³	Water	1
Transition		Air	0.00122
Air Gap		Air	0.00122
Wall Clad	.057 ft	Iron	7.86

Source Input
Grouping Method : Actual Photon Energies

Nuclide	curies	becquerels	uCi/cm³	Bq/cm³
I-131	6.6415e+001	2.4574e+012	6.0000e+001	2.2200e+006
Xe-133	6.6747e+002	2.4696e+013	6.0300e+002	2.2311e+007

Buildup
The material reference is : Wall Clad

Integration Parameters

Radial	10
Circumferential	10
Y Direction (axial)	20

Results

Energy MeV	Activity photons/sec	Fluence Rate MeV/cm²/sec No Buildup	Fluence Rate MeV/cm²/sec With Buildup	Exposure Rate mR/hr No Buildup	Exposure Rate mR/hr With Buildup
0.0041	1.352e+10	0.000e+00	3.876e-24	0.000e+00	2.889e-24
0.0043	1.517e+12	0.000e+00	4.540e-22	0.000e+00	3.243e-22
0.0295	3.310e+10	1.008e-49	7.335e-23	1.055e-51	7.676e-25
0.0298	6.140e+10	6.680e-48	1.376e-22	6.768e-50	1.394e-24
0.0306	3.369e+12	2.304e-42	7.792e-21	2.148e-44	7.263e-23
0.031	6.239e+12	1.198e-40	1.463e-20	1.080e-42	1.319e-22
0.0336	2.183e+10	6.084e-34	5.723e-23	4.328e-36	4.071e-25
0.035	2.239e+12	4.445e-28	6.248e-21	2.816e-30	3.958e-23
0.0796	5.348e+10	2.478e-01	4.620e-01	3.928e-04	7.325e-04
0.0802	6.434e+10	3.450e-01	6.469e-01	5.455e-04	1.023e-03
0.081	9.010e+12	5.931e+01	1.121e+02	9.343e-02	1.766e-01

Page : 2
DOS File: 8811B-1.MS5
Run Date: October 6, 2009
Run Time: 4:15:01 PM
Duration: 00:00:02

Tech Eval EC 377329
Attachment A

Energy MeV	Activity photons/sec	Fluence Rate MeV/cm²/sec No Buildup	Fluence Rate MeV/cm²/sec With Buildup	Exposure Rate mR/hr No Buildup	Exposure Rate mR/hr With Buildup
0.1772	6.508e+09	5.304e+01	1.805e+02	9.103e-02	3.098e-01
0.1777	1.758e+10	1.448e+02	4.936e+02	2.486e-01	8.477e-01
0.2843	1.487e+11	4.945e+03	2.004e+04	9.311e+00	3.775e+01
0.3258	6.162e+09	2.838e+02	1.164e+03	5.436e-01	2.229e+00
0.3294	5.662e+09	2.676e+02	1.097e+03	5.131e-01	2.105e+00
0.3645	1.994e+12	1.188e+05	4.869e+05	2.300e+02	9.426e+02
0.503	8.859e+09	1.066e+03	4.137e+03	2.092e+00	8.120e+00
0.637	1.784e+11	3.523e+04	1.269e+05	6.850e+01	2.467e+02
0.6427	5.395e+09	1.085e+03	3.895e+03	2.109e+00	7.569e+00
0.7229	4.429e+10	1.137e+04	3.904e+04	2.186e+01	7.508e+01
TOTALS:	2.504e+13	1.733e+05	6.840e+05	3.354e+02	1.323e+03

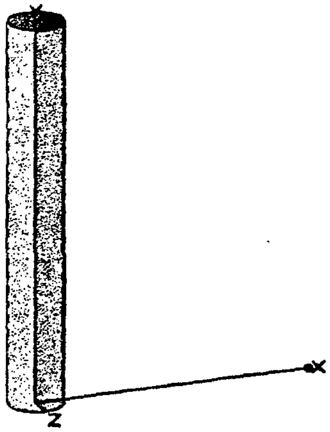
MicroShield v5.03 (5.03-00095)
PECO Energy

Page : 1
DOS File: 8811B-2.MS5
Run Date: October 6, 2009
Run Time: 4:15:28 PM
Duration: 00:00:02

Tech Eval EC 377329
Attachment B

File Ref: ___________
Date: ___________
By: ___________
Checked: ___________

Case Title: 1SI8811B Case 2
Description: 14 ft of Pipe 9 feet from valve
Geometry: 7 - Cylinder Volume - Side Shields



Source Dimensions

Height	426.72 cm	14 ft 0.0 in
Radius	28.735 cm	11.3 in

Dose Points

	X	Y	Z
# 1	304.8 cm	0 cm	0 cm
	10 ft 0.0 in	0.0 in	0.0 in

Shields

Shield Name	Dimension	Material	Density
Source	39.09 ft³	Water	1
Transition		Air	0.00122
Air Gap		Air	0.00122
Wall Clad	.057 ft	Iron	7.86

Source Input
Grouping Method : Actual Photon Energies

Nuclide	curies	becquerels	µCi/cm³	Bq/cm³
I-131	6.6415e+001	2.4574e+012	6.0000e+001	2.2200e+006
Xe-133	6.6747e+002	2.4696e+013	6.0300e+002	2.2311e+007

Buildup
The material reference is : Wall Clad

Integration Parameters

Radial	10
Circumferential	10
Y Direction (axial)	20

Results

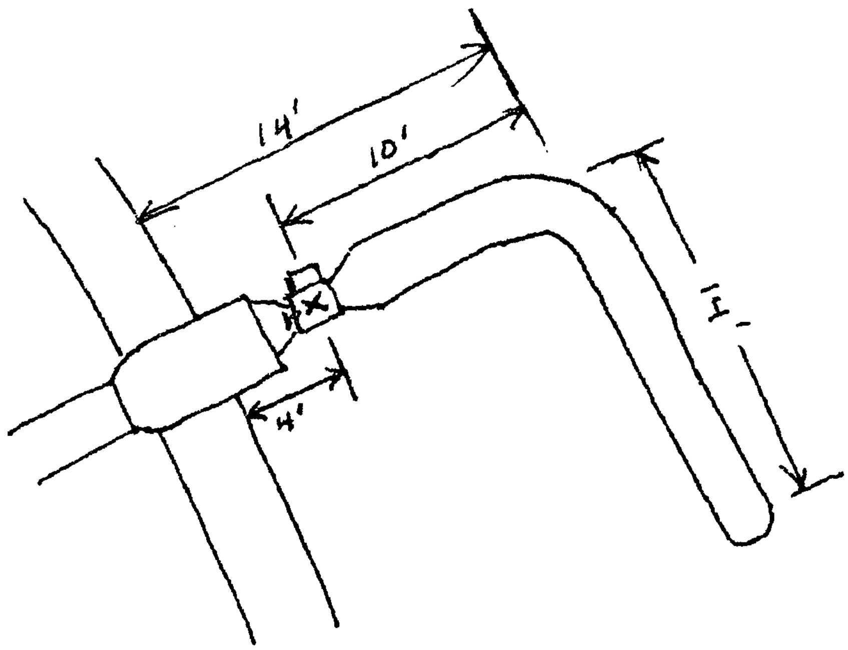
Energy MeV	Activity photons/sec	Fluence Rate MeV/cm²/sec No Buildup	Fluence Rate MeV/cm²/sec With Buildup	Exposure Rate mR/hr No Buildup	Exposure Rate mR/hr With Buildup
0.0041	1.352e+10	0.000e+00	2.863e-25	0.000e+00	2.134e-25
0.0043	1.517e+12	0.000e+00	3.354e-23	0.000e+00	2.395e-23
0.0295	3.310e+10	9.305e-51	5.418e-24	9.738e-53	5.670e-26
0.0298	6.140e+10	6.102e-49	1.016e-23	6.183e-51	1.030e-25
0.0306	3.369e+12	2.056e-43	5.755e-22	1.916e-45	5.365e-24
0.031	6.239e+12	1.060e-41	1.080e-21	9.554e-44	9.741e-24
0.0336	2.183e+10	5.151e-35	4.228e-24	3.664e-37	3.007e-26
0.035	2.239e+12	3.710e-29	4.615e-22	2.350e-31	2.924e-24
0.0796	5.348e+10	2.401e-02	4.478e-02	3.806e-05	7.100e-05
0.0802	6.434e+10	3.341e-02	6.267e-02	5.282e-05	9.909e-05
0.081	9.010e+12	5.739e+00	1.085e+01	9.041e-03	1.710e-02

Page : 2
DOS File: 8811B-2.MS5
Run Date: October 6, 2009
Run Time: 4:15:28 PM
Duration: 00:00:02

Tech Eval EC 377329
Attachment B

Energy MeV	Activity photons/sec	Fluence Rate MeV/cm²/sec No Buildup	Fluence Rate MeV/cm²/sec With Buildup	Exposure Rate mR/hr No Buildup	Exposure Rate mR/hr With Buildup
0.1772	6.508e+09	4.883e+00	1.669e+01	8.381e-03	2.864e-02
0.1777	1.758e+10	1.333e+01	4.563e+01	2.289e-02	7.836e-02
0.2843	1.487e+11	4.545e+02	1.846e+03	8.558e-01	3.477e+00
0.3258	6.162e+09	2.608e+01	1.070e+02	4.995e-02	2.049e-01
0.3294	5.662e+09	2.458e+01	1.009e+02	4.714e-02	1.934e-01
0.3645	1.994e+12	1.091e+04	4.466e+04	2.113e+01	8.644e+01
0.503	8.859e+09	9.772e+01	3.766e+02	1.918e-01	7.393e-01
0.637	1.784e+11	3.224e+03	1.148e+04	6.268e+00	2.232e+01
0.6427	5.395e+09	9.930e+01	3.525e+02	1.929e-01	6.849e-01
0.7229	4.429e+10	1.039e+03	3.522e+03	1.998e+00	6.773e+00
TOTALS:	2.504e+13	1.590e+04	6.252e+04	3.077e+01	1.210e+02

Tech Eval EC 377329
Attachment C



Sketch Excerpted From Drawing M-230, Sh 1
Rev. U

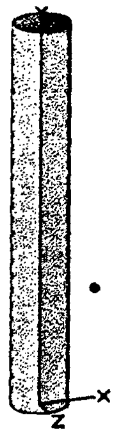
MicroShield v5.03 (5.03-00095)
PECO Energy

age : 1
OS File: 8811B-1A.MS5
un Date: October 6, 2009
un Time: 4:15:58 PM
uration: 00:00:01

Tech Eval EC 377329
Attachment D

File Ref: ________
Date: ________
By: ________
Checked: ________

Case Title: 1SI8811B Case 3
Description: 14 ft of Pipe With Valve on it - NO NG
Geometry: 7 - Cylinder Volume - Side Shields



Source Dimensions

Height	426.72 cm	14 ft 0.0 in
Radius	28.735 cm	11.3 in

Dose Points

	X	Y	Z
# 1	60.96 cm	121.92 cm	0 cm
	2 ft	4 ft	0.0 in

Shields

Shield Name	Dimension	Material	Density
Source	39.09 ft³	Water	1
Transition		Air	0.00122
Air Gap		Air	0.00122
Wall Clad	.057 ft	Iron	7.86

Source Input
Grouping Method : Actual Photon Energies

Nuclide	curies	becquerels	µCi/cm³	Bq/cm³
I-131	6.6415e+001	2.4574e+012	6.0000e+001	2.2200e+006

Buildup
The material reference is : Wall Clad

Integration Parameters

Radial	10
Circumferential	10
Y Direction (axial)	20

Results

Energy MeV	Activity photons/sec	Fluence Rate MeV/cm²/sec No Buildup	Fluence Rate MeV/cm²/sec With Buildup	Exposure Rate mR/hr No Buildup	Exposure Rate mR/hr With Buildup
0.0041	1.352e+10	0.000e+00	3.876e-24	0.000e+00	2.889e-24
0.0295	3.310e+10	1.008e-49	7.335e-23	1.055e-51	7.676e-25
0.0298	6.140e+10	6.680e-48	1.376e-22	6.768e-50	1.394e-24
0.0336	2.183e+10	6.084e-34	5.723e-23	4.328e-36	4.071e-25
0.0802	6.434e+10	3.450e-01	6.469e-01	5.455e-04	1.023e-03
0.1772	6.508e+09	5.304e+01	1.805e+02	9.103e-02	3.098e-01
0.2843	1.487e+11	4.945e+03	2.004e+04	9.311e+00	3.775e+01
0.3258	6.162e+09	2.838e+02	1.164e+03	5.436e-01	2.229e+00
0.3294	5.662e+09	2.676e+02	1.097e+03	5.131e-01	2.105e+00
0.3645	1.994e+12	1.188e+05	4.869e+05	2.300e+02	9.426e+02
0.503	8.859e+09	1.066e+03	4.137e+03	2.092e+00	8.120e+00
0.637	1.784e+11	3.523e+04	1.269e+05	6.850e+01	2.467e+02

Page : 2
DOS File: 8811B-1A.MS5
Run Date: October 6, 2009
Run Time: 4:15:58 PM
Duration: 00:00:01

Tech Eval EC 377329
Attachment D

Energy MeV	Activity photons/sec	Fluence Rate MeV/cm²/sec No Buildup	Fluence Rate MeV/cm²/sec With Buildup	Exposure Rate mR/hr No Buildup	Exposure Rate mR/hr With Buildup
0.6427	5.395e+09	1.085e+03	3.895e+03	2.109e+00	7.569e+00
0.7229	4.429e+10	1.137e+04	3.904e+04	2.186e+01	7.508e+01
TOTALS:	2.593e+12	1.731e+05	6.834e+05	3.350e+02	1.322e+03

ATTACHMENT 4

EC #378302, "Evaluate Temperature of the Pipe Penetration Curve Wall Area Aux. Bldg. Elev. 364', Using a Bounding Case and Realistic Case"
Revised Analysis From EC #377814

Braidwood Station

Engineering Change

Company Name : EXELON GENERATION CO.,LLC

EC Number : 0000378302 000
Status/Date : MODIFIED 12/30/2009
Facility : BRW BRAIDWOOD GENERATING STATION
Type/Sub-type: EVAL MECH

Print Date: 12/30/2009

Exelon

EC Title: EVALUATE TEMPERATURE OF THE PIPE PENETRATION CURVE WALL AREA AUX. BLDG. ELEV. 364', USING A BOUNDING CASE AND REALISTIC CASE REVISED ANALYSIS FROM EC 377814

Mod Nbr : 0000378302 KW1: SR KW2: KW3: KW4: KW5: EMERG

Master EC :	N	Work Group :		Temporary :	N
Outage :	N	Alert Group:	DEM	Aprd Reqd Date:	12/30/2009
WO Required :	N	Image Addr :		Exp Insvc Date:	
Adv Wk Appvd:		Alt Ref. :		Expires On :	09/24/2012
Auto-Advance:	Y	Priority :	BH	Auto-Asbuild :	N
Caveat Outst:		Department :	08952	Discipline :	DEM

Resp Engr : NICHOLAS J RADLOFF
Location :

Units

Fac	Unit	Description
BRW	01	UNIT ONE

Systems

Fac	System	Description
BRW	VA	AUX BLDG HVAC

Engineering Change

EC Number :	0000378302 000
Status/Date :	MODIFIED 12/30/2009
Facility :	BRW
Type/Sub-type:	EVAL MECH

Print Date: 12/30/2009

Exelon

EC Title: EVALUATE TEMPERATURE OF THE PIPE PENETRATION CURVE WALL AREA AUX. BLDG. ELEV. 364', USING A BOUNDING CASE AND REALISTIC CASE REVISED ANALYSIS FROM EC 377814

Mod Nbr : 0000378302 KW1: SR KW2: KW3: KW4: KW5: EMERG

Master EC :	N	Work Group :		Temporary :	N
Outage :	N	Alert Group:	DEM	Aprd Reqd Date:	12/30/2009
WO Required :	N	Image Addr :		Exp Insvc Date:	
Adv Wk Appvd:		Alt Ref. :		Expires On :	09/24/2012
Auto-Advance:	Y	Priority :	BH	Auto-Asbuild :	N
Caveat Outst:		Department :	08952	Discipline :	DEM
Resp Engr :	NICHOLAS	J RADLOFF			
Location :					

Milestone	Date	PassPort	Name		Req By
030-DAR CONCUR	12/29/2009	BRWUG	GOSNELL	JAMES	CANCELED
110-PREPARE EC	12/28/2009	QDCNR	RADLOFF	NICHOLAS	APPROVED
120-REVIEW EC	12/29/2009	BRWUG	GOSNELL	JAMES	APPROVED

This EC is safety-related, therefore, an independent review was performed. As reviewer and supervisor, I did not specify a specific approach to use, rule out any design considerations or establish design inputs. Also, due to the holidays, I was the only available qualified reviewer.

210-DEPT RVW-01	12/29/2009	QAD6I	LINTHICUM	ROY	APPROVED

Independent review performed by PRA specialist to ensure assumptions and conditions are consistent with the SDP.

240-ITPR-OTHER	12/30/2009	BYRGO	BARAN	DAVID	APPROVED

ITPR by Dave Baran.

300-APPROVE EC	12/30/2009	BRZRB	BELAIR	RAYMOND	APPROVED
900-ARCHIVE EC					CLOSED

Units

Fac	Unit	Description
BRW	01	UNIT ONE

Systems

Fac	System	Description
BRW	VA	AUX BLDG HVAC

Reference Documents List

Facility	Type	SubType	Document	Sheet
BRW	CALC	ENG	VA-102	

Title: AUX.BLDG ENERGY LOAD CALCS FOR EL. 330 346 364 383401 AND 426 IN ABNOR

BRW CALC ENG VA-101
Title: AUXILIARY BUILDING ENERGY LOAD FOR EL. 330'-0", 346'-0", 364'-0" AND 3

BRW CALC ENG BRW-96-461-M
Title: JUSTIFICATION OF EQ ZONE TEMPERATURES AND ALARA MINIMUM AIRFLOW REQUIR

Planning/Scheduling Information

Planning Start : Level of Effort:

Planning Event	From Date	Thru Date
100-PREP EVAL		

Cross References

Ref. Type	Number	Sub-Number	Description
AR	00991564		CONTAINMENT INTEGRITY DURING RH SYSTEM DRAININ
AR	00988355		NRC QUESTION ON BWEP ES-1.3 DIRECTIONS
AR	00986813		CONTAINMENT INTEGRITY DURING RH SYSTEM DRAININ
AR	00988980		NRC EXITED YELLOW FINDING FOR 1SI8811B FAILURE
AR	00986803		NRC / IEMA CONCERN WITH RAIN INTRUSTION TO U-1

Engineering Change Comments

Comments Last Updated By: **BRWUG** Last Updated Date: **12/23/2009**

Design Consideration Summary (DCS)

Engineering Change Number: EC 378302 Rev.000

Purpose

The purpose of this evaluation is twofold. First, to determine a bounding ambient temperature and relative humidity of the Unit 1 Spray Additive Tank Room and Pipe Penetration Area (i.e, U-1 Curved Wall Area) at floor Elevation 364' of the Auxiliary Building while a design basis accident LOCA on Unit 1 has occurred and the 1SI8811B valve fails to fully open. This bounding case includes a loss of offsite power (LOOP) coincident with the LOCA. A second analysis presents a realistic scenario considering actual plant operating history and operating configuration to determine a maximum expected area temperature and relative humidity for the same LOCA with no LOOP. The evaluation results will be used to support the Significant Determination Process (SDP) final evaluation for the failed 1SI8811B valve.

Conclusion

The temperature and humidity for the Unit 1 Spray Additive Tank Room and Pipe Penetration Area (Curved Wall Area) at floor Elevation 364' of the Auxiliary Building is presented in the table below. The room conditions in this evaluation are only applicable for the conditions that are listed above scope. The temperature and relative humidity remain bounded by the temperature and humidity values listed in the UFSAR Table. 3.11-2

Accident	Maximum Temperature (°F)	Maximum Humidity (%RH)
Design LOOP/LOCA	114.1	27
Realistic LOCA only	90	52
UFSAR Table 3.77-2	130	8 - 70

ATTACHMENT 1
Design Attribute Review (DAR)
EC 378302 Rev.000

When a topic is determined applicable, **the box ☒ is checked, and** the applicable topic is discussed. **IF** the information is discussed in other note panels a reference to the documentation required is given in accordance with the applicable procedures governing a particular Attribute.

Section Applicable	Design Change Attribute
4.1.4.1. ☒	IDENTIFY Basic SSC Functions
	Auxiliary Building Ventilation (VA) – The Auxiliary building HVAC (VA) is designed to provide an adequate environment for personnel health, safety, and proper functioning of equipment within the Auxiliary Building plant areas for normal and abnormal events. The areas served include the Auxiliary Building and Fuel Handling Building (FHB), but exclude the solid radwaste facilities control room, control room, and laboratory areas within the Auxiliary Building. The VA system is designed to maintain offsite radiological releases from the Auxiliary and FHB to within acceptable limits during normal and abnormal plant conditions. The Non-accessible Area Exhaust Filter Plenum Ventilation System filters air from the area of the active Emergency Core Cooling System (ECCS) components during the recirculation phase of a Loss Of Coolant Accident (LOCA). The Non-accessible Area Exhaust Filter Plenum Ventilation System, in conjunction with other normally operating systems, also provides environmental control of temperature in the ECCS pump room area and lower levels of the Auxiliary Building. The VA system is safety related. The Auxiliary Building exhaust system is designed to run continuously during all normal plant operations and exhaust auxiliary building air after filtering through prefilter and HEPA filter banks. Provisions are also made to route the effluents from non-accessible cubicles in the auxiliary building through charcoal adsorbers and HEPA filters automatically on a safety injection signal from Unit 1 or 2 and manually through a control switch in the main control room. On a loss-of-coolant accident (LOCA), the auxiliary building supply and exhaust fans powered by the affected unit are tripped. Two out of six charcoal booster fans are started to maintain negative pressure in the auxiliary building and route the exhaust air from non-accessible cubicles through the charcoal adsorber and upstream/downstream HEPA filters before exhausting to the outdoor atmosphere. FHB exhaust ventilation subsystem of VA is utilized to reduce gaseous iodine and particulate concentrations in the exhaust air from the FHB which are potentially present following a fuel drop accident, involving recently irradiated fuel.
4.1.4.2. ☒	IDENTIFY Configuration Change safety classification.
	This EC is classified as safety related. The evaluation supports a safety related system (VA).
4.1.4.3.	IDENTIFY Seismic Classification of the SSC.

ATTACHMENT 1
Design Attribute Review (DAR)
EC 378302 Rev.000

Section Applicable	Design Change Attribute
☒	This EC is classified as seismic category I. The evaluation involves seismic category I system VA and Aux. Bldg.
4.1.5. ☒	PROVIDE the performance requirements and design conditions (including margin) of the SSC needed to evaluate the change from the existing to the modified systems, structures, or components.
	See Evaluation Details
4.1.6. ☐	DETERMINE the design requirements necessary to facilitate periodic surveillance testing and acceptance testing that is necessary for the Configuration Change being considered.
4.1.7. ☐	DETERMINE the Codes, Standards, and Regulatory Requirements applicable to the Configuration Change.
4.1.8. ☐	IDENTIFY PWR Sump GL 2004-02 Program impacts Braidwood, Byron, and TMI only
4.1.9. ☐	DETERMINE changes required to existing Design Analysis or new parameters that require new calculations or calculation revisions that are used to assess the acceptability of a system or a component function in meeting various physical requirements.
4.1.10. ☐	If Redundancy, Diversity and Separation requirements are identified or affected, then REVIEW the original design basis as well as any subsequent modifications.
4.1.11. ☐	IDENTIFY any Failure Effects requirements. (See Attachment 12)
4.1.12. ☐	IDENTIFY Fire Protection and Appendix R Safe Shutdown requirements, by using the "Screening for Approved Fire Protection Program (AFPP) Impact", Attachment 2.
4.1.13. ☐	DETERMINE any Material requirements, such as material grade, product form, compatibility with existing or other new materials, galvanic interaction between dissimilar metals, special welding material requirements, critical properties, performance characteristics, alternative materials as well as any Material Suitability requirements such as compatibility, electrical insulation properties, protective coating, corrosion resistance, mechanical insulation etc. necessary for the Configuration Change.
4.1.14. ☐	Determine environmental conditions and impacts.

ATTACHMENT 1
Design Attribute Review (DAR)
EC 378302 Rev.000

Section Applicable	Design Change Attribute
4.1.15. ☒	DETERMINE if Environmental Qualification (EQ) of equipment is affected. (see Attachment 3)
	No adverse impact as discussed in EVAL DETAILS.
4.1.16. ☐	REVIEW the Operating Experience databases through the INPO Internet Site or equivalent in accordance with LS-AA-115:
4.1.17. ☐	DETERMINE if the configuration change may affect the existing Equipment Performance Information Exchange (EPIX) database.
4.1.18. ☐	DETERMINE if the Configuration Change may affect the existing Probabilistic Risk Assessment (PRA), Mitigating System Performance Index (MSPI) Basis Document PRA content, and shutdown risk models by using the screening checklist in Attachment 4.
4.1.19. ☐	EVALUATE if System Operational Requirements have changed.
4.1.20. ☐	IDENTIFY any Human Factors requirements.
4.1.21.	IDENTIFY procedure changes per direction in Attachment 9.
4.1.22. ☐	IDENTIFY any changes or additional training requirements for various departments, per direction in Attachment 9.
4.1.23. ☐	CONSIDER the functional and physical system interface requirements, including the affect of cumulative tolerances between the subject system or component and adjacent or related support systems, structures, and components that may have been affected by the Configuration Change.
4.1.24. ☐	DETERMINE specialized layout and arrangement requirements, such as protection from normal vehicle traffic flow, or physical location preferences that minimize plant operating requirements for both the structures and systems being modified, and adjacent equipment and that avoid susceptibility for water hammer and gas accumulation.

ATTACHMENT 1

Design Attribute Review (DAR)

EC 378302 Rev.000

Section Applicable	Design Change Attribute
4.1.25. ☐	DETERMINE if the Radiation Protection/ALARA programs are affected by review of changes that affect any of the following during normal or post accident conditions: Radiation sources; changes affecting controlled radiation areas; primary coolant fluid systems (Cobalt Materials); contaminated systems; radiation monitoring systems; HVAC Systems which could transport airborne contaminants; change or alter shielding. (see Attachment 5)
4.1.26. ☐	DETERMINE the need for walkdowns to look at accessibility to the work area(s) and any special installation considerations that need to be addressed during design development.
4.1.27. ☐	DETERMINE Accessibility for maintenance, repair and In-Service Inspection (ISI) and In-Service Testing (IST), and the conditions under which these activities will be performed.
4.1.28. ☐	DETERMINE handling, storage, cleaning, and shipping requirements, as well as transportability requirements for items which require special handling during transit from supplier to site, from site to vendor (for repair), or from site receiving to final placement in the plant.
4.1.29. ☐	DETERMINE the effect of the Configuration Change on existing Emergency Plan or environmental and discharge monitoring that are used to prevent undue risk to public health and safety.
4.1.30. ☐	DETERMINE Industrial Safety requirements such as restricting the use of dangerous materials, hazardous chemicals, escape provisions from enclosures, pertinent OSHA requirements, and grounding of electrical systems.
4.1.31. ☐	DETERMINE impact on nuclear fuel, core components, core design, reactivity management, criticality control and accountability of nuclear materials as well as transient and / or accident analysis, by using Attachment 6.
4.1.32. ☐	DETERMINE Load Path requirements for installation, removal, and repair of equipment and replacement of major components.

ATTACHMENT 1
Design Attribute Review (DAR)
EC 378302 Rev.000

Section Applicable	Design Change Attribute
4.1.33. ☐	IDENTIFY Mechanical System Characteristics where design limits are placed on the mechanical properties of a system or components.
4.1.34. ☐	IDENTIFY Chemistry requirements where limits are placed on the chemical properties of a system or component based upon safety, reliability, ALARA, economics, or other considerations.
4.1.35. ☐	IDENTIFY Electrical requirements where limits are placed on the electrical properties of a system or component.
4.1.36. ☐	IDENTIFY Instrument and Control requirements, including digital technology requirements.
4.1.37. ☐	IDENTIFY Security requirements such as site monitoring, alarm systems, vehicle barrier systems, security and security lighting.
4.1.38. ☐	IDENTIFY Civil/Structural requirements where design limits are placed on the structural properties of a SSC such as equipment foundations and component supports.
4.1.39. ☐	If the Configuration Change adds, relocates, or alters Seismic Category I mechanical and/or electrical components then ENSURE that the Seismic Dynamic Qualification (SD/Q) of the components has been addressed per CC-AA-320-001.
4.1.40. ☐	DETERMINE Personnel Requirements and Limitations such as the need for trade specialists and engineering experts as well as support personnel, such as Radiation Chemistry technicians, welding technicians with special expertise, use of specific contractor or station procedures for installation or the need for mock-ups for training, installation, or operation.
4.1.41. ☐	LIST special procedures and installation specifications that apply, but are not part of the normal installation procedural direction.

ATTACHMENT 1
Design Attribute Review (DAR)
EC 378302 Rev.000

Section Applicable	Design Change Attribute
4.1.42. ☐	DETERMINE Interfacing Department impact of the Configuration Change, such as Operations, Plant Engineering, Training (including Plant Simulator), Maintenance, Reactor Engineering, Radiation Protection and others. (see Attachments 10A through 10H)
4.1.43. ☐	CONSIDER impact on License Renewal/Life Extension Projects that may be in process, or may have already been approved. (see Attachment 11)
4.1.44. ☐	REVIEW the proposed changes for conformance with requirements of any applicable Nuclear Electric Insurance Limited (NEIL) Insurance Standard, or other appropriate insurance standards.
4.1.45. ☐	A comprehensive single point vulnerability (SPV) review of the configuration change shall be performed to ensure the configuration change does not add the potential to cause an unplanned reactor SCRAM.
4.1.46. ☐	Impact on Steam Generator Replacement Projects (PWR only, see Attachment 13)
4.4. ☐	Configuration Control Activities- Use of Attachment 7
4.5. ☐	Determination of Program Impact - Use of Attachment 8

Attachment 1 (Last Page)

1. Reason for Evaluation/Scope:

The purpose of this evaluation is to determine a bounding expected ambient temperature and relative humidity of the Unit 1 Spray Additive Tank Room and Pipe Penetration Area (i.e., U-1 Curved Wall Area or CWA) at floor Elevation 364' of the Auxiliary Building based on different PRA scenarios listed below in conjunction with the 1SI8811B valve failing to fully open.

Also, for conservative measures, a calculation will be performed to determine the expected temperature and relative humidity in the U-1 CWA during a LOOP/LOCA.

For comparison sake, Reference 4.9 states that 1SI881B is located in EQ zone A13C which has a maximum temperature of 130F and relative humidity of 8 to 70%. Also, VA-101 Rev. 006B "Auxiliary Building Energy Load for EL. 330'-0", 346'-0", 364'-0" and 383'-0" predicts a maximum temperature in this room of 92.6 °F for normal operation. Neither of these conservative analyses are invalidated or exceeded by this analysis.

This evaluation result will be used to support the Braidwood Phase 3 Significant Determination Process (SDP) Evaluation of Failure of 1SI8811B to Fully Open, BW-SDP-003. The piping heat load contributions for this evaluation are based on the following scenarios:

- A small or medium break Loss of Coolant Accident has occurred on Braidwood U-1
- The 1A and 1B SI and CV pumps inject to the Reactor Coolant System taking suction from the Refueling Water Storage Tank (RWST)
- The 1A and 1B Containment Spray (CS) pump does not actuate.
- Valve 1SI8811B, 1B Containment Recirculation sump isolation, fails to stroke fully open and stops at 34% open. Valve 1SI8811A, 1A Containment Recirculation sump isolation, also fails to open fully. Consequently, the CV and SI pumps are not switched over to the Containment Recirculation sumps. Since the SI8811A/B valves open partially, it is assumed that both RH pumps are stopped and do not operate in long term recirculation to the RCS Cold Leg until operator action is taken to fully open the 1SI8811A/B valves and restart the RH pumps. This scenario causes no significant increase in the heat load from piping located in the CWA until the RH pumps are restarted.
- Operations personnel are dispatched to the Auxiliary Building El. 364 ft, Curved Wall Area (CWA), to open valve 1SI8811B locally with the handwheel on the valve operator. The bounding timeframe credited for operator response in the U-1 364' curved wall area is assumed to be 13 hours which includes the time from receiving the SI signal to the time the operator exits the U-1 364' curved wall area. The fluid temperatures that have been evaluated are bounding because they are hottest since they are taken at about 30 minutes after the accident for a Large Break LOCA scenario.

2. Inputs:

2.1 According to Reference 4.1 (page A2) and Ref. 4.5, the VA supply airflow to the Unit 1 Spray Additive Tank Room and Pipe Penetration Area (Room #138) of Auxiliary Building Elevation 364' is 5343 cfm (ft^3/min) for VA two fan operation (prior to modification D20-0-00-355 where main supply/exhaust fan blade angles were changed). The calculated maximum U-1 CWA temperature during normal operation is 92.6 °F based on a calculated heat load of 362,215 Btu/Hr (Ref. 4.5).

2.2 According to Reference 4.3, the temperature for supply air to the room is 106.3 °F. This temperature conservatively includes additional heat load from maximum design outside air temperature of 95 °F DB/78 °F WB with no credit taken for auxiliary building chillers or VA main supply/exhaust fans operating (i.e., LOOP/LOCA). The calculated heat load for the U-1 CWA during VA abnormal operation is 146,500 Btu/Hr.

2.3 U-1 CWA design ambient temperature limit during normal operation is 122 °F in accordance with Reference 4.5. Per Ref. 4.9 and 4.1, The EQ ambient temperature limit for the U-1 CWA is 130 °F during normal operation. Because the VA system was designed to maintain the area below 122 °F, the maximum temperature limit for the area will be conservatively established at 122 °F.

2.4 From Ref. 4.3, the Non-Accessible (NAC) Booster fan airflow is 48000 cfm/fan with two NAC booster fans operating and supply airflow into the U-1 364' CWA is 4,911 cfm (No main supply/exhaust fans operating).

2.5 Based on Ref. 4.7, the VA summer operating lineup during this timeframe was one main supply fan, one main exhaust fan, and one auxiliary building chiller operating. The highest temperature recorded during operator rounds for the 1B SI pump room did not exceed 90 °F. The VA main supply fan air temperature to the Auxiliary Building was approximately 70 °F.

3. Assumptions:

3.1 For the LOOP/LOCA scenario, the Auxiliary Building Ventilation (VA) operating lineup is assumed to be in booster-only fan lineup which includes one Fuel Handling Building (FHB) booster fan and two Non-Accessible (NAC) booster fans running during maximum design summer time conditions of 95 °F DB/78 °F WB. These air conditions correspond to an enthalpy of 41.82 BTU/lb. This VA operating lineup and design temperature establishes a conservative bounding condition during the LOOP/LOCA accident scenario by creating the lowest possible supply airflows into the curved wall area with the highest ambient temperature and humidity profiles for the U-1 CWA. (i.e., no credit taken for having auxiliary building chillers available during summer or additional VA main supply/exhaust fans running). (Note that the highest recorded air temperature during the summer of 2008 at the Morris Illinois weather reporting station was 93 °F. Additionally, no day could be found where the combination of daily high temperature and recorded dew point resulted in an air enthalpy that exceeded 41.82 BTU/lb.)

3.2 Due to the short duration for the operator response into the curved wall area for the aforementioned PRA scenarios and the expected slow conduction of heat into the U-1 curved wall area, the heat transmission load was assumed to be negligible, thus was not considered as a design input into the overall heat load calculation.

3.3 There are no plant barrier impairments affecting the curved wall area configuration that could change the ventilation configuration design airflows or flow path.

4. References

4.1 Calculation BRW-96-461-M, Rev. 002B, "Justification of EQ Zone Temperatures and ALARA Minimum Airflow Requirements during VA Two-Fan operation".

4.2 EC 377814, Rev. 000 "Evaluate Temperature of the Curve Wall Area Aux. Bldg. Elev. 364', Using Flow from Booster Fan Operation Only".

4.3 VA-102 Rev 003A "Aux. Bldg Energy Load Calculation for EL. 330', 346', 364', 383', 401' and 426 in Abnormal Condition"

4.4 BW-SDP-003 "Braidwood Phase 3 SDP Evaluation of Failure of 1SI8811B to Fully Open"

4.5 VA-101 Rev. 006B "Auxiliary Building Energy Load for EL. 330'-0", 346'-0", 364'-0" and 383'-0".

4.6 Sargent & Lundy Mechanical Department Standard, MES-7.2, Piping Heat Losses - Insulated and Uninsulated

4.7 Review of PI Temperature Trend Data, Operator Rounds Data, Plant Engineering VA System Quarterly Walkdown Trend Data, and VA Operating Lineups for Auxiliary Building and U-1 CWA temperatures during timeframe of September 20, 2007 – June 24, 2009.

   a. The VA main supply fan air temperature was approximately 70 °F during summer time.

   b. The Curved Wall Area did not exceed 90 °F during the entire time in question. This was determined by reviewing daily temperature measurements of the 1B SI pump room and 1B CV pump room which both receive air directly from the CWA.

   c. VA lineup during summertime was one main supply/exhaust fan and one auxiliary building chiller operating throughout summer.

4.8 Historical weather data obtained from http://www.wunderground.com/ for Morris Illinois.

4.9 UFSAR Sec. 3.11, Table 3.11-2 – Environmental Design of Mechanical and Electrical Equipment

5. Method of Analysis

Bounding LOOP/LOCA Calculation

The calculated temperature increase due to additional heat loads in the CWA will be estimated based on conservative VA NAC booster fan airflow of 4,911 cfm.

The relationship $Q = 1.05x\ \Delta t\ x\ CFM$ (Reference 4.1) will be used to determine the ΔT due to total heat loads in the CWA during VA abnormal booster only fan operation.

The NAC booster fan airflow to the Unit l Spray Additive Tank and Pipe Penetration Area (U-1 364', 383', and 401' CWA - Room 138) is from Reference 4.3, page 110.

The total piping heat loads referenced in Ref. 4.3 calculation for room 138 are recalculated based on actual LOOP/LOCA piping operational lineup configurations in the CWA. Refer to Attachment A for a line by line disposition. Ref. 4.6 provides the guidance to calculate piping heat dissipation (Btu/Hr) to the room 138 and documenting it in Attachment A (shown below).

Realistic U-1 CWA Ambient Temperature and Relative Humidity During PRA Scenarios

The VA main supply fan air temperature to the U-1 CWA is no more than 70 °F with an Auxiliary Building chiller running. (Ref. 4.7)

The 1B SI pump room air temperature did not exceed 90°F for the period in question. (Ref. 4.7)

With a supply fan temperature of 70 °F, the air will be assumed to be saturated (100% RH) to conservatively maximize the humidity level to the U-1 CWA. Based on plotting the initial state of the air, the final relative humidity of the air can be determined knowing the final temperature (90°F) and plotting the sensible heating process via the psychrometric chart.

6. Numeric Analysis

Bounding LOOP/LOCA Calculation - Temperature of Unit 1 Spray Additive Tank & Pipe Penetration (Room 138):

From Reference 4.3, the temperature for supply air to the U-1 CWA room is conservatively calculated at 106.3 °F. This temperature conservatively includes additional heat load from the maximum outside design air conditions of 95 °F DB/78 °F WB.

Supply Air Temperature from Ref. 4.3 page 110 → **T_S = 106.3 °F (Conservative)**

Piping Heat Loads:
(From Attachment A, Abnormal Operations) **Q_{abp} = 3,052** (Btu/Hr)

Electric Heat Gain (Ref. 4.3-page 68) **Q_{Ele} = 32,765** (Btu/Hr)

Electric Lighting Heat Gain (Ref. 4.3-page 68) **Q_L = 4,555** (Btu/Hr)

$Q_{abn} = Q_{abp} + Q_{Ele} + Q_L$ **Q_{abn} = 40,372** (Btu/Hr)

The above abnormal operation piping heat load is recalculated in Attachment A tables, (shown below) will be used along with NAC booster fan airflow into the room # 138 of 4911 cfm (input 2.4).

Based on the above, the ΔT is calculated using VA non-accessible booster fan airflow of 4911 cfm, as shown below.

$Q_{Abn} = 1.05x\ \Delta T\ x\ CFM_{Boost}$ (Reference 4.1)

Where:

Q_{Abn} = Sensible Heat (Btu/Hr)

ΔT = Temperature Difference (°F)

CFM_{Boost} = Air Flow Supply to Rm. #138 with two NAC booster fans running (ft^3 per Minute - cfm)

CFM_{Boost} = 4,911 cfm

$$\Delta T = \frac{Q_{Abn}}{1.05x\ CFM_{Boost}}$$ **ΔT = 7.8 °F**

$T_{CWA} = T_S + \Delta T$ **T_{CWA} = 114.1 °F**

The estimated conservative calculated temperature for the Unit 1 Spray Additive Tank Room and Pipe Penetration Area during LOOP/LOCA would not have been more than:

$$T_{CWA} = 114.1\ °F$$

Using a psychrometric chart plotting initial and final temperatures determined that the final relative humidity is approximately 27% RH based on 95 °F DB/78 °F WB entering air condition and 114.1 °F final temperature.

Final U-1 CWA RH = 27% RH

Final U-1 CWA T_{CWA} = 114.1 °F

<u>Realistic U-1 CWA Ambient Temperature and Relative Humidity During PRA Scenarios</u>

Based on Reference 4.7, the PI temperature trend data for the 1B SI pump room was reviewed during this timeframe. The highest recorded temperature recorded in the 1B SI pump room was 90 °F. This temperature can be utilized as a representative temperature data point for Room 138. This is because air is exhausted from Room 138 into both the 1B SI pump room and 1B CV pump rooms, eventually exhausting to the VA non-accessible exhaust filtration system. Because the 1B SI pump is normally in standby condition (i.e., no additional cooling in the room), the temperature recorded during operator rounds would be representative of the U-1 CWA ambient temperatures during normal operation.

Because the RH pumps did not draw hot water from the containment sumps while the 1SI8811A/B valves are in a partially opened position during the PRA scenarios, no additional heat loads from RH system piping would be credited in the U-1 CWA until the 1SI8811A/B valves are fully opened. Based on design input Ref. 2.1 and 2.2, the calculated heat load in the U-1 CWA (Room 138) under abnormal conditions (i.e., LOOP/LOCA) is much lower than normal operating conditions. With the RH pumps isolated, the calculated heat load during abnormal conditions becomes even lower (i.e., no additional piping heat load from RH pumps operating in containment recirculation mode). Therefore, based on engineering judgment, the highest recorded temperature determined from the PI data and operator rounds temperature trends recorded during normal operation in the summer time would be expected to be representative of the highest ambient temperature condition that would be seen during the PRA accident scenarios (i.e., LOCA only). The highest temperature data recorded in the 1B SI pump room without the SI pump or room cooler operating was 90 °F based on Reference 4.7. Therefore, this temperature can be considered to be representative of the highest temperature in the U-1 CWA during the PRA accident scenarios of either a small break or medium break LOCA.

Based on the following design inputs:

Initial supply air to the Auxiliary Building – 70 °F DB

Initial supply air relative humidity – 100% RH

Final exhaust air leaving U-1 CWA - 90 °F DB

Pschrometric Chart Plotting Results (See Attachment B):

Final relative humidity for U-1 CWA – 52 % RH

Based on actual temperature trend data for the aforementioned timeframe of September 20,2007 – June 24, 2009, the estimated temperature and relative humidity for the Unit 1 Spray Additive Tank Room and Pipe Penetration Area would not have been more than:

Final U-1 CWA T_{CWA} = 90 °F

Final U-1 CWA Humidity = 52% RH

7. Conclusion

BOUNDING LOOP/LOCA ACCIDENT SCENARIO

The temperature and relative humidity for the Unit 1 Spray Additive Tank Room and Pipe Penetration Area (Curved Wall Area) at floor Elevation 364' of the Auxiliary Building is estimated to not exceed **114.1 °F and 27% RH.** The estimated temperature in this evaluation is only applicable for the conditions that are listed in sections 1 through 3 of this evaluation.

REALISTIC CWA PRA ACCIDENT SCENARIOS

The temperature and relative humidity for the Unit 1 Spray Additive Tank Room and Pipe Penetration Area (Curved Wall Area) at floor Elevation 364' of the Auxiliary Building is estimated to not exceed **90 °F and 52% RH.** The estimated temperature in this evaluation is only applicable for the conditions that are listed in sections 1 through 3 of this evaluation.

In conclusion, the LOOP/LOCA and Realistic accident evaluation results remain below the temperature and relative humidity values referenced in the UFSAR Sec. 3.11, and therefore, remain bounded by the values established per Ref. 4.9.

Prepared By:	Nick Radloff	**Date:** Refer to EC Milestone
Reviewed By:	James Gosnell	**Date:** Refer to EC Milestone
Approved By:	Raymond Belair	**Date:** Refer to EC Milestone

See Attachment "A" Below

Attachment A
Piping Heat Load Calculation for Curved Wall Area

Piping Heat Loads
Calc for CWA.pdf

Attachment B
Psychrometric Chart Plot

Psychrometric Chart
Plot.pdf

ATTACHMENT 5

EC 378180, "Analysis to Determine Back Flow from RWST to ECCS Recirculation Sump While 1SI8811A/B and 1SI8812A/B are Open for Six Minutes"

Braidwood Station

Engineering Change

Company Name : EXELON GENERATION CO.,LLC

EC Number : 0000378180 000
Status/Date : MODIFIED 12/29/2009
Facility : BRW BRAIDWOOD GENERATING STATION
Type/Sub-type: EVAL MECH

Print Date: 12/30/2009

Exelon

Page: 1

EC Title: ANALYSIS TO DETERMINE BACK FLOW FROM RWST TO ECCS RECIRCULATION SUMP WHILE 1SI8811A/B AND 1SI8812A/B ARE OPEN FOR SIX MINUTES

Mod Nbr : 0000378180 KW1: SR KW2: KW3: KW4: KW5:

Master EC :	N	Work Group :		Temporary :	N
Outage :	N	Alert Group:	DEM	Aprd Reqd Date:	12/17/2009
WO Required :	N	Image Addr :		Exp Insvc Date:	
Adv Wk Appvd:		Alt Ref. :		Expires On :	09/23/2012
Auto-Advance:	Y	Priority :	BH	Auto-Asbuild :	N
Caveat Outst:		Department :	08952	Discipline :	DEM
Resp Engr :	GIOVANNI	PANICI			
Location :					

Units

Fac	Unit	Description
BRW	01	UNIT ONE

Systems

Fac	System	Description
BRW	CV	CHEMICAL AND VOLUME CONTROL
BRW	RH	RESIDUAL HEAT REMOVAL
BRW	SI	SAFETY INJECTION

Engineering Change

EC Number :	0000378180 000
Status/Date :	MODIFIED 12/29/2009
Facility :	BRW
Type/Sub-type:	EVAL MECH

Print Date: 12/30/2009

Exelon

Page: 1

EC Title: ANALYSIS TO DETERMINE BACK FLOW FROM RWST TO ECCS RECIRCULATION SUMP WHILE 1SI8811A/B AND 1SI8812A/B ARE OPEN FOR SIX MINUTES

Mod Nbr : 0000378180 KW1: SR KW2: KW3: KW4: KW5:

Master EC :	N	Work Group :		Temporary :	N
Outage :	N	Alert Group:	DEM	Aprd Reqd Date:	12/17/2009
WO Required :	N	Image Addr :		Exp Insvc Date:	
Adv Wk Appvd:		Alt Ref. :		Expires On :	09/23/2012
Auto-Advance:	Y	Priority :	BH	Auto-Asbuild :	N
Caveat Outst:		Department :	08952	Discipline :	DEM
Resp Engr :	GIOVANNI		PANICI		
Location :					

Milestone	Date	PassPort	Name		Req By
030-DAR CONCUR	12/11/2009	BRWUG	GOSNELL	JAMES	CANCELED
110-PREPARE EC	12/28/2009	BRZYP	PANICI	GIOVANNI	APPROVED
120-REVIEW EC	12/29/2009	BYRGO	BARAN	DAVID	APPROVED
Performed a detailed review of the complete EC.					
240-ITPR-OTHER	12/29/2009	BRWUG	GOSNELL	JAMES	APPROVED
Independent review by John Rommel See review comments for his comments.					
300-APPROVE EC	12/29/2009	BRWUG	GOSNELL	JAMES	APPROVED
900-ARCHIVE EC					CLOSED

Units

Fac	Unit	Description
BRW	01	UNIT ONE

Systems

Fac	System	Description
BRW	SI	SAFETY INJECTION
BRW	CV	CHEMICAL AND VOLUME CONTROL
BRW	RH	RESIDUAL HEAT REMOVAL

Planning/Scheduling Information

Planning Start : Level of Effort:

Planning Event	From Date	Thru Date
100-PREP EVAL		

Cross References

Ref. Type	Number	Sub-Number	Description
AR	00987342		WATER IN ACTUATOR LIMIT SWITCH COMPARTMENT VAL
AR	00988980		NRC EXITED YELLOW FINDING FOR 1SI8811B FAILURE

4.1.4.1 Identify Basic SSC Functions

The function of the Emergency Core Cooling System (ECCS) is to provide core cooling and negative reactivity to ensure that the reactor core is protected after any of the following accidents:

a. Loss Of Coolant Accident (LOCA), coolant leakage greater than the capability of the normal charging system;
b. Rod ejection accident;
c. Loss of secondary coolant accident, including uncontrolled steam release or loss of feedwater; and
d. Steam Generator Tube Rupture (SGTR).

The addition of negative reactivity is designed primarily for the loss of secondary coolant accident where primary cooldown could add enough positive reactivity to achieve criticality and return to significant power.

The ECCS consists of three separate subsystems: centrifugal charging (CV) high head, Safety Injection (SI) (intermediate head), and Residual Heat Removal (RHR) (low head). Each subsystem consists of two redundant, 100% capacity trains. The Safety Injection accumulators are also part of the ECCS.

There are three phases of ECCS operation: injection, cold leg recirculation, and hot leg recirculation. In the injection phase, water is taken from the Refueling Water Storage Tank (RWST) and injected into the Reactor Coolant System (RCS) through the cold legs. During the recirculation phase of LOCA recovery, RHR pump suction is transferred to the containment recirculation sump. The RHR pumps then supply the suction of the CV and SI pumps. Initially, recirculation is through the same paths as the injection phase, i.e., through the cold legs. After approximately 6.0 hours, the ECCS flow is shifted to the hot legs.

Switchover of the suction of the RH pumps from the RWST to the Containment Recirculation Sump is started when the RWST reaches the LO-2 water level, approximately 46.7%. The isolation valves for the recirculation sumps, 1SI8811A and 1SI8811B, open automatically and actions to switchover the suction of the CV and SI pumps to the discharge of the RH pumps are completed manually from the Main Control Room. These actions include isolating the RH pumps from the RWST by closing valves 1SI8812A and 1SI8812B after the flow path from the sumps has been verified. Following the opening of the 1SI8811A and B valves, a drain path to the recirculation sumps from the RWST exists until the 1SI8812A and 1SI8812B valves are isolated.

The objective of EC 378180 is to determine the flow rate from the Refueling Water Storage Tank (RWST) to the Containment Recirculation sumps (1A and 1B), post Loss of Coolant Accident (LOCA), during the time period the isolation valves for the RH pumps from the RWST are open (Valves 1SI8812A and 1SI8812B) and the isolation valves for the suction of the RH pumps from the Containment Recirculation sumps (Valves 1SI8811A and 1SI8811B) are partially open. The time period has been determined to be 6 minutes based on the time taken to close valves 1SI8812A and 1SI8812B in a simulator scenario. The RWST outflow and resulting RWST level data will be used in support of a Significance Determination Process to determine the safety impact of the failure of valve 1SI8811B to fully open (Reference Issue Report #934782).

4.1.4.2 Identify Configuration Change safety classification.
Although the activities to support a Significance Determination Process (SDP) are not required to be safety related, EC 378180 is treated as safety related.

EC 378180 Revision 0
Evaluation of RWST Backflow to the Containment Recirculation Sump

Background- ECCS System Operation:
The Emergency Core Cooling System (ECCS) is designed to cool the reactor core and provide shutdown capability following the initiation of one of four different accident conditions:

1. Pipe Break in the Reactor Coolant System (RCS), which causes a discharge larger than what can be made up by the normal makeup system, up to and including the instantaneous circumferential break of the largest piping in the RCS.
2. Rupture of a control rod drive mechanism causing a rod cluster control assembly ejection accident.
3. Pipe breaks in the steam system, up to and including the instantaneous circumferential break of the largest pipe in the steam system.
4. A Steam Generator tube rupture

The ECCS is comprised of the following subsystems:

1. High Head Safety Injection – Two (2) Centrifugal Charging pumps
2. Medium Head Safety Injection – Two (2) Safety Injection pumps
3. Low Head Safety Injection – Two (2) Residual Heat Removal (RHR) pumps
4. Safety Injection Accumulators

There are three phases of operation for the Emergency Core Cooling System (ECCS): injection, cold leg recirculation, and hot leg recirculation. In the injection phase, all pumps take suction from the Refueling Water Storage Tank (RWST) and inject into the Reactor Coolant System (RCS) through the cold legs. When the RWST level decreases to about 46.7%, the suction to the RHR pumps (A & B) is transferred to the containment recirculation sumps (A & B). Valves manipulations are then made so that the RHR pumps supply the suction of the CV and SI pumps. Initially, recirculation is through the same paths as the injection phase, i.e., through the cold legs. After approximately 6.0 hours, the ECCS flow is injected to the RCS hot legs.

Switchover of the suction of the RHR pumps from the RWST to the Containment Recirculation Sump is started when the RWST reaches the LO-2 water level, approximately 46.7%. The isolation valves for the recirculation sumps, 1SI8811A and 1SI8811B, open automatically and actions to switchover the suction of the CV and SI pumps to the discharge of the RH pumps are completed manually from the Main Control Room. These actions include isolating the RHR pumps from the RWST by closing valves 1SI8812A and 1SI8812B after the flow path from the sumps has been verified (Reference 2). Following the opening of the 1SI8811A and B valves, a drain path to the recirculation sumps from the RWST exists until the 1SI8812A and 1SI8812B valves are isolated.

Reason for Evaluation/Scope:
During scheduled surveillance testing on 06/24/2009, the Safety Injection system containment sump suction isolation valve (1SI8811B) was stroked open. The control

board indication showed dual indication and never indicated a full open condition. At the valve, observers saw an approximate 30-40% open condition. Upon further investigation, water was found in the valve actuator limit switch compartment and the actuator torque switch was severely corroded. Evidence indicated that water had entered the compartment through an electrical conduit penetration. The torque switch and limit switch components were replaced and the compartment and wiring were cleaned and dried. On 06/26/2009, the valve was tested and restored to operable status.

The NRC has identified a preliminary yellow finding for this event (Reference IR #988980). In response to the preliminary NRC finding, Braidwood applied the Significance Determination Process (SDP) to the above event in accordance with the guidance in procedure LS-AA-2002.

In support of the SDP activities, several scenarios have been evaluated for risk insights. In these scenarios, the isolation valves for <u>both</u> Containment Recirculation Sumps, 1SI8811A and 1SI811B, are assumed to fail to open fully. This evaluation determines the backflow from the RWST to the containment recirculation sumps during the selected scenarios. The results of this evaluation will be used in the risk insight analyses, BW-SDP-003.

<u>Detailed Evaluation:</u>
The details of the evaluation for the RWST backflow are provided in Sargent & Lundy Evaluation 2009-13491 (Reference 3, attached to this EC).

The evaluation uses the ECCS hydraulic model developed in Reference 4 to make a Best-estimate determination of the amount of water that would flow from the RWST to the containment sumps at Braidwood Unit 1 during a six minute period starting at the RWST LO-2 alarm during which the containment sump isolation valves, 1SI8811A and 1SI8811B, are both stuck in a partially open position while the 1SI8812A/B valves to the RWST are open. Separate runs are made to determine the sensitivity of the RWST backflow to the sump to changes to a number of selected parameters.

Boundary conditions from four different sump back flow scenarios are analyzed: 5.2 inch LOCA, 2 inch LOCA, 0.86 inch LOCA, and a Bleed and Feed LOCA. The scenario dependent boundary conditions are the RCS pressure, the Containment pressure, and the sump water level. ECCS Pumps flow rates have been determined using the flow coefficients of the ECCS throttle valves as determined using the results of the flow balance tests performed during the most recently completed Braidwood Unit 1 refueling outage, A1R14 and pump curves based on the most recent ASME Group A pump testing for the Braidwood Unit 1 SI, CV, and RH pumps.

The PIPE-FLO hydraulic model of the Braidwood ECCS systems is taken from Reference 4. This model documents the pipe lengths, diameters, schedules, elevations, fittings, and component resistances for the flow balance test and sump back flow scenarios. The system line-ups for the flow balance test scenarios are also taken from Reference 4.

Sensitivity to Inputs:

Six cases are run to determine the sensitivity of the back flow rate to the containment sumps to changes to a number of inputs. The 5.2 inch LOCA scenario with the RWST at the LO-2 level is used as the base case. Each selected input is changed while the other inputs are maintained the same as in the base case. The six inputs that are varied are:

- RWST Level – The RWST level is increased by one foot.
- Primary System Pressure – The primary system pressure is increased by 10%
- Containment Pressure – The containment pressure is decreased by 10%
- C_v of valves 1SI8811A/B – The C_vs of the partially open containment sump isolation valves are increased by 1000
- ECCS pump curves – The pump curves of the SI, CV, and RH pumps are decreased by 3%.
- Pipe Resistance – The resistance of the most resistive pipe segments between the RWST and the containment sumps, 1SI82AA/BA and 1SI81AB/BB, are both decreased by eliminating one elbow.

The results of the six runs are given below:

	RWST Level + 1 ft	Primary System Pressure + 10%	Containment Pressure - 10%	1SI8811A/B Cv + 1000	EC CS Pump Curve - 3%	Pipe Resistance - 1 elbow
Sump A Back Flow (gpm)	3012	2961	3289	2953	2976	3006
Sump B Back Flow (gpm)	3257	3204	3544	3194	3224	3255
Total Sump Back Flow (gpm)	6269	6165	6833	6147	6200	6261
Sump Back Flow – Increase Over Base Case (gpm)	156	52	720	34	87	148

The sensitivity cases demonstrate how sump flow is affected by changes to the various input parameters. Containment Pressure has the greatest effect; a 10% decrease in pressure resulted in 10.5% increase in sump flow. Through discussion with the PRA specialist, the variability of the output for the given changes in input does not a make significant difference in the overall conclusions since they result in changes that are a small fraction of the total lost inventory from the RWST and significant margin remains. The effect of input variations will be further dispositioned in the significance determination, BW-SDP-003.

Conclusions/Findings:

The results of the analyses, including the RWST backflow, for each of the scenario that was evaluated are provided in the tables below.

5.2 Inch LOCA

	At Lo-2 Alarm	After Three Minutes	After Six Minutes	Average Over Six Minutes
RWST Level (feet)	427.3	422.4	417.9	
Primary System Pressure (psia)	29	28.5	28	
Containment Pressure (psia)	19.2	19.15	19.1	
Sump Water Level (feet)	2	2.4	2.9	
RWST Flow (gpm)	13959	13100	12223	13091
Sump A Back Flow (gpm)	2933	2509	2069	2501
Sump B Back Flow (gpm)	3180	2738	2291	2735.5
Total Sump Flow (gpm)	6113	5247	4360	5236.5

2 Inch LOCA

	At Lo-2 Alarm	After Six Minutes	Average Over Six Minutes
RWST Level (feet)	427.3	417.9	
Primary System Pressure (psia)	115	111	
Containment Pressure (psia)	18.8	18.7	
Sump Water Level (feet)	1.5	2.4	
RWST Flow (gpm)	13962	12279	13120.5
Sump A Back Flow (gpm)	3977	3105	3541
Sump B Back Flow (gpm)	4227	3311	3769
Total Sump Flow (gpm)	8204	6416	7310

0.86 Inch LOCA

	At Lo-2 Alarm	After Six Minutes	Average Over Six Minutes
RWST Level (feet)	427.3	418.0	
Primary System Pressure (psia)	835	835	
Containment Pressure (psia)	17.3	17.3	
Sump Water Level (feet)	1.3	2.2	
RWST Flow (gpm)	13740	12117	12928.5
Sump A Back Flow (gpm)	6171	5383	5777
Sump B Back Flow (gpm)	6530	5697	6113.5
Total Sump Flow (gpm)	12701	11080	11890.5

Feed and Bleed LOCA

	At Lo-2 Alarm	After Six Minutes	Average Over Six Minutes
RWST Level (feet)	427.3	420.3	
Primary System Pressure (psia)	211	211	
Containment Pressure (psia)	25.7	25.6	
Sump Water Level (feet)	2	2.6	
RWST Flow (gpm)	10511	8858	9684.5
Sump A Back Flow (gpm)	4480	3677	4078.5
Sump B Back Flow (gpm)	4741	3892	4316.5
Total Sump Flow (gpm)	9221	7569	8395

EC 378180 Revision 0
Evaluation of RWST Backflow to the Containment Recirculation Sump

References:

1. Issue Report #987342
2. Emergency Procedure 1BwEP ES-1.3 Revision 200
3. Sargent & Lundy Evaluation #2009-13491
4. Design Analysis #BRW-06-0016-M Revision 3

Preparer:	**Giovanni Panici**	**Date: 12-28-2009**
Reviewer:	**D. Baran**	**Date: 12-29-2009**
Approver:	**James Gosnell**	**Date: 12-29-2009**

Images of the text from Sargent & Lundy Evaluation #2009-13941 are provided in the pages that follow:

EC 378180 Revision 0
Evaluation of RWST Backflow to the Containment Recirculation Sump

Evaluation 2009-13491
Analysis of RWST Back Flow to the Containment Sumps

Exelon
Braidwood Unit 1
Safety Related
No Unverified Assumptions
Status: Approved

Prepared By: Anthony M. Ryan
Anthony M. Ryan
Date: 12-23-09

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Date: 12/23/09

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Table of Contents

	Cover Sheet	1
	Table of Contents	2
1.0	Purpose	3
2.0	Inputs	3
3.0	Assumptions	5
4.0	References	5
5.0	Methodology	6
6.0	Calculations	8
7.0	Results	10
8.0	Attachments	11

1.0 Purpose

Revision 3 of Calculation BYR06-029 / BRW-06-0016-M, Reference 4.1, documents a hydraulic model of the Byron and Braidwood ECCS systems. The model is used in the calculation to analyze ECCS flow balance test and cold leg and hot leg recirculation scenarios.

The purpose of this evaluation is to use the hydraulic model developed in Reference 4.1 to make a best estimate determination of the amount of water that would flow from the RWST to the containment sumps at Braidwood Unit 1 during a six minute period starting at the RWST LO-2 alarm during which the containment sump isolation valves, 1SI8811A and 1SI8811B, are both stuck in a partially open position while the 1SI8812A/B valves to the RWST are simultaneously open. Boundary conditions from four different sump back flow scenarios are analyzed: 5.2 inch LOCA, 2 inch LOCA, 0.86 inch LOCA, and a Bleed and Feed LOCA. The scenario dependent boundary conditions are the RCS pressure, the Containment pressure, and the sump water level. The flow rates will be determined using the C_vs of the ECCS throttle valves as determined using the results of the flow balance tests performed during the most recently completed Braidwood Unit 1 refueling outage, A1R14 and pump curves based on the most recent ASME Group A pump testing for the Braidwood Unit 1 SI, CV, and RH pumps. The ECCS throttle valves included in the flow balance tests are the SI to Cold Leg (1SI8822A-D) and CV to Cold Leg (1SI8810A-D) throttle valves.

2.0 Inputs

2.1 The PIPE-FLO hydraulic model of the Braidwood ECCS systems is taken from Reference 4.1. This model documents the pipe lengths, diameters, schedules, elevations, fittings, and component resistances for the flow balance test and sump back flow scenarios. The system line-ups for the flow balance test scenarios are also taken from Reference 4.1.

2.2 Data from the SI to cold leg and CV to cold leg flow balance tests from Braidwood Unit 1 refueling outage A1R14 is taken from Reference 4.2.

Table 2-1: A1R14 Flow Balance Test Data

	RCS Cold Leg Flow (gpm)						
Pump	Loop A	Loop B	Loop C	Loop D	RCP Seal Inj. or Miniflow (gpm)	Pump Discharge Pressure (psig)	Pump Suction Pressure (psig)
1A CV	116.5	116	116.1	116	80 (RCP seal)	840	18.4
1A SI	149.5	149.3	149.6	150.04	32 (Miniflow)	832	20.2

2.3 Data from the most recent ASME Group A pump testing for the Braidwood Unit 1 SI, CV, and RH pumps is taken from Reference 4.2.

Table 2-2: ASME Group A Pump Test Data

Pump	Flow Rate (gpm)	Differential Pressure (psid)
1A CV	193	2490
1B CV	195	2459
1A SI	45	1513
1B SI	44.5	1462.5
1A RH	633.8	185.8
1B RH	596	190.3

2.4 The vendor pump curves for the Braidwood Unit 1 RH, SI, and CV pumps are taken from Sections 2.3.2, 2.3.4, and 2.3.5 of Reference 4.1.

Table 2-3: Vendor Pump Curves

RH A		RH B		SI A		SI B		CV A		CV B	
Flow (gpm)	Head (ft)	Flow (gpm)	Head (ft)	Flow (gpm)	Head (ft)	Flow (gpm)	Head (ft)	Flow (gpm)	Head (ft)	Flow (gpm)	Head (ft)
0	455	0	455	0	3580	0	3600	0	5850	0	6000
1000	440	1000	432	50	3560	50	3580	100	5800	100	5900
2000	415	2000	400	150	3500	150	3500	175	5650	175	5700
2500	400	2500	390	250	3360	250	3360	250	5300	250	5300
3000	390	3000	380	350	3100	350	3160	325	4700	325	4600
3500	375	3500	365	450	2760	450	2850	400	3900	400	3800
4000	350	4000	345	550	2370	550	2450	475	2900	475	2800
4500	320	4500	315	655	1900	655	2020	550	1750	550	1600
5000	295	5000	280								

2.5 The system injection line-up used in the sump back flow scenarios are taken from highlighted P&IDs transmitted in Reference 4.4.

2.6 The RWST Level at the LO-2 alarm is 427.3 feet per Section 3 of Attachment A of Reference 4.7.

2.7 The RWST volume per foot of height is 8351.6 gallons per foot per Section 3 of Attachment A of Reference 4.7.

2.8 The flooded area of the containment floor conservatively used to minimize the containment flood height is 12114 ft^2 in Section 2.3.3 of Reference 4.8. With this area, the volume per foot of height of the containment floor is 90618.8 gallons per foot (12114 ft^2 * 7.4805 gal/ft^3 = 90618.8 gal/ft).

2.9 The following flow rates are to be used in the analysis of the back flow from the RWST to the containment sumps per Reference 4.5.

RCP Seal Injection Flow = 80 gpm for two CV pumps
CV Miniflow Rate = 65 gpm for each CV pump
Safety Injection Miniflow Rate = 30 gpm for each SI pump

2.10 The B train containment sump isolation valve, 1SI8811B, was determined to open 34.34 percent during surveillance testing per page 3 of Reference 4.9. The C_v of the valve at this position is conservatively determined to be 6000 using the C_v versus percent open graph from page 9 of Reference 4.9. The C_v is maximized for this analysis to conservatively maximize back flow to the sump. Note that the C_v used herein is greater (6000 vs. 5000) than that chosen in Reference 4.9 where a minimum C_v was conservative.

2.11 The A train containment sump isolation valve, 1SI8811A, was determined to open 29.1 percent during surveillance testing per page 3 of Reference 4.10. The C_v of the valve at this position is conservatively determined to be 5000 using the C_v versus percent open graph from page 9 of Reference 4.10. The C_v is maximized for this analysis to conservatively maximize back flow to the sump. Note that the C_v used herein is greater (5000 vs. 4000) than that chosen in Reference 4.10 where a minimum C_v was conservative.

2.12 The primary system pressure, containment pressure, and initial sump water level for each of the four subject LOCA scenarios are provided in Reference 4.6 and documented in Table 2-4.

Table 2-4: LOCA Scenario Boundary Conditions

	Primary System Pressure (psia)	Containment Pressure (psia)	Containment Water Level[1] (feet)
5.2 Inch LOCA at LO-2 Alarm	29	19.2	2
5.2 Inch LOCA After Six Minutes	28	19.1	-
2 Inch LOCA at LO-2 Alarm	115	18.8	1.5
2 Inch LOCA After Six Minutes	111	18.7	-
0.86 Inch LOCA at LO-2 Alarm	835	17.3	1.3
0.86 Inch LOCA After Six Minutes	835	17.3	-
Bleed & Feed at LO-2 Alarm	211	25.7	2
Bleed & Feed After Six Minutes	211	25.6	-

Note 1: The containment water level is the water level above the containment floor. From Section 6.6.1 of Reference 4.1, the containment floor is at elevation 377.0 feet while the containment sump piping is at an elevation of 368.2 feet. Therefore, the level input into PIPE-FLO for the containment sumps is 8.8 feet (377-368.2=8.8) greater than the level shown in Table 2-4.

3.0 Assumptions

3.1 It is assumed that there has been no change in pump performance or system hydraulic resistance since the last flow balance and pump tests. This is consistant with Assumption 3.3.1 of Reference 4.1

3.2 The assumptions found in Reference 4.1 that were used to create the hydraulic model are also assumed in this evaluation.

3.3 It is assumed that the change in density due to the range of RWST temperatures and boron concentrations present during the A1R14 flow balance tests has negligible impact on the determination of the throttle valve C_vs. Consequently, Equation 1 does not account for the density ratio between actual and standard water temperatures.

4.0 References

4.1 BYR06-029 / BRW-06-0016-M, Revision 3, SI/RHR/CS/CV System Hydraulic Analysis In Support of GSI-191.

4.2 DIT-BRW-2009-0078, Revision 0, dated 11-30-09, and Rev. 1, dated 12-9-09, see Attachment A.

4.3 PIPE-FLO Version 8, Engineered Software Incorporated (S&L Program No. 03.7.100-8.0).

4.4 DIT-BRW-2009-0079, Revision 0, dated 12-4-09, see Attachment B.

4.5 DIT-BRW-2009-0080, Revision 0, dated 12-7-09, see Attachment C.

4.6 DIT-BRW-2009-0082, Revision 0, dated 12-8-09, see Attachment D.

4.7 SITH-1, Refueling Water Storage Tank (RWST) Level Setpoints, Major Revision 7, up to and including Minor Revision 7A.

4.8 SI-90-01, Minimum Containment Flood Level, Major Revision 9, up to and including Minor Rev. 9C.

4.9 EC#377204, Evaluate 1SI8811B Flow at Partial Opening.

4.10 EC#378112, Evaluate 1SI8811A Flow at Partial Opening.

5.0 Methodology

5.1 Determination of C_vs from A1R14

Four flow balance tests are done each refueling outage at Braidwood. Two of these are the CV to cold leg and the SI to cold leg tests. The results of these tests include the flow rate through each injection leg (A-D), the pump suction and discharge pressures, and the seal injection or miniflow flow rates if any. The results from the most recently completed refueling outage at Braidwood Unit 1, A1R14, are shown in Input 2.2.

To determine the C_vs of the throttle valves as they were set in A1R14, the results of the flow balance tests are used as inputs into modified versions of the corresponding flow balance test scenario models from Reference 4.1. Specifically, the pump suction and discharge pressures are set in the model for the pumps in operation during that test, the flow rate through each injection leg is set at a control valve representing the throttle valve for each leg, and the seal injection or miniflow flow rates are set as boundary condition demands.

One of the outputs from the flow balance test model is the pressure drop across each throttle valve needed to establish the flow measured in that test. These throttle valve pressure drops can be used in conjunction with their flow rates and Equation 1 to determine each of their C_vs.

$$C_v = \frac{Q}{\sqrt{\Delta P}} \qquad \text{Equation 1}$$

where: C_v = valve flow coefficient
Q = the valve flow (gpm)
ΔP = the valve pressure drop (psi)

5.2 Modification of Vendor Pump Curves

To account for pump degradation or enhancement, the vendor curves for the RH, SI, and CV pumps (Input 2.4) are modified to agree with the latest ASME pump test results (Input 2.3). This is done by multiplying the pump curve developed head by a factor until it equals the developed head measured in the ASME test at the tested flow rate.

5.3 Back Flow to the Containment Sumps From the RWST

The rate of flow from the RWST to the Containment Sumps is calculated for four LOCA scenarios using the hydraulic model developed in Reference 4.1. The back flow occurs during the transition from injection to recirculation mode when the sump isolation valves (1SI8811A/B) stall in a partially open position. The open flow paths are the injection mode paths from the RWST through the RH, SI, and CV pumps to the cold legs as documented in Reference 4.4 with the addition of the back flow path through 1SI8811A/B to the containment sumps. The analyzed back flow scenarios begin when the RWST reaches the LO-2 level and end six minutes later. The boundary conditions which are changed for each scenario are the primary system pressure, the containment pressure, and the initial containment sump water level from Input 2.12. After six minutes, the RWST and containment sump water levels are iteratively adjusted using the average calculated flow rate over the six minute duration and their volume versus level relations documented in Inputs 2.7 and 2.8. The use of the average flow over the six minute duration is justified by running a case at three minutes for one of the LOCA scenarios and comparing the three minute results to the average from the six minute duration. The C_vs of the partially open 1SI8811A/B valves are taken from Inputs 2.10 and 2.11.

5.4 Sensitivity to Inputs

In response to a request from Exelon, the sensitivity of the back flow rate to the containment sumps to changes in six inputs will be determined by running a set of sensitivity cases. These PIPE-FLO cases will be created by starting with the LOCA scenario with the largest break size and modifying one parameter per case.

5.5 Identification of Software

The hydraulic models are created using PIPE-FLO Ver. 8, Reference 4.3. PIPE-FLO is a computer code designed to perform steady-state analyses of single phase hydraulic systems.

Sargent & Lundy L.L.C. Software Configuration Control Details:

Controlled File Detail for PIPE-FLO (S&L Program No. 03.7.100-8.0)
Type: 2 Status: O Effective Date: 09-21-2004

Controlled File Path: \\SNLVS5\SYS3\OPS$\PIP10080\

All computer runs are made on Sargent and Lundy L.L.C. PC No. ZD5955.

5.6 Acceptance Criteria

The results of this evaluation are used as input into other evaluations and calculations. As such, there are no acceptance criteria for this evaluation.

6.0 Calculations

6.1 C_vs from A1R14

Two flow balance test scenarios from Reference 4.1 are modified as described in Section 5.1 to determine the throttle valve C_vs that correspond to the measurements taken in A1R14. Since the C_vs of the throttle valves are independent of the pump used in the flow balance test, either the A train or the B train test data can be used herein. However, to be consistent with Reference 4.1, the SI A and CV A pump suction and discharge pressures were used in the SI to cold leg and CV to cold leg flow balance test models. The valve flow rates, valve pressure drops, and valve C_vs calculated using Equation 1 are shown in Tables 6-1 through 6-2. The PIPE-FLO output for these runs can be found in Attachment E.

Table 6-1: SI to Cold Leg – Ref. 4.1 Case 1A

Loop	Flow (gpm)	Pressure Drop (psi)	C_v
A	149.5	687.4	5.702
B	149.3	671.6	5.761
C	149.6	714.1	5.598
D	150.04	712.7	5.620

Table 6-2: CV to Cold Leg – Ref. 4.1 Case 4A

Loop	Flow (gpm)	Pressure Drop (psi)	C_v
A	116.5	540.4	5.012
B	116	462.2	5.396
C	116.1	551.3	4.945
D	116	595.2	4.755

6.2 Modified Pump Curves

The vendor pump curves are modified to match the latest ASME pump test results in Attachment G. The resulting modified pump curves that are used in the hydraulic models described in the next section can be found in Table 6-3.

Table 6-3: Pump Curves Modified to Match Latest ASME Pump Test Data

RH A		RH B		SI A		SI B		CV A		CV B	
Flow (gpm)	Head (ft)	Flow (gpm)	Head (ft)	Flow (gpm)	Head (ft)	Flow (gpm)	Head (ft)	Flow (gpm)	Head (ft)	Flow (gpm)	Head (ft)
0	437.9	0	452.8	0	3509.2	0	3391.8	0	6039.3	0	6087.2
1000	423.5	1000	429.9	50	3489.6	50	3372.9	100	5987.7	100	5985.7
2000	399.4	2000	398.1	150	3430.8	150	3297.6	175	5832.9	175	5782.8
2500	385.0	2500	388.1	250	3293.5	250	3165.7	250	5471.5	250	5377.0
3000	375.4	3000	378.2	350	3038.7	350	2977.2	325	4852.1	325	4666.8
3500	360.9	3500	363.2	450	2705.4	450	2685.2	400	4026.2	400	3855.2
4000	336.9	4000	343.3	550	2323.1	550	2308.3	475	2993.9	475	2840.7
4500	308.0	4500	313.5	655	1862.4	655	1903.2	550	1806.6	550	1623.3
5000	283.9	5000	278.6								

6.3 Back Flow to the Containment Sumps From the RWST

Two PIPE-FLO cases are run for each of the four LOCA scenarios, one when the RWST is at the LO-2 level, the other six minutes later. An additional case is run for the 5.2 inch LOCA case at three minutes. The output from these files can be found in Attachment F. The flow paths for the 5.2 and 2 inch LOCA scenarios with all SI, CV, and RH pumps injecting are as documented in Attachment B. The flow paths in the 0.86 inch LOCA scenario has been modified to reflect the inability of the RH pumps to inject to primary system pressure of 835 psia. Similarly, the flow paths in the Bleed and Feed LOCA scenario have been modified to reflect no injection by the RH pumps. In this scenario, the primary system pressure of 211 psia is below the potential discharge head of the RH pumps which indicates a possibility of injection. However, the corresponding pump flow rate is low enough for the RH miniflow valves (RH610 and RH611) to open. Once the RH miniflow valves are open, the pump flow rate increases and its developed head decreases until injection is no longer possible.

The RWST and containment sump water levels are iteratively calculated using the average RWST flow rate over the six minute duration from Table 7-1 and Inputs 2.6, 2.7, and 2.8. For example in the last iteration, the six minute RWST level in the 5.2 inch LOCA scenario is 427.3 ft – (13091 gpm * 6 min) / 8351.6 gal/ft = 417.9 feet and the six minute containment sump water level in the 5.2 inch LOCA scenario is 2 ft + (13091 gpm * 6 min) / 90618.8 gal/ft = 2.9 feet. The use of the average RWST flow rate to adjust the water levels is justified with a PIPE-FLO case run at three minutes for the 5.2 inch LOCA scenario. As can be seen in Table 7-1, the calculated RWST flow at three minutes is only 9 gpm different from the average calculated for the six minute duration.

6.4 Sensitivity to Inputs

In response to a request from Exelon, six cases are run to determine the sensitivity of the back flow rate to the containment sumps to a set of inputs. The 5.2 inch LOCA scenario with the RWST at the LO-2 level is used as the base case. The six inputs that are varied are:

- RWST Level – The RWST level is increased by one foot.
- Primary System Pressure – The primary system pressure is increased by 10%
- Containment Pressure – The containment pressure is decreased by 10%
- C_v of valves 1SI8811A/B – The C_vs of the partially open containment sump isolation valves are increased by 1000
- ECCS pump curves – The pump curves of the SI, CV, and RH pumps are artificially decreased by 3%. The pump curves in this case are adjusted without also repeating the flow balance test cases described in Section 5.1. This represents a scenario which is outside of the analyzed design basis as defined in Reference 4.1. See Assumption 3.1 of this evaluation and Assumption 3.3.1 in Reference 4.1.
- Pipe Resistance – The resistance of the most resistive pipe segments between the RWST and the containment sumps, 1SI82AA/BA and 1SI81AB/BB, are both decreased by eliminating one elbow.

The PIPE-FLO output can be found in Attachment H. The 3% degraded pump curves are in Attachment I.

7.0 Results

The back flow rates from the RWST to the Containment Sumps for the four LOCA scenarios can be found in Tables 7-1 through 7-4.

Table 7-1: 5.2 Inch LOCA

	At Lo-2 Alarm	After Three Minutes	After Six Minutes	Average Over Six Minutes
RWST Level (feet)	427.3	422.4	417.9	
Primary System Pressure (psia)	29	28.5	28	
Containment Pressure (psia)	19.2	19.15	19.1	
Sump Water Level (feet)	2	2.4	2.9	
RWST Flow (gpm)	13959	13100	12223	13091
Sump A Back Flow (gpm)	2933	2509	2069	2501
Sump B Back Flow (gpm)	3180	2738	2291	2735.5
Total Sump Flow (gpm)	6113	5247	4360	5236.5

Table 7-2: 2 Inch LOCA

	At Lo-2 Alarm	After Six Minutes	Average Over Six Minutes
RWST Level (feet)	427.3	417.9	
Primary System Pressure (psia)	115	111	
Containment Pressure (psia)	18.8	18.7	
Sump Water Level (feet)	1.5	2.4	
RWST Flow (gpm)	13962	12279	13120.5
Sump A Back Flow (gpm)	3977	3105	3541
Sump B Back Flow (gpm)	4227	3311	3769
Total Sump Flow (gpm)	8204	6416	7310

Table 7-3: 0.86 Inch LOCA

	At Lo-2 Alarm	After Six Minutes	Average Over Six Minutes
RWST Level (feet)	427.3	418.0	
Primary System Pressure (psia)	835	835	
Containment Pressure (psia)	17.3	17.3	
Sump Water Level (feet)	1.3	2.2	
RWST Flow (gpm)	13740	12117	12928.5
Sump A Back Flow (gpm)	6171	5383	5777
Sump B Back Flow (gpm)	6530	5697	6113.5
Total Sump Flow (gpm)	12701	11080	11890.5

Table 7-4: Bleed and Feed LOCA

	At Lo-2 Alarm	After Six Minutes	Average Over Six Minutes
RWST Level (feet)	427.3	420.3	
Primary System Pressure (psia)	211	211	
Containment Pressure (psia)	25.7	25.6	
Sump Water Level (feet)	2	2.6	
RWST Flow (gpm)	10511	8858	9684.5
Sump A Back Flow (gpm)	4480	3677	4078.5
Sump B Back Flow (gpm)	4741	3892	4316.5
Total Sump Flow (gpm)	9221	7569	8395

7.1 Sensitivity to Inputs

The results to the sensitivity cases can be found in Table 7-5. The base case results for the 5.2 inch LOCA scenario with the RWST at LO-2 level are in Table 7-1.

Table 7-5: Sensitivity to Inputs

	RWST Level +1 foot	Primary System Pressure +10%	Containment Pressure -10%	1SI8811A/B C_v +1000	ECCS Pump Curve -3%[1]	Pipe Resistance - 1 elbow
RWST Level (feet)	428.3	427.3	427.3	427.3	427.3	427.3
Primary System Pressure (psia)	29	31.9	29	29	29	29
Containment Pressure (psia)	19.2	19.2	17.28	19.2	19.2	19.2
Sump Water Level (feet)	2	2	2	2	2	2
RWST Flow (gpm)	14115	13951	14644	13991	13936	14108
Sump A Back Flow (gpm)	3012	2961	3289	2953	2976	3006
Sump B Back Flow (gpm)	3257	3204	3544	3194	3224	3255
Total Sump Flow (gpm)	6269	6165	6833	6147	6200	6261
Sump Back Flow Increase Over Base Case (gpm)	156	52	720	34	87	148

1. Note that this case represents a scenario which is outside of the analyzed design basis as defined in Reference 4.1. See Section 6.4.

8.0 Attachments

Attachment A - DIT-BRW-2009-0078, Reference 4.2	A1-A3
Attachment B - DIT-BRW-2009-0079, Reference 4.4	B1-B15
Attachment C - DIT-BRW-2009-0080, Reference 4.5	C1-C1
Attachment D - DIT-BRW-2009-0082, Reference 4.6	D1-D1
Attachment E – PIPE-FLO Output – A1R14 FBT Cases	E1-E28
Attachment F – PIPE-FLO Output – Sump Back Flow Cases	F1-F126
Attachment G – Modified Pump Curves	G1-G6
Attachment H – PIPE-FLO Output – Sensitivity cases	H1-H60
Attachment I – 3% Degraded Pump Curves for Sensitivity Case	I1-I1

The embedded file of the entire Sargent & Lundy evaluation #2009-13491 is provided below:

2009-13491.pdf

Evaluation 2009-13491
Analysis of RWST Back Flow to the Containment Sumps

Exelon
Braidwood Unit 1
Safety Related
No Unverified Assumptions
Status: Approved

Prepared By: *Anthony M. Ryan* Anthony M. Ryan — Date: 12-23-09

Reviewed By: *[signature]* Jennifer N. Zalon — Date: 12/23/09

Approved By: *Robert J. Peterson* Robert J. Peterson — Date: 12-23-09

Table of Contents

	Cover Sheet	1
	Table of Contents	2
1.0	Purpose	3
2.0	Inputs	3
3.0	Assumptions	5
4.0	References	5
5.0	Methodology	6
6.0	Calculations	8
7.0	Results	10
8.0	Attachments	11

1.0 Purpose

Revision 3 of Calculation BYR06-029 / BRW-06-0016-M, Reference 4.1, documents a hydraulic model of the Byron and Braidwood ECCS systems. The model is used in the calculation to analyze ECCS flow balance test and cold leg and hot leg recirculation scenarios.

The purpose of this evaluation is to use the hydraulic model developed in Reference 4.1 to make a best estimate determination of the amount of water that would flow from the RWST to the containment sumps at Braidwood Unit 1 during a six minute period starting at the RWST LO-2 alarm during which the containment sump isolation valves, 1SI8811A and 1SI8811B, are both stuck in a partially open position while the 1SI8812A/B valves to the RWST are simultaneously open. Boundary conditions from four different sump back flow scenarios are analyzed: 5.2 inch LOCA, 2 inch LOCA, 0.86 inch LOCA, and a Bleed and Feed LOCA. The scenario dependent boundary conditions are the RCS pressure, the Containment pressure, and the sump water level. The flow rates will be determined using the C_vs of the ECCS throttle valves as determined using the results of the flow balance tests performed during the most recently completed Braidwood Unit 1 refueling outage, A1R14 and pump curves based on the most recent ASME Group A pump testing for the Braidwood Unit 1 SI, CV, and RH pumps. The ECCS throttle valves included in the flow balance tests are the SI to Cold Leg (1SI8822A-D) and CV to Cold Leg (1SI8810A-D) throttle valves.

2.0 Inputs

2.1 The PIPE-FLO hydraulic model of the Braidwood ECCS systems is taken from Reference 4.1. This model documents the pipe lengths, diameters, schedules, elevations, fittings, and component resistances for the flow balance test and sump back flow scenarios. The system line-ups for the flow balance test scenarios are also taken from Reference 4.1.

2.2 Data from the SI to cold leg and CV to cold leg flow balance tests from Braidwood Unit 1 refueling outage A1R14 is taken from Reference 4.2.

Table 2-1: A1R14 Flow Balance Test Data

	RCS Cold Leg Flow (gpm)						
Pump	**Loop A**	**Loop B**	**Loop C**	**Loop D**	**RCP Seal Inj. or Miniflow (gpm)**	**Pump Discharge Pressure (psig)**	**Pump Suction Pressure (psig)**
1A CV	116.5	116	116.1	116	80 (RCP seal)	840	18.4
1A SI	149.5	149.3	149.6	150.04	32 (Miniflow)	832	20.2

2.3 Data from the most recent ASME Group A pump testing for the Braidwood Unit 1 SI, CV, and RH pumps is taken from Reference 4.2.

Table 2-2: ASME Group A Pump Test Data

Pump	**Flow Rate (gpm)**	**Differential Pressure (psid)**
1A CV	193	2490
1B CV	195	2459
1A SI	45	1513
1B SI	44.5	1462.5
1A RH	633.8	185.8
1B RH	596	190.3

2.4 The vendor pump curves for the Braidwood Unit 1 RH, SI, and CV pumps are taken from Sections 2.3.2, 2.3.4, and 2.3.5 of Reference 4.1.

Table 2-3: Vendor Pump Curves

RH A		RH B		SI A		SI B		CV A		CV B	
Flow (gpm)	Head (ft)	Flow (gpm)	Head (ft)	Flow (gpm)	Head (ft)	Flow (gpm)	Head (ft)	Flow (gpm)	Head (ft)	Flow (gpm)	Head (ft)
0	455	0	455	0	3580	0	3600	0	5850	0	6000
1000	440	1000	432	50	3560	50	3580	100	5800	100	5900
2000	415	2000	400	150	3500	150	3500	175	5650	175	5700
2500	400	2500	390	250	3360	250	3360	250	5300	250	5300
3000	390	3000	380	350	3100	350	3160	325	4700	325	4600
3500	375	3500	365	450	2760	450	2850	400	3900	400	3800
4000	350	4000	345	550	2370	550	2450	475	2900	475	2800
4500	320	4500	315	655	1900	655	2020	550	1750	550	1600
5000	295	5000	280								

2.5 The system injection line-up used in the sump back flow scenarios are taken from highlighted P&IDs transmitted in Reference 4.4.

2.6 The RWST Level at the LO-2 alarm is 427.3 feet per Section 3 of Attachment A of Reference 4.7.

2.7 The RWST volume per foot of height is 8351.6 gallons per foot per Section 3 of Attachment A of Reference 4.7.

2.8 The flooded area of the containment floor conservatively used to minimize the containment flood height is 12114 ft^2 in Section 2.3.3 of Reference 4.8. With this area, the volume per foot of height of the containment floor is 90618.8 gallons per foot (12114 ft^2 * 7.4805 gal/ft^3 = 90618.8 gal/ft).

2.9 The following flow rates are to be used in the analysis of the back flow from the RWST to the containment sumps per Reference 4.5.

RCP Seal Injection Flow = 80 gpm for two CV pumps
CV Miniflow Rate = 65 gpm for each CV pump
Safety Injection Miniflow Rate = 30 gpm for each SI pump

2.10 The B train containment sump isolation valve, 1SI8811B, was determined to open 34.34 percent during surveillance testing per page 3 of Reference 4.9. The C_v of the valve at this position is conservatively determined to be 6000 using the C_v versus percent open graph from page 9 of Reference 4.9. The C_v is maximized for this analysis to conservatively maximize back flow to the sump. Note that the C_v used herein is greater (6000 vs. 5000) than that chosen in Reference 4.9 where a minimum C_v was conservative.

2.11 The A train containment sump isolation valve, 1SI8811A, was determined to open 29.1 percent during surveillance testing per page 3 of Reference 4.10. The C_v of the valve at this position is conservatively determined to be 5000 using the C_v versus percent open graph from page 9 of Reference 4.10. The C_v is maximized for this analysis to conservatively maximize back flow to the sump. Note that the C_v used herein is greater (5000 vs. 4000) than that chosen in Reference 4.10 where a minimum C_v was conservative.

2.12 The primary system pressure, containment pressure, and initial sump water level for each of the four subject LOCA scenarios are provided in Reference 4.6 and documented in Table 2-4.

Table 2-4: LOCA Scenario Boundary Conditions

	Primary System Pressure (psia)	Containment Pressure (psia)	Containment Water Level[1] (feet)
5.2 Inch LOCA at LO-2 Alarm	29	19.2	2
5.2 Inch LOCA After Six Minutes	28	19.1	-
2 Inch LOCA at LO-2 Alarm	115	18.8	1.5
2 Inch LOCA After Six Minutes	111	18.7	-
0.86 Inch LOCA at LO-2 Alarm	835	17.3	1.3
0.86 Inch LOCA After Six Minutes	835	17.3	-
Bleed & Feed at LO-2 Alarm	211	25.7	2
Bleed & Feed After Six Minutes	211	25.6	-

Note 1: The containment water level is the water level above the containment floor. From Section 6.6.1 of Reference 4.1, the containment floor is at elevation 377.0 feet while the containment sump piping is at an elevation of 368.2 feet. Therefore, the level input into PIPE-FLO for the containment sumps is 8.8 feet (377-368.2=8.8) greater than the level shown in Table 2-4.

3.0 Assumptions

3.1 It is assumed that there has been no change in pump performance or system hydraulic resistance since the last flow balance and pump tests. This is consistant with Assumption 3.3.1 of Reference 4.1

3.2 The assumptions found in Reference 4.1 that were used to create the hydraulic model are also assumed in this evaluation.

3.3 It is assumed that the change in density due to the range of RWST temperatures and boron concentrations present during the A1R14 flow balance tests has negligible impact on the determination of the throttle valve C_vs. Consequently, Equation 1 does not account for the density ratio between actual and standard water temperatures.

4.0 References

4.1 BYR06-029 / BRW-06-0016-M, Revision 3, SI/RHR/CS/CV System Hydraulic Analysis In Support of GSI-191.

4.2 DIT-BRW-2009-0078, Revision 0, dated 11-30-09, and Rev. 1, dated 12-9-09, see Attachment A.

4.3 PIPE-FLO Version 8, Engineered Software Incorporated (S&L Program No. 03.7.100-8.0).

4.4 DIT-BRW-2009-0079, Revision 0, dated 12-4-09, see Attachment B.

4.5 DIT-BRW-2009-0080, Revision 0, dated 12-7-09, see Attachment C.

4.6 DIT-BRW-2009-0082, Revision 0, dated 12-8-09, see Attachment D.

4.7 SITH-1, Refueling Water Storage Tank (RWST) Level Setpoints, Major Revision 7, up to and including Minor Revision 7A.

4.8 SI-90-01, Minimum Containment Flood Level, Major Revision 9, up to and including Minor Rev. 9C.

4.9 EC#377204, Evaluate 1SI8811B Flow at Partial Opening.

4.10 EC#378112, Evaluate 1SI8811A Flow at Partial Opening.

5.0 Methodology

5.1 Determination of C_vs from A1R14

Four flow balance tests are done each refueling outage at Braidwood. Two of these are the CV to cold leg and the SI to cold leg tests. The results of these tests include the flow rate through each injection leg (A-D), the pump suction and discharge pressures, and the seal injection or miniflow flow rates if any. The results from the most recently completed refueling outage at Braidwood Unit 1, A1R14, are shown in Input 2.2.

To determine the C_vs of the throttle valves as they were set in A1R14, the results of the flow balance tests are used as inputs into modified versions of the corresponding flow balance test scenario models from Reference 4.1. Specifically, the pump suction and discharge pressures are set in the model for the pumps in operation during that test, the flow rate through each injection leg is set at a control valve representing the throttle valve for each leg, and the seal injection or miniflow flow rates are set as boundary condition demands.

One of the outputs from the flow balance test model is the pressure drop across each throttle valve needed to establish the flow measured in that test. These throttle valve pressure drops can be used in conjunction with their flow rates and Equation 1 to determine each of their C_vs.

$$C_v = \frac{Q}{\sqrt{\Delta P}} \qquad \text{Equation 1}$$

where: C_v = valve flow coefficient
Q = the valve flow (gpm)
ΔP = the valve pressure drop (psi)

5.2 Modification of Vendor Pump Curves

To account for pump degradation or enhancement, the vendor curves for the RH, SI, and CV pumps (Input 2.4) are modified to agree with the latest ASME pump test results (Input 2.3). This is done by multiplying the pump curve developed head by a factor until it equals the developed head measured in the ASME test at the tested flow rate.

5.3 Back Flow to the Containment Sumps From the RWST

The rate of flow from the RWST to the Containment Sumps is calculated for four LOCA scenarios using the hydraulic model developed in Reference 4.1. The back flow occurs during the transition from injection to recirculation mode when the sump isolation valves (1SI8811A/B) stall in a partially open position. The open flow paths are the injection mode paths from the RWST through the RH, SI, and CV pumps to the cold legs as documented in Reference 4.4 with the addition of the back flow path through 1SI8811A/B to the containment sumps. The analyzed back flow scenarios begin when the RWST reaches the LO-2 level and end six minutes later. The boundary conditions which are changed for each scenario are the primary system pressure, the containment pressure, and the initial containment sump water level from Input 2.12. After six minutes, the RWST and containment sump water levels are iteratively adjusted using the average calculated flow rate over the six minute duration and their volume versus level relations documented in Inputs 2.7 and 2.8. The use of the average flow over the six minute duration is justified by running a case at three minutes for one of the LOCA scenarios and comparing the three minute results to the average from the six minute duration. The C_vs of the partially open 1SI8811A/B valves are taken from Inputs 2.10 and 2.11.

5.4 Sensitivity to Inputs

In response to a request from Exelon, the sensitivity of the back flow rate to the containment sumps to changes in six inputs will be determined by running a set of sensitivity cases. These PIPE-FLO cases will be created by starting with the LOCA scenario with the largest break size and modifying one parameter per case.

5.5 Identification of Software

The hydraulic models are created using PIPE-FLO Ver. 8, Reference 4.3. PIPE-FLO is a computer code designed to perform steady-state analyses of single phase hydraulic systems.

Sargent & Lundy L.L.C. Software Configuration Control Details:

Controlled File Detail for PIPE-FLO (S&L Program No. 03.7.100-8.0)
Type: 2 Status: O Effective Date: 09-21-2004

Controlled File Path: \\SNLVS5\SYS3\OPS$\PIP10080\

All computer runs are made on Sargent and Lundy L.L.C. PC No. ZD5955.

5.6 Acceptance Criteria

The results of this evaluation are used as input into other evaluations and calculations. As such, there are no acceptance criteria for this evaluation.

6.0 Calculations

6.1 C_vs from A1R14

Two flow balance test scenarios from Reference 4.1 are modified as described in Section 5.1 to determine the throttle valve C_vs that correspond to the measurements taken in A1R14. Since the C_vs of the throttle valves are independent of the pump used in the flow balance test, either the A train or the B train test data can be used herein. However, to be consistent with Reference 4.1, the SI A and CV A pump suction and discharge pressures were used in the SI to cold leg and CV to cold leg flow balance test models. The valve flow rates, valve pressure drops, and valve C_vs calculated using Equation 1 are shown in Tables 6-1 through 6-2. The PIPE-FLO output for these runs can be found in Attachment E.

Table 6-1: SI to Cold Leg – Ref. 4.1 Case 1A

Loop	Flow (gpm)	Pressure Drop (psi)	C_v
A	149.5	687.4	5.702
B	149.3	671.6	5.761
C	149.6	714.1	5.598
D	150.04	712.7	5.620

Table 6-2: CV to Cold Leg – Ref. 4.1 Case 4A

Loop	Flow (gpm)	Pressure Drop (psi)	C_v
A	116.5	540.4	5.012
B	116	462.2	5.396
C	116.1	551.3	4.945
D	116	595.2	4.755

6.2 Modified Pump Curves

The vendor pump curves are modified to match the latest ASME pump test results in Attachment G. The resulting modified pump curves that are used in the hydraulic models described in the next section can be found in Table 6-3.

Table 6-3: Pump Curves Modified to Match Latest ASME Pump Test Data

RH A		RH B		SI A		SI B		CV A		CV B	
Flow (gpm)	Head (ft)	Flow (gpm)	Head (ft)	Flow (gpm)	Head (ft)	Flow (gpm)	Head (ft)	Flow (gpm)	Head (ft)	Flow (gpm)	Head (ft)
0	437.9	0	452.8	0	3509.2	0	3391.8	0	6039.3	0	6087.2
1000	423.5	1000	429.9	50	3489.6	50	3372.9	100	5987.7	100	5985.7
2000	399.4	2000	398.1	150	3430.8	150	3297.6	175	5832.9	175	5782.8
2500	385.0	2500	388.1	250	3293.5	250	3165.7	250	5471.5	250	5377.0
3000	375.4	3000	378.2	350	3038.7	350	2977.2	325	4852.1	325	4666.8
3500	360.9	3500	363.2	450	2705.4	450	2685.2	400	4026.2	400	3855.2
4000	336.9	4000	343.3	550	2323.1	550	2308.3	475	2993.9	475	2840.7
4500	308.0	4500	313.5	655	1862.4	655	1903.2	550	1806.6	550	1623.3
5000	283.9	5000	278.6								

6.3 Back Flow to the Containment Sumps From the RWST

Two PIPE-FLO cases are run for each of the four LOCA scenarios, one when the RWST is at the LO-2 level, the other six minutes later. An additional case is run for the 5.2 inch LOCA case at three minutes. The output from these files can be found in Attachment F. The flow paths for the 5.2 and 2 inch LOCA scenarios with all SI, CV, and RH pumps injecting are as documented in Attachment B. The flow paths in the 0.86 inch LOCA scenario has been modified to reflect the inability of the RH pumps to inject to primary system pressure of 835 psia. Similarly, the flow paths in the Bleed and Feed LOCA scenario have been modified to reflect no injection by the RH pumps. In this scenario, the primary system pressure of 211 psia is below the potential discharge head of the RH pumps which indicates a possibility of injection. However, the corresponding pump flow rate is low enough for the RH miniflow valves (RH610 and RH611) to open. Once the RH miniflow valves are open, the pump flow rate increases and its developed head decreases until injection is no longer possible.

The RWST and containment sump water levels are iteratively calculated using the average RWST flow rate over the six minute duration from Table 7-1 and Inputs 2.6, 2.7, and 2.8. For example in the last iteration, the six minute RWST level in the 5.2 inch LOCA scenario is 427.3 ft – (13091 gpm * 6 min) / 8351.6 gal/ft = 417.9 feet and the six minute containment sump water level in the 5.2 inch LOCA scenario is 2 ft + (13091 gpm * 6 min) / 90618.8 gal/ft = 2.9 feet. The use of the average RWST flow rate to adjust the water levels is justified with a PIPE-FLO case run at three minutes for the 5.2 inch LOCA scenario. As can be seen in Table 7-1, the calculated RWST flow at three minutes is only 9 gpm different from the average calculated for the six minute duration.

6.4 Sensitivity to Inputs

In response to a request from Exelon, six cases are run to determine the sensitivity of the back flow rate to the containment sumps to a set of inputs. The 5.2 inch LOCA scenario with the RWST at the LO-2 level is used as the base case. The six inputs that are varied are:

- RWST Level – The RWST level is increased by one foot.
- Primary System Pressure – The primary system pressure is increased by 10%
- Containment Pressure – The containment pressure is decreased by 10%
- C_v of valves 1SI8811A/B – The C_vs of the partially open containment sump isolation valves are increased by 1000
- ECCS pump curves – The pump curves of the SI, CV, and RH pumps are artificially decreased by 3%. The pump curves in this case are adjusted without also repeating the flow balance test cases described in Section 5.1. This represents a scenario which is outside of the analyzed design basis as defined in Reference 4.1. See Assumption 3.1 of this evaluation and Assumption 3.3.1 in Reference 4.1.
- Pipe Resistance – The resistance of the most resistive pipe segments between the RWST and the containment sumps, 1SI82AA/BA and 1SI81AB/BB, are both decreased by eliminating one elbow.

The PIPE-FLO output can be found in Attachment H. The 3% degraded pump curves are in Attachment I.

7.0 Results

The back flow rates from the RWST to the Containment Sumps for the four LOCA scenarios can be found in Tables 7-1 through 7-4.

Table 7-1: 5.2 Inch LOCA

	At Lo-2 Alarm	After Three Minutes	After Six Minutes	Average Over Six Minutes
RWST Level (feet)	427.3	422.4	417.9	
Primary System Pressure (psia)	29	28.5	28	
Containment Pressure (psia)	19.2	19.15	19.1	
Sump Water Level (feet)	2	2.4	2.9	
RWST Flow (gpm)	13959	13100	12223	13091
Sump A Back Flow (gpm)	2933	2509	2069	2501
Sump B Back Flow (gpm)	3180	2738	2291	2735.5
Total Sump Flow (gpm)	6113	5247	4360	5236.5

Table 7-2: 2 Inch LOCA

	At Lo-2 Alarm	After Six Minutes	Average Over Six Minutes
RWST Level (feet)	427.3	417.9	
Primary System Pressure (psia)	115	111	
Containment Pressure (psia)	18.8	18.7	
Sump Water Level (feet)	1.5	2.4	
RWST Flow (gpm)	13962	12279	13120.5
Sump A Back Flow (gpm)	3977	3105	3541
Sump B Back Flow (gpm)	4227	3311	3769
Total Sump Flow (gpm)	8204	6416	7310

Table 7-3: 0.86 Inch LOCA

	At Lo-2 Alarm	After Six Minutes	Average Over Six Minutes
RWST Level (feet)	427.3	418.0	
Primary System Pressure (psia)	835	835	
Containment Pressure (psia)	17.3	17.3	
Sump Water Level (feet)	1.3	2.2	
RWST Flow (gpm)	13740	12117	12928.5
Sump A Back Flow (gpm)	6171	5383	5777
Sump B Back Flow (gpm)	6530	5697	6113.5
Total Sump Flow (gpm)	12701	11080	11890.5

Table 7-4: Bleed and Feed LOCA

	At Lo-2 Alarm	After Six Minutes	Average Over Six Minutes
RWST Level (feet)	427.3	420.3	
Primary System Pressure (psia)	211	211	
Containment Pressure (psia)	25.7	25.6	
Sump Water Level (feet)	2	2.6	
RWST Flow (gpm)	10511	8858	9684.5
Sump A Back Flow (gpm)	4480	3677	4078.5
Sump B Back Flow (gpm)	4741	3892	4316.5
Total Sump Flow (gpm)	9221	7569	8395

7.1 Sensitivity to Inputs

The results to the sensitivity cases can be found in Table 7-5. The base case results for the 5.2 inch LOCA scenario with the RWST at LO-2 level are in Table 7-1.

Table 7-5: Sensitivity to Inputs

	RWST Level +1 foot	Primary System Pressure +10%	Containment Pressure -10%	1SI8811A/B C_v +1000	ECCS Pump Curve -3%[1]	Pipe Resistance - 1 elbow
RWST Level (feet)	428.3	427.3	427.3	427.3	427.3	427.3
Primary System Pressure (psia)	29	31.9	29	29	29	29
Containment Pressure (psia)	19.2	19.2	17.28	19.2	19.2	19.2
Sump Water Level (feet)	2	2	2	2	2	2
RWST Flow (gpm)	14115	13951	14644	13991	13936	14108
Sump A Back Flow (gpm)	3012	2961	3289	2953	2976	3006
Sump B Back Flow (gpm)	3257	3204	3544	3194	3224	3255
Total Sump Flow (gpm)	6269	6165	6833	6147	6200	6261
Sump Back Flow Increase Over Base Case (gpm)	156	52	720	34	87	148

1. Note that this case represents a scenario which is outside of the analyzed design basis as defined in Reference 4.1. See Section 6.4.

8.0 Attachments

Attachment A - DIT-BRW-2009-0078, Reference 4.2	A1-A3
Attachment B - DIT-BRW-2009-0079, Reference 4.4	B1-B15
Attachment C - DIT-BRW-2009-0080, Reference 4.5	C1-C1
Attachment D - DIT-BRW-2009-0082, Reference 4.6	D1-D1
Attachment E – PIPE-FLO Output – A1R14 FBT Cases	E1-E28
Attachment F – PIPE-FLO Output – Sump Back Flow Cases	F1-F126
Attachment G – Modified Pump Curves	G1-G6
Attachment H – PIPE-FLO Output – Sensitivity cases	H1-H60
Attachment I – 3% Degraded Pump Curves for Sensitivity Case	I1-I1

Design Information Transmittal

DIT # **DIT-BRW-2009-0078, Rev. 0** **Page 1 of 2**

Braidwood Units 1

To: R. Peterson

Organization: Sargent & Lundy Engineers

Address/Location: Chicago, IL

Status of Information: ☒ Verified ☐ Unverified

For Unverified DITs, include the Method and Schedule of Verification in the "Description of Information."

List Action Tracking # assigned for verification of "Unverified" information: NA

Description of Information: **This information is safety related**

This transmittal provides the following:

1. Results of the ECCS flow balance test to the Reactor Coolant System Cold Legs for the Braidwood Unit 1 Charging and Safety Injection Pumps during the A1R13 Refueling Outage.
2. Results from the latest ASME Group A Testing for the Braidwood Unit 1 Charging Pumps, Safety Injection Pumps and Residual Heat Removal Pumps

Purpose of Issuance: This data is to support the evaluation of the impact of the partial opening of valve 1SI8811B on the ECCS injection flows post accident.

Limitations: This information is applicable only to Braidwood U-1.

References (Source of Information):

As given in the body of this transmittal.

Reviewed: Giovanni Panici/ Giovanni Panici **Date:** 11-30-2009
Printed Name / Signature

Approved: J Gosnell/ James Gosnell **Date:** 11-30-09
Printed Name / Signature

Distribution: Original – NDIT File

A1R13 ECCS Flow Testing

	RCS Cold Leg Flow (gpm)				RCP Seal Inj. or Miniflow (gpm)	Pump Discharge P (psig)	Pump Suction P (psig)
Pump	**Loop A**	**Loop B**	**Loop C**	**Loop D**			
1A CV	116.5	116	116.1	116	80 (RCP seal)	840	18.4
1B CV	113.4	113.1	113.4	112.8	80 (RCP seal)	800	17.7
1A SI	149.5	149.3	149.6	150.04	32 (Miniflow)	832	20.2
1B SI	148.4	148.2	148.3	149.0	32 (Miniflow)	824	20.5

References:

1. Work Order #1224520 (1A and 1B CV Pumps)
2. Work Order #1224521 (1A and 1B SI Pumps)

ASME Group A Testing

Pump	Flow Rate (gpm)	Differential Pressure (psid)	Reference Work Order
1A CV	193	2490	01233429
1B CV	195	2459	01247868
1A SI	45	1513	01234771
1B SI	44.5	1462.5	01244058
1A RH	633.8	185.8	01243061
1B RH	596	190.3	01234770

Design Information Transmittal

DIT #	DIT-BRW-2009-0078, Rev. 1 Braidwood Units 1	**Page 1 of 1**

To: R. Peterson

Organization: Sargent & Lundy Engineers

Address/Location: Chicago, IL

Status of Information: ☒ Verified ☐ Unverified

For Unverified DITs, include the Method and Schedule of Verification in the "Description of Information."

List Action Tracking # assigned for verification of "Unverified" information: NA

Description of Information: **This information is safety related**

This transmittal complements transmittal #DIT-BRW-2009-0078 Revision 0.

Revision 0 to #DIT-BRW-2009-0078 noted incorrectly that the ECCS flow balance test data is from Refueling Outage A1R13.

The ECCS flow balance test data that is provided in DIT-BRW-2009-0078 Revision 0 was taken during testing that was performed during Refueling Outage A1R14.

Purpose of Issuance: This data is to support the evaluation of the impact of the partial opening of valve 1SI8811B on the ECCS injection flows post accident.

Limitations: This information is applicable only to Braidwood U-1.

References (Source of Information):
See #DIT-BRW-2009-0078 Revision 0.

Reviewed: Giovanni Panici/ Giovanni Panici **Date:** 12-9-09
Printed Name / Signature

Approved: James Gosnell/ James Gosnell **Date:** 12-9-09
Printed Name / Signature

Distribution: Original – NDIT File

Design Information Transmittal

DIT # DIT-BRW-2009-0079 Rev. 0 **Page 1 of 15**
Braidwood Unit 1

To: Robert Peterson

Organization: Sargent & Lundy

Address/Location: via email

Status of Information: ☒ Verified ☐ Unverified

For Unverified DITs, include the Method and Schedule of Verification in the "Description of Information."
List Action Tracking # assigned for verification of "Unverified" information: N/A

Description of Information: **This information is safety related**

The information provided in this transmittal provides marked up Piping and Instrument Diagrams to show the ECCS injection flow paths that will be in service during the injection phase of a LOCA. These marked drawings do not include ancillary paths such as:

1. Seal injection flow that will take RWST water and inject into the RCP seals (RCS) during the 6 minute period under consideration.
2. Normal charging flow path which is isolated during ECCS injection.
3. CV mini flow which is isolated at the LO-2.
4. RH mini flow that is recycled back to the RH pump suction after going through the Hx.
5. SI mini flow continues to return some water to the RWST during the 6 minute interval being analyzed.

Purpose of Issuance: Provide documented input for analysis to determine how much water flows from the RWST to the ECCS sumps in containment during a postulated 6 minute interval when the 1SI8811A/B and 1SI8812A/B are all open.

Limitations: This information is applicable to Braidwood, Unit 1.

References (Source of Information):
As given on the attached pages.

Prepared : Ken Radke [signature] Printed Name / Signature **Date:** 12/4/09

Approved (Br): James Gosnell/ [signature] Printed Name / Signature **Date:** 12-4-09

Distribution: Original – NDIT File

Date: 11/25/2009

2009-13491
Revision 0

Attachment B

ISI/SPT COLOR CODED DRAWINGS

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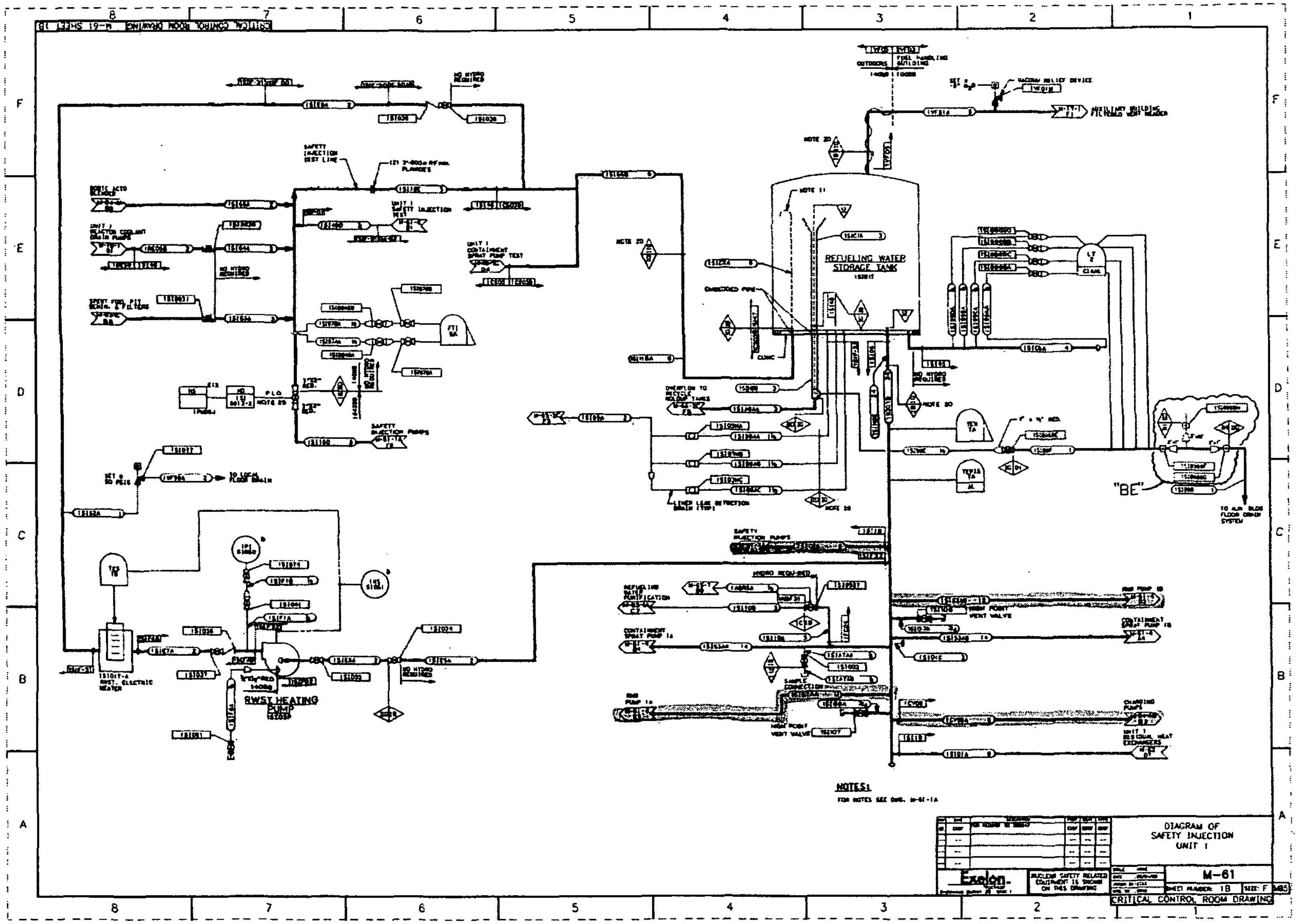
Page B2 of B15



le: C:\Documents and Settings\BRWVR\Documentum\Viewed\M-61, Sheet 1B, Rev BE, DIAGRAM OF SAFETY INJECTION UNIT 1 (CRITICAL CONTROL ROOM DRAWING)

Attachment B

ISI/SPT COLOR CODED DRAWINGS

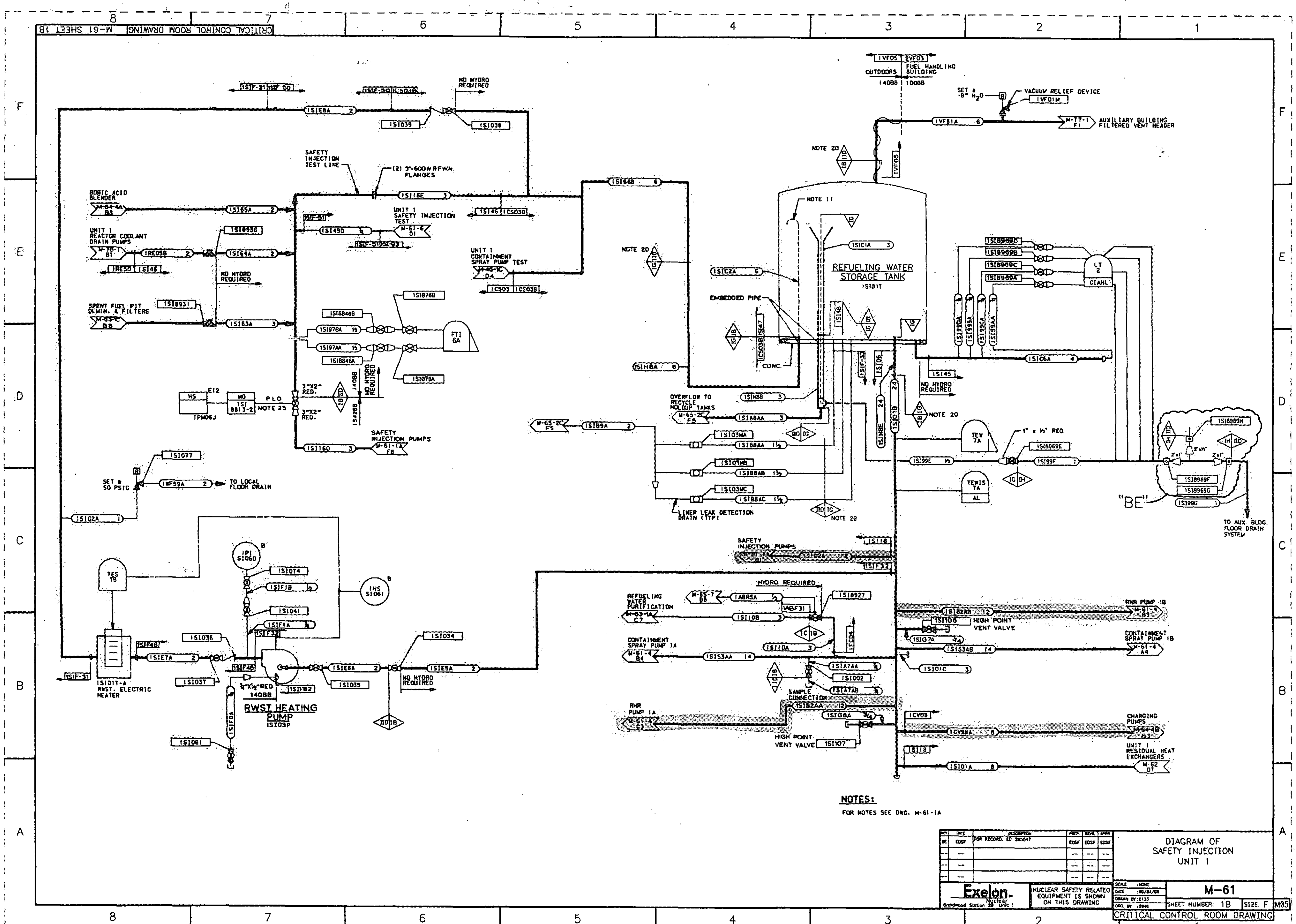


DIAGRAM OF SAFETY INJECTION UNIT 1

Exelon Nuclear — Braidwood Station — Unit: 1

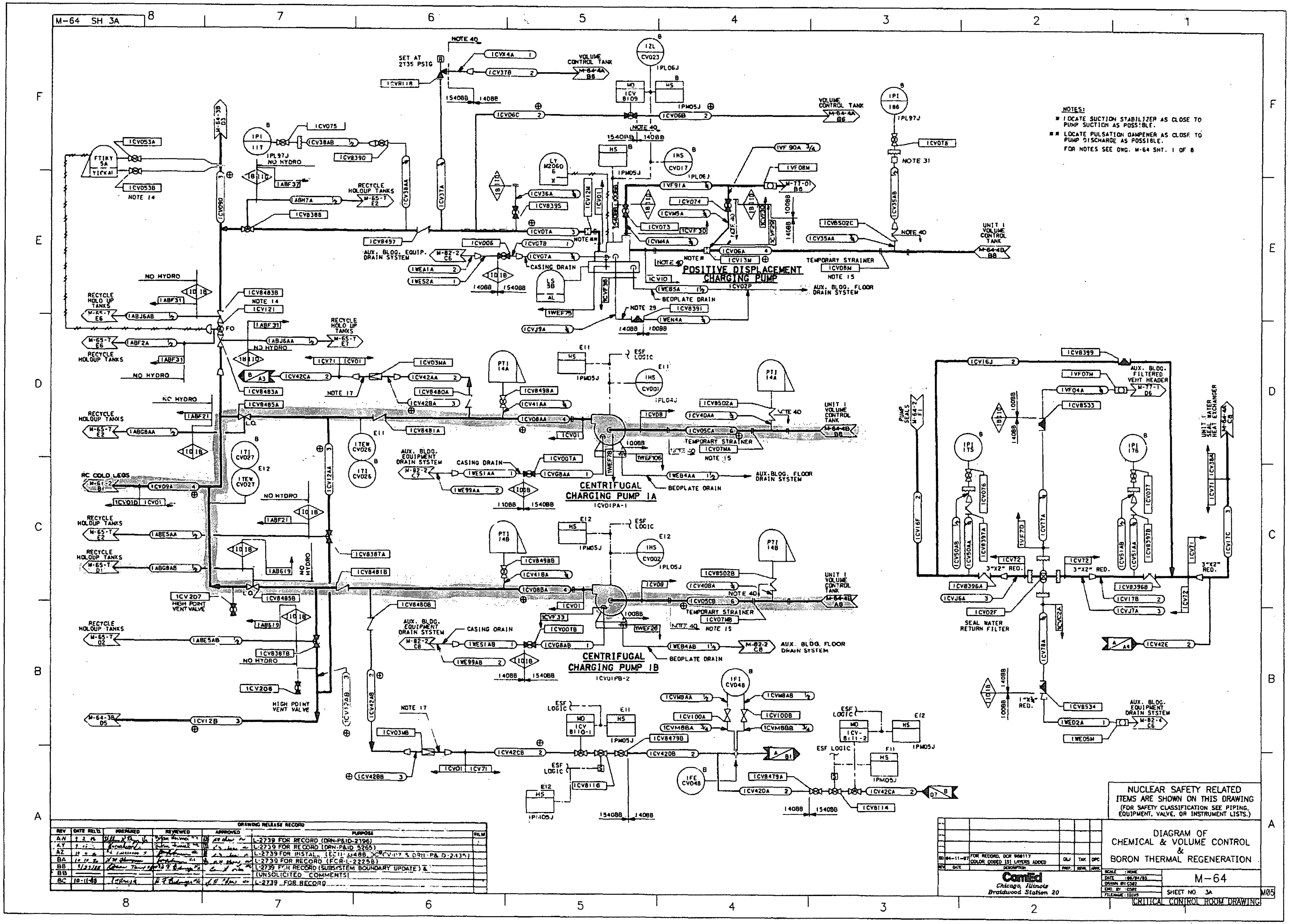
NUCLEAR SAFETY RELATED EQUIPMENT IS SHOWN ON THIS DRAWING

M-61 — SHEET NUMBER: 1B — SIZE: F — M05

CRITICAL CONTROL ROOM DRAWING

Attachment B

ISI/SPT COLOR CODED DRAWINGS



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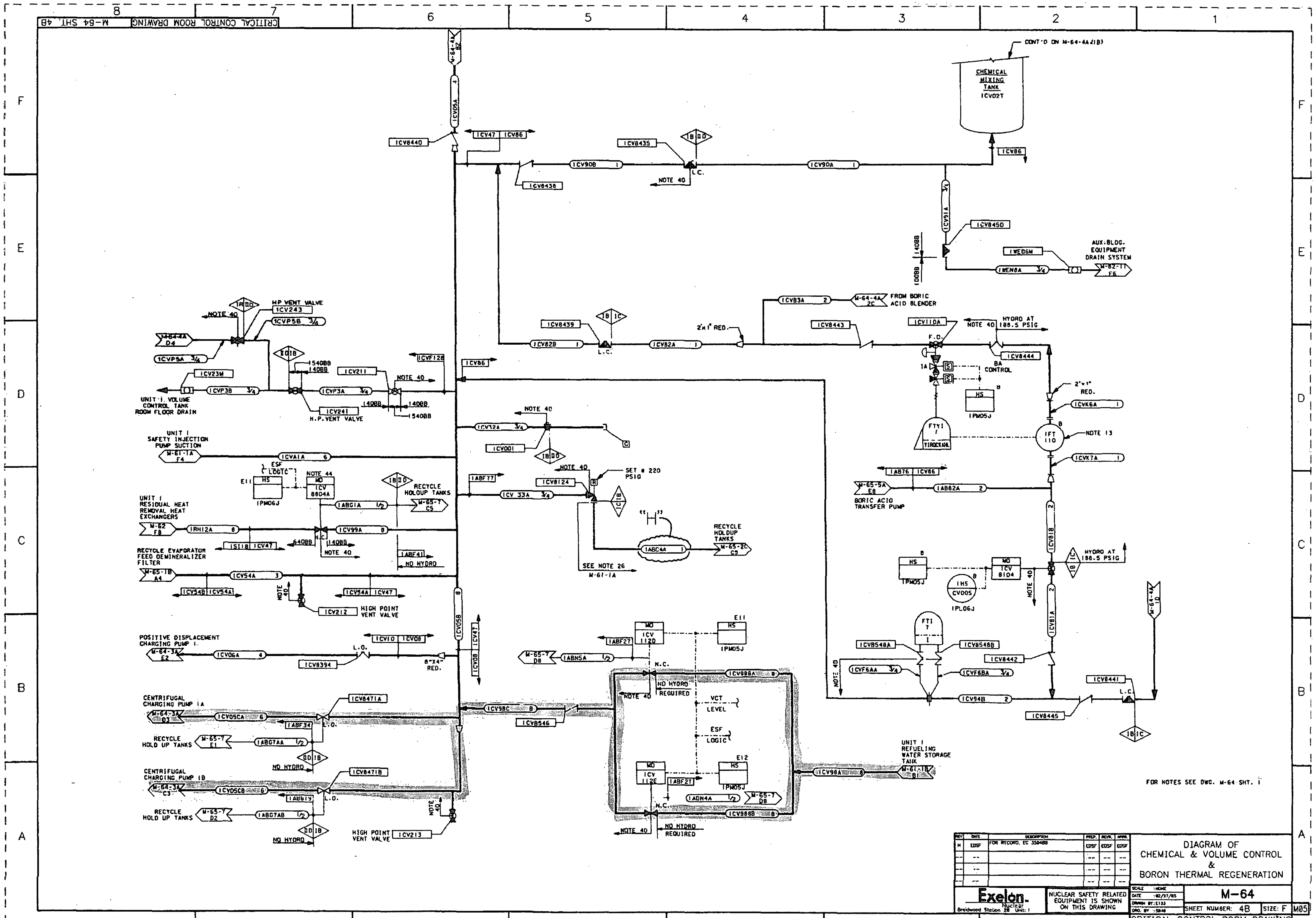

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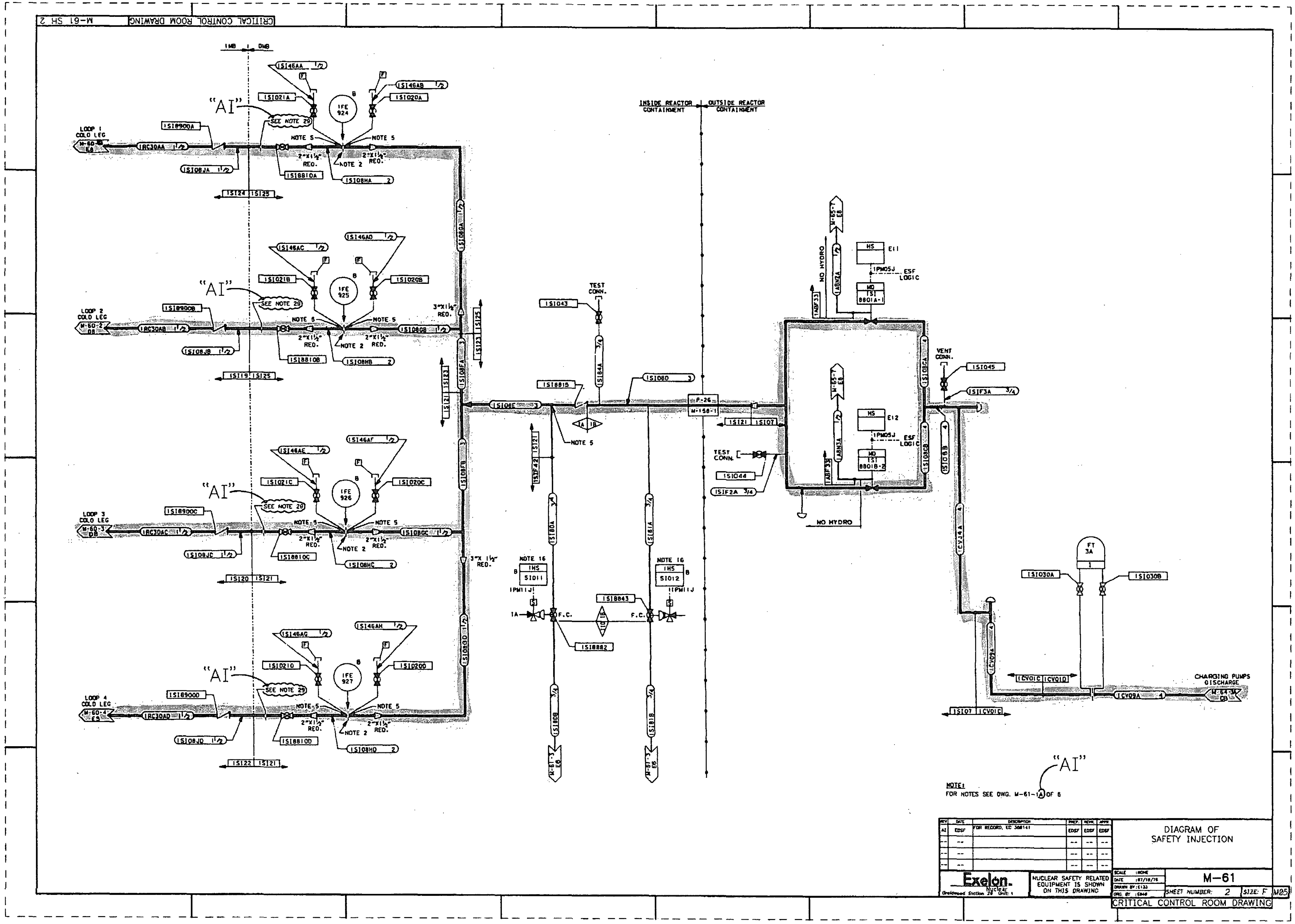

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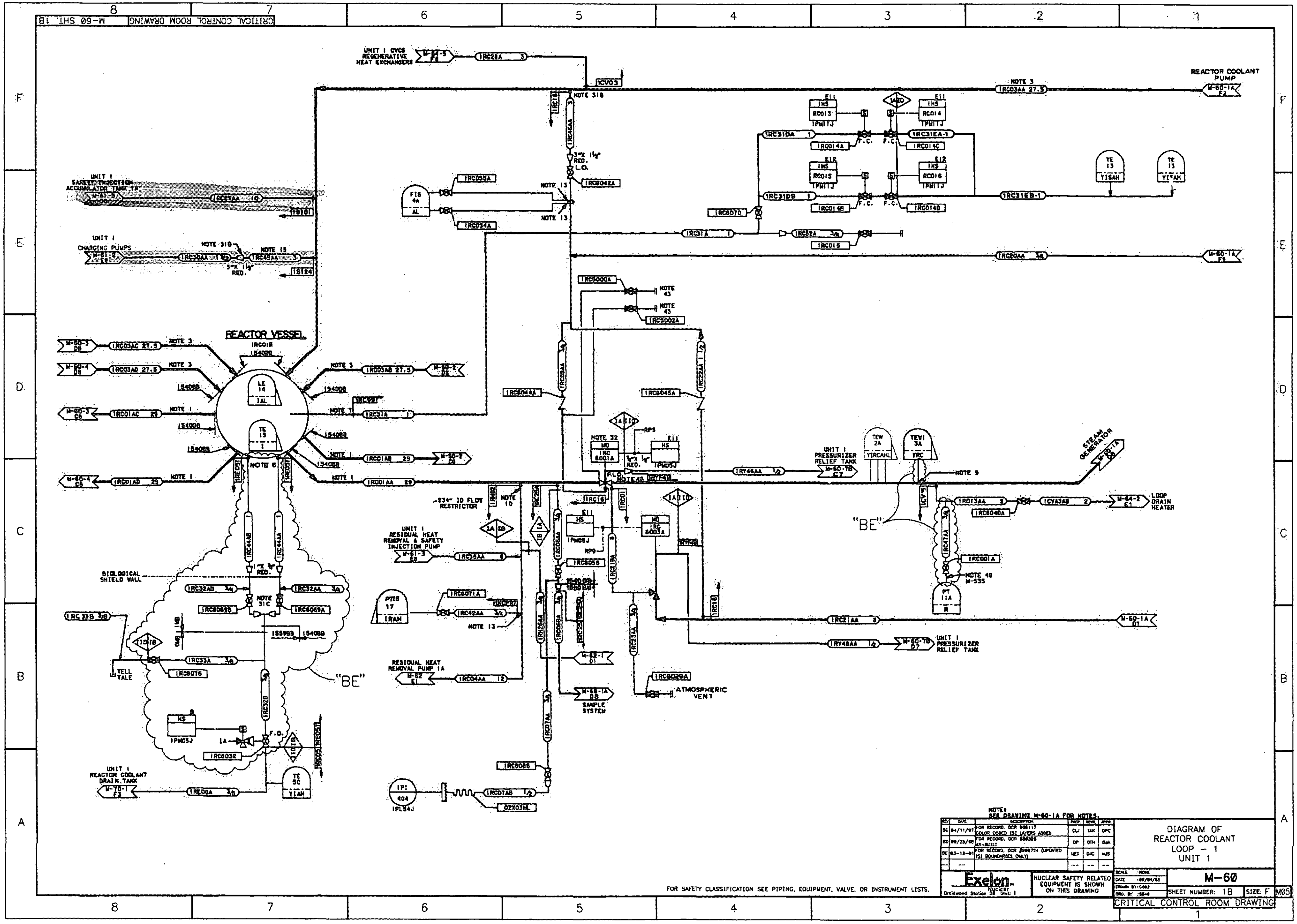

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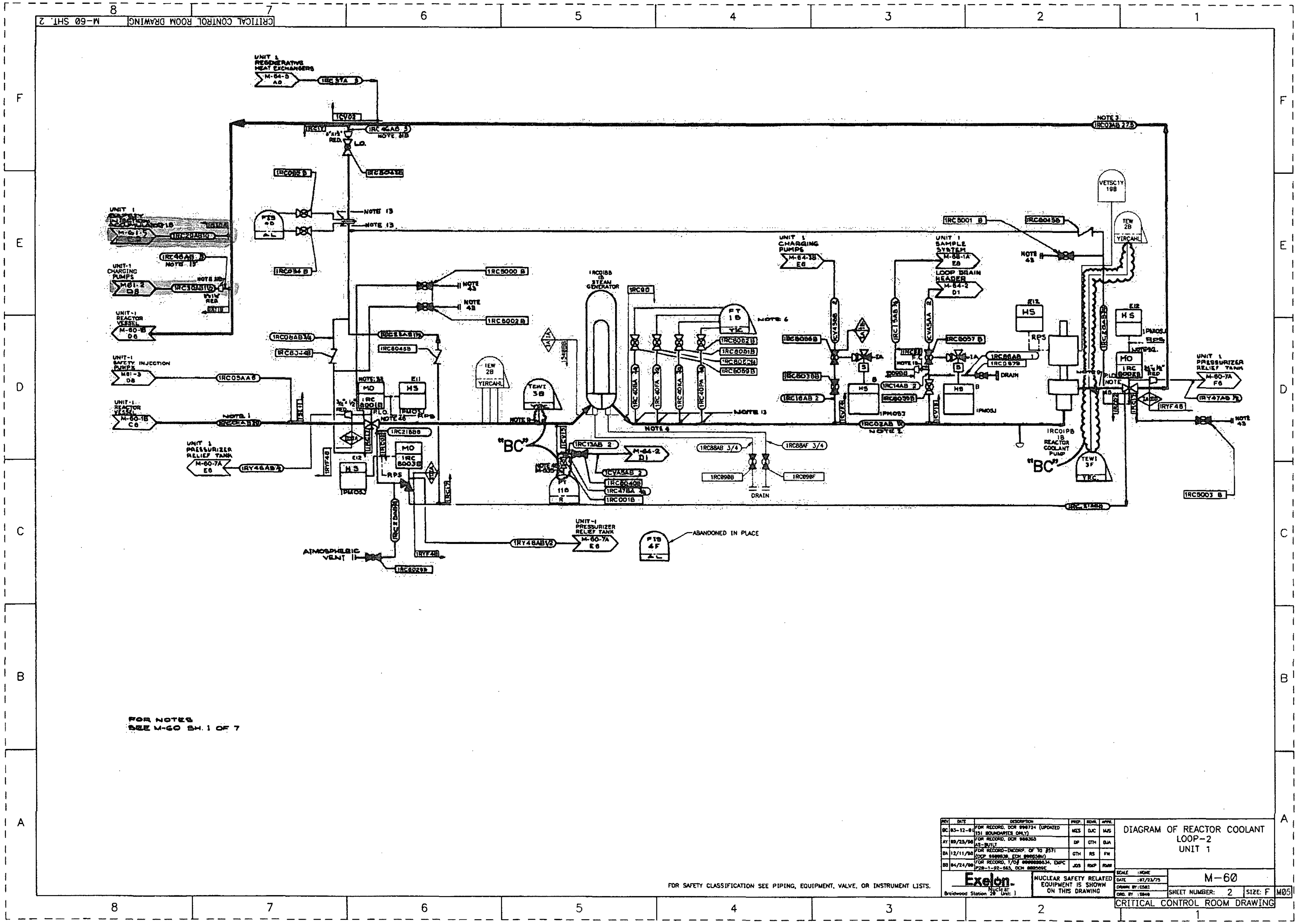

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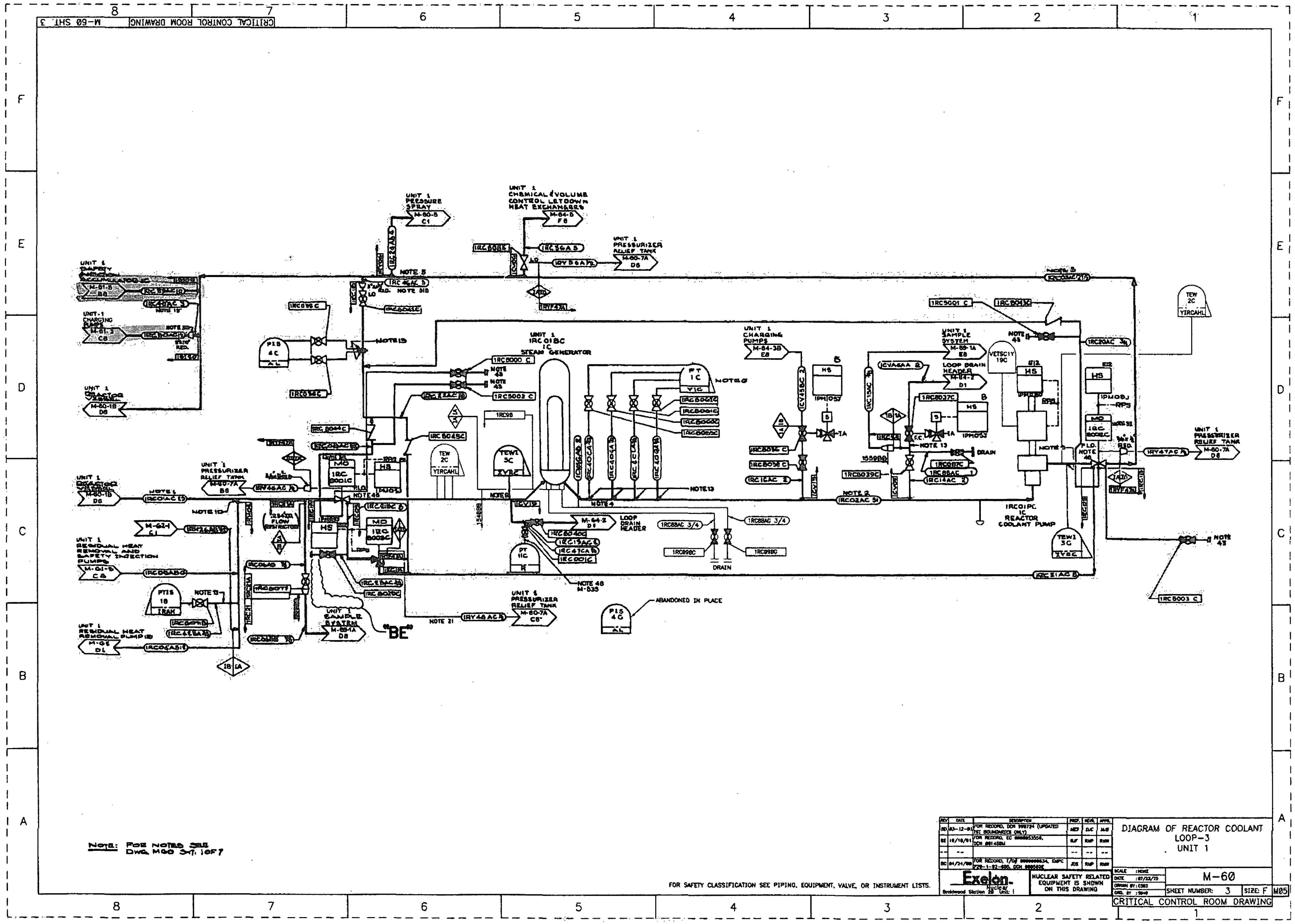

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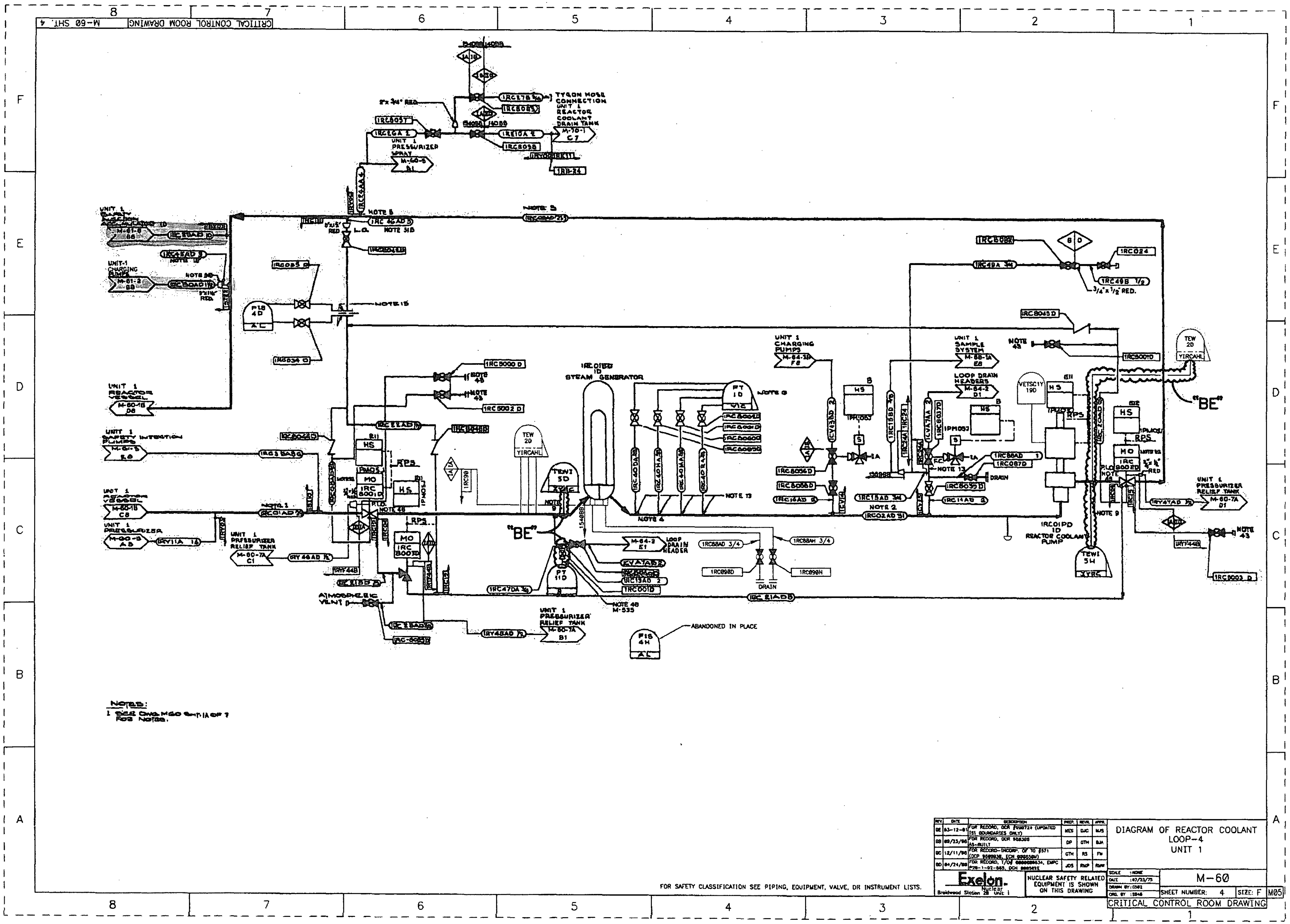

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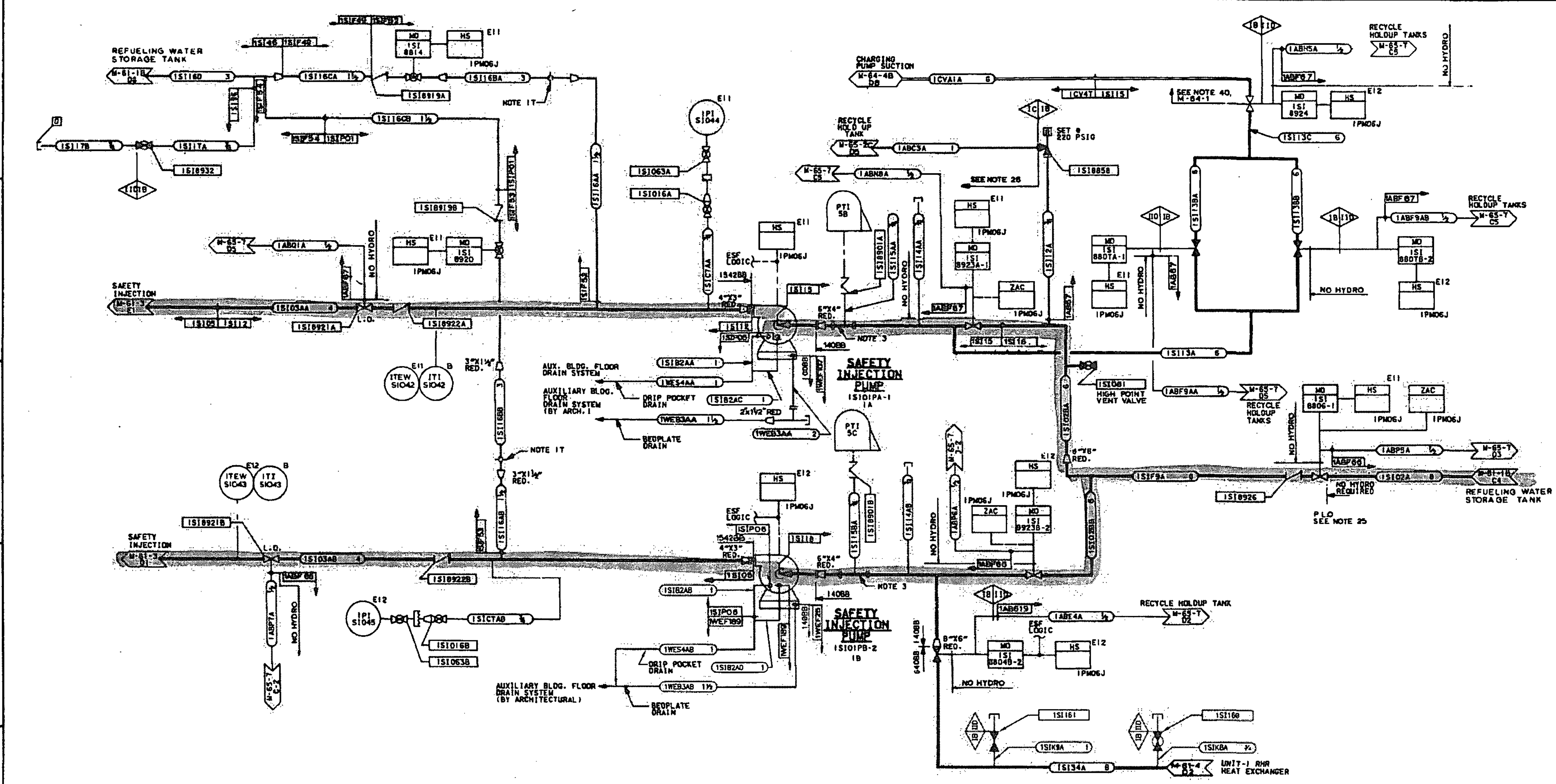
ISI/SPT COLOR CODED DRAWINGS

CRITICAL CONTROL ROOM DRAWING M-61 SHT.1A



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NOTES:

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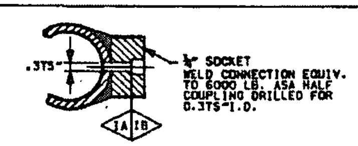

DEPENDING ON THE SIZE OF THE PROCESS LINE, NOTE 48,49 OR 50 ON DWG. 535 MAY BE SUBSTITUTED FOR THE ABOVE DETAIL.

2. FLOW METERING ORIFICE TO VERIFY FLOW DURING PREOPERATIONAL TESTING.
3. SPOOL PIECE FOR INSTALLATION OF STRAINER DURING PREOPERATIONAL FLUSHING. LOCATE AS CLOSE TO PUMP AS POSSIBLE. TEMPORARY STRAINERS HAVE SPECIALITY ITEM NUMBERS. 1SI02MA, 1SI02MB
4. LOCATE FLOW INDICATOR OUTSIDE OF SAFETY INJECTION PUMP ROOMS.
5. FLOW RESTRICTION FOR SAFETY CLASS 1A TO 1B TRANSITION TYPICAL FLOW RESTRICTOR.
6. PIPING SCHEDULE 40 MUST BE ADHERED TO DUE TO SAFETY ANALYSIS FLOW REQUIREMENT.
7. LOCATE VALVES AS CLOSE TOGETHER AS POSSIBLE.
8. LOCATE CONNECTION CLOSE TO TANK.
9. PIPE FRICATION TAPS FOR FLOW MEASUREMENT LOCATE TAPS 2'-0" APART.
10. HEAT TRACE LINE ALL THE WAY TO TANK.
11. PIPE MUST BE ABOVE NORMAL WATER LEVEL.
12. CONTAINMENT PENETRATION NOT REQUIRED. GUARD PIPE BURIED IN CONCRETE AND WELDED AT EITHER END TO SUMP LINER AND VALVE ENCLOSED.
13. VALVES INTERLOCKED TO PREVENT OPENING OF SI8811 UNLESS SI8812 IS CLOSED
14. A/E SUPPLY.
15. LOOP TO EXTEND 12" BELOW AND ABOVE OVERFLOW NOZZLE. TOTAL LINE LENGTH INCLUDING LOOP TO BE AS SHORT AS POSSIBLE.
16. BACK PANEL MOUNTED.
17. MINI FLOW ORIFICE SUPPLIED BY PUMP VENDOR.
18. LOCATE CONNECTION CLOSE TO CORRESPONDING BORON INJECTION TANK ISOLATION VALVES.
19. BLIND FLANGES NORMALLY INSTALLED. SPOOL PIECES TO BE INSTALLED DURING ACCUMULATOR DRAINING. ONLY AFTER DEPRESSURIZATION.
20. CLASS AND DESIGN TABLE CHANGE TO BE MADE AT TANK NOZZLE.
21. VALVE IS PER PIPING DESIGN TABLE 34088.
22. SEE DWG. M-82-2 FOR SAFETY INJECTION PUMP VENT PIPING.
23. ¼" SCH. 80 PIPE
24. BORON INJECTION TANK 1SI02T IS NO LONGER REQ'D BUT IS TO REMAIN INSTALLED.
25. POWER LOCK OUT SHALL BE IN EFFECT DURING ALL NORMAL OPERATING MODES POWER SHALL BE RECONNECTED ONLY WHEN SUCH POWER RESTORATION IS SPECIFICALLY ALLOWED BY PLANT OPERATING PROCEDURES OR TECHNICAL SPECIFICATIONS
26. HYDROTEST SHALL BE BASED ON A DESIGN PRESSURE OF 150 PSIG.
27. PIPING AND COMPONENTS BETWEEN ISOLATION VALVES 1SI8802A, 1SI8802B, 1SI8835 AND CHECK VALVES 1SI8922A, 1SI8922B ARE QUALIFIED FOR DESIGN PRESSURE OF 1825 PSIG.
28. LEAK OFF LINE HAS BEEN CUT & CAPPED.
29. A FULL BORE ORIFICE PLATE IS INSTALLED AT THIS LOCATION. SEE ISOMETRIC DRAWINGS FOR ADDITIONAL DETAILS.

"BG"

REV	DATE	DESCRIPTION	PREP.	REVW.	APPR.
BG	EDSF	FOR RECORD, EC 368141	EDSF	EDSF	EDSF
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Exelon Nuclear
Braidwood Station 2B Unit: 1

NUCLEAR SAFETY RELATED EQUIPMENT IS SHOWN ON THIS DRAWING

DIAGRAM OF SAFETY INJECTION UNIT 1

SCALE : NONE
DATE : 08/04/85
DRAWN BY : E133
DRG. BY : 5846

M-61
SHEET NUMBER: 1A SIZE: F M05
CRITICAL CONTROL ROOM DRAWING

Date: 11/25/2009

2009-13491
Revision 0

Attachment B

ISI/SPT COLOR CODED DRAWINGS

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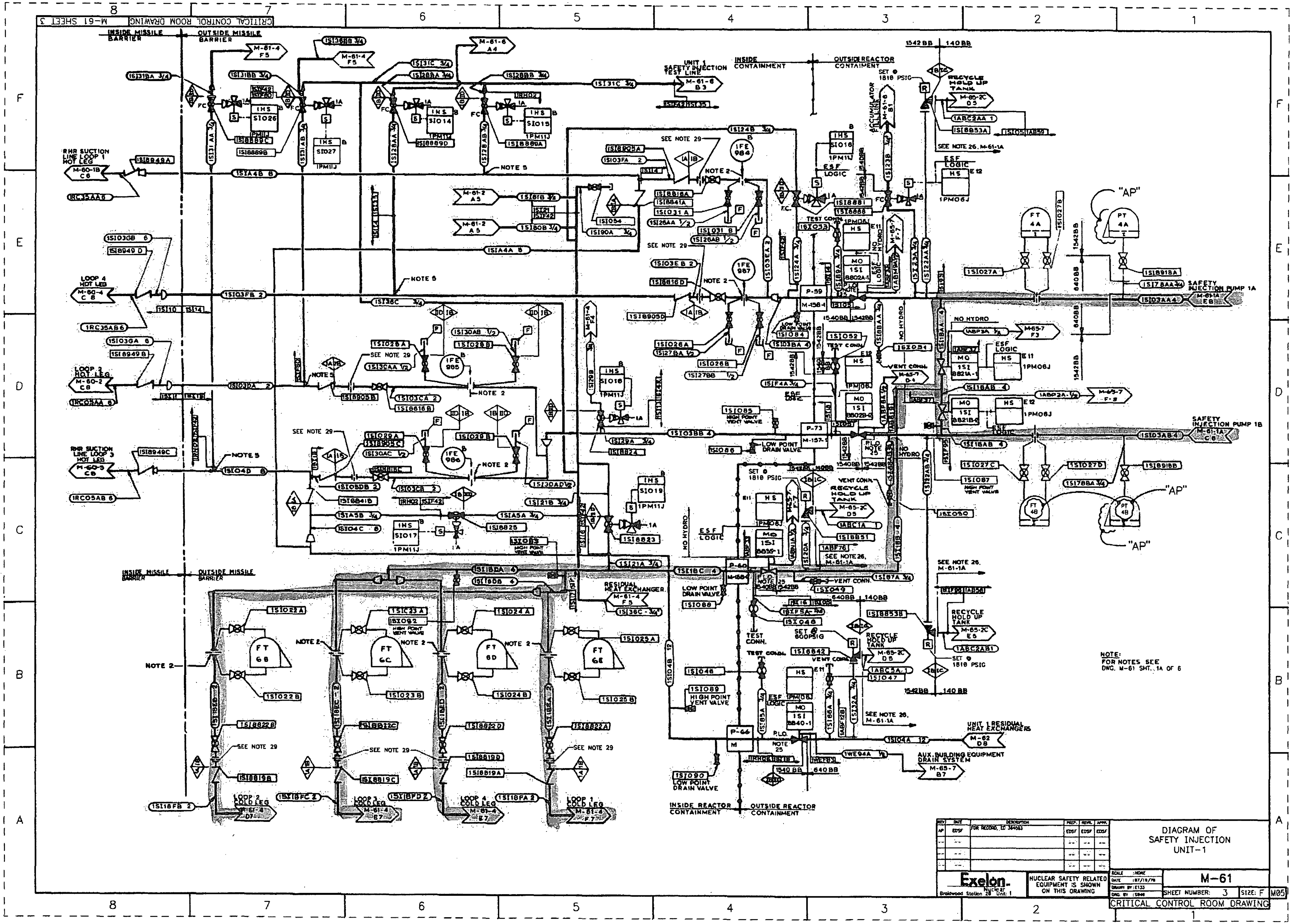
Page B11 of B15



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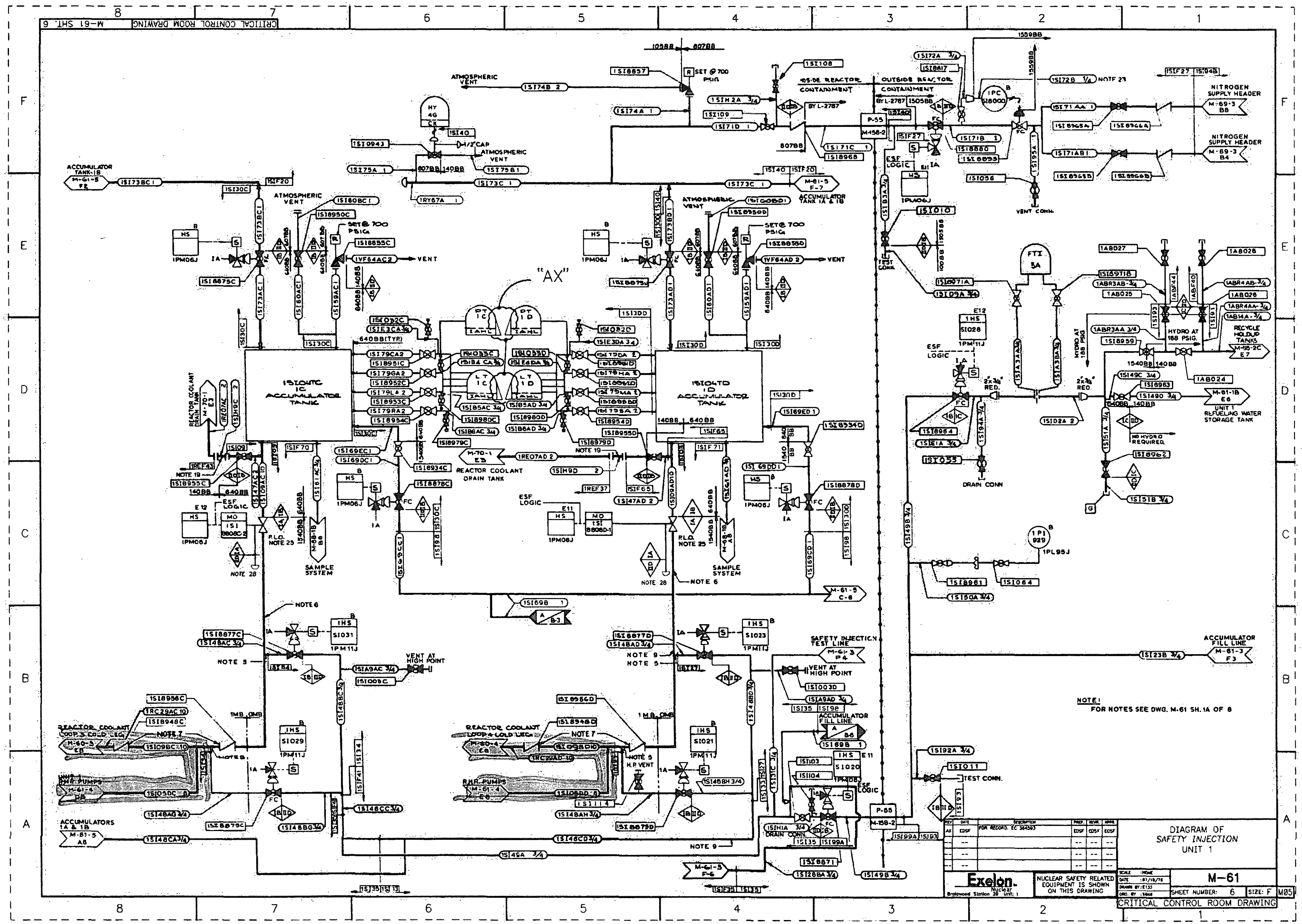
ISI/SPT COLOR CODED DRAWINGS



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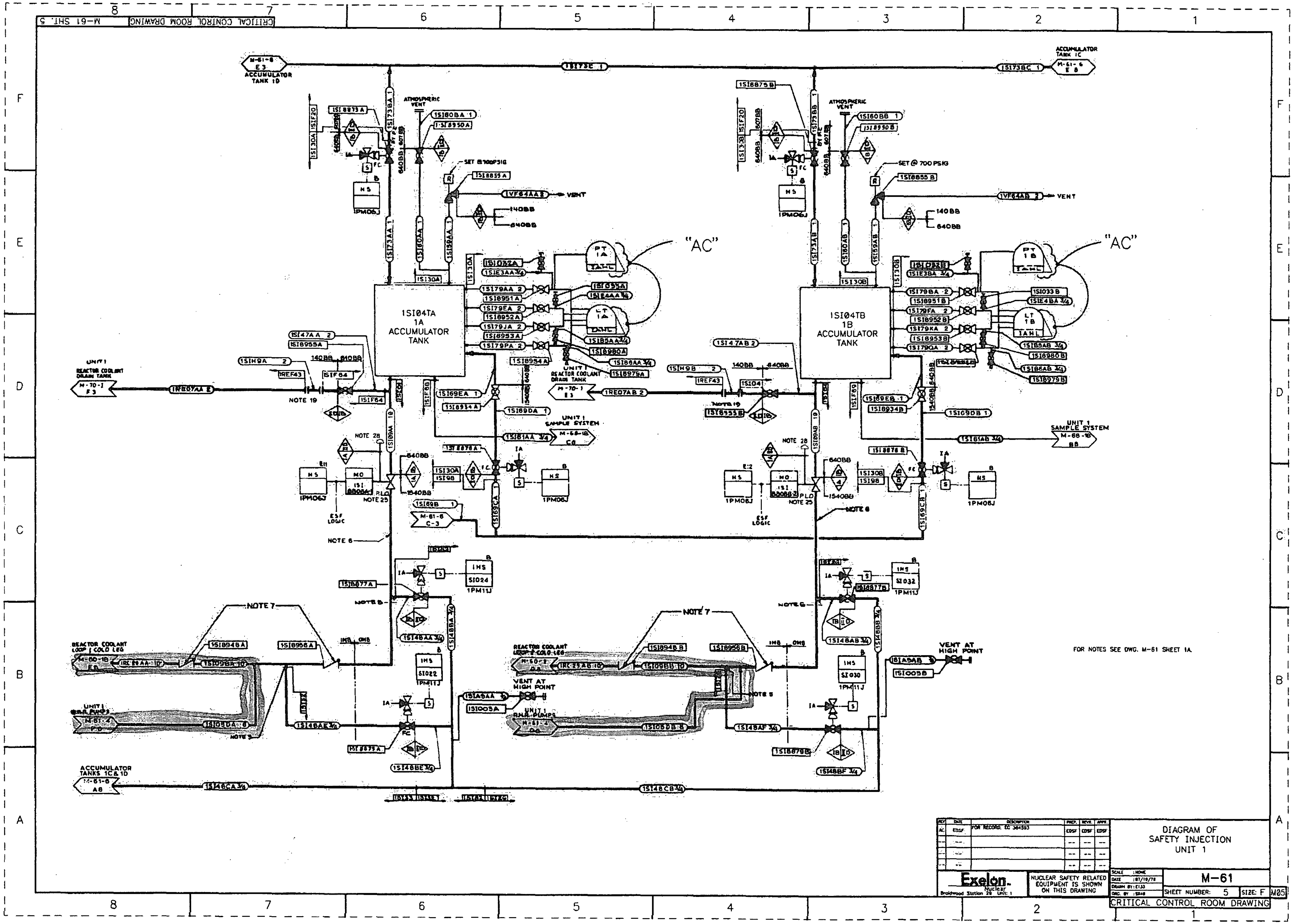

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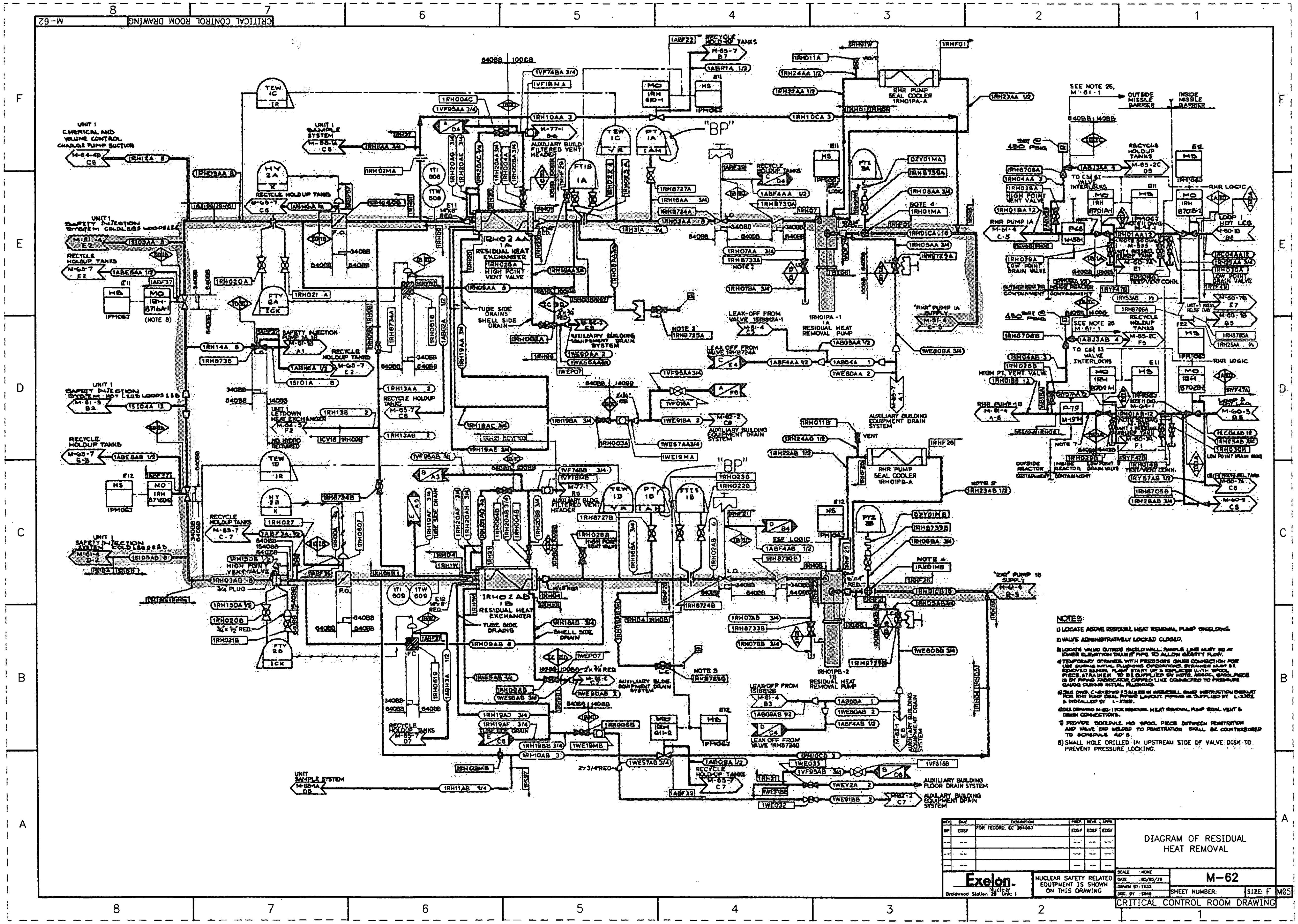

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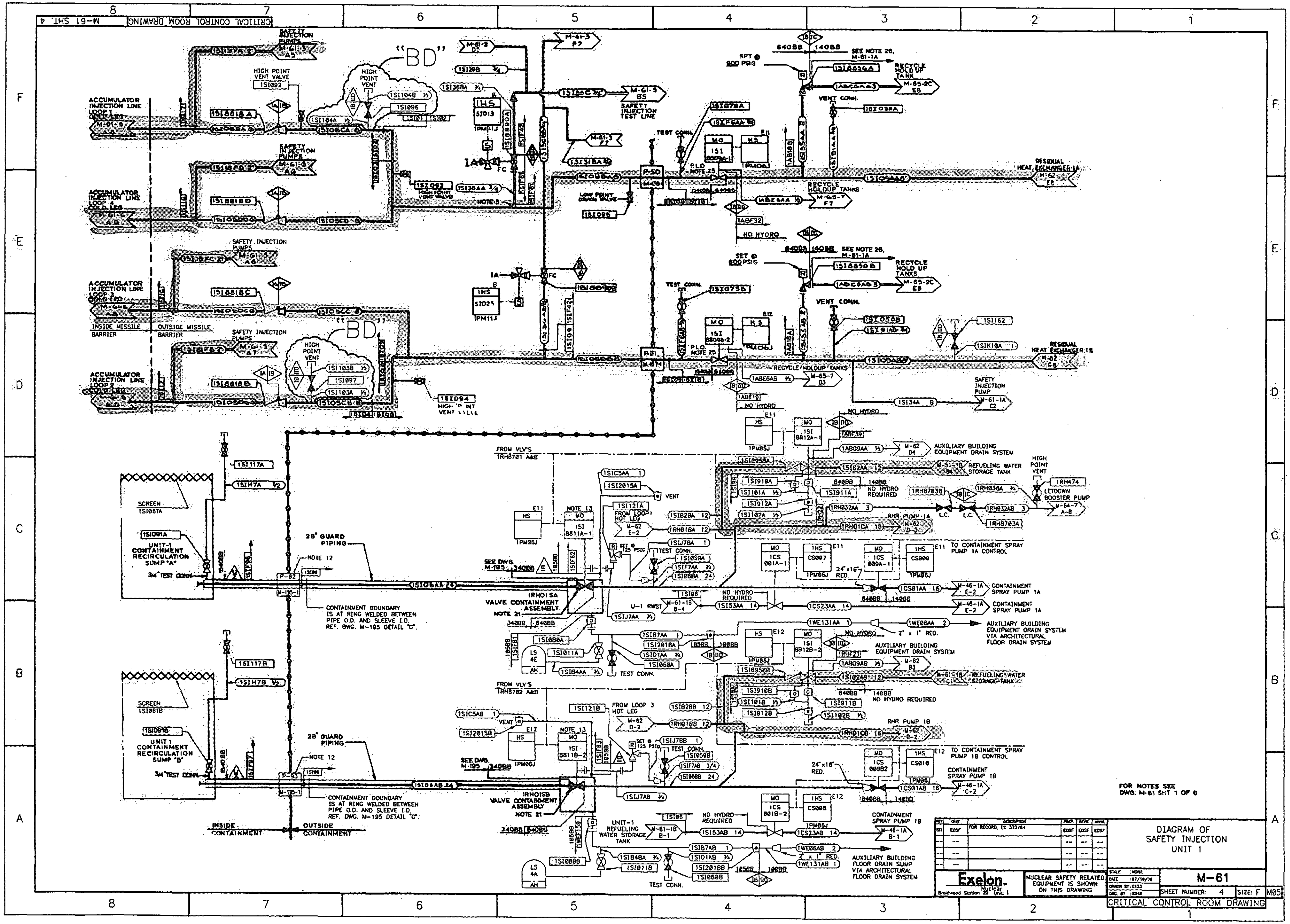

Design Information Transmittal

DIT # DIT-BRW-2009-0080 **Rev. 0** **Page 1 of 1**

Braidwood Unit 1

To: R. Peterson

Organization: Sargent & Lundy Engineers

Address/Location: Chicago, IL

Status of Information: ☒ Verified ☐ Unverified

For Unverified DITs, include the Method and Schedule of Verification in the "Description of Information."

List Action Tracking # assigned for verification of "Unverified" information: NA

Description of Information: **This information is safety related**

This transmittal provides the following:

- RCP Seal Injection Flow – 80 gpm for 2 CV pumps
  The flow rate is set at a minimum of 80 gpm in accordance with the ECCS Flow Balance procedure, with one Charging (CV) pump in operation and the Reactor Coolant System (RCS) depressurized (Reference 1). Using this value for two CV pump operation is conservative as it reduces the pump flow from the Refueling Water Storage Tank (RWST) which increases the gravity flow from the RWST to the Containment Recirculation Sump.

- CV Miniflow Rate – 65 gpm for each CV pump
  This flow path is isolated when the RCS pressure decreases below a pre-determined setpoint (Reference 2). The miniflow is recirculated to the outlet of the Volume Control Tank and to the suction of the CV pumps. Thus, this flow does not affect the pump flow from the RWST. In addition, more flow thru the pump results in a lower developed head and a lower injection flow rate. The 65 gpm is the flow that is measured during the ASME quarterly tests for the CV pumps (Reference 2). The recirculated flow is expected to have a negligible effect on the flow to the sumps from the RWST.

- Safety Injection Miniflow Rate – 30 gpm for each SI pump
  The Safety Injection (SI) pumps' miniflow rate during the ECCS Flow testing procedures is recorded to be about 30 gpm (Reference 3). Based on a review of the system configuration, the majority of the pressure drop in the recirculation lines is due to the miniflow orifice. Thus, the total miniflow rate with two (2) SI pumps in operation is expected to be near 60 gpm.

Purpose of Issuance: This data will be used to evaluate the RWST gravity flow to the Containment Recirculation Sump. This is in support of the evaluation of the impact of the partial opening of valve 1SI8811B on the ECCS injection flows post accident.

Limitations: This information is applicable to Braidwood U-1 and it is valid only in support of the activities for the Significance Determination Process related to the failure of valve 1SI8811B to open fully.

References (Source of Information):

1. WO #1060662
2. Design Information Transmittal #DIT-BRW-2009-0070 Rev. 0
3. Design Information Transmittal #DIT-BRW-2009-0078 rev. 0

Reviewed: Giovanni Panici/ Giovanni Panici **Date:** 12-7-2009
Printed Name / Signature

Approved: J Gosnell/ James S. Gosnell **Date:** 12-7-09
Printed Name / Signature

Distribution: Original – NDIT File

Design Information Transmittal

DIT # DIT-BRW-2009-0082 Rev. 0 **Page 1 of 1**

Braidwood Unit 1

To: Robert Peterson

Organization: Sargent & Lundy

Address/Location: via email

Status of Information: ☒ Verified ☐ Unverified

For Unverified DITs, include the Method and Schedule of Verification in the "Description of Information."
List Action Tracking # assigned for verification of "Unverified" information: N/A

Description of Information: **This information is NOT safety related**

The information provided in this transmittal provides inputs for RWST-to-ECCS sump flow modeling.

	5.2 Inch LOCA		2 Inch LOCA	
	At Lo-2 Alarm	After Six Minutes	At Lo-2 Alarm	After Six Minutes
Primary System Pressure (psia)	29	28	115	111
Containment Pressure (psia)	19.2	19.1	18.8	18.7
Sump Water Level (feet)	2	2.9	1.5	2.4

	0.86" LOCA		Bleed & Feed	
	At Lo-2 Alarm	After Six Minutes	At Lo-2 Alarm	After Six Minutes
Primary System Pressure (psia)	835	835	211	211
Containment Pressure (psia)	17.3	17.3	25.7	25.6
Sump Water Level (feet)	1.3	2.2	2	2.6

Purpose of Issuance: Provide documented input for analysis to determine how much water flows from the RWST to the ECCS sumps in containment during a postulated 6 minute interval when the 1SI8811A/B and 1SI8812A/B are all open.

Limitations: This information is applicable to Braidwood, Unit 1.

References (Source of Information):
MAAP CASES: BBSDP08, BBSDP14, BB0009b

Prepared : Roy Linthicum/ [signature] **Date:** 12/8/09
Printed Name / Signature

Approved (Br): James Gosnell/ [signature] **Date:** 12-8-09
Printed Name / Signature

Distribution: Original – NDIT File

PIPE-FLO	ver 9.0	12/1/2009 8:36			
System:	FST Bl to CL - A1R19				
Lineup:	FST Bl to CL (From RH)				
Company:	Exelon				
Project:	BYR06-029 Rev. 0				
by:	Sargent & Lundy L.L.C				
Footer:					
UNITS					CALCULATION
Flow Rate	US gpm				Iteration: 16
Pressure	psi a	Atm:	14.7	psi a	Deviation percent: 0.002933
Temperature	F				
Viscosity	cP				
Density	lb/ft³				
Grade	ft				
Length	ft				
Size	in				

Pipe Line	Specification	Fluid Zone	Size	Length	K	Status	Flow	Velocity	dP	HL	Tagged	From	To	Inside Dia	Pipe HL	Minor HL	Re	ffp	Valves/Fittings					
CS01AA(001)	Steel Sch 30 (clean)	Outage Recirc Water	16	12.3	0.6449		0	0	[illegible]	0	N	~N(003)	~N(005)	15.25	0	0	0.002137	0	2 x Pipe Bend - r/d 1.5 (90)	0.173	1 x CS009A-1 (Gate Valve)	0.09888	1 x Converging Tee (Through)	0.1
CS01AA(002)	Steel Sch 30 (clean)	Outage Recirc Water	16	10.6	0.2964		0	0	[illegible]	0	N	~N(005)	~N(006)	15.25	0	0	0.002137	0	1 x Reducer - Contraction (16 x 14 - 14)	0.02451	1 x Pipe Bend - r/d 1.5 (90)	0.173	1 x CS002A	0.09888
CS01AA(003)	Steel Sch 30 (clean)	Outage Recirc Water	14	2	0		0	0	[illegible]	0	N	~N(006)	Containment Spray Pump A	13.25	0	0	0.002459	0						
CS01AB(001)	Steel Sch 30 (clean)	Outage Recirc Water	16	4.3	0.2978		0	0	[illegible]	0	N	~N(236)	~N(237)	15.25	0	0	0.002137	0	1 x Gate - Double Disc	0.09888	1 x CS009B-2 (Gate Valve)	0.09888	1 x Converging Tee (Through)	0.1
CS01AB(002)	Steel Sch 30 (clean)	Outage Recirc Water	16	19.3	1.236		0	0	[illegible]	0	N	~N(237)	~N(238)	15.25	0	0	0.002137	0	3 x Elbow - Standard 90	0.3708	1 x Reducer - Contraction (16 x 14 - 14)	0.02451	1 x CS002B(Gate Valve)	0.09888
CS01AB(003)	Steel Sch 30 (clean)	Outage Recirc Water	14	2	0		0	0	[illegible]	0	N	~N(238)	Containment Spray Pump B	13.25	0	0	0.002459	0						
CS02AA(001)	Steel Sch 40 (clean)	Outage Recirc Water	8	2	0.05008		0	0	[illegible]	0	N	Containment Spray Pump A	~N(007)	7.981	0	0	0.004083	0	1 x Reducer - Enlargement (10 x 8 - 7)	0.05006				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0	N	~N(007)	~N(008)	10.02	0	0	0.003252	0	4 x Pipe Bend - r/d 1.5 (90)	0.188	1 x CS003A (Check Valve)	1.289	1 x CV004A (Gate Valve)	0.1074
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0	N	~N(008)	~N(009)	10.02	0	0	0.003252	0	1 x FE-CS011	4.9	4 x Pipe Bend - r/d 1.5 (90)	0.188	1 x Diverging Tee (Through)	1.00E-05
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0	N	~N(009)	CS007A-1	10.02	0	0	0.003252	0	3 x Pipe Bend - r/d 1.5 (90)	0.188	1 x CS007A-1 (Gate Valve)	0.1074	1 x Diverging Tee (Through)	1.00E-05
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0	N	CS007A-1	~N(001)	10.02	0	0	0.003252	0	6 x Pipe Bend - r/d 1.5 (90)	0.188	1 x Pipe Bend - r/d 1.5 (45)	0.1331	1 x CS008A (Check Valve)	1.289
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0	N	~N(001)	~N(001A)	10.02	0	0	0.003252	0	6 x Pipe Bend - r/d 1.5 (90)	0.188	1 x Pipe Bend - r/d 1.5 (45)	0.1331		
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0	N	Containment Spray Pump B	~N(239)	7.981	0	0	0.004083	0	1 x Elbow - Standard 90	0.4219	1 x Reducer - Enlargement (10 x 8 - 7)	0.05006		
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0	N	~N(239)	~N(240)	10.02	0	0	0.003252	0	2 x Elbow - Standard 90	0.4028	1 x CV004B (Gate Valve)	0.1074	1 x CV003B (Check Valve)	1.289
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0	N	~N(240)	~N(241)	10.02	0	0	0.003252	0	4 x Elbow - Standard 90	0.4028	1 x FE-CS012	4.9	1 x Diverging Tee (Through)	1.00E-05
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0	N	~N(241)	CS007B-2	10.02	0	0	0.003252	0	3 x Elbow - Standard 90	0.4028	1 x CV007B-2 (Gate Valve)	0.1074	1 x Diverging Tee (Through)	1.00E-05
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0	N	CS007B-2	~N(242)	10.02	0	0	0.003252	0	1 x Elbow - Standard 45	0.2148	6 x Elbow - Standard 90	0.4028	1 x CS008B (Check Valve)	1.289
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0	N	~N(242)	~N(243)	10.02	0	0	0.003252	0	1 x CS008B (Check Valve)	1	1 x Diverging Tee (Branch)	1.00E-05		
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.057	N	~N(244)	~N(243)	10.02	0.057	0	192263	0.01707	1 x Diverging Tee (Branch)	1.00E-05				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.099	N	~N(010)	~N(001A)	7.981	0.082	0.017	177297	0.01757	1 x Reducer - Contraction (10 x 8 - 7)	0.04215	1 x Diverging Tee (Through)	0.1		
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.088	N	~N(011)	~N(010)	6.065	0.061	0.027	108518	0.01929	1 x Reducer - Contraction (8 x 6 - 6)	0.06329	1 x Diverging Tee (Through)	0.3		
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.431	N	~N(012)	~N(011)	4.026	0.006	0.425	80228	0.02081	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156	1 x Diverging' Tee (Branch)	4.3		
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.432	N	~N(014)	~N(011)	4.026	0.007	0.425	80237	0.02081	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156	1 x Diverging' Tee (Branch)	4.3		
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.019	N	~N(013)	~N(012)	4.026	0.012	0.007	78109	0.02097	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.019	N	~N(033)	~N(014)	4.026	0.012	0.007	78078	0.02097	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.017	N	~N(015)	~N(013)	4.026	0.011	0.006	71993	0.02114	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.017	N	~N(034)	~N(033)	4.026	0.011	0.006	71962	0.02115	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.015	N	~N(016)	~N(015)	4.026	0.009	0.006	67840	0.02134	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.015	N	~N(035)	~N(034)	4.026	0.009	0.006	67849	0.02134	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.013	N	~N(017)	~N(016)	4.026	0.008	0.005	63731	0.02155	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.013	N	~N(036)	~N(035)	4.026	0.008	0.005	63700	0.02155	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.012	N	~N(018)	~N(017)	4.026	0.008	0.004	59624	0.02178	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.012	N	~N(037)	~N(036)	4.026	0.008	0.004	59593	0.02178	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				

CS02H(044)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.6	0	<-->	35.86	0.4	0	0	N	-N(102)	-N(103)	6.065	0	0	19319	0.02674				
CS02H(045)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.6	0	<-->	30.72	0.341	0	0	N	-N(099)	-N(098)	6.065	0	0	16504	0.02776				
CS02H(046)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.6	0	<-->	32.14	0.357	0	0	N	-N(101)	-N(102)	6.065	0	0	17270	0.02746				
CS02H(047)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.6	0	<-->	26.81	0.298	0	0	N	-N(092)	-N(099)	6.065	0	0	14403	0.02869				
CS02H(048)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.6	0	<-->	28.23	0.314	0	0	N	-N(107)	-N(101)	6.065	0	0	15169	0.02833				
CS02H(049)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.6	0	<-->	22.99	0.256	0	0	N	-N(093)	-N(092)	6.065	0	0	12354	0.02981				
CS02H(050)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.6	0	<-->	24.17	0.269	0	0	N	-N(106)	-N(107)	6.065	0	0	12985	0.02944				
CS02H(051)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.6	0	<-->	18.93	0.21	0	0	N	-N(094)	-N(093)	6.065	0	0	10170	0.03134				
CS02H(052)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.6	0	<-->	20.35	0.226	0	0	N	-N(105)	-N(106)	6.065	0	0	10936	0.03075				
CS02H(053)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.6	0	<-->	15.02	0.167	0	0	N	-N(091)	-N(094)	6.065	0	0	8070	0.03334				
CS02H(054)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.6	0	<-->	16.45	0.183	0	0	N	-N(108)	-N(105)	6.065	0	0	8836	0.03253				
CS02H(055)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.6	0	<-->	11.21	0.125	0	0	N	-N(090)	-N(091)	6.065	0	0	6021	0.03619				
CS02H(056)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.6	0	<-->	12.38	0.138	0	0	N	-N(109)	-N(108)	6.065	0	0	6652	0.03518				
CS02H(057)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.6	0	<-->	7.141	0.079	0	0	N	-N(089)	-N(090)	6.065	0	0	3837	0.04141				
CS02H(058)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.6	0	<-->	8.567	0.095	0	0	N	-N(110)	-N(109)	6.065	0	0	4603	0.03917				
CS02H(059)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.6	0	<-->	3.232	0.036	0	0	N	-N(100)	-N(089)	6.065	0	0	1736	0.03686				
CS02H(060)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.6	0	<-->	4.658	0.052	0	0	N	-N(111)	-N(110)	6.065	0	0	2502	0.04754				
CS02H(061)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.6	0	<-->	0.581	0.006	0	0	N	-N(100)	-N(111)	6.065	0	0	312.2	0.205				
CS02J(001)	Steel Sch 40 (clean)	Outage Recirc Water	6	1.6	4.353	<-->	186.2	2.069	0.127	0.293	N	-N(298)	-N(297)	6.065	0.004	0.289	100023	0.01948	1 x Reducer - Contraction (8 x 6 - 6)	0.05329	1 x Diverging Tee (Branch)	4.3
CS02J(002)	Steel Sch 40 (clean)	Outage Recirc Water	6	1.6	4.353	<-->	186.2	2.069	0.127	0.293	N	-N(300)	-N(297)	6.065	0.004	0.289	100023	0.01948	1 x Reducer - Contraction (8 x 6 - 6)	0.05329	1 x Diverging Tee (Branch)	4.3
CS02J(003)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	182	2.023	0.003	0.008	N	-N(301)	-N(298)	6.065	0.008	0	97785	0.01954				
CS02J(004)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	182	2.023	0.003	0.008	N	-N(302)	-N(300)	6.065	0.008	0	97785	0.01954				
CS02J(005)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	177.8	1.976	0.003	0.008	N	-N(303)	-N(301)	6.065	0.008	0	95549	0.01961				
CS02J(006)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	177.8	1.976	0.003	0.008	N	-N(304)	-N(302)	6.065	0.008	0	95549	0.01961				
CS02J(007)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	173.7	1.93	0.003	0.007	N	-N(305)	-N(303)	6.065	0.007	0	93314	0.01968				
CS02J(008)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	173.7	1.93	0.003	0.007	N	-N(306)	-N(304)	6.065	0.007	0	93314	0.01968				
CS02J(009)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	169.5	1.884	0.003	0.007	N	-N(307)	-N(305)	6.065	0.007	0	91080	0.01976				
CS02J(010)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	169.5	1.884	0.003	0.007	N	-N(308)	-N(306)	6.065	0.007	0	91080	0.01976				
CS02J(011)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	165.4	1.838	0.003	0.007	N	-N(310)	-N(307)	6.065	0.007	0	88847	0.01983				
CS02J(012)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	165.4	1.838	0.003	0.007	N	-N(309)	-N(308)	6.065	0.007	0	88847	0.01983				
CS02J(013)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	161.2	1.792	0.003	0.006	N	-N(311)	-N(310)	6.065	0.006	0	86616	0.01991				
CS02J(014)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	161.2	1.792	0.003	0.006	N	-N(312)	-N(309)	6.065	0.006	0	86616	0.01991				
CS02J(015)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	157.1	1.746	0.003	0.006	N	-N(314)	-N(311)	6.065	0.006	0	84385	0.02				
CS02J(016)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	157.1	1.746	0.003	0.006	N	-N(313)	-N(312)	6.065	0.006	0	84385	0.02				
CS02J(017)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	152.9	1.699	0.002	0.006	N	-N(318)	-N(314)	6.065	0.006	0	82155	0.02008				
CS02J(018)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	152.9	1.699	0.002	0.006	N	-N(317)	-N(313)	6.065	0.006	0	82155	0.02008				
CS02J(019)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	148.8	1.653	0.002	0.005	N	-N(315)	-N(318)	6.065	0.005	0	79926	0.02017				
CS02J(020)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	148.8	1.653	0.002	0.005	N	-N(316)	-N(317)	6.065	0.005	0	79926	0.02017				
CS02J(021)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	144.6	1.607	0.002	0.005	N	-N(320)	-N(315)	6.065	0.005	0	77698	0.02027				
CS02J(022)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	144.6	1.607	0.002	0.005	N	-N(319)	-N(316)	6.065	0.005	0	77698	0.02027				
CS02J(023)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	140.5	1.561	0.002	0.005	N	-N(321)	-N(320)	6.065	0.005	0	75471	0.02037				
CS02J(024)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	140.5	1.561	0.002	0.005	N	-N(322)	-N(319)	6.065	0.005	0	75471	0.02037				
CS02J(025)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	136.3	1.515	0.002	0.005	N	-N(323)	-N(321)	6.065	0.005	0	73245	0.02047				
CS02J(026)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	136.3	1.515	0.002	0.005	N	-N(324)	-N(322)	6.065	0.005	0	73245	0.02047				
CS02J(027)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	132.2	1.469	0.002	0.004	N	-N(325)	-N(323)	6.065	0.004	0	71019	0.02057				
CS02J(028)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	132.2	1.469	0.002	0.004	N	-N(326)	-N(324)	6.065	0.004	0	71019	0.02057				
CS02J(029)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	128	1.423	0.002	0.004	N	-N(327)	-N(325)	6.065	0.004	0	68794	0.02069				
CS02J(030)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	128	1.423	0.002	0.004	N	-N(328)	-N(326)	6.065	0.004	0	68794	0.02069				
CS02J(031)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	123.9	1.377	0.002	0.004	N	-N(329)	-N(327)	6.065	0.004	0	66570	0.0208				
CS02J(032)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	123.9	1.377	0.002	0.004	N	-N(330)	-N(328)	6.065	0.004	0	66570	0.0208				
CS02J(033)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	119.8	1.331	0.002	0.004	N	-N(331)	-N(329)	6.065	0.004	0	64348	0.02093				
CS02J(034)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	119.8	1.331	0.002	0.004	N	-N(332)	-N(330)	6.065	0.004	0	64348	0.02093				
CS02J(035)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	115.6	1.285	0.001	0.003	N	-N(333)	-N(331)	6.065	0.003	0	62123	0.02106				
CS02J(036)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	115.6	1.285	0.001	0.003	N	-N(334)	-N(332)	6.065	0.003	0	62123	0.02106				
CS02J(037)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	111.5	1.239	0.001	0.003	N	-N(335)	-N(333)	6.065	0.003	0	59901	0.02119				
CS02J(038)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	111.5	1.239	0.001	0.003	N	-N(336)	-N(334)	6.065	0.003	0	59901	0.02119				
CS02J(039)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	107.4	1.193	0.001	0.003	N	-N(337)	-N(335)	6.065	0.003	0	57679	0.02134				
CS02J(040)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	107.4	1.193	0.001	0.003	N	-N(338)	-N(336)	6.065	0.003	0	57679	0.02134				
CS02J(041)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	103.2	1.147	0.001	0.003	N	-N(339)	-N(337)	6.065	0.003	0	55458	0.02149				
CS02J(042)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	103.2	1.147	0.001	0.003	N	-N(340)	-N(338)	6.065	0.003	0	55458	0.02149				
CS02J(043)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	99.08	1.101	0.001	0.003	N	-N(341)	-N(339)	6.065	0.003	0	53237	0.02165				
CS02J(044)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	99.08	1.101	0.001	0.003	N	-N(342)	-N(340)	6.065	0.003	0	53237	0.02165				
CS02J(045)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	94.95	1.055	0.001	0.002	N	-N(343)	-N(341)	6.065	0.002	0	51016	0.02182				
CS02J(046)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	94.95	1.055	0.001	0.002	N	-N(344)	-N(342)	6.065	0.002	0	51016	0.02182				
CS02J(047)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	90.82	1.009	0	0.002	N	-N(345)	-N(343)	6.065	0.002	0	48796	0.022				
CS02J(048)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	90.82	1.009	0	0.002	N	-N(346)	-N(344)	6.065	0.002	0	48796	0.022				
CS02J(049)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	86.69	0.963	0	0.002	N	-N(347)	-N(345)	6.065	0.002	0	46576	0.0222				
CS02J(050)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	86.69	0.963	0	0.002	N	-N(348)	-N(346)	6.065	0.002	0	46576	0.0222				
CS02J(051)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	82.56	0.918	0	0.002	N	-N(349)	-N(347)	6.065	0.002	0	44356	0.02241				
CS02J(052)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	82.56	0.918	0	0.002	N	-N(350)	-N(348)	6.065	0.002	0	44356	0.02241				
CS02J(053)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	78.42	0.872	0	0.002	N	-N(351)	-N(349)	6.065	0.002	0	42137	0.02263				
CS02J(054)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	78.42	0.872	0	0.002	N	-N(352)	-N(350)	6.065	0.002	0	42137	0.02263				
CS02J(055)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	74.29	0.826	0	0.002	N	-N(353)	-N(351)	6.065	0.002	0	39918	0.02287				
CS02J(056)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	74.29	0.826	0	0.002	N	-N(354)	-N(352)	6.065	0.002	0	39918	0.02287				
CS02J(057)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	70.17	0.78	0	0.001	N	-N(355)	-N(353)	6.065	0.001	0	37699	0.02314				
CS02J(058)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	70.17	0.78	0	0.001	N	-N(356)	-N(354)	6.065	0.001	0	37699	0.02314				
CS02J(059)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	66.04	0.734	0	0.001	N	-N(357)	-N(355)	6.065	0.001	0	35481	0.02342				
CS02J(060)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	66.04	0.734	0	0.001	N	-N(358)	-N(356)	6.065	0.001	0	35481	0.02342				
CS02J(061)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	61.91	0.688	0	0.001	N	-N(359)	-N(357)	6.065	0.001	0	33263	0.02374				
CS02J(062)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	61.91	0.688	0	0.001	N	-N(360)	-N(358)	6.065	0.001	0	33263	0.02374				
CS02J(063)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	57.78	0.642	0	0	N	-N(361)	-N(359)	6.065	0	0	31044	0.02406				
CS02J(064)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	57.78	0.642	0	0	N	-N(362)	-N(360)	6.065	0	0	31044	0.02406				
CS02J(065)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	53.65	0.596	0	0	N	-N(363)	-N(361)	6.065	0	0	28826	0.02446				
CS02J(066)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	53.65	0.596	0	0	N	-N(364)	-N(362)	6.065	0	0	28826	0.02446				
CS02J(067)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	49.52	0.55	0	0	N	-N(365)	-N(363)	6.065	0	0	26609	0.02489				
CS02J(068)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	49.52	0.55	0	0	N	-N(366)	-N(364)	6.065	0	0	26608	0.02489				
CS02J(069)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	45.4	0.505	0	0	N	-N(367)	-N(365)	6.065	0	0	24391	0.02537				
CS02J(070)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	45.4	0.505	0	0	N	-N(368)	-N(366)	6.065	0	0	24391	0.02537				
CS02J(071)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	41.27	0.459	0	0	N	-N(369)	-N(367)	6.065	0	0	22173	0.02591				
CS02J(072)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	41.27	0.459	0	0	N	-N(370)	-N(368)	6.065	0	0	22173	0.02591				
CS02J(073)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	37.14	0.413	0	0	N	-N(371)	-N(369)	6.065	0	0	19956	0.02654				
CS02J(074)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	37.14	0.413	0	0	N	-N(372)	-N(370)	6.065	0	0	19956	0.02654				
CS02J(075)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	33.01	0.367	0	0	N	-N(373)	-N(371)	6.065	0	0	17738	0.02729				
CS02J(076)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	33.01	0.367	0	0	N	-N(374)	-N(372)	6.065	0	0	17738	0.02729				
CS02J(077)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	28.89	0.321	0	0	N	-N(375)	-N(373)	6.065	0	0	15521	0.02817				
CS02J(078)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	28.89	0.321	0	0	N	-N(376)	-N(374)	6.065	0	0	15521	0.02817				
CS02J(079)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	24.76	0.275	0	0	N	-N(377)	-N(375)	6.065	0	0	13304	0.02926				
CS02J(080)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	24.76	0.275	0	0	N	-N(378)	-N(376)	6.065	0	0	13304	0.02926				
CS02J(081)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	20.63	0.229	0	0	N	-N(379)	-N(377)	6.065	0	0	11086	0.03065				
CS02J(082)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	20.63	0.229	0	0	N	-N(380)	-N(378)	6.065	0	0	11086	0.03065				
CS02J(083)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	16.51	0.183	0	0	N	-N(381)	-N(379)	6.065	0	0	8869	0.0325				
CS02J(084)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	16.51	0.183	0	0	N	-N(382)	-N(380)	6.065	0	0	8869	0.0325				
CS02J(085)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	12.38	0.138	0	0	N	-N(383)	-N(381)	6.065	0	0	6652	0.03518				
CS02J(086)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	12.38	0.138	0	0	N	-N(384)	-N(382)	6.065	0	0	6652	0.03518				
CS02J(087)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	8.253	0.092	0	0	N	-N(385)	-N(383)	6.065	0	0	4434	0.03961				
CS02J(088)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	8.253	0.092	0	0	N	-N(387)	-N(384)	6.065	0	0	4434	0.03961				
CS02J(089)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	4.127	0.046	0	0	N	-N(388)	-N(385)	6.065	0	0	2217	0.04953				
CS02J(090)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	4.127	0.046	0	0	N	-N(389)	-N(387)	6.065	0	0	2217	0.04953				
CS02J(091)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0		0	0	0	0	N	-N(389)	-N(388)	6.065	0	0	9.58E-07	0				
CS02KA	Steel Sch 40 (clean)	Outage Recirc Water	10	2	20.2		434.2	1.768	1.073	0.982	N	-N(001A)	-N(112)	10.02	0.002	0.98	141218	0.01786	1 x FX-CS036 (Flow Element)	15.6	1 x Diverging Tee (Branch)	4.4
CS02KB	Steel Sch 40 (clean)	Outage Recirc Water	10	2.7	32.2		591.2	2.407	2.119	2.9	N	-N(243)	-N(390)	10.02	0.005	2.895	192263	0.01707	1 x FX-CS034 (Flow Element)	28.1	1 x Diverging Tee (Branch)	6.1
CS02L001	Steel Sch 40 (clean)	Outage Recirc Water	8	1.5	4.342		217.2	1.394	0.057	0.132	N	-N(112)	-N(113)	7.981	0.001	0.131	89864	0.0195	1 x Reducer - Contraction (10 x 8 - 7)	0.04215	1 x Diverging Tee (Branch)	4.3
CS02L002	Steel Sch 40 (clean)	Outage Recirc Water	8	1.5	4.342		217.1	1.393	0.057	0.132	N	-N(112)	-N(114)	7.981	0.001	0.131	88632	0.0195	1 x Reducer - Contraction (10 x 8 - 7)	0.04215	1 x Diverging Tee (Branch)	4.3
CS02L003	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		213.4	1.369	0.001	0.003	N	-N(113)	-N(115)	7.981	0.003	0	87121	0.01958				
CS02L004	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		213.6	1.371	0.001	0.003	N	-N(114)	-N(203)	7.981	0.003	0	87215	0.01956				
CS02L005	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		209.7	1.346	0.001	0.002	N	-N(115)	-N(116)	7.981	0.002	0	85633	0.01962				
CS02L006	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		210	1.348	0.001	0.002	N	-N(203)	-N(204)	7.981	0.002	0	85727	0.01961				
CS02L007	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		206.3	1.324	0.001	0.002	N	-N(116)	-N(117)	7.981	0.002	0	84216	0.01967				
CS02L008	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		206.2	1.323	0.001	0.002	N	-N(204)	-N(206)	7.981	0.002	0	84184	0.01967				
CS02L009	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		202.5	1.3	0.001	0.002	N	-N(117)	-N(118)	7.981	0.002	0	82674	0.01974				
CS02L010	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		202.7	1.301	0.001	0.002	N	-N(206)	-N(205)	7.981	0.002	0	82768	0.01973				
CS02L011	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		198.8	1.276	0	0.002	N	-N(118)	-N(119)	7.981	0.002	0	81186	0.0198				
CS02L012	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		199.1	1.278	0	0.002	N	-N(205)	-N(210)	7.981	0.002	0	81281	0.01979				
CS02L013	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		195.4	1.254	0	0.002	N	-N(119)	-N(120)	7.981	0.002	0	79771	0.01986				
CS02L014	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		195.3	1.253	0	0.002	N	-N(210)	-N(209)	7.981	0.002	0	79739	0.01986				
CS02L015	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		191.6	1.23	0	0.002	N	-N(120)	-N(122)	7.981	0.002	0	78229	0.01992				
CS02L016	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		191.8	1.231	0	0.002	N	-N(209)	-N(207)	7.981	0.002	0	78324	0.01992				
CS02L017	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		188	1.206	0	0.002	N	-N(122)	-N(121)	7.981	0.002	0	76743	0.01999				
CS02L018	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		188.2	1.208	0	0.002	N	-N(207)	-N(208)	7.981	0.002	0	76837	0.01999				
CS02L019	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		184.5	1.184	0	0.002	N	-N(121)	-N(123)	7.981	0.002	0	75328	0.02006				
CS02L020	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		184.4	1.184	0	0.002	N	-N(208)	-N(215)	7.981	0.002	0	75296	0.02006				
CS02L021	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		180.7	1.16	0	0.002	N	-N(123)	-N(124)	7.981	0.002	0	73788	0.02013				
CS02L022	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		180.9	1.161	0	0.002	N	-N(218)	-N(217)	7.981	0.002	0	73882	0.02013				
CS02L023	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		177.1	1.137	0	0.002	N	-N(124)	-N(126)	7.981	0.002	0	72302	0.0202				
CS02L024	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		177.3	1.138	0	0.002	N	-N(217)	-N(215)	7.981	0.002	0	72396	0.0202				
CS02L025	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		173.6	1.114	0	0.002	N	-N(126)	-N(125)	7.981	0.002	0	70888	0.02027				
CS02L026	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		173.5	1.114	0	0.002	N	-N(215)	-N(216)	7.981	0.002	0	70856	0.02028				
CS02L027	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		169.8	1.09	0	0.002	N	-N(125)	-N(130)	7.981	0.002	0	69348	0.02035				
CS02L028	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		170.1	1.092	0	0.002	N	-N(216)	-N(211)	7.981	0.002	0	69443	0.02035				
CS02L029	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		166.2	1.067	0	0.002	N	-N(130)	-N(129)	7.981	0.002	0	67864	0.02043				
CS02L030	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		166.4	1.068	0	0.002	N	-N(211)	-N(212)	7.981	0.002	0	67958	0.02043				
CS02L031	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		162.7	1.045	0	0.002	N	-N(129)	-N(127)	7.981	0.002	0	66451	0.02051				
CS02L032	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		162.7	1.044	0	0.002	N	-N(212)	-N(214)	7.981	0.002	0	66418	0.02051				
CS02L033	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		159	1.02	0	0.002	N	-N(127)	-N(128)	7.981	0.002	0	64911	0.0206				
CS02L034	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		159.2	1.022	0	0.002	N	-N(214)	-N(213)	7.981	0.002	0	65006	0.02059				
CS02L035	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		155.3	0.997	0	0.001	N	-N(128)	-N(132)	7.981	0.001	0	63427	0.02069				
CS02L036	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		155.6	0.999	0	0.001	N	-N(213)	-N(231)	7.981	0.001	0	63521	0.02068				
CS02L037	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		151.9	0.975	0	0.001	N	-N(132)	-N(131)	7.981	0.001	0	62015	0.02077				
CS02L038	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		151.8	0.974	0	0.001	N	-N(231)	-N(232)	7.981	0.001	0	61983	0.02077				
CS02L039	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		148.1	0.951	0	0.001	N	-N(131)	-N(136)	7.981	0.001	0	60476	0.02087				
CS02L040	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		148.3	0.952	0	0.001	N	-N(232)	-N(227)	7.981	0.001	0	60570	0.02086				
CS02L041	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		144.5	0.927	0	0.001	N	-N(136)	-N(135)	7.981	0.001	0	58993	0.02097				
CS02L042	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		144.7	0.929	0	0.001	N	-N(227)	-N(228)	7.981	0.001	0	59087	0.02096				
CS02L043	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		141	0.905	0	0.001	N	-N(135)	-N(133)	7.981	0.001	0	57581	0.02106				
CS02L044	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		140.9	0.905	0	0.001	N	-N(228)	-N(230)	7.981	0.001	0	57549	0.02106				
CS02L045	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		137.3	0.881	0	0.001	N	-N(133)	-N(134)	7.981	0.001	0	56043	0.02117				
CS02L046	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		137.5	0.882	0	0.001	N	-N(230)	-N(229)	7.981	0.001	0	56137	0.02116				
CS02L047	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		133.6	0.858	0	0.001	N	-N(134)	-N(144)	7.981	0.001	0	54560	0.02128				
CS02L048	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		133.9	0.859	0	0.001	N	-N(229)	-N(219)	7.981	0.001	0	54654	0.02127				
CS02L049	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		130.2	0.835	0	0.001	N	-N(144)	-N(143)	7.981	0.001	0	53148	0.02139				
CS02L050	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		130.1	0.835	0	0.001	N	-N(219)	-N(220)	7.981	0.001	0	53116	0.02139				
CS02L051	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		126.4	0.811	0	0	N	-N(143)	-N(141)	7.981	0	0	51611	0.02151				
CS02L052	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		126.6	0.813	0	0	N	-N(220)	-N(222)	7.981	0	0	51705	0.0215				
CS02L053	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		122.8	0.788	0	0	N	-N(141)	-N(142)	7.981	0	0	50128	0.02163				
CS02L054	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		123	0.789	0	0	N	-N(222)	-N(221)	7.981	0	0	50222	0.02162				
CS02L055	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		119.3	0.766	0	0	N	-N(142)	-N(137)	7.981	0	0	48717	0.02176				
CS02L056	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		119.2	0.765	0	0	N	-N(221)	-N(226)	7.981	0	0	48685	0.02175				
CS02L057	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		115.6	0.742	0	0	N	-N(137)	-N(138)	7.981	0	0	47180	0.02189				
CS02L058	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		115.6	0.743	0	0	N	-N(226)	-N(225)	7.981	0	0	47274	0.02188				
CS02L059	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		111.9	0.718	0	0	N	-N(138)	-N(140)	7.981	0	0	45697	0.02203				
CS02L060	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		112.2	0.72	0	0	N	-N(225)	-N(223)	7.981	0	0	45792	0.02202				
CS02L061	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		108.5	0.696	0	0	N	-N(140)	-N(139)	7.981	0	0	44287	0.02217				
CS02L062	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		108.4	0.696	0	0	N	-N(223)	-N(224)	7.981	0	0	44256	0.02217				
CS02L063	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		104.7	0.672	0	0	N	-N(139)	-N(145)	7.981	0	0	42750	0.02232				
CS02L064	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		104.9	0.673	0	0	N	-N(224)	-N(175)	7.981	0	0	42844	0.02231				
CS02L065	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		101.1	0.649	0	0	N	-N(145)	-N(146)	7.981	0	0	41268	0.02248				
CS02L066	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		101.3	0.65	0	0	N	-N(175)	-N(176)	7.981	0	0	41362	0.02247				
CS02L067	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		97.62	0.627	0	0	N	-N(146)	-N(147)	7.981	0	0	39858	0.02264				
CS02L068	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		97.54	0.626	0	0	N	-N(176)	-N(177)	7.981	0	0	39825	0.02265				
CS02L069	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		93.85	0.602	0	0	N	-N(147)	-N(148)	7.981	0	0	38321	0.02283				
CS02L070	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		94.09	0.604	0	0	N	-N(177)	-N(179)	7.981	0	0	38415	0.02282				

CS02L071	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0	90.23	0.579	0	0	N	~N(148)	~N(149)	7.981	0	0	36839	0.02302
CS02L072	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0	90.46	0.581	0	0	N	~N(179)	~N(178)	7.981	0	0	36934	0.023
CS02L073	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0	86.77	0.557	0	0	N	~N(149)	~N(150)	7.981	0	0	35429	0.02321
CS02L074	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0	86.69	0.556	0	0	N	~N(178)	~N(183)	7.981	0	0	35397	0.02321
CS02L075	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0	83.01	0.533	0	0	N	~N(150)	~N(151)	7.981	0	0	33893	0.02342
CS02L076	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0	83.24	0.534	0	0	N	~N(183)	~N(182)	7.981	0	0	33987	0.02341
CS02L077	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0	79.38	0.509	0	0	N	~N(151)	~N(153)	7.981	0	0	32411	0.02365
CS02L078	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0	79.61	0.511	0	0	N	~N(182)	~N(180)	7.981	0	0	32506	0.02363
CS02L079	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0	75.93	0.487	0	0	N	~N(153)	~N(152)	7.981	0	0	31002	0.02388
CS02L080	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0	75.85	0.487	0	0	N	~N(180)	~N(181)	7.981	0	0	30969	0.02388
CS02L081	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0	72.17	0.463	0	0	N	~N(152)	~N(154)	7.981	0	0	29465	0.02414
CS02L082	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0	72.4	0.465	0	0	N	~N(181)	~N(191)	7.981	0	0	29560	0.02412
CS02L083	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0	68.54	0.44	0	0	N	~N(154)	~N(155)	7.981	0	0	27984	0.02442
CS02L084	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0	68.77	0.441	0	0	N	~N(191)	~N(190)	7.981	0	0	28078	0.0244
CS02L085	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0	65.09	0.418	0	0	N	~N(155)	~N(157)	7.981	0	0	26575	0.0247
CS02L086	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0	65.01	0.417	0	0	N	~N(190)	~N(188)	7.981	0	0	26542	0.0247
CS02L087	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0	61.32	0.394	0	0	N	~N(157)	~N(156)	7.981	0	0	25038	0.02503
CS02L088	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0	61.56	0.395	0	0	N	~N(188)	~N(189)	7.981	0	0	25133	0.02501
CS02L089	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0	57.7	0.37	0	0	N	~N(156)	~N(161)	7.981	0	0	23557	0.02538
CS02L090	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0	57.93	0.372	0	0	N	~N(189)	~N(184)	7.981	0	0	23651	0.02536
CS02L091	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0	54.24	0.348	0	0	N	~N(161)	~N(160)	7.981	0	0	22148	0.02574
CS02L092	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0	54.16	0.348	0	0	N	~N(184)	~N(185)	7.981	0	0	22115	0.02575
CS02L093	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0	50.48	0.324	0	0	N	~N(160)	~N(158)	7.981	0	0	20612	0.02617
CS02L094	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0	50.71	0.325	0	0	N	~N(185)	~N(187)	7.981	0	0	20706	0.02615
CS02L095	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0	46.85	0.301	0	0	N	~N(158)	~N(159)	7.981	0	0	19131	0.02664
CS02L096	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0	47.08	0.302	0	0	N	~N(187)	~N(186)	7.981	0	0	19225	0.02661
CS02L097	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0	43.4	0.279	0	0	N	~N(159)	~N(162)	7.981	0	0	17721	0.02713
CS02L098	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0	43.32	0.278	0	0	N	~N(186)	~N(201)	7.981	0	0	17689	0.02714
CS02L099	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0	39.64	0.254	0	0	N	~N(162)	~N(163)	7.981	0	0	16185	0.02773
CS02L100	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0	39.87	0.256	0	0	N	~N(201)	~N(200)	7.981	0	0	16279	0.02769
CS02L101	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0	36.01	0.231	0	0	N	~N(163)	~N(171)	7.981	0	0	14704	0.0284
CS02L102	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0	36.24	0.233	0	0	N	~N(200)	~N(192)	7.981	0	0	14798	0.02835
CS02L103	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0	32.56	0.209	0	0	N	~N(171)	~N(170)	7.981	0	0	13295	0.02912
CS02L104	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0	32.48	0.208	0	0	N	~N(192)	~N(193)	7.981	0	0	13262	0.02914
CS02L105	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0	28.8	0.185	0	0	N	~N(170)	~N(168)	7.981	0	0	11759	0.03005
CS02L106	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0	29.03	0.186	0	0	N	~N(193)	~N(195)	7.981	0	0	11853	0.02999
CS02L107	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0	25.17	0.162	0	0	N	~N(168)	~N(169)	7.981	0	0	10278	0.03113
CS02L108	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0	25.4	0.163	0	0	N	~N(195)	~N(194)	7.981	0	0	10372	0.03105
CS02L109	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0	21.72	0.139	0	0	N	~N(169)	~N(164)	7.981	0	0	8869	0.03238
CS02L110	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0	21.84	0.139	0	0	N	~N(194)	~N(199)	7.981	0	0	8836	0.03242
CS02L111	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0	17.96	0.115	0	0	N	~N(164)	~N(165)	7.981	0	0	7333	0.03413
CS02L112	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0	18.19	0.117	0	0	N	~N(199)	~N(198)	7.981	0	0	7427	0.034
CS02L113	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0	14.33	0.092	0	0	N	~N(165)	~N(167)	7.981	0	0	5852	0.03639
CS02L114	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0	14.56	0.093	0	0	N	~N(198)	~N(196)	7.981	0	0	5946	0.03623
CS02L115	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0	10.88	0.07	0	0	N	~N(167)	~N(166)	7.981	0	0	4442	0.0395
CS02L116	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0	10.8	0.069	0	0	N	~N(196)	~N(197)	7.981	0	0	4410	0.03959
CS02L117	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0	7.118	0.046	0	0	N	~N(166)	~N(172)	7.981	0	0	2906	0.04517
CS02L118	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0	7.349	0.047	0	0	N	~N(197)	~N(202)	7.981	0	0	3001	0.0447
CS02L119	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0	3.491	0.022	0	0	N	~N(172)	~N(173)	7.981	0	0	1425	0.0449
CS02L120	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0	3.722	0.024	0	0	N	~N(202)	~N(174)	7.981	0	0	1520	0.04211
CS02L121	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0	0.04	0	0	0	N	~N(173)	~N(174)	7.981	0	0	16.19	3.954
CS02M(001)	Steel Sch 40 (clean)	Outage Recirc Water	10	1.8	4.405	295.8	1.204	0.043	0.1	N	~N(390)	~N(391)	10.02	0.001	0.099	96122	0.01901
CS02M(002)	Steel Sch 40 (clean)	Outage Recirc Water	10	1.8	4.405	295.8	1.204	0.043	0.1	N	~N(390)	~N(392)	10.02	0.001	0.099	96141	0.01901
CS02M(003)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	290.3	1.863	0.002	0.005	N	~N(391)	~N(393)	7.981	0.005	0	118517	0.01861
CS02M(004)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	290.3	1.863	0.002	0.005	N	~N(392)	~N(394)	7.981	0.005	0	118541	0.01861
CS02M(005)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	285	1.829	0.002	0.005	N	~N(393)	~N(395)	7.981	0.005	0	116354	0.01867
CS02M(006)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	285	1.829	0.002	0.005	N	~N(394)	~N(396)	7.981	0.005	0	116379	0.01867
CS02M(007)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	279.7	1.795	0.002	0.005	N	~N(395)	~N(397)	7.981	0.005	0	114192	0.01872
CS02M(008)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	279.7	1.795	0.002	0.005	N	~N(396)	~N(398)	7.981	0.005	0	114217	0.01872
CS02M(009)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	274.4	1.761	0.002	0.005	N	~N(397)	~N(399)	7.981	0.005	0	112031	0.01878
CS02M(010)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	274.4	1.761	0.002	0.005	N	~N(398)	~N(400)	7.981	0.005	0	112065	0.01878
CS02M(011)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	269.1	1.727	0.002	0.005	N	~N(399)	~N(401)	7.981	0.005	0	109870	0.01883
CS02M(012)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	269.1	1.727	0.002	0.005	N	~N(400)	~N(402)	7.981	0.005	0	109895	0.01883
CS02M(013)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	263.8	1.693	0.002	0.005	N	~N(401)	~N(403)	7.981	0.005	0	107710	0.01889
CS02M(014)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	263.9	1.694	0.002	0.005	N	~N(402)	~N(404)	7.981	0.005	0	107734	0.01889
CS02M(015)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	258.5	1.659	0.002	0.004	N	~N(403)	~N(405)	7.981	0.004	0	105550	0.01895
CS02M(016)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	258.6	1.66	0.002	0.004	N	~N(404)	~N(406)	7.981	0.004	0	105574	0.01895
CS02M(017)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	253.2	1.625	0.002	0.004	N	~N(405)	~N(407)	7.981	0.004	0	103391	0.01902
CS02M(018)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	253.3	1.625	0.002	0.004	N	~N(406)	~N(408)	7.981	0.004	0	103415	0.01902
CS02M(019)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	247.9	1.591	0.002	0.004	N	~N(407)	~N(409)	7.981	0.004	0	101231	0.01908
CS02M(020)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	248	1.592	0.002	0.004	N	~N(408)	~N(410)	7.981	0.004	0	101256	0.01908
CS02M(021)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	242.6	1.557	0.002	0.004	N	~N(409)	~N(411)	7.981	0.004	0	99073	0.01915
CS02M(022)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	242.7	1.558	0.002	0.004	N	~N(410)	~N(412)	7.981	0.004	0	99097	0.01915
CS02M(023)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	237.4	1.523	0.002	0.004	N	~N(411)	~N(413)	7.981	0.004	0	96914	0.01922
CS02M(024)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	237.4	1.524	0.002	0.004	N	~N(412)	~N(414)	7.981	0.004	0	96939	0.01922
CS02M(025)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	232.1	1.49	0.002	0.004	N	~N(413)	~N(415)	7.981	0.004	0	94756	0.01929
CS02M(026)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	232.1	1.49	0.002	0.004	N	~N(414)	~N(416)	7.981	0.004	0	94781	0.01929
CS02M(027)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	226.8	1.456	0.001	0.003	N	~N(415)	~N(417)	7.981	0.003	0	92599	0.01936
CS02M(028)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	226.8	1.456	0.001	0.003	N	~N(416)	~N(418)	7.981	0.003	0	92623	0.01936
CS02M(029)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	221.5	1.422	0.001	0.003	N	~N(417)	~N(419)	7.981	0.003	0	90442	0.01944
CS02M(030)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	221.6	1.422	0.001	0.003	N	~N(418)	~N(420)	7.981	0.003	0	90466	0.01944
CS02M(031)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	216.2	1.388	0.001	0.003	N	~N(419)	~N(421)	7.981	0.003	0	88285	0.01952
CS02M(032)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	216.3	1.388	0.001	0.003	N	~N(420)	~N(422)	7.981	0.003	0	88309	0.01952
CS02M(033)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	210.9	1.354	0.001	0.003	N	~N(421)	~N(423)	7.981	0.003	0	86128	0.0196
CS02M(034)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	211	1.354	0.001	0.003	N	~N(422)	~N(424)	7.981	0.003	0	86152	0.0196
CS02M(035)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	205.7	1.32	0.001	0.003	N	~N(423)	~N(425)	7.981	0.003	0	83971	0.01968
CS02M(036)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	205.7	1.32	0.001	0.003	N	~N(424)	~N(426)	7.981	0.003	0	83996	0.01968
CS02M(037)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	200.4	1.286	0.001	0.003	N	~N(425)	~N(427)	7.981	0.003	0	81815	0.01977
CS02M(038)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	200.4	1.286	0.001	0.003	N	~N(426)	~N(428)	7.981	0.003	0	81840	0.01977
CS02M(039)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	195.1	1.252	0.001	0.003	N	~N(427)	~N(429)	7.981	0.003	0	79659	0.01986
CS02M(040)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	195.2	1.253	0.001	0.003	N	~N(428)	~N(430)	7.981	0.003	0	79684	0.01986
CS02M(041)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	189.8	1.218	0.001	0.002	N	~N(429)	~N(431)	7.981	0.002	0	77504	0.01996
CS02M(042)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	189.9	1.219	0.001	0.002	N	~N(430)	~N(432)	7.981	0.002	0	77528	0.01996
CS02M(043)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	184.5	1.184	0.001	0.002	N	~N(431)	~N(433)	7.981	0.002	0	75349	0.02005
CS02M(044)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	184.6	1.185	0.001	0.002	N	~N(432)	~N(434)	7.981	0.002	0	75373	0.02005
CS02M(045)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	179.3	1.151	0	0.002	N	~N(433)	~N(435)	7.981	0.002	0	73193	0.02016
CS02M(046)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	179.3	1.151	0	0.002	N	~N(434)	~N(436)	7.981	0.002	0	73218	0.02016
CS02M(047)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	174	1.117	0	0.002	N	~N(435)	~N(437)	7.981	0.002	0	71038	0.02027
CS02M(048)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	174	1.117	0	0.002	N	~N(436)	~N(438)	7.981	0.002	0	71063	0.02026
CS02M(049)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	168.7	1.083	0	0.002	N	~N(437)	~N(439)	7.981	0.002	0	68884	0.02038
CS02M(050)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	168.8	1.083	0	0.002	N	~N(438)	~N(440)	7.981	0.002	0	68908	0.02038
CS02M(051)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	163.4	1.049	0	0.002	N	~N(439)	~N(441)	7.981	0.002	0	66729	0.0205
CS02M(052)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	163.5	1.049	0	0.002	N	~N(440)	~N(442)	7.981	0.002	0	66753	0.02049
CS02M(053)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	158.2	1.015	0	0.002	N	~N(441)	~N(443)	7.981	0.002	0	64575	0.02062
CS02M(054)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	158.2	1.015	0	0.002	N	~N(442)	~N(444)	7.981	0.002	0	64599	0.02062
CS02M(055)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	152.9	0.981	0	0.002	N	~N(443)	~N(445)	7.981	0.002	0	62421	0.02075
CS02M(056)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	152.9	0.982	0	0.002	N	~N(444)	~N(446)	7.981	0.002	0	62445	0.02075
CS02M(057)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	147.6	0.947	0	0.002	N	~N(445)	~N(447)	7.981	0.002	0	60267	0.02088
CS02M(058)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	147.7	0.948	0	0.002	N	~N(446)	~N(448)	7.981	0.002	0	60291	0.02088
CS02M(059)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	142.3	0.914	0	0.001	N	~N(447)	~N(449)	7.981	0.001	0	58113	0.02103
CS02M(060)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	142.4	0.914	0	0.001	N	~N(448)	~N(450)	7.981	0.001	0	58137	0.02102
CS02M(061)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	137.1	0.88	0	0.001	N	~N(449)	~N(451)	7.981	0.001	0	55959	0.02118
CS02M(062)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	137.1	0.88	0	0.001	N	~N(450)	~N(452)	7.981	0.001	0	55983	0.02117
CS02M(063)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	131.8	0.846	0	0.001	N	~N(451)	~N(453)	7.981	0.001	0	53806	0.02134
CS02M(064)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	131.8	0.846	0	0.001	N	~N(452)	~N(454)	7.981	0.001	0	53830	0.02133
CS02M(065)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	126.5	0.812	0	0.001	N	~N(453)	~N(455)	7.981	0.001	0	51652	0.0215
CS02M(066)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	126.6	0.812	0	0.001	N	~N(454)	~N(456)	7.981	0.001	0	51676	0.0215
CS02M(067)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	121.2	0.778	0	0.001	N	~N(455)	~N(457)	7.981	0.001	0	49499	0.02168
CS02M(068)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	121.3	0.778	0	0.001	N	~N(456)	~N(458)	7.981	0.001	0	49523	0.02168
CS02M(069)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	116	0.744	0	0.001	N	~N(457)	~N(459)	7.981	0.001	0	47346	0.02187
CS02M(070)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	116	0.745	0	0.001	N	~N(458)	~N(460)	7.981	0.001	0	47370	0.02187
CS02M(071)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	110.7	0.71	0	0	N	~N(459)	~N(461)	7.981	0	0	45192	0.02206
CS02M(072)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	110.7	0.711	0	0	N	~N(460)	~N(462)	7.981	0	0	45217	0.02207
CS02M(073)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	105.4	0.677	0	0	N	~N(461)	~N(463)	7.981	0	0	43039	0.02229
CS02M(074)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	105.5	0.677	0	0	N	~N(462)	~N(464)	7.981	0	0	43064	0.02229
CS02M(075)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	100.1	0.643	0	0	N	~N(463)	~N(465)	7.981	0	0	40886	0.02253
CS02M(076)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	100.2	0.643	0	0	N	~N(464)	~N(466)	7.981	0	0	40911	0.02252
CS02M(077)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	94.86	0.609	0	0	N	~N(465)	~N(467)	7.981	0	0	38733	0.02278
CS02M(078)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	94.92	0.609	0	0	N	~N(466)	~N(468)	7.981	0	0	38758	0.02278
CS02M(079)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	89.59	0.575	0	0	N	~N(467)	~N(469)	7.981	0	0	36581	0.02305
CS02M(080)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	89.65	0.575	0	0	N	~N(468)	~N(470)	7.981	0	0	36605	0.02305
CS02M(081)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	84.32	0.541	0	0	N	~N(469)	~N(471)	7.981	0	0	34428	0.02335
CS02M(082)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	84.38	0.542	0	0	N	~N(470)	~N(472)	7.981	0	0	34452	0.02334
CS02M(083)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	79.05	0.507	0	0	N	~N(471)	~N(473)	7.981	0	0	32275	0.02367
CS02M(084)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	79.11	0.508	0	0	N	~N(472)	~N(474)	7.981	0	0	32299	0.02367
CS02M(085)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	73.77	0.474	0	0	N	~N(473)	~N(475)	7.981	0	0	30123	0.02403
CS02M(086)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	73.83	0.474	0	0	N	~N(474)	~N(476)	7.981	0	0	30147	0.02402
CS02M(087)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	68.5	0.44	0	0	N	~N(475)	~N(477)	7.981	0	0	27970	0.02442
CS02M(088)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	68.56	0.44	0	0	N	~N(476)	~N(478)	7.981	0	0	27994	0.02441
CS02M(089)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	63.23	0.406	0	0	N	~N(477)	~N(479)	7.981	0	0	25817	0.02486
CS02M(090)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	63.29	0.406	0	0	N	~N(478)	~N(480)	7.981	0	0	25842	0.02485
CS02M(091)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	57.96	0.372	0	0	N	~N(479)	~N(481)	7.981	0	0	23665	0.02535
CS02M(092)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	58.02	0.372	0	0	N	~N(480)	~N(482)	7.981	0	0	23689	0.02535
CS02M(093)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	52.69	0.338	0	0	N	~N(481)	~N(483)	7.981	0	0	21512	0.02592
CS02M(094)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	52.75	0.339	0	0	N	~N(482)	~N(484)	7.981	0	0	21536	0.02591
CS02M(095)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	47.42	0.304	0	0	N	~N(483)	~N(485)	7.981	0	0	19360	0.02656
CS02M(096)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	47.47	0.305	0	0	N	~N(484)	~N(486)	7.981	0	0	19384	0.02656
CS02M(097)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	42.14	0.27	0	0	N	~N(485)	~N(487)	7.981	0	0	17207	0.02732
CS02M(098)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	42.2	0.271	0	0	N	~N(486)	~N(488)	7.981	0	0	17232	0.02731
CS02M(099)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	36.87	0.237	0	0	N	~N(487)	~N(489)	7.981	0	0	15055	0.02823
CS02M(100)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	36.93	0.237	0	0	N	~N(488)	~N(490)	7.981	0	0	15079	0.02822
CS02M(101)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	31.6	0.203	0	0	N	~N(489)	~N(491)	7.981	0	0	12902	0.02935
CS02M(102)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	31.66	0.203	0	0	N	~N(490)	~N(492)	7.981	0	0	12927	0.02933
CS02M(103)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	26.33	0.169	0	0	N	~N(491)	~N(493)	7.981	0	0	10750	0.03076
CS02M(104)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	26.39	0.169	0	0	N	~N(492)	~N(494)	7.981	0	0	10774	0.03075
CS02M(105)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	21.06	0.135	0	0	N	~N(493)	~N(495)	7.981	0	0	8598	0.03266
CS02M(106)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	21.12	0.136	0	0	N	~N(494)	~N(496)	7.981	0	0	8622	0.03263
CS02M(107)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	15.79	0.101	0	0	N	~N(495)	~N(497)	7.981	0	0	6445	0.03539
CS02M(108)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	15.84	0.102	0	0	N	~N(496)	~N(498)	7.981	0	0	6469	0.03536
CS02M(109)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	10.51	0.067	0	0	N	~N(497)	~N(499)	7.981	0	0	4293	0.03992
CS02M(110)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	10.57	0.068	0	0	N	~N(498)	~N(500)	7.981	0	0	4317	0.03985
CS02M(111)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	5.242	0.034	0	0	N	~N(499)	~N(501)	7.981	0	0	2140	0.05006
CS02M(112)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	5.301	0.034	0	0	N	~N(500)	~N(502)	7.981	0	0	2165	0.04988
CS02M(113)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	0.03	0	0	0	N	~N(502)	~N(501)	7.981	0	0	12.11	5.287
CS05AA	Steel Sch 40 (clean)	Outage Recirc Water	3	1	8.3	0	0	0	0	N	~N(008)	~N(563)	3.068	0	0	0	0
CS05AB	Steel Sch 40 (clean)	Outage Recirc Water	3	1	9.3	0	0	0	0	N	~N(240)	~N(562)	3.068	0	0	0	0
CS06AA	Steel Sch 40 (clean)	Outage Recirc Water	6	1	0.6	0	0	-1.384	0	N	~N(563)	~N(556)	6.065	0	0	0	0
CS06AB	Steel Sch 40 (clean)	Outage Recirc Water	6	1	0.6	0	0	1.061	0	N	~N(562)	~N(557)	6.065	0	0	0	0
CS23AA	Steel Sch 30 (clean)	Outage Recirc Water	14	15.7	1.00E-05	0	0	-5.406	0	N	~N(556)	~N(005)	13.25	0	0	0	0
CS23AB	Steel Sch 30 (clean)	Outage Recirc Water	14	4.9	1.00E-05	0	0	-2.119	0	N	~N(557)	~N(237)	13.25	0	0	0	0
CV05B(001)	Steel Sch 40 (clean)	Outage Recirc Water	8	17.5	0.8	0	0	0	0	N	~N(622)	~N(627)	7.981	0	0	0.008166	0
CV05B(002)	Steel Sch 40 (clean)	Outage Recirc Water	8	21.7	0.5907	0	0	0	0	N	~N(631)	~N(622)	7.981	0	0	0.008166	0
CV05B(003)	Steel Sch 40 (clean)	Outage Recirc Water	8	18.6	1.00E-05	0	0	0	0	N	~N(633)	~N(631)	7.981	0	0	0.01225	0
CV05B(004)	Steel Sch 40 (clean)	Outage Recirc Water	8	18.5	0.5907	0	0	0	0	N	~N(625)	~N(633)	7.981	0	0	0.01225	0
CV05B(005)	Steel Sch 40 (clean)	Outage Recirc Water	8	13.7	1.00E-05	0	0	0.865	0	N	~N(624)	~N(625)	7.981	0	0	0	0
CV05B(006)	Steel Sch 40 (clean)	Outage Recirc Water	8	1	1.00E-05	0	0	0	0	N	~N(623)	~N(624)	7.981	0	0	0	0
CV05CA	Steel Sch 40 (clean)	Outage Recirc Water	6	24.5	2.812	0	0	-1.687	0	N	~N(627)	Centrifugal Charging Pump A	6.065	0	0	0.005373	0
CV05CB	Steel Sch 40 (clean)	Outage Recirc Water	6	119.8	1.921	0	0	-1.687	0	N	~N(627)	Centrifugal Charging Pump B	6.065	0	0	0.005373	0
CV06A	Steel Sch 40 (clean)	Outage Recirc Water	4	39.4	427.6	0	0	-2.508	0	N	~N(631)	Positive Dis. Charging Pump	4.026	0	0	0.008094	0
CV07A(001)	Steel Sch 160 (clean)	Outage Recirc Water	3	2.7	8.631	0	0	0	0	N	Positive Dis. Charging Pump	~N(641)	2.624	0	0	0.01242	0
CV07A(002)	Steel Sch.160 (clean)	Outage Recirc Water	3	30.5	10.05	0	0	1.557	0	N	~N(641)	~N(640)	2.624	0	0	0.01242	0

CS02M(001)	1 x Reducer - Contraction (10 x 8 - 7)	0.1047	1 x Diverging* Tee (Branch)	4.3						
CS02M(002)	1 x Reducer - Contraction (10 x 8 - 7)	0.1047	1 x Diverging* Tee (Branch)	4.3						
CS05AA	1 x Diverging Tee (Branch)	8.3								
CS05AB	1 x Diverging Tee (Branch)	9.3								
CS06AA	1 x Converging Tee (Branch)	0.6								
CS06AB	1 x Converging Tee (Branch)	0.6								
CS23AA	1 x Converging Tee (Branch)	1.00E-05								
CS23AB	1 x Converging Tee (Branch)	1.00E-05								
CV05B(001)	1 x Diverging* Tee (Branch)	0.8								
CV05B(002)	3 x Pipe Bend - r/d 1.5 (90)	0.1909	1 x Converging Tee (Through)	1.00E-05						
CV05B(003)	1 x Diverging Tee (Branch)	1.00E-05								
CV05B(004)	3 x Pipe Bend - r/d 1.5 (90)	0.1909	1 x Converging Tee (Through)	1.00E-05						
CV05B(005)	1 x Converging* Tee (Branch)	1.00E-05								
CV05B(006)	1 x Converging* Tee (Branch)	1.00E-05								
CV05CA	2 x Pipe Bend - r/d 1.5 (90)	0.2085	1 x CV8471A (Gate Valve)	0.195	1 x Diverging Tee (Branch)	2.3				
CV05CB	8 x Pipe Bend - r/d 1.5 (90)	0.2085	1 x Reducer - Contraction (8 x 6 - 5.5)	0.058	1 x CV8471B (Gate Valve)	0.195	1 x Diverging Tee (Through)	1.00E-05		
CV06A	5 x Pipe Bend - r/d 1.5 (90)	0.2279	1 x Reducer - Contraction (8 x 4 - 6)	0.1867	1 x CV13M(Suct. Stabilizer)	423.9	1 x CV8394(Diaphragm Valve)	2.436	1 x Diverging Tee (Through)	1.00E-05
CV07A(001)	1 x Pipe Bend - r/d 1.5 (90)	0.2511	1 x CV12M(Puls. Dampener)	6.379						
CV07A(002)	1 x CV8497(Check Valve)	3.2	3 x Pipe Bend - r/d 1.5 (90)	0.2511	1 x CV8388(Globe Valve)	6.1	1 x Diverging Tee (Through)	1.00E-05		

CV08AA(001)	Steel Sch.160 (clean)	Outage Recirc Water	4	2.8	0.4721		0	0	0.389	0	N	Centrifugal Charging Pump A	~N(637)	3.438	0	0	0.009478	0	2 x Pipe Bend - r/d 1.5 (90)	0.2361
CV08AA(002)	Steel Sch.160 (clean)	Outage Recirc Water	4	4.8	2.975		0	0	0	0	N	~N(637)	~N(638)	3.438	0	0	0.009478	0	1 x CV8481A(Check Valve)	2.975
CV08AA(003)	Steel Sch 40 (clean)	Outage Recirc Water	4	12.8	2.005		0	0	0.822	0	N	~N(638)	~N(639)	4.026	0	0	0.008094	0	3 x Pipe Bend - r/d 1.5 (90)	0.2279
CV08BA(001)	Steel Sch.160 (clean)	Outage Recirc Water	4	1.7	0.2361		0	0	0.389	0	N	Centrifugal Charging Pump B	~N(634)	3.438	0	0	0.009478	0	1 x Pipe Bend - r/d 1.5 (90)	0.2361
CV08BA(002)	Steel Sch.160 (clean)	Outage Recirc Water	4	3.7	3.211		0	0	0	0	N	~N(634)	~N(635)	3.438	0	0	0.009478	0	1 x Pipe Bend - r/d 1.5 (90)	0.2361
CV08BA(003)	Steel Sch 40 (clean)	Outage Recirc Water	4	103.1	3.733		0	0	0.822	0	N	~N(635)	~N(636)	4.026	0	0	0.008094	0	4 x Pipe Bend - r/d 1.5 (90)	0.2279
CV09A(001)	Steel Sch 160 (clean)	Outage Recirc Water	4	13.3	2.6		0	0	0	0	N	~N(639)	~N(636)	3.438	0	0	0.01896	0	1 x Converging Tee (Branch)	2.6
CV09A(002)	Steel Sch 160 (clean)	Outage Recirc Water	4	23.3	9.156		0	0	7.266	0	N	~N(636)	~N(643)	3.438	0	0	0.02844	0	4 x Pipe Bend - r/d 1.5 (90)	0.2361
CV09D(001)	Steel Sch.160 (clean)	Outage Recirc Water	3	2.6	0.2638		0	0	0	0	N	~N(640)	~N(642)	2.624	0	0	0.01242	0	1 x Reducer - Contraction (4 x 3 - 4)	0.03381
CV09D(002)	Steel Sch.160 (clean)	Outage Recirc Water	3	8.6	0.23		0	0	0	0	N	~N(642)	~N(639)	2.624	0	0	0.01242	0	1 x CV8483B(Gate Valve)	0.23
CV09D(003)	Steel Sch.160 (clean)	Outage Recirc Water	3	23	8.4		0	0	2.884	0	N	~N(640)	~N(667)	2.624	0	0	0	0	1 x FE121	8.4
CV09D(004)	Steel Sch.160 (clean)	Outage Recirc Water	3	12.5	0		0	0	0	0	N	~N(667)	~N(668)	2.624	0	0	0	0		
CV12AA	Steel Sch.160 (clean)	Outage Recirc Water	3	15.6	1.74	XXX	—	—	—	—	N	~N(638)	~N(676)	2.624	—	—	—	—	3 x Pipe Bend - r/d 1.5 (90)	0.2511
CV12AB	Steel Sch.160 (clean)	Outage Recirc Water	3	116.7	3.247	XXX	—	—	—	—	N	~N(635)	~N(678)	2.624	—	—	—	—	8 x Pipe Bend - r/d 1.5 (90)	0.2511
CV12B	Steel Sch.160 (clean)	Outage Recirc Water	3	0.8	0		0	0	0	0	N	~N(678)	~N(679)	2.624	0	0	0	0		
CV13B	Steel Sch.160 (clean)	Outage Recirc Water	3	13.8	0.2512		0	0	3.267	0	N	~N(679)	~N(667)	2.624	0	0	0	0	1 x Pipe Bend - r/d 1.5 (90)	0.2511
CV43A(001)	Steel Sch.160 (clean)	Outage Recirc Water	2	92	49.04		0	0	1.946	0	N	~N(668)	~N(669)	1.687	0	0	0	0	13 x Pipe Bend - r/d 1.5 (90)	0.2791
CV43A(002)	Steel Sch.160 (clean)	Outage Recirc Water	2	80.5	1.116		0	0	0.303	0	N	~N(669)	~N(670)	1.687	0	0	0	0	4 x Pipe Bend - r/d 1.5 (90)	0.2791
CV43A(003)	Steel Sch.160 (clean)	Outage Recirc Water	2	117.8	2.151		0	0	1.211	0	N	~N(670)	~N(671)	1.687	0	0	0	0	7 x Pipe Bend - r/d 1.5 (90)	0.2791
CV43BA/RC16AA	Steel Sch 160 (clean)	Outage Recirc Water	2	134.4	15.41	XXX	—	—	—	—	N	~N(671)	Hot Leg A(001)	1.687	—	—	—	—	13 x Pipe Bend - r/d 1.5 (90)	0.2791
CV43BB/RC16AB	Steel Sch 160 (clean)	Outage Recirc Water	2	19	13.29	XXX	—	—	—	—	N	~N(671)	Hot Leg B(001)	1.687	—	—	—	—	4 x Pipe Bend - r/d 1.5 (90)	0.2791
CV43BC/RC16AC	Steel Sch.160 (clean)	Outage Recirc Water	2	59.1	13.46	XXX	—	—	—	—	N	~N(670)	Hot Leg C(001)	1.687	—	—	—	—	8 x Pipe Bend - r/d 1.5 (90)	0.2791
CV43BD/RC16AD	Steel Sch.160 (clean)	Outage Recirc Water	2	51.7	12.9	XXX	—	—	—	—	N	~N(669)	Hot Leg D(001)	1.687	—	—	—	—	4 x Pipe Bend - r/d 1.5 (90)	0.2791
CV98A	Steel Sch 40 (clean)	Outage Recirc Water	8	5.5	0		0	0	-2.379	0	N	~N(508)	~N(618)	7.981	0	0	0	0		
CV98BA	Steel Sch.40 (clean)	Outage Recirc Water	8	8.8	6.977	XXX	—	—	—	—	N	~N(618)	~N(621)	7.981	—	—	—	—	1 x Pipe Bend - r/d 1.5 (90)	0.1969
CV98BB	Steel Sch.40 (clean)	Outage Recirc Water	8	8.8	0.3789	XXX	—	—	—	—	N	~N(618)	~N(621)	7.981	—	—	—	—	1 x Pipe Bend - r/d 1.5 (90)	0.1969
CV98C	Steel Sch.40 (clean)	Outage Recirc Water	8	6.5	1.9		0	0	0	0	N	~N(621)	~N(622)	7.981	0	0	0	0	1 x CV8546(Check Valve)	1.9
CVA1A/SI13C	Steel Sch.40 (clean)	Outage Recirc Water	6	22.5	0.8205		0	0	1.773	0	N	~N(626)	~N(624)	6.065	0	0	0	0	1 x SI8924 (Gate Valve)	0.195
CV-4A	Steel Sch.160 (clean)	Outage Recirc Water	4	19.8	1.72		0	0	3.979	0	N	~N(643)	~N(644)	3.438	0	0	0.02844	0	3 x Pipe Bend - r/d 1.5 (90)	0.2361
Pipe(002)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.078	1.515	2.677	6.689	N	A2(001)	~N(073)	1.049	0.006	6.683	12667	0.03215	1 x Spray Nozzle	186.7
Pipe(003)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	3.921	1.457	2.675	6.186	N	A2(003)	~N(072)	1.049	0.006	6.18	12181	0.03241	1 x Spray Nozzle	186.7
Pipe(004)	Steel Sch.40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	3.824	1.421	2.674	5.882	N	A2(005)	~N(071)	1.049	0.006	5.876	11878	0.03257	1 x Spray Nozzle	186.7
Pipe(006)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	3.826	1.422	2.677	5.89	N	A2(002)	~N(070)	1.049	0.006	5.884	11886	0.03257	1 x Spray Nozzle	186.7
Pipe(007)	Steel Sch.40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	3.921	1.457	2.675	6.186	N	A2(004)	~N(067)	1.049	0.006	6.18	12181	0.03241	1 x Spray Nozzle	186.7
Pipe(008)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.076	1.514	2.674	6.682	N	A2(006)	~N(068)	1.049	0.006	6.676	12661	0.03215	1 x Spray Nozzle	186.7
Pipe(009)	Steel Sch.40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.075	1.514	2.672	6.679	N	A2(007)	~N(074)	1.049	0.006	6.673	12657	0.03216	1 x Spray Nozzle	186.7
Pipe(010)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	3.823	1.42	2.672	5.879	N	A2(008)	~N(069)	1.049	0.006	5.873	11875	0.03257	1 x Spray Nozzle	186.7
Pipe(011)	Steel Sch.40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	3.918	1.456	2.671	6.176	N	A2(009)	~N(075)	1.049	0.006	6.17	12171	0.03241	1 x Spray Nozzle	186.7

[illegible]

Pipe(246)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.291	1.594	4.414	7.405	N	B3(026)	~N(271)	1.049	0.007	7.399	13329	0.03183	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(247)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.29	1.594	4.414	7.405	N	B3(027)	~N(272)	1.049	0.007	7.398	13328	0.03183	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(248)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.29	1.594	4.414	7.405	N	B3(028)	~N(273)	1.049	0.007	7.398	13328	0.03183	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(249)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.29	1.594	4.414	7.405	N	B3(029)	~N(274)	1.049	0.007	7.398	13327	0.03183	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(250)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.29	1.594	4.414	7.405	N	B3(030)	~N(275)	1.049	0.007	7.398	13327	0.03183	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(251)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.29	1.594	4.413	7.404	N	B3(031)	~N(276)	1.049	0.007	7.397	13327	0.03183	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(252)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.29	1.594	4.413	7.404	N	B3(032)	~N(277)	1.049	0.007	7.397	13327	0.03183	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(253)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.29	1.594	4.413	7.404	N	B3(033)	~N(278)	1.049	0.008	7.396	13326	0.03183	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(254)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.29	1.594	4.413	7.404	N	B3(034)	~N(279)	1.049	0.008	7.396	13326	0.03183	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(255)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.29	1.594	4.413	7.403	N	B3(035)	~N(280)	1.049	0.007	7.396	13326	0.03183	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(256)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.29	1.594	4.413	7.403	N	B3(036)	~N(281)	1.049	0.007	7.396	13326	0.03183	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(257)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.29	1.594	4.413	7.403	N	B3(037)	~N(282)	1.049	0.007	7.396	13326	0.03183	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(258)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.29	1.594	4.413	7.403	N	B3(038)	~N(283)	1.049	0.007	7.396	13326	0.03183	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(259)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.29	1.594	4.413	7.403	N	B3(039)	~N(284)	1.049	0.007	7.396	13325	0.03183	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(260)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.29	1.594	4.413	7.403	N	B3(040)	~N(285)	1.049	0.007	7.396	13325	0.03183	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(261)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.29	1.594	4.413	7.403	N	B3(041)	~N(286)	1.049	0.008	7.395	13325	0.03183	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(262)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.29	1.594	4.413	7.403	N	B3(042)	~N(287)	1.049	0.008	7.395	13325	0.03183	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(263)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.29	1.594	4.413	7.402	N	B3(043)	~N(288)	1.049	0.007	7.395	13325	0.03183	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(264)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.29	1.594	4.413	7.402	N	B3(044)	~N(289)	1.049	0.007	7.395	13325	0.03183	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(265)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.289	1.594	4.412	7.402	N	B3(045)	~N(290)	1.049	0.007	7.395	13325	0.03183	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(266)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.289	1.594	4.412	7.402	N	B3(046)	~N(291)	1.049	0.007	7.395	13325	0.03183	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(267)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.289	1.594	4.412	7.402	N	B3(047)	~N(292)	1.049	0.007	7.395	13325	0.03183	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(268)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.289	1.594	4.412	7.402	N	B3(048)	~N(293)	1.049	0.007	7.395	13325	0.03183	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(269)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.289	1.594	4.412	7.402	N	B3(049)	~N(294)	1.049	0.007	7.395	13325	0.03183	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(270)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.289	1.594	4.412	7.402	N	B3(050)	~N(295)	1.049	0.007	7.395	13325	0.03183	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(271)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.289	1.594	4.412	7.402	N	B3(051)	~N(296)	1.049	0.007	7.395	13325	0.03183	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(272)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.164	1.547	1.071	6.977	N	B2(001)	~N(298)	1.049	0.007	6.97	12937	0.03202	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(273)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.164	1.547	1.071	6.977	N	B2(002)	~N(300)	1.049	0.007	6.97	12937	0.03202	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(274)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.162	1.546	1.068	6.969	N	B2(003)	~N(301)	1.049	0.007	6.962	12929	0.03202	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(275)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.162	1.546	1.068	6.969	N	B2(004)	~N(302)	1.049	0.007	6.962	12929	0.03202	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(276)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.16	1.545	1.065	6.962	N	B2(005)	~N(303)	1.049	0.007	6.955	12922	0.03202	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(277)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.16	1.545	1.065	6.962	N	B2(006)	~N(304)	1.049	0.007	6.955	12922	0.03202	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(278)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.158	1.545	1.062	6.954	N	B2(007)	~N(305)	1.049	0.006	6.948	12916	0.03203	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(279)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.158	1.545	1.062	6.954	N	B2(008)	~N(306)	1.049	0.006	6.948	12916	0.03203	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(280)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.156	1.544	1.059	6.948	N	B2(009)	~N(307)	1.049	0.007	6.941	12909	0.03203	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(281)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.156	1.544	1.059	6.948	N	B2(010)	~N(308)	1.049	0.007	6.941	12909	0.03203	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(282)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.154	1.543	1.056	6.941	N	B2(011)	~N(310)	1.049	0.007	6.934	12903	0.03203	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(283)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.154	1.543	1.056	6.941	N	B2(012)	~N(309)	1.049	0.007	6.934	12903	0.03203	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(284)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.152	1.542	1.053	6.935	N	B2(013)	~N(311)	1.049	0.007	6.928	12897	0.03204	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(285)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.152	1.542	1.053	6.935	N	B2(014)	~N(312)	1.049	0.007	6.928	12897	0.03204	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(286)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.15	1.542	1.05	6.929	N	B2(015)	~N(314)	1.049	0.007	6.922	12892	0.03204	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(287)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.15	1.542	1.05	6.929	N	B2(016)	~N(313)	1.049	0.007	6.922	12892	0.03204	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(288)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.148	1.541	1.048	6.923	N	B2(017)	~N(318)	1.049	0.007	6.916	12886	0.03204	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(289)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.148	1.541	1.048	6.923	N	B2(018)	~N(317)	1.049	0.007	6.916	12886	0.03204	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(290)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.147	1.541	1.046	6.918	N	B2(019)	~N(315)	1.049	0.007	6.911	12881	0.03204	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(291)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.147	1.541	1.046	6.918	N	B2(020)	~N(316)	1.049	0.007	6.911	12881	0.03204	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(292)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.145	1.54	1.043	6.912	N	B2(021)	~N(320)	1.049	0.006	6.906	12877	0.03205	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(293)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.145	1.54	1.043	6.912	N	B2(022)	~N(319)	1.049	0.006	6.906	12877	0.03205	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(294)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.144	1.539	1.041	6.908	N	B2(023)	~N(321)	1.049	0.007	6.901	12872	0.03205	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(295)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.144	1.539	1.041	6.908	N	B2(024)	~N(322)	1.049	0.007	6.901	12872	0.03205	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(296)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.142	1.539	1.039	6.903	N	B2(025)	~N(323)	1.049	0.007	6.896	12868	0.03205	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(297)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.142	1.539	1.039	6.903	N	B2(026)	~N(324)	1.049	0.007	6.896	12868	0.03205	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(298)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.141	1.538	1.037	6.899	N	B2(027)	~N(325)	1.049	0.007	6.892	12864	0.03205	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(299)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.141	1.538	1.037	6.899	N	B2(028)	~N(326)	1.049	0.007	6.892	12864	0.03206	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(300)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.14	1.538	1.036	6.895	N	B2(029)	~N(327)	1.049	0.007	6.888	12860	0.03206	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(301)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.14	1.538	1.036	6.895	N	B2(030)	~N(328)	1.049	0.007	6.888	12860	0.03206	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(302)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.139	1.538	1.034	6.891	N	B2(031)	~N(329)	1.049	0.007	6.884	12856	0.03206	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(303)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.139	1.538	1.034	6.891	N	B2(032)	~N(330)	1.049	0.007	6.884	12856	0.03206	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(304)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.137	1.537	1.032	6.887	N	B2(033)	~N(331)	1.049	0.007	6.88	12853	0.03206	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(305)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.137	1.537	1.032	6.887	N	B2(034)	~N(332)	1.049	0.007	6.88	12853	0.03206	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(306)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.136	1.537	1.031	6.884	N	B2(035)	~N(333)	1.049	0.007	6.877	12850	0.03206	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(307)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.136	1.537	1.031	6.884	N	B2(036)	~N(334)	1.049	0.007	6.877	12850	0.03206	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(308)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.135	1.536	1.03	6.88	N	B2(037)	~N(335)	1.049	0.008	6.874	12847	0.03206	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(309)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.135	1.536	1.03	6.88	N	B2(038)	~N(336)	1.049	0.006	6.874	12847	0.03206	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(310)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.135	1.536	1.028	6.877	N	B2(039)	~N(337)	1.049	0.006	6.871	12844	0.03206	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(311)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.135	1.536	1.028	6.877	N	B2(040)	~N(338)	1.049	0.006	6.871	12844	0.03206	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(312)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.134	1.536	1.027	6.875	N	B2(041)	~N(339)	1.049	0.007	6.868	12841	0.03206	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(313)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.134	1.536	1.027	6.875	N	B2(042)	~N(340)	1.049	0.007	6.868	12841	0.03206	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(314)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.133	1.536	1.026	6.872	N	B2(043)	~N(341)	1.049	0.007	6.865	12839	0.03206	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(315)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.133	1.536	1.026	6.872	N	B2(044)	~N(342)	1.049	0.007	6.865	12839	0.03206	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(316)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.132	1.535	1.025	6.87	N	B2(045)	~N(343)	1.049	0.007	6.863	12837	0.03207	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(317)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.132	1.535	1.025	6.87	N	B2(046)	~N(344)	1.049	0.007	6.863	12837	0.03207	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(318)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.132	1.535	1.024	6.867	N	B2(047)	~N(345)	1.049	0.006	6.861	12835	0.03207	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(319)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.132	1.535	1.024	6.867	N	B2(048)	~N(346)	1.049	0.006	6.861	12835	0.03207	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(320)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.131	1.535	1.023	6.865	N	B2(049)	~N(347)	1.049	0.006	6.859	12833	0.03207	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(321)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.131	1.535	1.023	6.865	N	B2(050)	~N(348)	1.049	0.006	6.859	12833	0.03207	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(322)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.13	1.535	1.022	6.864	N	B2(051)	~N(349)	1.049	0.007	6.857	12831	0.03207	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(323)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.13	1.535	1.022	6.864	N	B2(052)	~N(350)	1.049	0.007	6.857	12831	0.03207	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(324)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.13	1.534	1.022	6.862	N	B2(053)	~N(351)	1.049	0.007	6.855	12829	0.03207	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(325)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.13	1.534	1.022	6.862	N	B2(054)	~N(352)	1.049	0.007	6.855	12829	0.03207	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(326)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.129	1.534	1.021	6.86	N	B2(055)	~N(353)	1.049	0.006	6.854	12828	0.03207	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(327)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.129	1.534	1.021	6.86	N	B2(056)	~N(354)	1.049	0.006	6.854	12828	0.03207	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(328)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.129	1.534	1.02	6.859	N	B2(057)	~N(355)	1.049	0.007	6.852	12827	0.03207	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(329)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.129	1.534	1.02	6.859	N	B2(058)	~N(356)	1.049	0.007	6.852	12827	0.03207	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(330)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.129	1.534	1.02	6.858	N	B2(059)	~N(357)	1.049	0.007	6.851	12826	0.03207	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(331)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.129	1.534	1.02	6.858	N	B2(060)	~N(358)	1.049	0.007	6.851	12826	0.03207	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(332)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.128	1.534	1.019	6.857	N	B2(061)	~N(359)	1.049	0.007	6.85	12825	0.03207	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(333)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.128	1.534	1.019	6.857	N	B2(062)	~N(360)	1.049	0.007	6.85	12825	0.03207	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(334)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.128	1.534	1.019	6.856	N	B2(063)	~N(361)	1.049	0.007	6.849	12824	0.03207	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(335)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<-->	4.128	1.534	1.019	6.856	N	B2(064)	~N(362)	1.049	0.007	6.849	12824	0.03207	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1

Pipe(336)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.128	1.534	1.018	6.855	N	B2(065)	~N(363)	1.049	0.007	6.848	12823	0.03207	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(337)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.128	1.534	1.018	6.855	N	B2(066)	~N(364)	1.049	0.007	6.848	12823	0.03207	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(338)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.128	1.533	1.018	6.854	N	B2(067)	~N(365)	1.049	0.007	6.847	12822	0.03207	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(339)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.128	1.533	1.018	6.854	N	B2(068)	~N(366)	1.049	0.007	6.847	12822	0.03207	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(340)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.127	1.533	1.018	6.853	N	B2(069)	~N(367)	1.049	0.006	6.847	12822	0.03207	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(341)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.127	1.533	1.018	6.853	N	B2(070)	~N(368)	1.049	0.006	6.847	12822	0.03207	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(342)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.127	1.533	1.018	6.853	N	B2(071)	~N(369)	1.049	0.007	6.846	12821	0.03207	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(343)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.127	1.533	1.018	6.853	N	B2(072)	~N(370)	1.049	0.007	6.846	12821	0.03207	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(344)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.127	1.533	1.017	6.852	N	B2(073)	~N(371)	1.049	0.006	6.846	12821	0.03207	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(345)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.127	1.533	1.017	6.852	N	B2(074)	~N(372)	1.049	0.006	6.846	12821	0.03207	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(346)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.127	1.533	1.017	6.852	N	B2(075)	~N(373)	1.049	0.007	6.845	12820	0.03207	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(347)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.127	1.533	1.017	6.852	N	B2(076)	~N(374)	1.049	0.007	6.845	12820	0.03207	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(348)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.127	1.533	1.017	6.852	N	B2(077)	~N(375)	1.049	0.007	6.845	12820	0.03207	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(349)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.127	1.533	1.017	6.852	N	B2(078)	~N(376)	1.049	0.007	6.845	12820	0.03207	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(350)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.127	1.533	1.017	6.852	N	B2(079)	~N(377)	1.049	0.007	6.845	12820	0.03207	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(351)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.127	1.533	1.017	6.852	N	B2(080)	~N(378)	1.049	0.007	6.845	12820	0.03207	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(352)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.127	1.533	1.017	6.851	N	B2(081)	~N(379)	1.049	0.006	6.845	12820	0.03207	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(353)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.127	1.533	1.017	6.851	N	B2(082)	~N(380)	1.049	0.006	6.845	12820	0.03207	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(354)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.127	1.533	1.017	6.851	N	B2(083)	~N(381)	1.049	0.006	6.845	12820	0.03207	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(355)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.127	1.533	1.017	6.851	N	B2(084)	~N(382)	1.049	0.006	6.845	12820	0.03207	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(356)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.127	1.533	1.017	6.851	N	B2(085)	~N(383)	1.049	0.006	6.845	12819	0.03207	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(357)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.127	1.533	1.017	6.851	N	B2(086)	~N(384)	1.049	0.006	6.845	12819	0.03207	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(358)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.127	1.533	1.017	6.851	N	B2(087)	~N(385)	1.049	0.006	6.845	12819	0.03207	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(359)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.127	1.533	1.017	6.851	N	B2(088)	~N(387)	1.049	0.006	6.845	12819	0.03207	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(360)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.127	1.533	1.017	6.851	N	B2(089)	~N(388)	1.049	0.006	6.845	12819	0.03207	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(361)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.127	1.533	1.017	6.851	N	B2(090)	~N(389)	1.049	0.006	6.845	12819	0.03207	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(362)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.297	1.968	4.882	11.29	N	~N(391)	B1(001)	1.049	0.01	11.28	16455	0.03058	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(363)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.297	1.968	4.882	11.29	N	~N(392)	B1(002)	1.049	0.01	11.28	16455	0.03058	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(364)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.296	1.967	4.88	11.28	N	~N(393)	B1(003)	1.049	0.01	11.27	16451	0.03058	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(365)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.296	1.968	4.88	11.28	N	~N(394)	B1(004)	1.049	0.01	11.27	16451	0.03058	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(366)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.295	1.967	4.877	11.28	N	~N(395)	B1(005)	1.049	0.01	11.27	16447	0.03058	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(367)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.295	1.967	4.877	11.28	N	~N(396)	B1(006)	1.049	0.01	11.27	16447	0.03058	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(368)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.293	1.967	4.875	11.27	N	~N(397)	B1(007)	1.049	0.01	11.26	16443	0.03059	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(369)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.293	1.967	4.875	11.27	N	~N(398)	B1(008)	1.049	0.01	11.26	16444	0.03059	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(370)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.292	1.966	4.873	11.27	N	~N(399)	B1(009)	1.049	0.01	11.26	16440	0.03059	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(371)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.292	1.966	4.873	11.27	N	~N(400)	B1(010)	1.049	0.01	11.26	16440	0.03059	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(372)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.291	1.966	4.871	11.26	N	~N(401)	B1(011)	1.049	0.01	11.25	16436	0.03059	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(373)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.291	1.966	4.871	11.26	N	~N(402)	B1(012)	1.049	0.01	11.25	16437	0.03059	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(374)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.29	1.965	4.869	11.26	N	~N(403)	B1(013)	1.049	0.01	11.25	16433	0.03059	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(375)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.29	1.965	4.869	11.26	N	~N(404)	B1(014)	1.049	0.01	11.25	16433	0.03059	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(376)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.289	1.965	4.867	11.25	N	~N(405)	B1(015)	1.049	0.01	11.24	16430	0.03059	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(377)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.289	1.965	4.867	11.25	N	~N(406)	B1(016)	1.049	0.01	11.24	16430	0.03059	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(378)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.288	1.965	4.865	11.25	N	~N(407)	B1(017)	1.049	0.01	11.24	16427	0.03059	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(379)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.288	1.965	4.865	11.25	N	~N(408)	B1(018)	1.049	0.01	11.24	16427	0.03059	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(380)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.287	1.964	4.863	11.25	N	~N(409)	B1(019)	1.049	0.02	11.23	16424	0.03059	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(381)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.287	1.964	4.864	11.25	N	~N(410)	B1(020)	1.049	0.02	11.23	16424	0.03059	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(382)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.286	1.964	4.862	11.24	N	~N(411)	B1(021)	1.049	0.01	11.23	16421	0.03059	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(383)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.286	1.964	4.862	11.24	N	~N(412)	B1(022)	1.049	0.01	11.23	16421	0.03059	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(384)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.285	1.964	4.86	11.24	N	~N(413)	B1(023)	1.049	0.01	11.23	16418	0.03059	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(385)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.285	1.964	4.86	11.24	N	~N(414)	B1(024)	1.049	0.01	11.23	16418	0.03059	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(386)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.284	1.963	4.859	11.23	N	~N(415)	B1(025)	1.049	0.01	11.22	16416	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(387)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.284	1.963	4.859	11.23	N	~N(416)	B1(026)	1.049	0.01	11.22	16416	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(388)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.284	1.963	4.857	11.23	N	~N(417)	B1(027)	1.049	0.01	11.22	16413	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(389)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.284	1.963	4.857	11.23	N	~N(418)	B1(028)	1.049	0.01	11.22	16413	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(390)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.283	1.963	4.856	11.23	N	~N(419)	B1(029)	1.049	0.01	11.22	16411	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(391)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.283	1.963	4.856	11.23	N	~N(420)	B1(030)	1.049	0.01	11.22	16411	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(392)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.282	1.962	4.854	11.22	N	~N(421)	B1(031)	1.049	0.01	11.21	16408	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(393)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.282	1.962	4.854	11.22	N	~N(422)	B1(032)	1.049	0.01	11.21	16408	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(394)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.281	1.962	4.853	11.22	N	~N(423)	B1(033)	1.049	0.01	11.21	16406	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(395)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.281	1.962	4.853	11.22	N	~N(424)	B1(034)	1.049	0.01	11.21	16406	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(396)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.281	1.962	4.852	11.22	N	~N(425)	B1(035)	1.049	0.01	11.21	16404	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(397)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.281	1.962	4.852	11.22	N	~N(426)	B1(036)	1.049	0.01	11.21	16404	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(398)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.28	1.962	4.851	11.22	N	~N(427)	B1(037)	1.049	0.02	11.2	16402	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(399)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.28	1.962	4.851	11.22	N	~N(428)	B1(038)	1.049	0.02	11.2	16402	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(400)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.279	1.961	4.849	11.21	N	~N(429)	B1(039)	1.049	0.01	11.2	16400	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(401)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.279	1.961	4.849	11.21	N	~N(430)	B1(040)	1.049	0.01	11.2	16400	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(402)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.279	1.961	4.848	11.21	N	~N(431)	B1(041)	1.049	0.01	11.2	16398	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(403)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.279	1.961	4.848	11.21	N	~N(432)	B1(042)	1.049	0.01	11.2	16398	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(404)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.278	1.961	4.847	11.21	N	~N(433)	B1(043)	1.049	0.01	11.2	16397	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(405)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.278	1.961	4.847	11.21	N	~N(434)	B1(044)	1.049	0.01	11.2	16397	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(406)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.278	1.961	4.846	11.21	N	~N(435)	B1(045)	1.049	0.01	11.2	16395	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(407)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.278	1.961	4.846	11.21	N	~N(436)	B1(046)	1.049	0.01	11.2	16395	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(408)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.277	1.961	4.845	11.2	N	~N(437)	B1(047)	1.049	0.01	11.19	16393	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(409)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.277	1.961	4.845	11.2	N	~N(438)	B1(048)	1.049	0.01	11.19	16394	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(410)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.277	1.96	4.845	11.2	N	~N(439)	B1(049)	1.049	0.01	11.19	16392	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(411)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.277	1.96	4.845	11.2	N	~N(440)	B1(050)	1.049	0.01	11.19	16392	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(412)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.276	1.96	4.844	11.2	N	~N(441)	B1(051)	1.049	0.01	11.19	16391	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(413)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.276	1.96	4.844	11.2	N	~N(442)	B1(052)	1.049	0.01	11.19	16391	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(414)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.276	1.96	4.843	11.2	N	~N(443)	B1(053)	1.049	0.01	11.19	16389	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(415)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.276	1.96	4.843	11.2	N	~N(444)	B1(054)	1.049	0.01	11.19	16389	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(416)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.275	1.96	4.842	11.2	N	~N(445)	B1(055)	1.049	0.01	11.19	16388	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(417)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.276	1.96	4.842	11.2	N	~N(446)	B1(056)	1.049	0.01	11.19	16388	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(418)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.275	1.96	4.842	11.19	N	~N(447)	B1(057)	1.049	0.01	11.18	16387	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(419)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.275	1.96	4.842	11.19	N	~N(448)	B1(058)	1.049	0.01	11.18	16387	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(420)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.275	1.96	4.841	11.19	N	~N(449)	B1(059)	1.049	0.01	11.18	16386	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(421)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.275	1.96	4.841	11.19	N	~N(450)	B1(060)	1.049	0.01	11.18	16386	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(422)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.274	1.96	4.84	11.19	N	~N(451)	B1(061)	1.049	0.01	11.18	16385	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(423)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.274	1.96	4.84	11.19	N	~N(452)	B1(062)	1.049	0.01	11.19	16385	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(424)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.274	1.958	4.84	11.19	N	~N(453)	B1(063)	1.049	0.01	11.18	16384	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(425)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.274	1.958	4.84	11.19	N	~N(454)	B1(064)	1.049	0.01	11.18	16384	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(426)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.274	1.959	4.839	11.19	N	~N(455)	B1(065)	1.049	0.01	11.18	16383	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(427)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.274	1.959	4.839	11.19	N	~N(456)	B1(066)	1.049	0.01	11.18	16383	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(428)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.274	1.959	4.839	11.19	N	~N(457)	B1(067)	1.049	0.01	11.18	16382	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(429)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.274	1.959	4.839	11.19	N	~N(458)	B1(068)	1.049	0.01	11.18	16382	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(430)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.273	1.959	4.838	11.19	N	~N(459)	B1(069)	1.049	0.01	11.18	16382	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(431)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.273	1.959	4.838	11.19	N	~N(460)	B1(070)	1.049	0.01	11.18	16382	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(432)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.273	1.959	4.838	11.19	N	~N(461)	B1(071)	1.049	0.01	11.18	16381	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(433)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.273	1.959	4.838	11.19	N	~N(462)	B1(072)	1.049	0.01	11.18	16381	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(434)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.273	1.959	4.838	11.19	N	~N(463)	B1(073)	1.049	0.02	11.17	16380	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(435)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.273	1.959	4.838	11.18	N	~N(464)	B1(074)	1.049	0.02	11.17	16380	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(436)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.273	1.959	4.837	11.18	N	~N(465)	B1(075)	1.049	0.01	11.17	16380	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(437)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.273	1.959	4.837	11.18	N	~N(466)	B1(076)	1.049	0.01	11.17	16380	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(438)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.273	1.959	4.837	11.18	N	~N(467)	B1(077)	1.049	0.01	11.17	16379	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(439)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.273	1.959	4.837	11.18	N	~N(468)	B1(078)	1.049	0.01	11.17	16379	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(440)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.272	1.959	4.837	11.18	N	~N(469)	B1(079)	1.049	0.01	11.17	16379	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(441)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.272	1.959	4.837	11.18	N	~N(470)	B1(080)	1.049	0.01	11.17	16379	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(442)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.272	1.959	4.836	11.18	N	~N(471)	B1(081)	1.049	0.01	11.17	16378	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(443)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.272	1.959	4.836	11.18	N	~N(472)	B1(082)	1.049	0.01	11.17	16378	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(444)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.272	1.959	4.836	11.18	N	~N(473)	B1(083)	1.049	0.01	11.17	16378	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(445)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.272	1.959	4.836	11.18	N	~N(474)	B1(084)	1.049	0.01	11.17	16378	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(446)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.272	1.959	4.836	11.18	N	~N(475)	B1(085)	1.049	0.01	11.17	16378	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(447)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.272	1.959	4.836	11.18	N	~N(476)	B1(086)	1.049	0.01	11.17	16378	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(448)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.272	1.959	4.836	11.18	N	~N(477)	B1(087)	1.049	0.01	11.17	16377	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(449)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.272	1.959	4.836	11.18	N	~N(478)	B1(088)	1.049	0.01	11.17	16377	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(450)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.272	1.959	4.836	11.18	N	~N(479)	B1(089)	1.049	0.01	11.17	16377	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(451)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.272	1.959	4.836	11.18	N	~N(480)	B1(090)	1.049	0.01	11.17	16377	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(452)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.272	1.959	4.836	11.18	N	~N(481)	B1(091)	1.049	0.01	11.17	16377	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(453)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.272	1.959	4.836	11.18	N	~N(482)	B1(092)	1.049	0.01	11.17	16377	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(454)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.272	1.959	4.835	11.18	N	~N(483)	B1(093)	1.049	0.01	11.17	16377	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(455)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.272	1.959	4.835	11.18	N	~N(484)	B1(094)	1.049	0.01	11.17	16377	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(456)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.272	1.959	4.835	11.18	N	~N(485)	B1(095)	1.049	0.01	11.17	16376	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(457)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.272	1.959	4.835	11.18	N	~N(486)	B1(096)	1.049	0.01	11.17	16376	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(458)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.272	1.959	4.835	11.18	N	~N(487)	B1(097)	1.049	0.01	11.17	16376	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(459)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.272	1.959	4.835	11.18	N	~N(488)	B1(098)	1.049	0.01	11.17	16376	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(460)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.272	1.959	4.835	11.18	N	~N(489)	B1(099)	1.049	0.01	11.17	16376	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(461)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.272	1.959	4.835	11.18	N	~N(490)	B1(100)	1.049	0.01	11.17	16376	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(462)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.272	1.959	4.835	11.18	N	~N(491)	B1(101)	1.049	0.01	11.17	16376	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(463)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.272	1.959	4.835	11.18	N	~N(492)	B1(102)	1.049	0.01	11.17	16376	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(464)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.272	1.959	4.835	11.18	N	~N(493)	B1(103)	1.049	0.01	11.17	16376	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(465)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.272	1.959	4.835	11.18	N	~N(494)	B1(104)	1.049	0.01	11.17	16376	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(466)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.272	1.959	4.835	11.18	N	~N(495)	B1(105)	1.049	0.01	11.17	16376	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(467)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.272	1.959	4.835	11.18	N	~N(496)	B1(106)	1.049	0.01	11.17	16376	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(468)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.272	1.959	4.835	11.18	N	~N(497)	B1(107)	1.049	0.01	11.17	16376	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(469)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.272	1.959	4.835	11.18	N	~N(498)	B1(108)	1.049	0.01	11.17	16376	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(470)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.272	1.959	4.835	11.18	N	~N(499)	B1(109)	1.049	0.01	11.17	16376	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(471)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.272	1.959	4.835	11.18	N	~N(500)	B1(110)	1.049	0.01	11.17	16376	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(472)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.272	1.959	4.835	11.18	N	~N(501)	B1(111)	1.049	0.01	11.17	16376	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(473)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.272	1.959	4.835	11.18	N	~N(502)	B1(112)	1.049	0.01	11.17	16376	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(474)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		3.78	1.404	2.313	5.744	N	~N(113)	A1(001)	1.049	0.006	5.742	11742	0.03266	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
RC04AA	Steel Sch 140 (clean)	Outage Recirc Water	12	13.6	0.318		0	0	2.854	0	N	~N(546)	Hot Leg A(002)	10.5	0	0	0	0	1 x Pipe Bend - r/d 1.5 (90)	0.1862	1 x Pipe Bend - r/d 1.5 (45)	0.1318	1 x Diverging Tee (Through)	1.00E-05				
RC04AA/RH01AA	Steel Sch 140 (clean)	Outage Recirc Water	12	149.8	2.723	XXX	—	—	—	—	N	~N(546)	~N(548)	10.5	—	—	—	—	13 x Pipe Bend - r/d 1.5 (90)	0.1862	1 x Pipe Bend - r/d 1.5 (45)	0.1318	1 x RH8701B-2	0.17				
RC04AB	Steel Sch 140 (clean)	Outage Recirc Water	12	9.4	0.318	XXX	—	—	—	—	N	~N(542)	Hot Leg C(002)	10.5	—	—	—	—	1 x Pipe Bend - r/d 1.5 (90)	0.1862	1 x Pipe Bend - r/d 1.5 (45)	0.1318	1 x Converging Tee (Through)	1.00E-05				
RC04AB/RH01AB	Steel Sch 140 (clean)	Outage Recirc Water	12	148.4	3.227		0	0	-3.373	0	N	~N(542)	~N(551)	10.5	0	0	0	0	15 x Pipe Bend - r/d 1.5 (90)	0.1862	2 x Pipe Bend - r/d 1.5 (45)	0.1318	1 x RH8702B-2	0.17	1 x Diverging* Tee (Branch)	1.00E-05		
RC05AA	Steel Sch 160 (clean)	Outage Recirc Water	6	7	2.841		0	0	-1.297	0	N	~N(610)	Hot Leg B(002)	5.187	0	0	0	0	1 x Pipe Bend - r/d 1.5 (90)	0.2156	1 x 8949B	2.625						
RC05AB	Steel Sch 160 (clean)	Outage Recirc Water	6	12.9	3.866	XXX	—	—	—	—	N	~N(541)	~N(342)	5.187	—	—	—	—	2 x Pipe Bend - r/d 1.5 (90)	0.2156	1 x 8949C (Check Valve)	2.625	1 x Converging Tee (Branch)	0.6				
RC36AA	Steel Sch 160 (clean)	Outage Recirc Water	6	7.5	4.066	XXX	—	—	—	—	N	~N(545)	~N(546)	5.187	—	—	—	—	2 x Pipe Bend - r/d 1.5 (90)	0.2156	1 x 8949A (Check Valve)	2.625	1 x Diverging Tee (Branch)	1				
RC35AB	Steel Sch 160 (clean)	Outage Recirc Water	6	7	2.841		0	0	-1.297	0	N	~N(603)	Hot Leg D(002)	5.187	0	0	0	0	1 x Pipe Bend - r/d 1.5 (90)	0.2156	1 x 8949D	2.625						
RC45AA	Steel Sch 160 (clean)	Outage Recirc Water	3	0.6	3.805		0.001	0	0	0	N	~N(650)	Cold Leg A(001)	2.624	0	0	1.26	50.79	1 x Reducer - Enlargement (3 x 1.5 - 3.5)	3.805								
RC45AB	Steel Sch 160 (clean)	Outage Recirc Water	3	0.6	3.805		0	0	0	0	N	~N(666)	Cold Leg B(001)	2.624	0	0	0.2878	0	1 x Reducer - Enlargement (3 x 1.5 - 3.5)	3.805								
RC45AC	Steel Sch 160 (clean)	Outage Recirc Water	3	0.6	3.805		0	0	0	0	N	~N(852)	Cold Leg C(001)	2.624	0	0	0.1119	0	1 x Reducer - Enlargement (3 x 1.5 - 3.5)	3.805								
RC45AD	Steel Sch 160 (clean)	Outage Recirc Water	3	0.6	3.805	<—>	0.001	0	0	0	N	Cold Leg D(001)	~N(661)	2.624	0	0	1.399	45.75	1 x Reducer - Enlargement (3 x 1.5 - 3.5)	3.805								
RH01BA(001)	Steel Sch 40S (clean)	Outage Recirc Water	12	81	1.439		0	0	-12.59	0	N	~N(548)	~N(549)	12	0	0	0	0	7 x Pipe Bend - r/d 1.5 (90)	0.1813	1 x RH8701A-1	0.17	1 x Converging Tee (Through)	1.00E-05				
RH01BA(002)	Steel Sch 40S (clean)	Outage Recirc Water	12	1.8	1.00E-05		0	0	0	0	N	~N(549)	~N(004)	12	0	0	0	0	1 x Converging Tee (Branch)	1.00E-05								
RH01BB(001)	Steel Sch 40S (clean)	Outage Recirc Water	12	76.5	1.077		0	0	-12.87	0	N	~N(551)	~N(552)	12	0	0	0	0	5 x Pipe Bend - r/d 1.5 (90)	0.1813	1 x RH8701A-1	0.17						
RH01BB(002)	Steel Sch 40S (clean)	Outage Recirc Water	12	4.5	1.17		0	0	0	0	N	~N(552)	~N(553)	12	0	0	0	0	1 x Reducer - Enlargement (16 x 12 - 14)	0.07036	1 x Converging Tee (Branch)	1.1	1 x Converging Tee (Through)	1.00E-05				
RH01BB(003)	Steel Sch 40 (clean)	Outage Recirc Water	16	1	0.335		0	0	0	0	N	~N(553)	~N(235)	15	0	0	0	0	1 x Reducer - Enlargement (12 x 16 - 0)	0.335								
RH01CA(001)	Steel Sch 40 (clean)	Outage Recirc Water	16	6.4	0.5229	XXX	—	—	—	—	N	~N(002)	~N(235)	15	—	—	—	—	1 x Pipe Bend - r/d 1.5 (45)	0.1229	1 x Diverging Tee (Branch)	0.4	1 x Converging Tee (Through)	1.00E-05				
RH01CA(002)	Steel Sch 40 (clean)	Outage Recirc Water	16	16.2	0.1736		0	0	-2.422	0	N	~N(004)	~N(512)	15	0	0	0	0	1 x Pipe Bend - r/d 1.5 (90)	0.1736	1 x Converging Tee (Through)	1.00E-05						
RH01CA(003)	Steel Sch 40 (clean)	Outage Recirc Water	16	13.2	0.1736		0	0	0	0	N	~N(512)	~N(535)	15	0	0	0.002172	0	1 x Pipe Bend - r/d 1.5 (90)	0.1736								
RH01CA(004)	Steel Sch 40 (clean)	Outage Recirc Water	14	6.8	0.1907		0	0	0.735	0	N	~N(535)	Residual Heat Removal Pump A	13.124	0	0	0.002483	0	1 x Pipe Bend - r/d 1.5 (90)	0.1782	1 x Reducer - Contraction (16 x 14 - 14)	0.01254						
RH01CB(001)	Steel Sch 40 (clean)	Outage Recirc Water	16	6.3	0.6229	XXX	—	—	—	—	N	~N(234)	~N(236)	15	—	—	—	—	1 x Pipe Bend - r/d 1.5 (45)	0.1229	1 x Diverging Tee (Branch)	0.5	1 x Converging Tee (Through)	1.00E-05				
RH01CB(002)	Steel Sch 40 (clean)	Outage Recirc Water	16	19.1	0.3472		0	0	-2.422	0	N	~N(235)	~N(524)	15	0	0	0	0	2 x Pipe Bend - r/d 1.5 (90)	0.1736	1 x Converging Tee (Through)	1.00E-05						
RH01CB(003)	Steel Sch 40 (clean)	Outage Recirc Water	16	9.1	0		0	0	0	0	N	~N(524)	~N(536)	15	0	0	0	0										
RH01CB(004)	Steel Sch 40 (clean)	Outage Recirc Water	14	6.4	0.1907		0	0	0.735	0	N	~N(536)	Residual Heat Removal Pump B	13.124	0	0	0	0	1 x Pipe Bend - r/d 1.5 (90)	0.1782	1 x Reducer - Contraction (16 x 14 - 14)	0.01254						
RH02AA(001)	Steel Sch 40 (clean)	Outage Recirc Water	8	99.7	5.544		0	0	8.736	0	N	Residual Heat Removal Pump A	~N(513)	7.981	0	0	0.004083	0	1 x FE610	1.7	1 x RH8724A (Gate Valve)	0.182	1 x RH8730A (Check Valve)	1.89	9 x Pipe Bend - r/d 1.5 (90)	0.1969		
RH02AA(002)	Steel Sch 40 (clean)	Outage Recirc Water	8	23	0.8719		0	0	-3.244	0	N	~N(513)	~N(514)	7.981	0	0	0.004083	0	1 x Pipe Bend - r/d 1 (90)	0.2813	3 x Pipe Bend - r/d 1.5 (90)	0.1969	1 x Diverging Tee (Through)	1.00E-05				
RH02AA(003)	Steel Sch 40 (clean)	Outage Recirc Water	14	1	1.465		0	0	0	0	N	~N(514)	Residual HX A	13.124	0	0	0.002483	0	1 x Reducer - Enlargement (14 x 8 - 13)	1.465								
RH02AB(001)	Steel Sch 40 (clean)	Outage Recirc Water	8	115.7	6.217		0	0	8.78	0	N	Residual Heat Removal Pump B	~N(525)	7.981	0	0	0	0	1 x FE611	1.7	1 x RH8724B (Gate Valve)	0.182	1 x RH8730B (Check Valve)	1.89	11 x Pipe Bend - r/d 1.5 (90)	0.1969	2 x Pipe Bend - r/d 1.5 (45)	0.1394
RH02AB(002)	Steel Sch 40 (clean)	Outage Recirc Water	8	18.3	0.73		0	0	-3.287	0	N	~N(525)	~N(526)	7.981	0	0	0	0	3 x Pipe Bend - r/d 1.5 (90)	0.1969	1 x Diverging Tee (Through)	1.00E-05	1 x Pipe Bend - r/d 1.5 (45)	0.1394				
RH02AB(003)	Steel Sch 40 (clean)	Outage Recirc Water	14	1	1.465		0	0	0	0	N	~N(526)	Residual HX B	13.124	0	0	0	0	1 x Reducer - Enlargement (14 x 8 - 13)	1.465								
RH03AA(001)	Steel Sch 40 (clean)	Outage Recirc Water	14	1	0.7153		0	0	0	0	N	Residual HX A	~N(515)	13.124	0	0	0.002483	0	1 x Reducer - Contraction (14 x 8 - 13)	0.7153								
RH03AA(002)	Steel Sch 40 (clean)	Outage Recirc Water	8	17.1	0.8144		0	0	2.379	0	N	~N(515)	~N(516)	7.981	0	0	0.004083	0	1 x Elbow - Short radius, r/d 1 (90)	0.2813	2 x Pipe Bend - r/d 1.5 (90)	0.1969	1 x Pipe Bend - r/d 1.5 (45)	0.1394				
RH03AA(003)	Steel Sch 40 (clean)	Outage Recirc Water	8	7.3	3.646	XXX	—	—	—	—	N	~N(516)	~N(517)	7.981	—	—	—	—	1 x Pipe Bend - r/d 1.5 (90)	0.1969	1 x RH606 (Butterfly Valve)	2.252	1 x Diverging Tee (Through)	1.00E-05	1 x Converging* Tee (Branch)	1.2		
RH03AA(004)	Steel Sch 40 (clean)	Outage Recirc Water	8	64.4	2.781		0	0	3.33	0	N	~N(517)	~N(518)	7.981	0	0	0	0	6 x Pipe Bend - r/d 1.5 (90)	0.1969	1 x FE618	1.6						
RH03AA(005)	Steel Sch 40 (clean)	Outage Recirc Water	8	11.4	0.1969		0	0	0	0	N	~N(518)	~N(519)	7.981	0	0	0.01225	0	1 x Pipe Bend - r/d 1.5 (90)	0.1969	1 x Diverging Tee (Through)	1.00E-05						
RH03AA(006)	Steel Sch 40 (clean)	Outage Recirc Water	8	6.3	2.282		0	0	0	0	N	~N(519)	~N(520)	7.981	0	0	0.01225	0	1 x RH8716A-1(Gate Valve)	0.182	1 x Diverging Tee (Through)	2.1						
RH03AA(007)	Steel Sch 40 (clean)	Outage Recirc Water	8	1.1	5.981		0	0	0	0	N	~N(520)	~N(521)	7.981	0	0	0.01225	0	1 x Reducer - Enlargement (12 x 8 - 8)	0.1909	1 x Diverging Tee (Through)	5.8						
RH03AA(008)	Steel Sch 40S (clean)	Outage Recirc Water	12	1	1.2		0	0	0	0	N	~N(521)	~N(522)	12	0	0	0.006147	0	1 x Converging* Tee (Branch)	1.2								
RH03AB(001)	Steel Sch 40 (clean)	Outage Recirc Water	14	1	0.7153		0	0	0	0	N	Residual HX B	~N(527)	13.124	0	0	0	0	1 x Reducer - Contraction (14 x 8 - 13)	0.7153								
RH03AB(002)	Steel Sch 40 (clean)	Outage Recirc Water	8	17	0.7875		0	0	3.287	0	N	~N(527)	~N(528)	7.981	0	0	0	0	4 x Pipe Bend - r/d 1.5 (90)	0.1969								
RH03AB(003)	Steel Sch 40 (clean)	Outage Recirc Water	8	2	3.452		0	0	0	0	N	~N(528)	~N(529)	7.981	0	0	0	0	1 x RH607(Butterfly Valve)	2.252	1 x Diverging Tee (Through)	1.00E-05	1 x Converging* Tee (Branch)	1.2				

RH03AB(004)	Steel Sch 40 (clean)	Outage Recirc Water	8	70.9	2.781		0	0	3.287	0	N	~N(529)	~N(530)	7.981	0	0	0	0	8 x Pipe Bend - r/d 1.5 (90)	0.1969	1 x FE819	1.6						
RH03AB(005)	Steel Sch 40 (clean)	Outage Recirc Water	8	30.3	0.3729		0	0	0	0	N	~N(530)	~N(531)	7.981	0	0	0.01225	0	1 x Reducer - Enlargement (12 x 8 - 8)	0.1909	1 x RH8716B-2 (Gate Valve)	0.182	1 x Diverging Tee (Branch)	1.00E-05				
RH03AB(006)	Steel Sch 40S (clean)	Outage Recirc Water	12	1.5	1.00E-06		0	0	0	0	N	~N(531)	~N(522)	12	0	0	0.008147	0	1 x Converging* Tee (Branch)	1.00E-05								
RH09AA(001)	Steel Sch 40 (clean)	Outage Recirc Water	8	1	1.00E-05		0	0	0	0	N	~N(513)	~N(558)	7.981	0	0	0	0	1 x Diverging Tee (Branch)	1.00E-05								
RH09AA(002)	Steel Sch 40 (clean)	Outage Recirc Water	8	1	1.00E-05	XXX	—	—	—	—	N	~N(558)	~N(517)	7.981	—	—	—	—	1 x Converging* Tee (Branch)	1.00E-05								
RH09AB(001)	Steel Sch 40 (clean)	Outage Recirc Water	8	1	1.00E-05		0	0	0	0	N	~N(525)	~N(560)	7.981	0	0	0	0	1 x Diverging Tee (Branch)	1.00E-05								
RH09AB(002)	Steel Sch 40 (clean)	Outage Recirc Water	8	1	1.00E-05	XXX	—	—	—	—	N	~N(560)	~N(529)	7.981	—	—	—	—	1 x Converging* Tee (Branch)	1.00E-05								
RH10AA(001)	Steel Sch 40 (clean)	Outage Recirc Water	3	1	1.00E-05		0	0	-9.082	0	N	~N(516)	~N(559)	3.068	0	0	0.01062	0	1 x Diverging Tee (Branch)	1.00E-05								
RH10AA(002)	Steel Sch 40 (clean)	Outage Recirc Water	3	1	1.00E-05		0	0	0	0	N	~N(559)	~N(512)	3.068	0	0	0.01062	0	1 x Converging Tee (Branch)	1.00E-05								
RH10AB(001)	Steel Sch 40 (clean)	Outage Recirc Water	3	1	1.00E-05	XXX	—	—	—	—	N	~N(528)	~N(561)	3.068	—	—	—	—	1 x Diverging Tee (Branch)	1.00E-05								
RH10AB(002)	Steel Sch 40 (clean)	Outage Recirc Water	3	1	1.00E-05		0	0	-8.991	0	N	~N(561)	~N(524)	3.068	0	0	0	0	1 x Converging Tee (Branch)	1.00E-05								
RH12A/CV98A	Steel Sch 40 (clean)	Outage Recirc Water	8	28.8	5.573		0	0	-1.081	0	N	~N(518)	~N(525)	7.981	0	0	0.01225	0	8 x Pipe Bend - r/d 1.5 (90)	0.1969	1 x CV8804A (Gate Valve)	0.182	1 x Diverging Tee (Branch)	4.8	1 x Converging* Tee (Branch)	1.00E-05		
RH14A	Steel Sch 40 (clean)	Outage Recirc Water	8	4.4	1.979	XXX	—	—	—	—	N	~N(520)	~N(536)	7.981	—	—	—	—	1 x Pipe Bend - r/d 1.5 (90)	0.1969	1 x RH8735 (Gate Valve)	0.182	1 x Diverging Tee (Branch)	1.6				
SI01A	Steel Sch 40 (clean)	Outage Recirc Water	8	28.4	0.9844		0	0	3.46	0	N	~N(538)	~N(509)	7.981	0	0	0	0	5 x Pipe Bend - r/d 1.5 (90)	0.1969								
SI01B(001)	Steel Sch 20 (clean)	Outage Recirc Water	24	113.2	0.3195		630.4	0.477	-5.274	0.005	N	Refueling Water Storage Tank	~N(503)	23.25	0.004	0.001	88361	0.01876	2 x Pipe Bend - r/d 1.5 (90)	0.1598								
SI01B(002)	Steel Sch 20 (clean)	Outage Recirc Water	24	58	0.3195		0	0	0.519	0	N	~N(503)	~N(504)	23.25	0	0	0	0	2 x Pipe Bend - r/d 1.5 (90)	0.1598	1 x Diverging Tee (Through)	1.00E-05						
SI01B(003)	Steel Sch 20 (clean)	Outage Recirc Water	24	4.6	1.00E-05		0	0	0	0	N	~N(504)	~N(505)	23.25	0	0	0	0	1 x Diverging Tee (Through)	1.00E-05								
SI01B(004)	Steel Sch 20 (clean)	Outage Recirc Water	24	60.3	0.4524		0	0	0	0	N	~N(505)	~N(506)	23.25	0	0	0	0	4 x Pipe Bend - r/d 1.5 (45)	0.1131	1 x Diverging Tee (Through)	1.00E-05						
SI01B(005)	Steel Sch 20 (clean)	Outage Recirc Water	24	7	2.00E-05		0	0	0	0	N	~N(506)	~N(507)	23.25	0	0	0	0	1 x Converging* Tee (Branch)	1.00E-05	1 x Diverging Tee (Through)	1.00E-05						
SI01B(006)	Steel Sch 20 (clean)	Outage Recirc Water	24	2	1.00E-05		0	0	0	0	N	~N(509)	~N(507)	23.25	0	0	0	0	1 x Converging* Tee (Branch)	1.00E-05								
SI01B(007)	Steel Sch 20 (clean)	Outage Recirc Water	24	1	29.43		0	0	0	0	N	~N(509)	~N(508)	23.25	0	0	0	0	1 x Reducer - Contraction (24 x 8 - 0)	29.43								
SI02A/SIF9A	Steel Sch 40 (clean)	Outage Recirc Water	8	28.3	3.868		630.4	4.046	-1.876	1.164	N	~N(503)	~N(590)	7.981	0.182	0.982	257411	0.01878	4 x Pipe Bend - r/d 1.5 (90)	0.1969	1 x SI8806-1(Gate Valve)	0.18	1 x SI8926(Check Valve)	1.9	1 x Diverging Tee (Branch)	1	1 x Converging Tee (Through)	1.00E-05
SI02BA(001)	Steel Sch 40 (clean)	Outage Recirc Water	8	1.7	0.1598		630.4	4.046	0.022	0.051	N	~N(590)	~N(591)	7.981	0.01	0.041	257411	0.01676	1 x Reducer - Contraction (8 x 6 - 6)	0.1598								
SI02BA(002)	Steel Sch 40 (clean)	Outage Recirc Water	6	174.8	2.749		630.4	7.007	-1.457	6.531	N	~N(591)	~N(592)	6.065	4.437	2.094	338730	0.01685	8 x Pipe Bend - r/d 1.5 (90)	0.2085	5 x Pipe Bend - r/d 1.5 (45)	0.1476	1 x SI8923A-1	0.195	1 x Converging Tee (Through)	1.00E-05		
SI02BA(003)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.4	0.6286		630.4	7.007	0.288	0.565	N	~N(592)	~N(593)	6.065	0.086	0.479	338730	0.01685	1 x Reducer - Contraction (6 x 4 - 5.5)	0.42	1 x Pipe Bend - r/d 1.5 (90)	0.2085						
SI02BA(004)	Steel Sch 40 (clean)	Outage Recirc Water	4	1	0		630.4	15.9	0.088	0.204	N	~N(593)	Safety Injection Pump A	4.026	0.204	0	610283	0.01741										
SI02BB(001)	Steel Sch 40 (clean)	Outage Recirc Water	6	4.7	1.104		0	0	0	0	N	~N(595)	~N(590)	6.065	0	0	0.02149	0	1 x SI8923B-2	0.195	1 x Pipe Bend - r/d 1.5 (90)	0.2085	1 x Diverging Tee (Through)	1.00E-05	1 x Converging Tee (Branch)	0.7		
SI02BB(002)	Steel Sch 40 (clean)	Outage Recirc Water	6	14.7	14.14		0	0	-4.282	0	N	~N(595)	~N(596)	6.065	0	0	0.005373	0	2 x Pipe Bend - r/d 1.5 (90)	0.2085	1 x Reducer - Contraction (6 x 4 - 5.5)	0.42	1 x Diverging Tee (Branch)	13.3				
SI02BB(003)	Steel Sch 40 (clean)	Outage Recirc Water	4	1	0		0	0	0.043	0	N	~N(596)	Safety Injection Pump B	4.026	0	0	0.008094	0										
SI03AA(001)	Steel Sch 80 (clean)	Outage Recirc Water	3	1	0.05412		630.4	30.65	0.817	1.868	N	Safety Injection Pump A	~N(599)	2.9	1.099	0.789	706413	0.01824	1 x Reducer - Enlargement (4 x 3 - 4)	0.05412								
SI03AA(002)	Steel Sch 80 (clean)	Outage Recirc Water	4	79.6	9.34		598.4	16.71	30.44	59.48	N	~N(599)	~N(600)	3.826	19.01	40.47	509702	0.01757	8 x Pipe Bend - r/d 1.5 (90)	0.2305	1 x FE918	4.3	1 x SI8921A	0.221	1 x SI8922A	2.975		
SI03AA(003)	Steel Sch 80 (clean)	Outage Recirc Water	4	51.8	0.9219		0	0	2.379	0	N	~N(600)	~N(676)	3.826	0	0	0	0	4 x Pipe Bend - r/d 1.5 (90)	0.2305	1 x Diverging Tee (Branch)	1.00E-05						
SI03AB(001)	Steel Sch 80 (clean)	Outage Recirc Water	3	1	0.05412		0	0	0	0	N	Safety Injection Pump B	~N(604)	2.9	0	0	0.01124	0	1 x Reducer - Enlargement (4 x 3 - 4)	0.05412								
SI03AB(002)	Steel Sch 80 (clean)	Outage Recirc Water	4	34.3	8.744		0	0	4.714	0	N	~N(604)	~N(605)	3.826	0	0	0.008517	0	4 x Pipe Bend - r/d 1.5 (90)	0.2305	1 x FE922	4.3	1 x SI8921B	0.221	1 x SI8922B	2.975	2 x Pipe Bend - r/d 1.5 (45)	0.1832
SI03AB(003)	Steel Sch 80 (clean)	Outage Recirc Water	4	25.4	9.461	XXX	—	—	—	—	N	~N(605)	~N(676)	3.826	—	—	—	—	2 x Pipe Bend - r/d 1.5 (90)	0.2305	1 x Diverging Tee (Branch)	1.00E-05						
SI03BA(001)	Steel Sch 160 (clean)	Outage Recirc Water	4	34.1	3.641	XXX	—	—	—	—	N	~N(675)	~N(601)	3.438	—	—	—	—	1 x Reducer - Contraction (4 x 2 - 4)	2.24	1 x SI8802A-1	0.221	5 x Pipe Bend - r/d 1.5 (90)	0.2361				
SI03BA(002)	Steel Sch 160 (clean)	Outage Recirc Water	2	0.5	0		0	0	0	0	N	~N(601)	~N(602)	1.687	0	0	0	0										
SI03BB(001)	Steel Sch 160 (clean)	Outage Recirc Water	4	43.8	3.877	XXX	—	—	—	—	N	~N(676)	~N(606)	3.438	—	—	—	—	1 x Reducer - Contraction (4 x 2 - 4)	2.24	1 x SI8802B-2	0.221	6 x Pipe Bend - r/d 1.5 (90)	0.2361				
SI03BB(002)	Steel Sch 160 (clean)	Outage Recirc Water	2	1.4	0		0	0	0	0	N	~N(606)	~N(607)	1.687	0	0	0	0										
SI03CA(001)	Steel Sch 160 (clean)	Outage Recirc Water	2	13.5	0.2791		0	0	1.341	0	N	~N(607)	~N(738)	1.687	0	0	0	0	1 x Pipe Bend - r/d 1.5 (90)	0.2791	1 x Diverging Tee (Branch)	1.00E-05						
SI03CA(002)	Steel Sch 160 (clean)	Outage Recirc Water	2	0.4	4.3		0	0	0	0	N	~N(738)	~N(739)	1.687	0	0	0	0	1 x FE985	4.3								
SI03CA(003)	Steel Sch 160 (clean)	Outage Recirc Water	2	1.6	0		0	0	0	0	N	~N(739)	~N(740)	1.687	0	0	0	0										
SI03CA(004)	Steel Sch 160 (clean)	Outage Recirc Water	2	1	12.53		0	0	0	0	N	~N(740)	~N(741)	1.687	0	0	0	0	1 x SI8816B(Globe Valve)	12.53								
SI03CA(005)	Steel Sch 160 (clean)	Outage Recirc Water	2	0.5	0		0	0	0	0	N	~N(741)	~N(742)	1.687	0	0	0	0										
SI03CA(006)	Steel Sch 160 (clean)	Outage Recirc Water	2	0.4	1.00E-06		0	0	0	0	N	~N(742)	~N(743)	1.687	0	0	0	0	1 x SI06MB(Orifice)	1.00E-05								
SI03CB(001)	Steel Sch 160 (clean)	Outage Recirc Water	2	2	1.00E-05		0	0	0.043	0	N	~N(607)	~N(732)	1.687	0	0	0	0	1 x Diverging Tee (Through)	1.00E-05								
SI03CB(002)	Steel Sch 160 (clean)	Outage Recirc Water	2	0.4	4.3		0	0	0	0	N	~N(732)	~N(733)	1.687	0	0	0	0	1 x FE986	4.3								
SI03CB(003)	Steel Sch 160 (clean)	Outage Recirc Water	2	2.3	0		0	0	0	0	N	~N(733)	~N(734)	1.687	0	0	0	0										
SI03CB(004)	Steel Sch 160 (clean)	Outage Recirc Water	2	1	12.53		0	0	0	0	N	~N(734)	~N(735)	1.687	0	0	0	0	1 x SI8816C(Globe Valve)	12.53								
SI03CB(005)	Steel Sch 160 (clean)	Outage Recirc Water	2	0.2	0		0	0	0	0	N	~N(735)	~N(736)	1.687	0	0	0	0										
SI03CB(006)	Steel Sch 160 (clean)	Outage Recirc Water	2	0.4	1.00E-05		0	0	0	0	N	~N(736)	~N(737)	1.687	0	0	0	0	1 x SI05MC(Orifice)	1.00E-05								
SI03DA	Steel Sch 160 (clean)	Outage Recirc Water	2	94.2	5.378		0	0	6.444	0	N	~N(743)	~N(610)	1.687	0	0	0	0	10 x Pipe Bend - r/d 1.5 (90)	0.2791	1 x Reducer - Enlargement (6 x 2 - 6)	0.5821	1 x SI8905B(Check Valve)	2.005				
SI03DB	Steel Sch 160 (clean)	Outage Recirc Water	2	4.5	2.284		0	0	0.389	0	N	~N(737)	~N(540)	1.687	0	0	0	0	1 x Pipe Bend - r/d 1.5 (90)	0.2791	1 x SI8905C(Check Valve)	2.005	1 x Converging Tee (Branch)	1.00E-05				
SI03EA(001)	Steel Sch 160 (clean)	Outage Recirc Water	2	7.5	1.00E-05		0	0	1.168	0	N	~N(602)	~N(720)	1.687	0	0	0	0	1 x Diverging Tee (Branch)	1.00E-05								
SI03EA(002)	Steel Sch 160 (clean)	Outage Recirc Water	2	0.1	16		0	0	0	0	N	~N(720)	~N(721)	1.687	0	0	0	0	1 x FE984	16								
SI03EA(003)	Steel Sch 160 (clean)	Outage Recirc Water	2	2.1	0		0	0	0	0	N	~N(721)	~N(722)	1.687	0	0	0	0										
SI03EA(004)	Steel Sch 160 (clean)	Outage Recirc Water	2	1	12.53		0	0	0	0	N	~N(722)	~N(723)	1.687	0	0	0	0	1 x SI8815A(Globe Valve)	12.53								
SI03EA(005)	Steel Sch 160 (clean)	Outage Recirc Water	2	0.4	0		0	0	0	0	N	~N(723)	~N(724)	1.687	0	0	0	0										

0	1 x SI05MA(Orifice)	1.00E-05								
0	1 x Diverging Tee (Through)	1.00E-05								
0	1 x FE987	16								
0										
0	1 x SI8816D(Globe Valve)	12.53								
0										
0	1 x SI05MD(Orifice)	1.00E-05								
0	1 x SI8905A(Check Valve)	2.005	1 x Converging Tee (Branch)	0.7						
0	2 x Pipe Bend - r/d 1.5 (45)	0.1978	9 x Pipe Bend - r/d 1.5 (90)	0.2791	1 x Reducer - Enlargement (6 x 2 - 6)	0.5821	1 x SI8905D(Check Valve)	2.005		
0	1 x Pipe Bend - r/d 1.5 (45)	0.1264	2 x Pipe Bend - r/d 1.5 (90)	0.1813						
—	1 x SI8840-1 (Gate Valve)	0.169	5 x Pipe Bend - r/d 1.5 (90)	0.1862						
0	1 x Reducer - Contraction (12 x 8 - 8)	0.4803	1 x Diverging Tee (Through)	1.00E-05						
0	1 x SI8841B (Check Valve)	0.84	1 x Converging Tee (Through)	1.00E-05						
0	7 x Pipe Bend - r/d 1.5 (90)	0.2035	1 x Reducer - Contraction (8 x 6 - 6)	0.1344						
0	1 x Pipe Bend - r/d 1.5 (45)	0.1394	4 x Pipe Bend - r/d 1.5 (90)	0.1969	1 x Diverging Tee (Branch)	2.7				
0	3 x Pipe Bend - r/d 1.5 (45)	0.1394	3 x Pipe Bend - r/d 1.5 (90)	0.1969	1 x Diverging Tee (Through)	1.00E-05				
0	5 x Pipe Bend - r/d 1.5 (90)	0.1909	1 x Diverging Tee (Branch)	2.6						
—	1 x SI8809A-1 (Gate Valve)	0.182	1 x Pipe Bend - r/d 1.5 (90)	0.2035	1 x Diverging Tee (Through)	1.00E-05				
0	1 x SI8809B-2 (Gate Valve)	0.182								
0	2 x Pipe Bend - r/d 1.5 (45)	0.144	16 x Pipe Bend - r/d 1.5 (90)	0.2035	1 x Pipe Bend - r/d 1 (90)	0.2907	1 x Reducer - Contraction (8 x 6 - 6)	0.1344	1 x Diverging Tee (Through)	0.1
0	18 x Pipe Bend - r/d 1.5 (90)	0.2035	1 x Pipe Bend - r/d 1 (90)	0.2907	1 x Reducer - Contraction (8 x 6 - 6)	0.1344	1 x Diverging* Tee (Branch)	5.1		
—	1 x Pipe Bend - r/d 1.5 (90)	0.2035	1 x Reducer - Contraction (8 x 6 - 6)	0.1344	1 x Diverging* Tee (Branch)	3.6				
0	1 x Pipe Bend - r/d 1.5 (90)	0.2035	1 x Reducer - Contraction (8 x 6 - 6)	0.1344	1 x Diverging Tee (Branch)	4.2				
—	2 x Pipe Bend - r/d 1.5 (90)	0.2156	1 x SI8818A (Check Valve)	2.625	1 x Converging Tee (Through)	0.3				
0.0199	1 x Pipe Bend - r/d 1.5 (45)	0.1526	8 x Pipe Bend - r/d 1.5 (90)	0.2156	1 x Converging Tee (Branch)	0.6				
—	1 x Pipe Bend - r/d 1.5 (90)	0.2156	1 x SI8818B (Check Valve)	2.625	1 x Converging Tee (Through)	0.2				
0.0199	8 x Pipe Bend - r/d 1.5 (90)	0.2156	1 x Converging Tee (Branch)	0.6						
0	1 x SI8818C (Check Valve)	2.625	2 x Pipe Bend - r/d 1.5 (45)	0.1526	1 x Converging Tee (Through)	0.2				
0.0199	8 x Pipe Bend - r/d 1.5 (90)	0.2156	1 x Pipe Bend - r/d 1.5 (45)	0.1526	1 x Converging Tee (Branch)	0.6				
0	1 x SI8818D (Check Valve)	2.625	1 x Converging Tee (Through)	0.3						
0.01989	1 x Pipe Bend - r/d 1.5 (45)	0.1526	7 x Pipe Bend - r/d 1.5 (90)	0.2156	1 x Converging Tee (Branch)	0.6				
0	2 x Pipe Bend - r/d 1.5 (90)	0.1806	1 x SI8811A-1 (Gate Valve)	0.1471	1 x Sump Internal Resistance	1				
0	2 x Elbow - Standard 90	0.3441	1 x Sump Internal Resistance	1	1 x SI8811B-2 (Gate Valve)	0.1471				
0	1 x Reducer - Contraction (24 x 16 - 20)	0.4344	1 x Pipe Bend - r/d 1.5 (90)	0.1806	1 x Diverging Tee (Through)	1.00E-05				
0	1 x Elbow - Standard 90	0.3441	1 x Reducer - Contraction (24 x 16 - 20)	0.4344	1 x Diverging Tee (Through)	1.00E-05				
0	1 x Pipe Bend - r/d 1.5 (45)	0.1671	2 x Pipe Bend - r/d 1.5 (90)	0.2351						
38.58	1 x Pipe Bend - r/d 1.5 (90)	0.2361	1 x SI8801A-1	0.221	1 x Diverging Tee (Branch)	5	1 x Converging Tee (Through)	2.1		
37.93	1 x Pipe Bend - r/d 1.5 (90)	0.2361	1 x SI8801B-2	0.221	1 x Diverging Tee (Through)	1.00E-05	1 x Converging Tee (Branch)	1.6		
0	2 x Pipe Bend - r/d 1.5 (90)	0.2511	1 x Reducer - Contraction (4 x 3 - 4)	0.03381	1 x SI8815	3.15				
41.35	13 x Pipe Bend - r/d 1.5 (90)	0.2511	1 x Diverging* Tee (Branch)	4.3						
42.37	1 x Diverging* Tee (Branch)	4.2								
25.9	1 x Pipe Bend - r/d 1.5 (90)	0.2957	1 x Diverging Tee (Branch)	1.2						
32.65	1 x Reducer - Enlargement (2 x 1.5 - 3)	0.0525	1 x FE924	200						
0	1 x Pipe Bend - r/d 1.5 (90)	0.2957	1 x Reducer - Contraction (3 x 1.5 - 3.5)	0.107	1 x Diverging Tee (Through)	0.9				
0	1 x Reducer - Enlargement (2 x 1.5 - 3)	0.0525	1 x FE925	200						
0	1 x Pipe Bend - r/d 1.5 (90)	0.2957	1 x Reducer - Contraction (3 x 1.5 - 3.5)	0.107	1 x Diverging* Tee (Branch)	4.1				
0	1 x Reducer - Enlargement (2 x 1.5 - 3)	0.0525	1 x FE926	200						
23.33	2 x Pipe Bend - r/d 1.5 (45)	0.2093	1 x Reducer - Contraction (3 x 1.5 - 3.5)	0.107	1 x Diverging* Tee (Branch)	4.4				
29.42	1 x Reducer - Enlargement (2 x 1.5 - 3)	0.0525	1 x FE927	200						
25.9	1 x SI8900A(Check Valve)	1.978	2 x Pipe Bend - r/d 1.5 (45)	0.2093	8 x Pipe Bend - r/d 1.5 (90)	0.2957				
25.9	1 x Reducer - Enlargement (2 x 1.5 - 3)	0.02078	2 x Pipe Bend - r/d 1.5 (90)	0.2957						
25.9	1 x SI8810A(Globe Valve)	12.69								
25.9										
25.9	1 x SI04MA(Orifice)	1.00E-05								
0	1 x SI8900B(Check Valve)	1.978	3 x Pipe Bend - r/d 1.5 (90)	0.2957						
0	1 x Reducer - Enlargement (2 x 1.5 - 3)	0.02078								
0	1 x SI8810B(Globe Valve)	12.69								
0	2 x Pipe Bend - r/d 1.5 (45)	0.2093	7 x Pipe Bend - r/d 1.5 (90)	0.2957						
0	1 x SI04MB(Orifice)	1.00E-05								
0	1 x SI8900C(Check Valve)	1.978	20 x Pipe Bend - r/d 1.5 (90)	0.2957	2 x Pipe Bend - r/d 1.5 (45)	0.2093				
0	1 x Reducer - Enlargement (2 x 1.5 - 3)	0.02078								
0	1 x SI8810C(Globe Valve)	12.69								
0	1 x Pipe Bend - r/d 1.5 (90)	0.2957								
0	1 x SI04MC(Orifice)	1.00E-05								
23.33	1 x SI8900D(Check Valve)	1.978	6 x Pipe Bend - r/d 1.5 (90)	0.2957	2 x Pipe Bend - r/d 1.5 (45)	0.2093				
23.33	1 x Reducer - Enlargement (2 x 1.5 - 3)	0.02078								
23.33	1 x SI8810D(Globe Valve)	12.69								
23.33	2 x Pipe Bend - r/d 1.5 (90)	0.2957								
23.33	1 x SI04MD(Orifice)	1.00E-05								
0	3 x Pipe Bend - r/d 1.5 (90)	0.188	1 x Exit - Sharp Edged	1						
—	7 x Pipe Bend - r/d 1.5 (90)	0.1932	1 x Pipe Bend - r/d 1.5 (45)	0.1368	1 x SI8808A-1(Gate Valve)	0.18	1 x SI8956A(Check Valve)	0.84	1 x Converging Tee (Through)	1.00E-05
0	3 x Pipe Bend - r/d 1.5 (90)	0.188	1 x Exit - Sharp Edged	1						
—	6 x Pipe Bend - r/d 1.5 (90)	0.1932	2 x Pipe Bend - r/d 1.5 (45)	0.1368	1 x SI8808B-2(Gate Valve)	0.18	1 x SI8956B(Check Valve)	0.84	1 x Converging Tee (Through)	1.00E-05
0	3 x Pipe Bend - r/d 1.5 (90)	0.188	1 x Exit - Sharp Edged	1						
—	4 x Pipe Bend - r/d 1.5 (90)	0.1932	1 x SI8808C-2(Gate Valve)	0.18	1 x SI8956C(Check Valve)	0.84	1 x Converging Tee (Through)	1.00E-05		
0	3 x Pipe Bend - r/d 1.5 (90)	0.188	1 x Exit - Sharp Edged	1						
—	9 x Pipe Bend - r/d 1.5 (90)	0.1932	1 x SI8808D-1(Gate Valve)	0.18	1 x SI8956D(Check Valve)	0.84	1 x Converging Tee (Through)	1.00E-05		
0.02112	1 x Pipe Bend - r/d 1.5 (90)	0.1932	2 x Pipe Bend - r/d 1.5 (45)	0.1368	1 x SI8948A (Check Valve)	0.84				
0.02112	1 x Pipe Bend - r/d 1.5 (90)	0.1932	2 x Pipe Bend - r/d 1.5 (45)	0.1368	1 x SI8948B (Check Valve)	0.84				
0.02112	1 x Pipe Bend - r/d 1.5 (90)	0.1932	1 x Pipe Bend - r/d 1.5 (45)	0.1368	1 x SI8948C (Check Valve)	0.84				
0.0211	1 x Pipe Bend - r/d 1.5 (90)	0.1932	1 x SI8948D (Check Valve)	0.84	2 x Pipe Bend - r/d 1.5 (45)	0.1368				
0	1 x Converging Tee (Branch)	0.7								
—	1 x SI8807A-1 (Gate Valve)	0.195	2 x Pipe Bend - r/d 1.5 (90)	0.2085	1 x Diverging Tee (Through)	1.00E-05	1 x Converging Tee (Branch)	1.00E-05		
—	1 x SI8807B-2 (Gate Valve)	0.195	2 x Pipe Bend - r/d 1.5 (90)	0.2085	1 x Diverging Tee (Branch)	1.00E-05	1 x Converging Tee (Through)	1.00E-05		
0.01757	1 x SI8821A-1 (Gate Valve)	0.221	1 x Diverging Tee (Through)	1.00E-05	1 x Converging* Tee (Branch)	1.2				
0	1 x SI8821B-2 (Gate Valve)	0.221	9 x Pipe Bend - r/d 1.5 (90)	0.2305	1 x Diverging Tee (Through)	1.00E-05	1 x Converging* Tee (Branch)	2.5		
0.01757	1 x Pipe Bend - r/d 1.5 (45)	0.1632	4 x Pipe Bend - r/d 1.5 (90)	0.2305						
0.01781	1 x SI8835-1 (Gate Valve)	0.221								
0.01653	4 x Pipe Bend - r/d 1.5 (90)	0.2361	1 x Diverging Tee (Branch)	5						
0.01653	3 x Pipe Bend - r/d 1.5 (45)	0.1671	13 x Pipe Bend - r/d 1.5 (90)	0.2361	1 x Diverging Tee (Through)	1.00E-05				
0.02105	2 x Mitre Bend @ 90	1.196	1 x Diverging Tee (Branch)	1.2						
0.02105	1 x FE980	4.1								
0.02105										
0.02105	1 x SI8822A(Globe Valve)	7.22E-11								
0.02105										
0.02105	1 x SI08MA(Orifice)	1.00E-05								
0.02105	3 x Mitre Bend @ 90	1.196	1 x Diverging Tee (Through)	1.00E-05						
0.02105	1 x FE983	4.1								
0.02105										
0.02105	1 x SI8822B(Globe Valve)	7.22E-11								
0.02105										
0.02105	1 x SI06MB(Orifice)	1.00E-05								
0.02105	1 x Reducer - Contraction (4 x 2 - 4)	0.1299	2 x Mitre Bend @ 90	1.196	1 x Diverging* Tee (Branch)	0.3				
0.02105	1 x FE982	4.1								
0.02105										
0.02105	1 x SI8822C(Globe Valve)	7.22E-11								
0.02105										
0.02105	1 x SI06MC(Orifice)	1.00E-05								
0.02104	1 x Reducer - Contraction (4 x 2 - 4)	0.1299	2 x Mitre Bend @ 90	1.196	1 x Diverging* Tee (Branch)	0.3				
0.02104	1 x FE981	4.1								
0.02104										
0.02104	1 x SI8822D(Globe Valve)	7.22E-11								
0.02104										
0.02104	1 x SI06MD(Orifice)	1.00E-05								
0.02105	1 x SI8819A(Check Valve)	2.005	1 x Mitre Bend @ 90	1.196	1 x Converging Tee (Branch)	1				
0.02105	2 x Mitre Bend @ 90	1.196	1 x SI8819B(Check Valve)	2.005	1 x Converging Tee (Branch)	1				
0.02105	1 x Mitre Bend @ 45	0.299	1 x SI8819C(Check Valve)	2.005	1 x Mitre Bend @ 90	1.196	1 x Converging Tee (Branch)	1		
0.02104	2 x Mitre Bend @ 90	1.196	1 x SI8819D(Check Valve)	2.005	1 x Converging Tee (Branch)	1				
0	4 x Pipe Bend - r/d 1.5 (45)	0.1394	3 x Pipe Bend - r/d 1.5 (90)	0.1969	1 x Reducer - Contraction (8 x 6 - 6)	0.1598	1 x SI8804B-2	0.182	1 x Diverging Tee (Through)	2.7
0										
—	6 x Pipe Bend - r/d 1.5 (90)	0.1778	1 x CS001A-1(Gate Valve)	0.1016	1 x Diverging Tee (Branch)	1.00E-05	1 x Converging Tee (Through)	1.00E-05		
—	2 x Pipe Bend - r/d 1.5 (90)	0.1778	1 x CS001B-2(Gate Valve)	0.1016	2 x Pipe Bend - r/d 1.5 (45)	0.1259	1 x Diverging Tee (Branch)	1.00E-05	1 x Converging Tee (Through)	1.00E-05
0	3 x Pipe Bend - r/d 1.5 (90)	0.1815	1 x SI8958A(Check Valve)	1.8	1 x SI8812A(Gate Valve)	0.17	1 x Converging Tee (Branch)	1.00E-05		

SI82AB/BB	Steel Sch.40 (clean)	Outage Recirc Water	12	67.1	2.515	XXX	—	—	—	—	N	~N(504)	~N(552)	11.938	—	—	—	—	3 x Pipe Bend - r/d 1.5 (90)	0.1815	1 x SI8958B(Check Valve)	1.8	1 x SI8812B(Gate Valve)	0.17	1 x Diverging Tee (Branch)	1.00E-06	1 x Converging Tee (Branch)	1.00E-06
SIA4A	Steel Sch.160 (clean)	Outage Recirc Water	8	15.1	1.847	XXX	—	—	—	—	N	~N(537)	~N(544)	6.813	—	—	—	—	2 x Pipe Bend - r/d 1.5 (90)	0.2035	1 x SI8841A (Check Valve)	0.84	1 x Diverging Tee (Branch)	1.00E-06	1 x Converging Tee (Through)	0.8		
SIA4B	Steel Sch.160 (clean)	Outage Recirc Water	8	84.8	2.11		0	0	-0.173	0	N	~N(544)	~N(545)	6.813	9	0	0	0	9 x Pipe Bend - r/d 1.5 (90)	0.2035	1 x Pipe Bend - r/d 1.5 (45)	0.144	1 x Reducer - Contraction (8 x 6 - 8)	0.1344				

Node List	Status	Pressure	Grade	Elev
~N(001)		81.42	582.3	428
~N(001A)		18.14	582.3	574.3
~N(002)		22.53	373.2	355.1
~N(003)		25.47	373.2	348.3
~N(004)		45.76	421.7	349.9
~N(005)		27.2	373.2	344.3
~N(006)		27.2	373.2	344.3
~N(007)		115.9	582.3	348.3
~N(008)		110.8	582.3	360
~N(009)		95.78	582.3	394.8
~N(010)		12.61	582.4	587.2
~N(011)		9.92	582.4	593.5
~N(012)		10.11	582.9	593.5
~N(013)		10.12	582.9	593.5
~N(014)		10.11	582.9	593.5
~N(015)		10.12	582.9	593.5
~N(016)		10.13	582.9	593.5
~N(017)		10.13	582.9	593.5
~N(018)		10.14	583	593.5
~N(019)		10.14	583	593.5
~N(020)		10.15	583	593.5
~N(021)		10.15	583	593.5
~N(022)		10.16	583	593.5
~N(023)		10.16	583	593.5
~N(024)		10.15	583	593.5
~N(025)		10.16	583	593.5
~N(026)		10.16	583	593.5
~N(027)		10.16	583	593.5
~N(028)		10.16	583	593.5
~N(029)		10.16	583	593.5
~N(030)		10.16	583	593.5
~N(031)		10.16	583	593.5
~N(032)		10.16	583	593.5
~N(033)		10.12	582.9	593.5
~N(034)		10.12	582.9	593.5
~N(035)		10.13	582.9	593.5
~N(036)		10.14	583	593.5
~N(037)		10.14	583	593.5
~N(038)		10.13	582.9	593.5
~N(039)		10.16	583	593.5
~N(040)		10.16	583	593.5
~N(041)		10.16	583	593.5
~N(042)		10.15	583	593.5
~N(043)		10.15	583	593.5
~N(044)		10.15	583	593.5
~N(045)		10.16	583	593.5
~N(046)		10.16	583	593.5
~N(047)		10.16	583	593.5
~N(048)		10.16	583	593.5
~N(049)		10.16	583	593.5
~N(050)		10.16	583	593.5
~N(051)		11.97	582.7	589
~N(052)		12.04	582.8	589
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~N(173)		16.99	581.1	575.8

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~N(182)	16.99	581.1	575.8
~N(183)	16.99	581.1	575.8
~N(184)	16.99	581.1	575.8
~N(185)	16.99	581.1	575.8
~N(186)	16.99	581.1	575.8
~N(187)	16.99	581.1	575.8
~N(188)	16.99	581.1	575.8
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~N(598)		33.84	420.6	376.3
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~N(603)		26.9	424.2	396
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~N(606)		34.69	424.2	378
~N(607)		34.69	424.2	378
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~N(619)		35.27	414	366.4
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~N(625)		35.48	420.6	372.5
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~N(659)		31.4	424.2	385.6
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~N(667)		34.51	424.2	378.4
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~N(675)		813	2229	383
~N(676)	Isolated	—	—	379
~N(677)		802.5	2205	383
~N(678)		37.8	424.2	370.8
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~N(684)		19.55	424.2	413
~N(686)		19.56	424.2	413
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~N(724)		33.52	424.2	380.7
~N(725)		33.52	424.2	380.7
~N(726)		34.69	424.2	378
~N(727)		34.69	424.2	378
~N(728)		34.69	424.2	378
~N(730)		34.69	424.2	378
~N(731)		34.69	424.2	378
~N(732)		34.64	424.2	378.1
~N(733)		34.64	424.2	378.1
~N(734)		34.64	424.2	378.1
~N(736)		34.64	424.2	378.1
~N(737)		34.64	424.2	378.1
~N(738)		33.35	424.2	381.1
~N(739)		33.35	424.2	381.1
~N(740)		33.35	424.2	381.1
~N(742)		33.35	424.2	381.1
~N(743)		33.35	424.2	381.1

Tank List	Surface Pressure	Level	Status	Flow	Pressure	Grade	Elev
Accumulator Tank A	1000	0		0	1000	2707	428.7
Accumulator Tank B	1000	0		0	1000	2707	428.6
Accumulator Tank C	1000	0		0	1000	2707	428.6
Accumulator Tank D	1000	0		0	1000	2707	428.5
Cont. Recirc. Sump A	14.7	5		0	16.66	373.2	368.2
Cont. Recirc. Sump B	14.7	5		0	16.66	373.2	368.2
Refueling Water Storage Tank	21.24	12.6		630.4	26.69	421.7	394

Demand List	Demand Type	Flow	Pressure	Status	Grade	Elev
~N(599)	Flow out	32	845.8		2268	366.6
~N(604)	Flow out	0	817.2		2222	366.6
~N(623)	Flow in	0	36.35		420.6	370.5
~N(633)	Flow in	0	35.48		420.6	372.5
~N(634)	Flow out	0	38.32		424.2	369.6
~N(637)	Flow out	0	38.32		424.2	369.6
~N(641)	Flow out	0	39.06		424.2	367.9
~N(658)	Flow out	0	34.51		424.2	378.4
~N(679)	Flow out	0	37.8		424.2	370.8
A1(001)	Spray	3.78	14.7		575.4	575.4
A1(002)	Spray	3.471	14.7		576.3	576.3
A1(003)	Spray	3.645	14.7		575.8	575.8
A1(004)	Spray	3.645	14.7		575.8	575.8
A1(005)	Spray	3.47	14.7		576.3	576.3
A1(006)	Spray	3.778	14.7		575.4	575.4
A1(007)	Spray	3.777	14.7		575.4	575.4
A1(008)	Spray	3.469	14.7		576.3	576.3
A1(009)	Spray	3.643	14.7		575.8	575.8
A1(010)	Spray	3.643	14.7		575.8	575.8

A1(011)	Spray	3.467	14.7	576.3	576.3
A1(012)	Spray	3.776	14.7	575.4	575.4
A1(013)	Spray	3.775	14.7	575.4	575.4
A1(014)	Spray	3.466	14.7	576.3	576.3
A1(015)	Spray	3.64	14.7	575.8	575.8
A1(016)	Spray	3.64	14.7	575.8	575.8
A1(017)	Spray	3.465	14.7	576.3	576.3
A1(018)	Spray	3.774	14.7	575.4	575.4
A1(019)	Spray	3.773	14.7	575.4	575.4
A1(020)	Spray	3.464	14.7	576.3	576.3
A1(021)	Spray	3.636	14.7	575.8	575.8
A1(022)	Spray	3.636	14.7	575.8	575.8
A1(023)	Spray	3.463	14.7	576.3	576.3
A1(024)	Spray	3.772	14.7	575.4	575.4
A1(025)	Spray	3.771	14.7	575.4	575.4
A1(026)	Spray	3.462	14.7	576.3	576.3
A1(027)	Spray	3.637	14.7	575.8	575.8
A1(028)	Spray	3.637	14.7	575.8	575.8
A1(029)	Spray	3.461	14.7	576.3	576.3
A1(030)	Spray	3.77	14.7	575.4	575.4
A1(031)	Spray	3.77	14.7	575.4	575.4
A1(032)	Spray	3.46	14.7	576.3	576.3
A1(033)	Spray	3.635	14.7	575.8	575.8
A1(034)	Spray	3.635	14.7	575.8	575.8
A1(035)	Spray	3.459	14.7	576.3	576.3
A1(036)	Spray	3.769	14.7	575.4	575.4
A1(037)	Spray	3.768	14.7	575.4	575.4
A1(038)	Spray	3.459	14.7	576.3	576.3
A1(039)	Spray	3.634	14.7	575.8	575.8
A1(040)	Spray	3.634	14.7	575.8	575.8
A1(041)	Spray	3.458	14.7	576.3	576.3
A1(042)	Spray	3.767	14.7	575.4	575.4
A1(043)	Spray	3.767	14.7	575.4	575.4
A1(044)	Spray	3.457	14.7	576.3	576.3
A1(045)	Spray	3.632	14.7	575.8	575.8
A1(046)	Spray	3.632	14.7	575.8	575.8
A1(047)	Spray	3.457	14.7	576.3	576.3
A1(048)	Spray	3.766	14.7	575.4	575.4
A1(049)	Spray	3.766	14.7	575.4	575.4
A1(050)	Spray	3.456	14.7	576.3	576.3
A1(051)	Spray	3.631	14.7	575.8	575.8
A1(052)	Spray	3.631	14.7	575.8	575.8
A1(053)	Spray	3.456	14.7	576.3	576.3
A1(054)	Spray	3.765	14.7	575.4	575.4
A1(055)	Spray	3.765	14.7	575.4	575.4
A1(056)	Spray	3.455	14.7	576.3	576.3
A1(057)	Spray	3.63	14.7	575.8	575.8
A1(058)	Spray	3.63	14.7	575.8	575.8
A1(059)	Spray	3.455	14.7	576.3	576.3
A1(060)	Spray	3.765	14.7	575.4	575.4
A1(061)	Spray	3.764	14.7	575.4	575.4
A1(062)	Spray	3.454	14.7	576.3	576.3
A1(063)	Spray	3.63	14.7	575.8	575.8
A1(064)	Spray	3.63	14.7	575.8	575.8
A1(065)	Spray	3.454	14.7	576.3	576.3
A1(066)	Spray	3.764	14.7	575.4	575.4
A1(067)	Spray	3.764	14.7	575.4	575.4
A1(068)	Spray	3.454	14.7	576.3	576.3
A1(069)	Spray	3.629	14.7	575.8	575.8
A1(070)	Spray	3.629	14.7	575.8	575.8
A1(071)	Spray	3.453	14.7	576.3	576.3
A1(072)	Spray	3.763	14.7	575.4	575.4
A1(073)	Spray	3.763	14.7	575.4	575.4
A1(074)	Spray	3.453	14.7	576.3	576.3
A1(075)	Spray	3.628	14.7	575.8	575.8
A1(076)	Spray	3.628	14.7	575.8	575.8
A1(077)	Spray	3.453	14.7	576.3	576.3
A1(078)	Spray	3.763	14.7	575.4	575.4
A1(079)	Spray	3.763	14.7	575.4	575.4
A1(080)	Spray	3.453	14.7	576.3	576.3
A1(081)	Spray	3.628	14.7	575.8	575.8
A1(082)	Spray	3.628	14.7	575.8	575.8
A1(083)	Spray	3.452	14.7	576.3	576.3
A1(084)	Spray	3.762	14.7	575.4	575.4
A1(085)	Spray	3.762	14.7	575.4	575.4
A1(086)	Spray	3.452	14.7	576.3	576.3
A1(087)	Spray	3.628	14.7	575.8	575.8
A1(088)	Spray	3.628	14.7	575.8	575.8
A1(089)	Spray	3.452	14.7	576.3	576.3
A1(090)	Spray	3.762	14.7	575.4	575.4
A1(091)	Spray	3.762	14.7	575.4	575.4
A1(092)	Spray	3.452	14.7	576.3	576.3
A1(093)	Spray	3.627	14.7	575.8	575.8
A1(094)	Spray	3.627	14.7	575.8	575.8
A1(095)	Spray	3.452	14.7	576.3	576.3
A1(096)	Spray	3.762	14.7	575.4	575.4
A1(097)	Spray	3.762	14.7	575.4	575.4
A1(098)	Spray	3.452	14.7	576.3	576.3
A1(099)	Spray	3.627	14.7	575.8	575.8
A1(100)	Spray	3.627	14.7	575.8	575.8
A1(101)	Spray	3.452	14.7	576.3	576.3
A1(102)	Spray	3.762	14.7	575.4	575.4
A1(103)	Spray	3.762	14.7	575.4	575.4
A1(104)	Spray	3.452	14.7	576.3	576.3
A1(105)	Spray	3.627	14.7	575.8	575.8
A1(106)	Spray	3.627	14.7	575.8	575.8
A1(107)	Spray	3.452	14.7	576.3	576.3
A1(108)	Spray	3.762	14.7	575.4	575.4
A1(109)	Spray	3.762	14.7	575.4	575.4
A1(110)	Spray	3.452	14.7	576.3	576.3
A1(111)	Spray	3.627	14.7	575.8	575.8
A1(112)	Spray	3.627	14.7	575.8	575.8
A1(113)	Spray	3.452	14.7	576.3	576.3
A1(114)	Spray	3.762	14.7	575.4	575.4
A1(115)	Spray	3.762	14.7	575.4	575.4
A1(116)	Spray	3.452	14.7	576.3	576.3
A1(117)	Spray	3.627	14.7	575.8	575.8
A1(118)	Spray	3.627	14.7	575.8	575.8
A1(119)	Spray	3.452	14.7	576.3	576.3
A1(120)	Spray	3.762	14.7	575.4	575.4
A2(001)	Spray	4.076	14.7	589.5	589.5
A2(002)	Spray	3.826	14.7	588.7	588.7
A2(003)	Spray	3.921	14.7	589	589
A2(004)	Spray	3.921	14.7	589	589
A2(005)	Spray	3.824	14.7	588.7	588.7
A2(006)	Spray	4.076	14.7	589.5	589.5
A2(007)	Spray	4.075	14.7	589.5	589.5
A2(008)	Spray	3.823	14.7	588.7	588.7
A2(009)	Spray	3.918	14.7	589	589
A2(010)	Spray	3.918	14.7	589	589
A2(011)	Spray	3.821	14.7	588.7	588.7
A2(012)	Spray	4.073	14.7	589.5	589.5
A2(013)	Spray	4.072	14.7	589.5	589.5
A2(014)	Spray	3.82	14.7	588.7	588.7
A2(015)	Spray	3.916	14.7	589	589
A2(016)	Spray	3.916	14.7	589	589
A2(017)	Spray	3.818	14.7	588.7	588.7
A2(018)	Spray	4.07	14.7	589.5	589.5
A2(019)	Spray	4.07	14.7	589.5	589.5
A2(020)	Spray	3.818	14.7	588.7	588.7
A2(021)	Spray	3.914	14.7	589	589
A2(022)	Spray	3.914	14.7	589	589
A2(023)	Spray	3.817	14.7	588.7	588.7
A2(024)	Spray	4.069	14.7	589.5	589.5
A2(025)	Spray	4.068	14.7	589.5	589.5
A2(026)	Spray	3.816	14.7	588.7	588.7
A2(027)	Spray	3.912	14.7	589	589
A2(028)	Spray	3.912	14.7	589	589
A2(029)	Spray	3.815	14.7	588.7	588.7
A2(030)	Spray	4.067	14.7	589.5	589.5
A2(031)	Spray	4.067	14.7	589.5	589.5
A2(032)	Spray	3.815	14.7	588.7	588.7
A2(033)	Spray	3.911	14.7	589	589
A2(034)	Spray	3.911	14.7	589	589
A2(035)	Spray	3.814	14.7	588.7	588.7
A2(036)	Spray	4.066	14.7	589.5	589.5
A2(037)	Spray	4.066	14.7	589.5	589.5
A2(038)	Spray	3.814	14.7	588.7	588.7
A2(039)	Spray	3.91	14.7	589	589
A2(040)	Spray	3.91	14.7	589	589
A2(041)	Spray	3.814	14.7	588.7	588.7
A2(042)	Spray	4.066	14.7	589.5	589.5
A2(043)	Spray	4.066	14.7	589.5	589.5
A2(044)	Spray	3.813	14.7	588.7	588.7
A2(045)	Spray	3.91	14.7	589	589
A2(046)	Spray	3.91	14.7	589	589
A2(047)	Spray	3.813	14.7	588.7	588.7
A2(048)	Spray	4.065	14.7	589.5	589.5
A2(049)	Spray	4.065	14.7	589.5	589.5
A2(050)	Spray	3.813	14.7	588.7	588.7
A2(051)	Spray	3.909	14.7	589	589
A2(052)	Spray	3.909	14.7	589	589
A2(053)	Spray	3.813	14.7	588.7	588.7
A2(054)	Spray	4.065	14.7	589.5	589.5
A2(055)	Spray	4.065	14.7	589.5	589.5
A2(056)	Spray	3.813	14.7	588.7	588.7
A2(057)	Spray	3.909	14.7	589	589
A2(058)	Spray	3.909	14.7	589	589
A2(059)	Spray	3.813	14.7	588.7	588.7
A2(060)	Spray	4.077	14.7	589.5	589.5
A3(001)	Spray	5.09	14.7	593.3	593.3
A3(002)	Spray	5.138	14.7	593.5	593.5
A3(003)	Spray	5.085	14.7	593.3	593.3
A3(004)	Spray	5.085	14.7	593.3	593.3
A3(005)	Spray	5.13	14.7	593.5	593.5
A3(006)	Spray	5.081	14.7	593.3	593.3
A3(007)	Spray	5.077	14.7	593.3	593.3
A3(008)	Spray	5.128	14.7	593.5	593.5
A3(009)	Spray	5.074	14.7	593.3	593.3
A3(010)	Spray	5.074	14.7	593.3	593.3
A3(011)	Spray	5.12	14.7	593.5	593.5

A3{012}	Spray	5.071	14.7	593.3	593.3
A3{013}	Spray	5.059	14.7	593.3	593.3
A3{014}	Spray	5.118	14.7	593.5	593.5
A3{015}	Spray	5.067	14.7	593.3	593.3
A3{016}	Spray	5.067	14.7	593.3	593.3
A3{017}	Spray	5.114	14.7	593.5	593.5
A3{018}	Spray	5.065	14.7	593.3	593.3
A3{019}	Spray	5.063	14.7	593.3	593.3
A3{020}	Spray	5.112	14.7	593.5	593.5
A3{021}	Spray	5.062	14.7	593.3	593.3
A3{022}	Spray	5.062	14.7	593.3	593.3
A3{023}	Spray	5.11	14.7	593.5	593.5
A3{024}	Spray	5.061	14.7	593.3	593.3
A3{025}	Spray	5.06	14.7	593.3	593.3
A3{026}	Spray	5.109	14.7	593.5	593.5
A3{027}	Spray	5.06	14.7	593.3	593.3
A3{028}	Spray	5.059	14.7	593.3	593.3
A3{029}	Spray	5.108	14.7	593.5	593.5
A3{030}	Spray	5.059	14.7	593.3	593.3
A3{031}	Spray	5.059	14.7	593.3	593.3
A3{032}	Spray	5.108	14.7	593.5	593.5
A3{033}	Spray	5.059	14.7	593.3	593.3
A3{034}	Spray	5.059	14.7	593.3	593.3
A3{035}	Spray	5.107	14.7	593.5	593.5
A3{036}	Spray	5.058	14.7	593.3	593.3
A3{037}	Spray	5.058	14.7	593.3	593.3
A3{038}	Spray	5.107	14.7	593.5	593.5
A3{039}	Spray	5.058	14.7	593.3	593.3
B1{001}	Spray	5.297	14.7	567	567
B1{002}	Spray	5.297	14.7	567	567
B1{003}	Spray	5.296	14.7	567	567
B1{004}	Spray	5.296	14.7	567	567
B1{005}	Spray	5.295	14.7	567	567
B1{006}	Spray	5.295	14.7	567	567
B1{007}	Spray	5.293	14.7	567	567
B1{008}	Spray	5.293	14.7	567	567
B1{009}	Spray	5.292	14.7	567	567
B1{010}	Spray	5.292	14.7	567	567
B1{011}	Spray	5.291	14.7	567	567
B1{012}	Spray	5.291	14.7	567	567
B1{013}	Spray	5.29	14.7	567	567
B1{014}	Spray	5.29	14.7	567	567
B1{015}	Spray	5.289	14.7	567	567
B1{016}	Spray	5.289	14.7	567	567
B1{017}	Spray	5.288	14.7	567	567
B1{018}	Spray	5.288	14.7	567	567
B1{019}	Spray	5.287	14.7	567	567
B1{020}	Spray	5.287	14.7	567	567
B1{021}	Spray	5.286	14.7	567	567
B1{022}	Spray	5.286	14.7	567	567
B1{023}	Spray	5.285	14.7	567	567
B1{024}	Spray	5.285	14.7	567	567
B1{025}	Spray	5.284	14.7	567	567
B1{026}	Spray	5.284	14.7	567	567
B1{027}	Spray	5.284	14.7	567	567
B1{028}	Spray	5.284	14.7	567	567
B1{029}	Spray	5.283	14.7	567	567
B1{030}	Spray	5.283	14.7	567	567
B1{031}	Spray	5.282	14.7	567	567
B1{032}	Spray	5.282	14.7	567	567
B1{033}	Spray	5.281	14.7	567	567
B1{034}	Spray	5.281	14.7	567	567
B1{035}	Spray	5.281	14.7	567	567
B1{036}	Spray	5.281	14.7	567	567
B1{037}	Spray	5.28	14.7	567	567
B1{038}	Spray	5.28	14.7	567	567
B1{039}	Spray	5.279	14.7	567	567
B1{040}	Spray	5.279	14.7	567	567
B1{041}	Spray	5.279	14.7	567	567
B1{042}	Spray	5.279	14.7	567	567
B1{043}	Spray	5.278	14.7	567	567
B1{044}	Spray	5.278	14.7	567	567
B1{045}	Spray	5.278	14.7	567	567
B1{046}	Spray	5.278	14.7	567	567
B1{047}	Spray	5.277	14.7	567	567
B1{048}	Spray	5.277	14.7	567	567
B1{049}	Spray	5.277	14.7	567	567
B1{050}	Spray	5.277	14.7	567	567
B1{051}	Spray	5.276	14.7	567	567
B1{052}	Spray	5.276	14.7	567	567
B1{053}	Spray	5.276	14.7	567	567
B1{054}	Spray	5.276	14.7	567	567
B1{055}	Spray	5.275	14.7	567	567
B1{056}	Spray	5.275	14.7	567	567
B1{057}	Spray	5.275	14.7	567	567
B1{058}	Spray	5.275	14.7	567	567
B1{059}	Spray	5.275	14.7	567	567
B1{060}	Spray	5.275	14.7	567	567
B1{061}	Spray	5.274	14.7	567	567
B1{062}	Spray	5.274	14.7	567	567
B1{063}	Spray	5.274	14.7	567	567
B1{064}	Spray	5.274	14.7	567	567
B1{065}	Spray	5.274	14.7	567	567
B1{066}	Spray	5.274	14.7	567	567
B1{067}	Spray	5.274	14.7	567	567
B1{068}	Spray	5.274	14.7	567	567
B1{069}	Spray	5.273	14.7	567	567
B1{070}	Spray	5.273	14.7	567	567
B1{071}	Spray	5.273	14.7	567	567
B1{072}	Spray	5.273	14.7	567	567
B1{073}	Spray	5.273	14.7	567	567
B1{074}	Spray	5.273	14.7	567	567
B1{075}	Spray	5.273	14.7	567	567
B1{076}	Spray	5.273	14.7	567	567
B1{077}	Spray	5.273	14.7	567	567
B1{078}	Spray	5.273	14.7	567	567
B1{079}	Spray	5.272	14.7	567	567
B1{080}	Spray	5.272	14.7	567	567
B1{081}	Spray	5.272	14.7	567	567
B1{082}	Spray	5.272	14.7	567	567
B1{083}	Spray	5.272	14.7	567	567
B1{084}	Spray	5.272	14.7	567	567
B1{085}	Spray	5.272	14.7	567	567
B1{086}	Spray	5.272	14.7	567	567
B1{087}	Spray	5.272	14.7	567	567
B1{088}	Spray	5.272	14.7	567	567
B1{089}	Spray	5.272	14.7	567	567
B1{090}	Spray	5.272	14.7	567	567
B1{091}	Spray	5.272	14.7	567	567
B1{092}	Spray	5.272	14.7	567	567
B1{093}	Spray	5.272	14.7	567	567
B1{094}	Spray	5.272	14.7	567	567
B1{095}	Spray	5.272	14.7	567	567
B1{096}	Spray	5.272	14.7	567	567
B1{097}	Spray	5.272	14.7	567	567
B1{098}	Spray	5.272	14.7	567	567
B1{099}	Spray	5.272	14.7	567	567
B1{100}	Spray	5.272	14.7	567	567
B1{101}	Spray	5.272	14.7	567	567
B1{102}	Spray	5.272	14.7	567	567
B1{103}	Spray	5.272	14.7	567	567
B1{104}	Spray	5.273	14.7	567	567
B1{105}	Spray	5.272	14.7	567	567
B1{106}	Spray	5.272	14.7	567	567
B1{107}	Spray	5.272	14.7	567	567
B1{108}	Spray	5.272	14.7	567	567
B1{109}	Spray	5.272	14.7	567	567
B1{110}	Spray	5.272	14.7	567	567
B1{111}	Spray	5.272	14.7	567	567
B1{112}	Spray	5.272	14.7	567	567
B2{001}	Spray	4.164	14.7	589	589
B2{002}	Spray	4.164	14.7	589	589
B2{003}	Spray	4.162	14.7	589	589
B2{004}	Spray	4.162	14.7	589	589
B2{005}	Spray	4.16	14.7	589	589
B2{006}	Spray	4.16	14.7	589	589
B2{007}	Spray	4.158	14.7	589	589
B2{008}	Spray	4.158	14.7	589	589
B2{009}	Spray	4.156	14.7	589	589
B2{010}	Spray	4.156	14.7	589	589
B2{011}	Spray	4.154	14.7	589	589
B2{012}	Spray	4.154	14.7	589	589
B2{013}	Spray	4.152	14.7	589	589
B2{014}	Spray	4.152	14.7	589	589
B2{015}	Spray	4.15	14.7	589	589
B2{016}	Spray	4.15	14.7	589	589
B2{017}	Spray	4.148	14.7	589	589
B2{018}	Spray	4.148	14.7	589	589
B2{019}	Spray	4.147	14.7	589	589
B2{020}	Spray	4.147	14.7	589	589
B2{021}	Spray	4.145	14.7	589	589
B2{022}	Spray	4.145	14.7	589	589
B2{023}	Spray	4.144	14.7	589	589
B2{024}	Spray	4.144	14.7	589	589
B2{025}	Spray	4.142	14.7	589	589
B2{026}	Spray	4.142	14.7	589	589
B2{027}	Spray	4.141	14.7	589	589
B2{028}	Spray	4.141	14.7	589	589
B2{029}	Spray	4.14	14.7	589	589
B2{030}	Spray	4.14	14.7	589	589
B2{031}	Spray	4.139	14.7	589	589
B2{032}	Spray	4.139	14.7	589	589
B2{033}	Spray	4.137	14.7	589	589
B2{034}	Spray	4.137	14.7	589	589
B2{035}	Spray	4.136	14.7	589	589
B2{036}	Spray	4.136	14.7	589	589
B2{037}	Spray	4.135	14.7	589	589
B2{038}	Spray	4.135	14.7	589	589
B2{039}	Spray	4.135	14.7	589	589
B2{040}	Spray	4.135	14.7	589	589
B2{041}	Spray	4.134	14.7	589	589

B2(042)	Spray	4.134	14.7		589	589
B2(043)	Spray	4.133	14.7		589	589
B2(044)	Spray	4.133	14.7		589	589
B2(045)	Spray	4.132	14.7		589	589
B2(046)	Spray	4.132	14.7		589	589
B2(047)	Spray	4.132	14.7		589	589
B2(048)	Spray	4.132	14.7		589	589
B2(049)	Spray	4.131	14.7		589	589
B2(050)	Spray	4.131	14.7		589	589
B2(051)	Spray	4.13	14.7		589	589
B2(052)	Spray	4.13	14.7		589	589
B2(053)	Spray	4.13	14.7		589	589
B2(054)	Spray	4.13	14.7		589	589
B2(055)	Spray	4.129	14.7		589	589
B2(056)	Spray	4.129	14.7		589	589
B2(057)	Spray	4.129	14.7		589	589
B2(058)	Spray	4.129	14.7		589	589
B2(059)	Spray	4.129	14.7		589	589
B2(060)	Spray	4.129	14.7		589	589
B2(061)	Spray	4.128	14.7		589	589
B2(062)	Spray	4.128	14.7		589	589
B2(063)	Spray	4.128	14.7		589	589
B2(064)	Spray	4.128	14.7		589	589
B2(065)	Spray	4.128	14.7		589	589
B2(066)	Spray	4.128	14.7		589	589
B2(067)	Spray	4.128	14.7		589	589
B2(068)	Spray	4.128	14.7		589	589
B2(069)	Spray	4.127	14.7		589	589
B2(070)	Spray	4.127	14.7		589	589
B2(071)	Spray	4.127	14.7		589	589
B2(072)	Spray	4.127	14.7		589	589
B2(073)	Spray	4.127	14.7		589	589
B2(074)	Spray	4.127	14.7		589	589
B2(075)	Spray	4.127	14.7		589	589
B2(076)	Spray	4.127	14.7		589	589
B2(077)	Spray	4.127	14.7		589	589
B2(078)	Spray	4.127	14.7		589	589
B2(079)	Spray	4.127	14.7		589	589
B2(080)	Spray	4.127	14.7		589	589
B2(081)	Spray	4.127	14.7		589	589
B2(082)	Spray	4.127	14.7		589	589
B2(083)	Spray	4.127	14.7		589	589
B2(084)	Spray	4.127	14.7		589	589
B2(085)	Spray	4.127	14.7		589	589
B2(086)	Spray	4.127	14.7		589	589
B2(087)	Spray	4.127	14.7		589	589
B2(088)	Spray	4.127	14.7		589	589
B2(089)	Spray	4.127	14.7		589	589
B2(090)	Spray	4.127	14.7		589	589
B3(001)	Spray	4.296	14.7		589	589
B3(002)	Spray	4.296	14.7		589	589
B3(003)	Spray	4.296	14.7		589	589
B3(004)	Spray	4.296	14.7		589	589
B3(005)	Spray	4.295	14.7		589	589
B3(006)	Spray	4.295	14.7		589	589
B3(007)	Spray	4.294	14.7		589	589
B3(008)	Spray	4.294	14.7		589	589
B3(009)	Spray	4.294	14.7		589	589
B3(010)	Spray	4.294	14.7		589	589
B3(011)	Spray	4.293	14.7		589	589
B3(012)	Spray	4.293	14.7		589	589
B3(013)	Spray	4.293	14.7		589	589
B3(014)	Spray	4.293	14.7		589	589
B3(015)	Spray	4.292	14.7		589	589
B3(016)	Spray	4.292	14.7		589	589
B3(017)	Spray	4.292	14.7		589	589
B3(018)	Spray	4.292	14.7		589	589
B3(019)	Spray	4.291	14.7		589	589
B3(020)	Spray	4.291	14.7		589	589
B3(021)	Spray	4.291	14.7		589	589

PIPE-FLO	ver 8.0	12/1/2009 8 25
System:	FBT CV to CL - A1R13	
Lineup	FBT CV to CL (From RH)	
Company	Exelon	
Project	BYR06-029 Rev. 0	
by	Sargent & Lundy L.L.C.	
Footer:		

UNITS:					CALCULATION
Flow Rate:	US gpm				Iteration: 18
Pressure:	psi a	Atm:	14.7	psi a	Deviation percent: 0.002727
Temperature:	F				
Viscosity:	cP				
Density:	lb/ft				
Grade:	ft				
Length:	ft				
Size:	in				

Pipe List	Specification	Fluid Zone	Size	Length	K	Status	Flow	Velocity	dP	HL	Tagged	From	To	Inside Dia	Pipe HL	Minor HL	Re	ffp	Valves/Fittings					
CS01AA(001)	Steel Sch.30 (clean)	Outage Recirc Water	16	12.3	0.5449		0	0	-1.73	0	N	~N(003)	~N(005)	15.25	0	0	0.002137	0	2 x Pipe Bend - r/d 1.5 (90)	0.173	1 x CS009A-1 (Gate Valve)	0.09888	1 x Converging Tee (Through)	0.1
CS01AA(002)	Steel Sch.30 (clean)	Outage Recirc Water	16	10.6	0.2954		0	0	0	0	N	~N(005)	~N(006)	15.25	0	0	0.002137	0	1 x Reducer - Contraction (16 x 14 - 14)	0.02451	1 x Pipe Bend - r/d 1.5 (90)	0.173	1 x CS002A	0.09888
CS01AA(003)	Steel Sch.30 (clean)	Outage Recirc Water	14	2	0		0	0	0.865	0	N	~N(006)	Containment Spray Pump A	13.25	0	0	0.002459	0						
CS01AB(001)	Steel Sch.30 (clean)	Outage Recirc Water	16	4.3	0.2978		0	0	0	0	N	~N(236)	~N(237)	15.25	0	0	0.002137	0	1 x Gate - Double Disc	0.09888	1 x CS009B-2 (Gate Valve)	0.09888	1 x Converging Tee (Through)	0.1
CS01AB(002)	Steel Sch.30 (clean)	Outage Recirc Water	16	19.3	1.236		0	0	0	0	N	~N(237)	~N(238)	15.25	0	0	0.002137	0	3 x Elbow - Standard 90	0.3708	1 x Reducer - Contraction (16 x 14 - 14)	0.02451	1 x CS002B(Gate Valve)	0.09888
CS01AB(003)	Steel Sch.30 (clean)	Outage Recirc Water	14	2	0		0	0	0.822	0	N	~N(238)	Containment Spray Pump B	13.25	0	0	0.002459	0						
CS02AA(001)	Steel Sch 40 (clean)	Outage Recirc Water	8	2	0.05008		0	0	0.432	0	N	Containment Spray Pump A	~N(007)	7.981	0	0	0.004083	0	1 x Reducer - Enlargement (10 x 8 - 7)	0.05008				
CS02AA(002)	Steel Sch 40 (clean)	Outage Recirc Water	10	25.5	2.148		0	0	5.06	0	N	~N(007)	~N(008)	10.02	0	0	0.003252	0	4 x Pipe Bend - r/d 1.5 (90)	0.188	1 x CS003A (Check Valve)	1.289	1 x CV004A (Gate Valve)	0.1074
CS02AA(003)	Steel Sch 40 (clean)	Outage Recirc Water	10	101.3	5.652		0	0	15.05	0	N	~N(008)	~N(009)	10.02	0	0	0.003252	0	1 x FE-CS011	4.9	4 x Pipe Bend - r/d 1.5 (90)	0.188	1 x Diverging Tee (Through)	1.00E-05
CS02AA(004)	Steel Sch 40 (clean)	Outage Recirc Water	10	34.8	0.5713		0	0	5.276	0	N	~N(009)	CS007A-1	10.02	0	0	0.003252	0	3 x Pipe Bend - r/d 1.5 (90)	0.188	1 x CS007A-1 (Gate Valve)	0.1074	1 x Diverging Tee (Through)	1.00E-05
CS02AA(005)	Steel Sch 40 (clean)	Outage Recirc Water	10	63.7	2.55		0	0	9.062	0	N	CS007A-1	~N(001)	10.02	0	0	0.003252	0	6 x Pipe Bend - r/d 1.5 (90)	0.188	1 x Pipe Bend - r/d 1.5 (45)	0.1331	1 x CS008A (Check Valve)	1.289
CS02AA(006)	Steel Sch 40 (clean)	Outage Recirc Water	10	155.7	1.261		0	0	83.27	0	N	~N(001)	~N(001A)	10.02	0	0	0.003252	0	6 x Pipe Bend - r/d 1.5 (90)	0.188	1 x Pipe Bend - r/d 1.5 (45)	0.1331		
CS02AB(001)	Steel Sch 40 (clean)	Outage Recirc Water	8	2	0.472		0	0	-0.432	0	N	Containment Spray Pump B	~N(239)	7.981	0	0	0.004083	0	1 x Elbow - Standard 90	0.4218	1 x Reducer - Enlargement (10 x 8 - 7)	0.05008		
CS02AB(002)	Steel Sch 40 (clean)	Outage Recirc Water	10	9.9	2.202		0	0	0.218	0	N	~N(239)	~N(240)	10.02	0	0	0.003252	0	2 x Elbow - Standard 90	0.4028	1 x CV004B (Gate Valve)	0.1074	1 x CV003B (Check Valve)	1.289
CS02AB(003)	Steel Sch 40 (clean)	Outage Recirc Water	10	59.1	6.511		0	0	14.92	0	N	~N(240)	~N(241)	10.02	0	0	0.003252	0	4 x Elbow - Standard 90	0.4028	1 x FE-CS012	4.9	1 x Diverging Tee (Through)	1.00E-05
CS02AB(004)	Steel Sch 40 (clean)	Outage Recirc Water	10	33.8	1.316		0	0	7.655	0	N	~N(241)	CS007B-2	10.02	0	0	0.003252	0	3 x Elbow - Standard 90	0.4028	1 x CV007B-2 (Gate Valve)	0.1074	1 x Diverging Tee (Through)	1.00E-05
CS02AB(005)	Steel Sch 40 (clean)	Outage Recirc Water	10	75.4	3.92		0	0	12.54	0	N	CS007B-2	~N(242)	10.02	0	0	0.003252	0	1 x Elbow - Standard 45	0.2148	6 x Elbow - Standard 90	0.4028	1 x CS008B (Check Valve)	1.289
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]																						
CS02J(035)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	115.6	1.285	0.001	0.003	N	-N(333)	-N(331)	6.065	0.003	0	62123	0.02108				
CS02J(036)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	115.6	1.285	0.001	0.003	N	-N(334)	-N(332)	6.065	0.003	0	62123	0.02108				
CS02J(037)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	111.5	1.239	0.001	0.003	N	-N(335)	-N(333)	6.065	0.003	0	59901	0.02119				
CS02J(038)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	111.5	1.239	0.001	0.003	N	-N(336)	-N(334)	6.065	0.003	0	59901	0.02119				
CS02J(039)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	107.4	1.193	0.001	0.003	N	-N(337)	-N(335)	6.065	0.003	0	57679	0.02134				
CS02J(040)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	107.4	1.193	0.001	0.003	N	-N(338)	-N(336)	6.065	0.003	0	57679	0.02134				
CS02J(041)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	103.2	1.147	0.001	0.003	N	-N(339)	-N(337)	6.065	0.003	0	55458	0.02149				
CS02J(042)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	103.2	1.147	0.001	0.003	N	-N(340)	-N(338)	6.065	0.003	0	55458	0.02149				
CS02J(043)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	99.06	1.101	0.001	0.003	N	-N(341)	-N(339)	6.065	0.003	0	53237	0.02165				
CS02J(044)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	99.06	1.101	0.001	0.003	N	-N(342)	-N(340)	6.065	0.003	0	53237	0.02165				
CS02J(045)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	94.95	1.055	0.001	0.002	N	-N(343)	-N(341)	6.065	0.002	0	51016	0.02182				
CS02J(046)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	94.95	1.055	0.001	0.002	N	-N(344)	-N(342)	6.065	0.002	0	51016	0.02182				
CS02J(047)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	90.82	1.009	0	0.002	N	-N(345)	-N(343)	6.065	0.002	0	48796	0.022				
CS02J(048)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	90.82	1.009	0	0.002	N	-N(346)	-N(344)	6.065	0.002	0	48796	0.022				
CS02J(049)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	86.69	0.963	0	0.002	N	-N(347)	-N(345)	6.065	0.002	0	46576	0.0222				
CS02J(050)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	86.69	0.963	0	0.002	N	-N(348)	-N(346)	6.065	0.002	0	46576	0.0222				
CS02J(051)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	82.56	0.918	0	0.002	N	-N(349)	-N(347)	6.065	0.002	0	44356	0.02241				
CS02J(052)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	82.56	0.918	0	0.002	N	-N(350)	-N(348)	6.065	0.002	0	44356	0.02241				
CS02J(053)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	78.42	0.872	0	0.002	N	-N(351)	-N(349)	6.065	0.002	0	42137	0.02263				
CS02J(054)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	78.42	0.872	0	0.002	N	-N(352)	-N(350)	6.065	0.002	0	42137	0.02263				
CS02J(055)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	74.29	0.826	0	0.002	N	-N(353)	-N(351)	6.065	0.002	0	39918	0.02287				
CS02J(056)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	74.29	0.826	0	0.002	N	-N(354)	-N(352)	6.065	0.002	0	39918	0.02287				
CS02J(057)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	70.17	0.78	0	0.001	N	-N(355)	-N(353)	6.065	0.001	0	37699	0.02314				
CS02J(058)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	70.17	0.78	0	0.001	N	-N(356)	-N(354)	6.065	0.001	0	37699	0.02314				
CS02J(059)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	66.04	0.734	0	0.001	N	-N(357)	-N(355)	6.065	0.001	0	35481	0.02342				
CS02J(060)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	66.04	0.734	0	0.001	N	-N(358)	-N(356)	6.065	0.001	0	35481	0.02342				
CS02J(061)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	61.91	0.688	0	0.001	N	-N(359)	-N(357)	6.065	0.001	0	33263	0.02374				
CS02J(062)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	61.91	0.688	0	0.001	N	-N(360)	-N(358)	6.065	0.001	0	33263	0.02374				
CS02J(063)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	57.78	0.642	0	0	N	-N(361)	-N(359)	6.065	0	0	31044	0.02408				
CS02J(064)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	57.78	0.642	0	0	N	-N(362)	-N(360)	6.065	0	0	31044	0.02408				
CS02J(065)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	53.65	0.596	0	0	N	-N(363)	-N(361)	6.065	0	0	28826	0.02446				
CS02J(066)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	53.65	0.596	0	0	N	-N(364)	-N(362)	6.065	0	0	28826	0.02446				
CS02J(067)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	49.52	0.55	0	0	N	-N(365)	-N(363)	6.065	0	0	26609	0.02489				
CS02J(068)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	49.52	0.55	0	0	N	-N(366)	-N(364)	6.065	0	0	26609	0.02489				
CS02J(069)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	45.4	0.505	0	0	N	-N(367)	-N(365)	6.065	0	0	24391	0.02537				
CS02J(070)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	45.4	0.505	0	0	N	-N(368)	-N(366)	6.065	0	0	24391	0.02537				
CS02J(071)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	41.27	0.459	0	0	N	-N(369)	-N(367)	6.065	0	0	22173	0.02591				
CS02J(072)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	41.27	0.459	0	0	N	-N(370)	-N(368)	6.065	0	0	22173	0.02591				
CS02J(073)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	37.14	0.413	0	0	N	-N(371)	-N(369)	6.065	0	0	19956	0.02654				
CS02J(074)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	37.14	0.413	0	0	N	-N(372)	-N(370)	6.065	0	0	19956	0.02654				
CS02J(075)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	33.01	0.367	0	0	N	-N(373)	-N(371)	6.065	0	0	17738	0.02729				
CS02J(076)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	33.01	0.367	0	0	N	-N(374)	-N(372)	6.065	0	0	17738	0.02729				
CS02J(077)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	28.89	0.321	0	0	N	-N(375)	-N(373)	6.065	0	0	15521	0.02817				
CS02J(078)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	28.89	0.321	0	0	N	-N(376)	-N(374)	6.065	0	0	15521	0.02817				
CS02J(079)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	24.76	0.275	0	0	N	-N(377)	-N(375)	6.065	0	0	13304	0.02926				
CS02J(080)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	24.76	0.275	0	0	N	-N(378)	-N(376)	6.065	0	0	13304	0.02926				
CS02J(081)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	20.63	0.229	0	0	N	-N(379)	-N(377)	6.065	0	0	11086	0.03065				
CS02J(082)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	20.63	0.229	0	0	N	-N(380)	-N(378)	6.065	0	0	11086	0.03065				
CS02J(083)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	16.51	0.183	0	0	N	-N(381)	-N(379)	6.065	0	0	8869	0.0325				
CS02J(084)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	16.51	0.183	0	0	N	-N(382)	-N(380)	6.065	0	0	8869	0.0325				
CS02J(085)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	12.38	0.138	0	0	N	-N(383)	-N(381)	6.065	0	0	6652	0.03518				
CS02J(086)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	12.38	0.138	0	0	N	-N(384)	-N(382)	6.065	0	0	6652	0.03518				
CS02J(087)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	8.253	0.092	0	0	N	-N(385)	-N(383)	6.065	0	0	4434	0.03961				
CS02J(088)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	8.253	0.092	0	0	N	-N(387)	-N(384)	6.065	0	0	4434	0.03961				
CS02J(089)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	4.127	0.046	0	0	N	-N(388)	-N(385)	6.065	0	0	2217	0.04953				
CS02J(090)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0	<-->	4.127	0.046	0	0	N	-N(389)	-N(387)	6.065	0	0	2217	0.04953				
CS02J(091)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.2	0		0	0	0	0	N	-N(389)	-N(388)	6.065	0	0	9.58E-07	0				
CS02KA	Steel Sch 40 (clean)	Outage Recirc Water	10	2	20.2		434.2	1.788	1.073	0.982	N	-N(001A)	-N(112)	10.02	0.002	0.98	141218	0.01786	1 x FX-CS036 (Flow Element)	15.8	1 x Diverging Tee (Branch)	4.4
CS02KB	Steel Sch 40 (clean)	Outage Recirc Water	10	2.7	32.2		591.2	2.407	2.119	2.9	N	-N(743)	-N(390)	10.02	0.005	2.895	192263	0.01707	1 x FX-CS038 (Flow Element)	26.1	1 x Diverging Tee (Branch)	6.1
CS02L001	Steel Sch 40 (clean)	Outage Recirc Water	8	1.5	4.342		217.2	1.394	0.057	0.132	N	-N(112)	-N(113)	7.981	0.001	0.131	88664	0.0195	1 x Reducer - Contraction (10 x 8 - 7)	0.04215	1 x Diverging* Tee (Branch)	4.3
CS02L002	Steel Sch 40 (clean)	Outage Recirc Water	8	1.5	4.342		217.1	1.393	0.057	0.132	N	-N(112)	-N(114)	7.981	0.001	0.131	88632	0.0195	1 x Reducer - Contraction (10 x 8 - 7)	0.04215	1 x Diverging* Tee (Branch)	4.3
CS02L003	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		213.4	1.369	0.001	0.003	N	-N(113)	-N(115)	7.981	0.003	0	87121	0.01956				
CS02L004	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		213.8	1.371	0.001	0.003	N	-N(114)	-N(203)	7.981	0.003	0	87215	0.01956				
CS02L005	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		209.7	1.346	0.001	0.002	N	-N(115)	-N(116)	7.981	0.002	0	85633	0.01962				
CS02L006	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		210	1.348	0.001	0.002	N	-N(203)	-N(204)	7.981	0.002	0	85727	0.01961				
CS02L007	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		206.3	1.324	0.001	0.002	N	-N(116)	-N(117)	7.981	0.002	0	84216	0.01967				
CS02L008	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		206.2	1.323	0.001	0.002	N	-N(204)	-N(206)	7.981	0.002	0	84184	0.01967				
CS02L009	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		202.5	1.3	0.001	0.002	N	-N(117)	-N(118)	7.981	0.002	0	82674	0.01974				
CS02L010	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		202.7	1.301	0.001	0.002	N	-N(206)	-N(205)	7.981	0.002	0	82768	0.01973				
CS02L011	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		198.8	1.276	0	0.002	N	-N(118)	-N(119)	7.981	0.002	0	81186	0.0198				
CS02L012	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		199.1	1.278	0	0.002	N	-N(205)	-N(210)	7.981	0.002	0	81281	0.01979				
CS02L013	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		195.4	1.254	0	0.002	N	-N(119)	-N(120)	7.981	0.002	0	79771	0.01986				
CS02L014	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		195.3	1.253	0	0.002	N	-N(210)	-N(209)	7.981	0.002	0	79739	0.01986				
CS02L015	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		191.6	1.23	0	0.002	N	-N(120)	-N(122)	7.981	0.002	0	78229	0.01992				
CS02L016	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		191.8	1.231	0	0.002	N	-N(209)	-N(207)	7.981	0.002	0	78324	0.01992				
CS02L017	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		188	1.206	0	0.002	N	-N(122)	-N(121)	7.981	0.002	0	76743	0.01999				
CS02L018	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		188.2	1.208	0	0.002	N	-N(207)	-N(208)	7.981	0.002	0	76837	0.01999				
CS02L019	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		184.5	1.184	0	0.002	N	-N(121)	-N(123)	7.981	0.002	0	75326	0.02006				
CS02L020	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		184.4	1.184	0	0.002	N	-N(208)	-N(218)	7.981	0.002	0	75296	0.02006				
CS02L021	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		180.7	1.16	0	0.002	N	-N(123)	-N(124)	7.981	0.002	0	73768	0.02013				
CS02L022	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		180.9	1.161	0	0.002	N	-N(218)	-N(217)	7.981	0.002	0	73862	0.02013				
CS02L023	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		177.1	1.137	0	0.002	N	-N(124)	-N(126)	7.981	0.002	0	72302	0.0202				
CS02L024	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		177.3	1.138	0	0.002	N	-N(217)	-N(215)	7.981	0.002	0	72396	0.0202				
CS02L025	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		173.6	1.114	0	0.002	N	-N(126)	-N(125)	7.981	0.002	0	70888	0.02027				
CS02L026	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		173.5	1.114	0	0.002	N	-N(215)	-N(216)	7.981	0.002	0	70856	0.02028				
CS02L027	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		169.8	1.09	0	0.002	N	-N(125)	-N(130)	7.981	0.002	0	69348	0.02035				
CS02L028	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		170.1	1.092	0	0.002	N	-N(216)	-N(211)	7.981	0.002	0	69443	0.02035				
CS02L029	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		166.2	1.067	0	0.002	N	-N(130)	-N(129)	7.981	0.002	0	67864	0.02043				
CS02L030	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		166.4	1.068	0	0.002	N	-N(211)	-N(212)	7.981	0.002	0	67958	0.02043				
CS02L031	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		162.7	1.045	0	0.002	N	-N(129)	-N(127)	7.981	0.002	0	66451	0.02051				
CS02L032	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		162.7	1.044	0	0.002	N	-N(212)	-N(214)	7.981	0.002	0	66418	0.02051				
CS02L033	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		159	1.02	0	0.002	N	-N(127)	-N(128)	7.981	0.002	0	64911	0.0206				
CS02L034	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		159.2	1.022	0	0.002	N	-N(214)	-N(213)	7.981	0.002	0	65006	0.02059				
CS02L035	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		155.3	0.997	0	0.001	N	-N(128)	-N(132)	7.981	0.001	0	63427	0.02069				
CS02L036	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		155.6	0.999	0	0.001	N	-N(213)	-N(231)	7.981	0.001	0	63521	0.02068				
CS02L037	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		151.9	0.975	0	0.001	N	-N(132)	-N(131)	7.981	0.001	0	62015	0.02077				
CS02L038	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		151.8	0.974	0	0.001	N	-N(231)	-N(232)	7.981	0.001	0	61983	0.02077				
CS02L039	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		148.1	0.951	0	0.001	N	-N(131)	-N(136)	7.981	0.001	0	60476	0.02087				
CS02L040	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		148.3	0.952	0	0.001	N	-N(232)	-N(227)	7.981	0.001	0	60570	0.02086				
CS02L041	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		144.5	0.927	0	0.001	N	-N(136)	-N(135)	7.981	0.001	0	58993	0.02097				
CS02L042	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		144.7	0.929	0	0.001	N	-N(227)	-N(228)	7.981	0.001	0	59087	0.02096				
CS02L043	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		141	0.905	0	0.001	N	-N(135)	-N(133)	7.981	0.001	0	57581	0.02106				
CS02L044	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		140.9	0.905	0	0.001	N	-N(228)	-N(230)	7.981	0.001	0	57549	0.02106				
CS02L045	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		137.3	0.881	0	0.001	N	-N(133)	-N(134)	7.981	0.001	0	56043	0.02117				
CS02L046	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		137.5	0.882	0	0.001	N	-N(230)	-N(229)	7.981	0.001	0	56137	0.02116				
CS02L047	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		133.6	0.858	0	0.001	N	-N(134)	-N(144)	7.981	0.001	0	54560	0.02128				
CS02L048	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		133.9	0.859	0	0.001	N	-N(229)	-N(219)	7.981	0.001	0	54654	0.02127				
CS02L049	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		130.2	0.835	0	0.001	N	-N(144)	-N(143)	7.981	0.001	0	53148	0.02139				
CS02L050	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		130.1	0.835	0	0.001	N	-N(219)	-N(220)	7.981	0.001	0	53116	0.02139				
CS02L051	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		126.4	0.811	0	0	N	-N(143)	-N(141)	7.981	0	0	51611	0.02151				
CS02L052	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		126.6	0.813	0	0	N	-N(220)	-N(222)	7.981	0	0	51706	0.0215				
CS02L053	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		122.8	0.788	0	0	N	-N(141)	-N(142)	7.981	0	0	50128	0.02163				
CS02L054	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		123	0.789	0	0	N	-N(222)	-N(221)	7.981	0	0	50222	0.02162				
CS02L055	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		119.3	0.766	0	0	N	-N(142)	-N(137)	7.981	0	0	48717	0.02175				
CS02L056	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		119.2	0.765	0	0	N	-N(221)	-N(226)	7.981	0	0	48685	0.02175				
CS02L057	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		115.6	0.742	0	0	N	-N(137)	-N(138)	7.981	0	0	47180	0.02189				
CS02L058	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		115.8	0.743	0	0	N	-N(226)	-N(225)	7.981	0	0	47274	0.02188				
CS02L059	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		111.9	0.718	0	0	N	-N(138)	-N(140)	7.981	0	0	45697	0.02203				
CS02L060	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		112.2	0.72	0	0	N	-N(225)	-N(223)	7.981	0	0	45792	0.02202				
CS02L061	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		108.5	0.696	0	0	N	-N(140)	-N(139)	7.981	0	0	44287	0.02217				
CS02L062	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		108.4	0.696	0	0	N	-N(223)	-N(224)	7.981	0	0	44255	0.02217				
CS02L063	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		104.7	0.672	0	0	N	-N(139)	-N(145)	7.981	0	0	42750	0.02232				
CS02L064	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		104.9	0.673	0	0	N	-N(224)	-N(175)	7.981	0	0	42844	0.02231				
CS02L065	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		101.1	0.649	0	0	N	-N(145)	-N(146)	7.981	0	0	41268	0.02248				
CS02L066	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		101.3	0.65	0	0	N	-N(175)	-N(176)	7.981	0	0	41362	0.02247				
CS02L067	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		97.62	0.627	0	0	N	-N(146)	-N(147)	7.981	0	0	39858	0.02264				
CS02L068	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		97.54	0.626	0	0	N	-N(176)	-N(177)	7.981	0	0	39825	0.02265				
CS02L069	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		93.85	0.602	0	0	N	-N(147)	-N(148)	7.981	0	0	38321	0.02283				
CS02L070	Steel Sch 40 (clean)	Outage Recirc Water	8	3	0		94.09	0.604	0	0	N	-N(177)	-N(178)	7.981	0	0	38415	0.02282				

[illegible]																		
CS02M(003)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	290.3	1.863	0.002	0.005	N	~N(391)	~N(393)	7.981	0.005	0	118517	0.01861	
CS02M(004)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	290.3	1.863	0.002	0.005	N	~N(392)	~N(394)	7.981	0.005	0	118541	0.01861	
CS02M(005)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	285	1.829	0.002	0.005	N	~N(393)	~N(395)	7.981	0.005	0	116354	0.01867	
CS02M(006)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	285	1.829	0.002	0.005	N	~N(394)	~N(396)	7.981	0.005	0	116379	0.01867	
CS02M(007)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	279.7	1.795	0.002	0.005	N	~N(395)	~N(397)	7.981	0.005	0	114192	0.01872	
CS02M(008)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	279.7	1.796	0.002	0.005	N	~N(396)	~N(398)	7.981	0.005	0	114217	0.01872	
CS02M(009)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	274.4	1.761	0.002	0.005	N	~N(397)	~N(399)	7.981	0.005	0	112031	0.01878	
CS02M(010)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	274.4	1.761	0.002	0.005	N	~N(398)	~N(400)	7.981	0.005	0	112055	0.01878	
CS02M(011)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	269.1	1.727	0.002	0.005	N	~N(399)	~N(401)	7.981	0.005	0	109870	0.01883	
CS02M(012)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	269.1	1.727	0.002	0.005	N	~N(400)	~N(402)	7.981	0.005	0	109895	0.01883	
CS02M(013)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	263.8	1.693	0.002	0.005	N	~N(401)	~N(403)	7.981	0.005	0	107710	0.01889	
CS02M(014)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	263.9	1.694	0.002	0.005	N	~N(402)	~N(404)	7.981	0.005	0	107734	0.01889	
CS02M(015)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	258.5	1.659	0.002	0.004	N	~N(403)	~N(405)	7.981	0.004	0	105550	0.01895	
CS02M(016)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	258.6	1.66	0.002	0.004	N	~N(404)	~N(406)	7.981	0.004	0	105574	0.01895	
CS02M(017)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	253.2	1.625	0.002	0.004	N	~N(405)	~N(407)	7.981	0.004	0	103391	0.01902	
CS02M(018)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	253.3	1.626	0.002	0.004	N	~N(406)	~N(408)	7.981	0.004	0	103415	0.01902	
CS02M(019)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	247.9	1.591	0.002	0.004	N	~N(407)	~N(409)	7.981	0.004	0	101231	0.01908	
CS02M(020)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	248	1.592	0.002	0.004	N	~N(408)	~N(410)	7.981	0.004	0	101256	0.01908	
CS02M(021)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	242.6	1.557	0.002	0.004	N	~N(409)	~N(411)	7.981	0.004	0	99073	0.01915	
CS02M(022)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	242.7	1.558	0.002	0.004	N	~N(410)	~N(412)	7.981	0.004	0	99097	0.01915	
CS02M(023)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	237.4	1.523	0.002	0.004	N	~N(411)	~N(413)	7.981	0.004	0	96914	0.01922	
CS02M(024)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	237.4	1.524	0.002	0.004	N	~N(412)	~N(414)	7.981	0.004	0	96938	0.01922	
CS02M(025)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	232.1	1.49	0.002	0.004	N	~N(413)	~N(415)	7.981	0.004	0	94756	0.01929	
CS02M(026)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	232.1	1.49	0.002	0.004	N	~N(414)	~N(416)	7.981	0.004	0	94781	0.01929	
CS02M(027)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	226.8	1.456	0.001	0.003	N	~N(415)	~N(417)	7.981	0.003	0	92599	0.01936	
CS02M(028)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	226.8	1.456	0.001	0.003	N	~N(416)	~N(418)	7.981	0.003	0	92623	0.01936	
CS02M(029)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	221.5	1.422	0.001	0.003	N	~N(417)	~N(419)	7.981	0.003	0	90442	0.01944	
CS02M(030)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	221.6	1.422	0.001	0.003	N	~N(418)	~N(420)	7.981	0.003	0	90466	0.01944	
CS02M(031)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	216.2	1.388	0.001	0.003	N	~N(419)	~N(421)	7.981	0.003	0	88285	0.01952	
CS02M(032)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	216.3	1.388	0.001	0.003	N	~N(420)	~N(422)	7.981	0.003	0	88309	0.01952	
CS02M(033)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	210.9	1.354	0.001	0.003	N	~N(421)	~N(423)	7.981	0.003	0	86128	0.0196	
CS02M(034)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	211	1.354	0.001	0.003	N	~N(422)	~N(424)	7.981	0.003	0	86152	0.0196	
CS02M(035)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	205.7	1.32	0.001	0.003	N	~N(423)	~N(425)	7.981	0.003	0	83971	0.01968	
CS02M(036)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	205.7	1.32	0.001	0.003	N	~N(424)	~N(426)	7.981	0.003	0	83996	0.01968	
CS02M(037)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	200.4	1.286	0.001	0.003	N	~N(425)	~N(427)	7.981	0.003	0	81815	0.01977	
CS02M(038)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	200.4	1.286	0.001	0.003	N	~N(426)	~N(428)	7.981	0.003	0	81840	0.01977	
CS02M(039)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	195.1	1.252	0.001	0.003	N	~N(427)	~N(429)	7.981	0.003	0	79659	0.01986	
CS02M(040)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	195.2	1.253	0.001	0.003	N	~N(428)	~N(430)	7.981	0.003	0	79684	0.01986	
CS02M(041)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	189.8	1.218	0.001	0.002	N	~N(429)	~N(431)	7.981	0.002	0	77504	0.01996	
CS02M(042)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	189.9	1.219	0.001	0.002	N	~N(430)	~N(432)	7.981	0.002	0	77528	0.01996	
CS02M(043)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	184.5	1.184	0.001	0.002	N	~N(431)	~N(433)	7.981	0.002	0	75349	0.02006	
CS02M(044)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	184.6	1.185	0.001	0.002	N	~N(432)	~N(434)	7.981	0.002	0	75373	0.02005	
CS02M(045)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	179.3	1.151	0	0.002	N	~N(433)	~N(435)	7.981	0.002	0	73193	0.02016	
CS02M(046)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	179.3	1.151	0	0.002	N	~N(434)	~N(436)	7.981	0.002	0	73218	0.02016	
CS02M(047)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	174	1.117	0	0.002	N	~N(435)	~N(437)	7.981	0.002	0	71038	0.02027	
CS02M(048)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	174	1.117	0	0.002	N	~N(436)	~N(438)	7.981	0.002	0	71063	0.02026	
CS02M(049)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	168.7	1.083	0	0.002	N	~N(437)	~N(439)	7.981	0.002	0	68884	0.02038	
CS02M(050)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	168.8	1.083	0	0.002	N	~N(438)	~N(440)	7.981	0.002	0	68908	0.02038	
CS02M(051)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	163.4	1.049	0	0.002	N	~N(439)	~N(441)	7.981	0.002	0	66729	0.0206	
CS02M(052)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	163.5	1.049	0	0.002	N	~N(440)	~N(442)	7.981	0.002	0	66753	0.02049	
CS02M(053)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	158.2	1.015	0	0.002	N	~N(441)	~N(443)	7.981	0.002	0	64575	0.02062	
CS02M(054)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	158.2	1.015	0	0.002	N	~N(442)	~N(444)	7.981	0.002	0	64599	0.02062	
CS02M(055)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	152.9	0.981	0	0.002	N	~N(443)	~N(445)	7.981	0.002	0	62421	0.02075	
CS02M(056)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	152.9	0.982	0	0.002	N	~N(444)	~N(446)	7.981	0.002	0	62445	0.02075	
CS02M(057)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	147.6	0.947	0	0.002	N	~N(445)	~N(447)	7.981	0.002	0	60267	0.02088	
CS02M(058)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	147.7	0.948	0	0.002	N	~N(446)	~N(448)	7.981	0.002	0	60291	0.02088	
CS02M(059)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	142.3	0.914	0	0.001	N	~N(447)	~N(449)	7.981	0.001	0	58113	0.02103	
CS02M(060)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	142.4	0.914	0	0.001	N	~N(448)	~N(450)	7.981	0.001	0	58137	0.02102	
CS02M(061)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	137.1	0.88	0	0.001	N	~N(449)	~N(451)	7.981	0.001	0	55959	0.02118	
CS02M(062)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	137.1	0.88	0	0.001	N	~N(450)	~N(452)	7.981	0.001	0	55983	0.02117	
CS02M(063)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	131.8	0.846	0	0.001	N	~N(451)	~N(453)	7.981	0.001	0	53806	0.02134	
CS02M(064)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	131.8	0.846	0	0.001	N	~N(452)	~N(454)	7.981	0.001	0	53830	0.02133	
CS02M(065)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	126.5	0.812	0	0.001	N	~N(453)	~N(455)	7.981	0.001	0	51652	0.0215	
CS02M(066)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	126.6	0.812	0	0.001	N	~N(454)	~N(456)	7.981	0.001	0	51676	0.0215	
CS02M(067)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	121.2	0.778	0	0.001	N	~N(455)	~N(457)	7.981	0.001	0	49499	0.02168	
CS02M(068)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	121.3	0.778	0	0.001	N	~N(456)	~N(458)	7.981	0.001	0	49523	0.02168	
CS02M(069)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	116	0.744	0	0.001	N	~N(457)	~N(459)	7.981	0.001	0	47346	0.02187	
CS02M(070)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	116	0.745	0	0.001	N	~N(458)	~N(460)	7.981	0.001	0	47370	0.02187	
CS02M(071)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	110.7	0.71	0	0	N	~N(459)	~N(461)	7.981	0	0	45192	0.02208	
CS02M(072)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	110.7	0.711	0	0	N	~N(460)	~N(462)	7.981	0	0	45217	0.02207	
CS02M(073)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	105.4	0.677	0	0	N	~N(461)	~N(463)	7.981	0	0	43039	0.02229	
CS02M(074)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	105.5	0.677	0	0	N	~N(462)	~N(464)	7.981	0	0	43064	0.02229	
CS02M(075)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	100.1	0.643	0	0	N	~N(463)	~N(465)	7.981	0	0	40886	0.02253	
CS02M(076)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	100.2	0.643	0	0	N	~N(464)	~N(466)	7.981	0	0	40911	0.02252	
CS02M(077)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	94.86	0.609	0	0	N	~N(465)	~N(467)	7.981	0	0	38733	0.02278	
CS02M(078)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	94.92	0.609	0	0	N	~N(466)	~N(468)	7.981	0	0	38758	0.02278	
CS02M(079)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	89.59	0.575	0	0	N	~N(467)	~N(469)	7.981	0	0	36581	0.02305	
CS02M(080)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	89.65	0.575	0	0	N	~N(468)	~N(470)	7.981	0	0	36605	0.02305	
CS02M(081)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	84.32	0.541	0	0	N	~N(469)	~N(471)	7.981	0	0	34428	0.02335	
CS02M(082)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	84.38	0.542	0	0	N	~N(470)	~N(472)	7.981	0	0	34452	0.02334	
CS02M(083)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	79.05	0.507	0	0	N	~N(471)	~N(473)	7.981	0	0	32275	0.02367	
CS02M(084)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	79.11	0.508	0	0	N	~N(472)	~N(474)	7.981	0	0	32299	0.02367	
CS02M(085)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	73.77	0.474	0	0	N	~N(473)	~N(475)	7.981	0	0	30123	0.02403	
CS02M(086)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	73.83	0.474	0	0	N	~N(474)	~N(476)	7.981	0	0	30147	0.02402	
CS02M(087)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	68.5	0.44	0	0	N	~N(475)	~N(477)	7.981	0	0	27970	0.02447	
CS02M(088)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	68.56	0.44	0	0	N	~N(476)	~N(478)	7.981	0	0	27994	0.02441	
CS02M(089)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	63.23	0.406	0	0	N	~N(477)	~N(479)	7.981	0	0	25817	0.02486	
CS02M(090)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	63.29	0.406	0	0	N	~N(478)	~N(480)	7.981	0	0	25842	0.02485	
CS02M(091)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	57.96	0.372	0	0	N	~N(479)	~N(481)	7.981	0	0	23665	0.02535	
CS02M(092)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	58.02	0.372	0	0	N	~N(480)	~N(482)	7.981	0	0	23689	0.02535	
CS02M(093)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	52.69	0.338	0	0	N	~N(481)	~N(483)	7.981	0	0	21512	0.02592	
CS02M(094)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	52.75	0.339	0	0	N	~N(482)	~N(484)	7.981	0	0	21536	0.02591	
CS02M(095)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	47.42	0.304	0	0	N	~N(483)	~N(485)	7.981	0	0	19360	0.02656	
CS02M(096)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	47.47	0.305	0	0	N	~N(484)	~N(486)	7.981	0	0	19384	0.02656	
CS02M(097)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	42.14	0.27	0	0	N	~N(485)	~N(487)	7.981	0	0	17207	0.02732	
CS02M(098)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	42.2	0.271	0	0	N	~N(486)	~N(488)	7.981	0	0	17232	0.02731	
CS02M(099)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	36.87	0.237	0	0	N	~N(487)	~N(489)	7.981	0	0	15055	0.02823	
CS02M(100)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	36.93	0.237	0	0	N	~N(488)	~N(490)	7.981	0	0	15079	0.02822	
CS02M(101)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	31.6	0.203	0	0	N	~N(489)	~N(491)	7.981	0	0	12902	0.02935	
CS02M(102)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	31.66	0.203	0	0	N	~N(490)	~N(492)	7.981	0	0	12927	0.02933	
CS02M(103)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	26.33	0.169	0	0	N	~N(491)	~N(493)	7.981	0	0	10750	0.03076	
CS02M(104)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	26.39	0.169	0	0	N	~N(492)	~N(494)	7.981	0	0	10774	0.03075	
CS02M(105)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	21.06	0.135	0	0	N	~N(493)	~N(495)	7.981	0	0	8598	0.03258	
CS02M(106)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	21.12	0.136	0	0	N	~N(494)	~N(496)	7.981	0	0	8622	0.03263	
CS02M(107)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	15.79	0.101	0	0	N	~N(495)	~N(497)	7.981	0	0	6445	0.03539	
CS02M(108)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	15.84	0.102	0	0	N	~N(496)	~N(498)	7.981	0	0	6469	0.03536	
CS02M(109)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	10.51	0.067	0	0	N	~N(497)	~N(499)	7.981	0	0	4293	0.03992	
CS02M(110)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	10.57	0.068	0	0	N	~N(498)	~N(500)	7.981	0	0	4317	0.03985	
CS02M(111)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	5.242	0.034	0	0	N	~N(499)	~N(501)	7.981	0	0	2140	0.05008	
CS02M(112)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	5.301	0.034	0	0	N	~N(500)	~N(502)	7.981	0	0	2165	0.04988	
CS02M(113)	Steel Sch 40 (clean)	Outage Recirc Water	8	3.6	0	0.03	0	0	0	N	~N(502)	~N(501)	7.981	0	0	12.11	5.287	
CS05AA	Steel Sch 40 (clean)	Outage Recirc Water	3	1	8.3	0	0	0	0	N	~N(008)	~N(563)	3.068	0	0	0	0	1 x Diverging Tee (Branch)
CS05AB	Steel Sch 40 (clean)	Outage Recirc Water	3	1	9.3	0	0	0	0	N	~N(240)	~N(562)	3.068	0	0	0	0	1 x Diverging Tee (Branch)
CS06AA	Steel Sch 40 (clean)	Outage Recirc Water	6	1	0.8	0	0	-1.384	0	N	~N(563)	~N(556)	6.065	0	0	0	0	1 x Converging Tee (Branch)
CS06AB	Steel Sch 40 (clean)	Outage Recirc Water	6	1	0.8	0	0	1.081	0	N	~N(562)	~N(557)	6.065	0	0	0	0	1 x Converging Tee (Branch)
CS23AA	Steel Sch 30 (clean)	Outage Recirc Water	14	15.7	1.00E-05	0	0	-6.406	0	N	~N(556)	~N(005)	13.25	0	0	0	0	1 x Converging Tee (Branch)
CS23AB	Steel Sch 30 (clean)	Outage Recirc Water	14	4.9	1.00E-05	0	0	-2.119	0	N	~N(557)	~N(237)	13.25	0	0	0	0	1 x Converging Tee (Branch)
CV05B(001)	Steel Sch 40 (clean)	Outage Recirc Water	8	17.5	1.00E-05	544.6	3.495	0.037	0.085	N	~N(627)	~N(627)	7.981	0.085	0	222362	0.01707	1 x Diverging Tee (Through)
CV05B(002)	Steel Sch 40 (clean)	Outage Recirc Water	8	21.7	0.5907	0	0	0	0	N	~N(631)	~N(622)	7.981	0	0	0.01225	0	3 x Pipe Bend [illegible]
CV05B(003)	Steel Sch 40 (clean)	Outage Recirc Water	8	16.6	0	0	0	0	0	N	~N(633)	~N(631)	7.981	0	0	0.008166	0	
CV05B(004)	Steel Sch 40 (clean)	Outage Recirc Water	8	16.5	0.5907	0	0	0	0	N	~N(625)	~N(633)	7.981	0	0	0.008166	0	3 x Pipe Bend [illegible]
CV05B(005)	Steel Sch 40 (clean)	Outage Recirc Water	8	13.7	1.2	0	0	0.865	0	N	~N(624)	~N(625)	7.981	0	0	0.008166	0	1 x Converging [illegible]
CV05B(006)	Steel Sch 40 (clean)	Outage Recirc Water	8	1	1.00E-05	0	0	0	0	N	~N(623)	~N(624)	7.981	0	0	0	0	1 x Converging [illegible]
[illegible]																		

CV08AA(001)	Steel Sch 160 (clean)	Outage Recirc Water	4	2.8	0.4721		544.6	18.84	1.829
CV08AA(002)	Steel Sch.160 (clean)	Outage Recirc Water	4	4.8	2.975		544.6	18.84	7.796
CV08AA(003)	Steel Sch 40 (clean)	Outage Recirc Water	4	12.8	0.9047		544.6	13.74	2.815
CV08BA(001)	Steel Sch 160 (clean)	Outage Recirc Water	4	1.7	0.2361		0	0	0.369
CV08BA(002)	Steel Sch.160 (clean)	Outage Recirc Water	4	3.7	3.211		0	0	0
CV08BA(003)	Steel Sch.40 (clean)	Outage Recirc Water	4	103.1	3.733		0	0	0.822
CV09A(001)	Steel Sch 160 (clean)	Outage Recirc Water	4	13.3	2.5		464.6	16.07	5.782
CV09A(002)	Steel Sch. 160 (clean)	Outage Recirc Water	4	23.3	8.156		464.6	16.07	25.67
CV09D(001)	Steel Sch.160 (clean)	Outage Recirc Water	3	2.6	0.2638		80	4.75	0.078
CV09D(002)	Steel Sch 160 (clean)	Outage Recirc Water	3	8.6	10.03		80	4.75	1.645
CV09D(003)	Steel Sch. 160 (clean)	Outage Recirc Water	3	23	11.4		80	4.75	5.047
CV09D(004)	Steel Sch. 160 (clean)	Outage Recirc Water	3	12.5	1.00E-05		0	0	0
CV12AA	Steel Sch. 160 (clean)	Outage Recirc Water	3	15.6	1.74	XXX	—	—	—
CV12AB	Steel Sch 160 (clean)	Outage Recirc Water	3	116.7	3.247	XXX	—	—	—
CV12B	Steel Sch. 160 (clean)	Outage Recirc Water	3	0.8	0		0	0	0
CV13B	Steel Sch 160 (clean)	Outage Recirc Water	3	13.8	2.251		80	4.75	-2.744
CV43A(001)	Steel Sch.160 (clean)	Outage Recirc Water	2	92	49.04		0	0	1.946
CV43A(002)	Steel Sch.160 (clean)	Outage Recirc Water	2	80.5	1.118		0	0	0.303
CV43A(003)	Steel Sch 160 (clean)	Outage Recirc Water	2	117.8	2.151		0	0	1.211
CV43BA/RC18AA	Steel Sch 160 (clean)	Outage Recirc Water	2	134.4	15.41	XXX	—	—	—
CV43BB/RC18AB	Steel Sch 160 (clean)	Outage Recirc Water	2	19	13.29	XXX	—	—	—
CV43BC/RC18AC	Steel Sch.160 (clean)	Outage Recirc Water	2	59.1	13.46	XXX	—	—	—
CV43BD/RC18AD	Steel Sch.160 (clean)	Outage Recirc Water	2	[illegible]	12.9	XXX	—	—	—

Pipe(155)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		3.452	1.282	2.289	4.793	N	~N(169)	A1(107)	1.049	0.005	4.788	10722	0.03328	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(156)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		3.762	1.398	2.289	5.693	N	~N(164)	A1(109)	1.049	0.006	5.687	11686	0.03268	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(157)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		3.627	1.348	2.289	5.293	N	~N(165)	A1(111)	1.049	0.005	5.288	11268	0.03293	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(158)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		3.452	1.282	2.289	4.793	N	~N(167)	A1(113)	1.049	0.005	4.788	10722	0.03328	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(159)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		3.762	1.398	2.289	5.693	N	~N(166)	A1(115)	1.049	0.006	5.687	11686	0.03268	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(160)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		3.627	1.348	2.289	5.293	N	~N(172)	A1(117)	1.049	0.005	5.288	11268	0.03293	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(161)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		3.452	1.282	2.289	4.793	N	~N(173)	A1(119)	1.049	0.005	4.788	10722	0.03328	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(162)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		3.762	1.398	2.289	5.693	N	~N(174)	A1(120)	1.049	0.006	5.687	11686	0.03268	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(163)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		3.627	1.348	2.289	5.293	N	~N(202)	A1(118)	1.049	0.005	5.288	11268	0.03293	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(164)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		3.452	1.282	2.289	4.793	N	~N(197)	A1(116)	1.049	0.005	4.788	10722	0.03328	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(165)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		3.762	1.398	2.289	5.693	N	~N(196)	A1(114)	1.049	0.006	5.687	11686	0.03268	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(166)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		3.627	1.348	2.289	5.293	N	~N(198)	A1(112)	1.049	0.005	5.288	11268	0.03293	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(167)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		3.452	1.282	2.289	4.793	N	~N(199)	A1(110)	1.049	0.005	4.788	10722	0.03328	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(168)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		3.762	1.398	2.289	5.693	N	~N(194)	A1(108)	1.049	0.006	5.687	11686	0.03268	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(169)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		3.627	1.348	2.289	5.293	N	~N(195)	A1(106)	1.049	0.005	5.288	11268	0.03293	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(170)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		3.452	1.282	2.289	4.793	N	~N(193)	A1(104)	1.049	0.005	4.788	10722	0.03328	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(171)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		3.762	1.398	2.289	5.693	N	~N(192)	A1(102)	1.049	0.005	5.688	11686	0.03268	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(172)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		3.627	1.348	2.289	5.293	N	~N(200)	A1(100)	1.049	0.005	5.288	11268	0.03293	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(173)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		3.452	1.282	2.289	4.794	N	~N(201)	A1(098)	1.049	0.005	4.789	10723	0.03328	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(174)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		3.762	1.398	2.29	5.694	N	~N(186)	A1(096)	1.049	0.006	5.688	11686	0.03268	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(175)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		3.627	1.348	2.29	5.294	N	~N(187)	A1(094)	1.049	0.005	5.289	11268	0.03293	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(176)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		3.452	1.282	2.29	4.794	N	~N(185)	A1(092)	1.049	0.005	4.789	10723	0.03328	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(177)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		3.762	1.398	2.29	5.694	N	~N(184)	A1(090)	1.049	0.005	5.689	11687	0.03268	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(178)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		3.628	1.348	2.29	5.295	N	~N(189)	A1(088)	1.049	0.006	5.289	11269	0.03293	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(179)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		3.452	1.283	2.29	4.795	N	~N(188)	A1(086)	1.049	0.005	4.79	10724	0.03328	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(180)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		3.762	1.398	2.29	5.695	N	~N(190)	A1(084)	1.049	0.006	5.689	11688	0.03268	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(181)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		3.628	1.348	2.29	5.295	N	~N(191)	A1(082)	1.049	0.005	5.29	11270	0.03293	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(182)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		3.453	1.283	2.29	4.796	N	~N(181)	A1(080)	1.049	0.005	4.791	10725	0.03328	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(183)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		3.763	1.398	2.291	5.696	N	~N(180)	A1(078)	1.049	0.005	5.691	11689	0.03268	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(184)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		3.628	1.348	2.291	5.297	N	~N(182)	A1(076)	1.049	0.006	5.291	11271	0.03293	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(185)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		3.453	1.283	2.291	4.797	N	~N(183)	A1(074)	1.049	0.005	4.792	10727	0.03327	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(186)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		3.763	1.398	2.291	5.698	N	~N(178)	A1(072)	1.049	0.006	5.692	11690	0.03268	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(187)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		3.629	1.348	2.291	5.298	N	~N(179)	A1(070)	1.049	0.005	5.293	11273	0.03293	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(188)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		3.454	1.283	2.292	4.799	N	~N(177)	A1(068)	1.049	0.005	4.794	10729	0.03327	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(189)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		3.764	1.398	2.292	5.699	N	~N(176)	A1(066)	1.049	0.005	5.694	11692	0.03268	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(190)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		3.63	1.348	2.292	5.3	N	~N(175)	A1(064)	1.049	0.005	5.295	11275	0.03293	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(191)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		3.645	1.354	2.312	5.346	N	~N(203)	A1(004)	1.049	0.006	5.34	11323	0.0329	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(192)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		3.778	1.404	2.311	5.743	N	~N(204)	A1(006)	1.049	0.006	5.737	11737	0.03265	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(193)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		3.459	1.289	2.31	4.841	N	~N(206)	A1(008)	1.049	0.005	4.836	10775	0.03324	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(194)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		3.643	1.353	2.309	5.338	N	~N(205)	A1(010)	1.049	0.005	5.333	11316	0.0329	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(195)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		3.776	1.403	2.308	5.736	N	~N(210)	A1(012)	1.049	0.006	5.73	11730	0.03266	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
[illegible] (rows Pipe(196)–Pipe(241))	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Pipe(242)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.291	1.594	4.415	7.408	N	B3(022)	~N(267)	1.049	0.007	7.401	13330	0.03183	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(243)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.291	1.594	4.415	7.407	N	B3(023)	~N(268)	1.049	0.007	7.4	13329	0.03183	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(244)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.291	1.594	4.415	7.407	N	B3(024)	~N(269)	1.049	0.007	7.4	13329	0.03183	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(245)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.291	1.594	4.414	7.406	N	B3(025)	~N(270)	1.049	0.007	7.399	13329	0.03183	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(246)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.291	1.594	4.414	7.406	N	B3(026)	~N(271)	1.049	0.007	7.399	13329	0.03183	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(247)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.29	1.594	4.414	7.405	N	B3(027)	~N(272)	1.049	0.007	7.398	13328	0.03183	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(248)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.29	1.594	4.414	7.405	N	B3(028)	~N(273)	1.049	0.007	7.398	13328	0.03183	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(249)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.29	1.594	4.414	7.405	N	B3(029)	~N(274)	1.049	0.007	7.398	13327	0.03183	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(250)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.29	1.594	4.414	7.405	N	B3(030)	~N(275)	1.049	0.007	7.398	13327	0.03183	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(251)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.29	1.594	4.413	7.404	N	B3(031)	~N(276)	1.049	0.007	7.397	13327	0.03183	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(252)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.29	1.594	4.413	7.404	N	B3(032)	~N(277)	1.049	0.007	7.397	13327	0.03183	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(253)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.29	1.594	4.413	7.404	N	B3(033)	~N(278)	1.049	0.008	7.396	13326	0.03183	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(254)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.29	1.594	4.413	7.404	N	B3(034)	~N(279)	1.049	0.008	7.396	13326	0.03183	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(255)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.29	1.594	4.413	7.403	N	B3(035)	~N(280)	1.049	0.007	7.396	13326	0.03183	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(256)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.29	1.594	4.413	7.403	N	B3(036)	~N(281)	1.049	0.007	7.396	13326	0.03183	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(257)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.29	1.594	4.413	7.403	N	B3(037)	~N(282)	1.049	0.007	7.396	13326	0.03183	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(258)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.29	1.594	4.413	7.403	N	B3(038)	~N(283)	1.049	0.007	7.396	13326	0.03183	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(259)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.29	1.594	4.413	7.403	N	B3(039)	~N(284)	1.049	0.007	7.396	13325	0.03183	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(260)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.29	1.594	4.413	7.403	N	B3(040)	~N(285)	1.049	0.007	7.396	13325	0.03183	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(261)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.29	1.594	4.413	7.403	N	B3(041)	~N(286)	1.049	0.008	7.395	13325	0.03183	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(262)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.29	1.594	4.413	7.403	N	B3(042)	~N(287)	1.049	0.008	7.395	13325	0.03183	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(263)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.29	1.594	4.413	7.402	N	B3(043)	~N(288)	1.049	0.007	7.395	13325	0.03183	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(264)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.29	1.594	4.413	7.402	N	B3(044)	~N(289)	1.049	0.007	7.395	13325	0.03183	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(265)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.289	1.594	4.412	7.402	N	B3(045)	~N(290)	1.049	0.007	7.395	13325	0.03183	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(266)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.289	1.594	4.412	7.402	N	B3(046)	~N(291)	1.049	0.007	7.395	13325	0.03183	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(267)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.289	1.594	4.412	7.402	N	B3(047)	~N(292)	1.049	0.007	7.395	13325	0.03183	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(268)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.289	1.594	4.412	7.402	N	B3(048)	~N(293)	1.049	0.007	7.395	13325	0.03183	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(269)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.289	1.594	4.412	7.402	N	B3(049)	~N(294)	1.049	0.007	7.395	13325	0.03183	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(270)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.289	1.594	4.412	7.402	N	B3(050)	~N(295)	1.049	0.007	7.395	13325	0.03183	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(271)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.289	1.594	4.412	7.402	N	B3(051)	~N(296)	1.049	0.007	7.395	13325	0.03183	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(272)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.164	1.547	1.071	6.977	N	B2(001)	~N(298)	1.049	0.007	6.97	12937	0.03202	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(273)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.164	1.547	1.071	6.977	N	B2(002)	~N(300)	1.049	0.007	6.97	12937	0.03202	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(274)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.162	1.546	1.068	6.969	N	B2(003)	~N(301)	1.049	0.007	6.962	12929	0.03202	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(275)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.162	1.546	1.068	6.969	N	B2(004)	~N(302)	1.049	0.007	6.962	12929	0.03202	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(276)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.16	1.545	1.065	6.962	N	B2(005)	~N(303)	1.049	0.007	6.955	12922	0.03202	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(277)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.16	1.545	1.065	6.962	N	B2(006)	~N(304)	1.049	0.007	6.955	12922	0.03202	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(278)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.158	1.545	1.062	6.954	N	B2(007)	~N(305)	1.049	0.006	6.948	12916	0.03203	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(279)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.158	1.545	1.062	6.954	N	B2(008)	~N(306)	1.049	0.006	6.948	12916	0.03203	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(280)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.156	1.544	1.059	6.948	N	B2(009)	~N(307)	1.049	0.007	6.941	12909	0.03203	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(281)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.156	1.544	1.059	6.948	N	B2(010)	~N(308)	1.049	0.007	6.941	12909	0.03203	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(282)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.154	1.543	1.056	6.941	N	B2(011)	~N(310)	1.049	0.007	6.934	12903	0.03203	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(283)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.154	1.543	1.056	6.941	N	B2(012)	~N(309)	1.049	0.007	6.934	12903	0.03203	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(284)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.152	1.542	1.053	6.935	N	B2(013)	~N(311)	1.049	0.007	6.928	12897	0.03204	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(285)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.152	1.542	1.053	6.935	N	B2(014)	~N(312)	1.049	0.007	6.928	12897	0.03204	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(286)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.15	1.542	1.05	6.929	N	B2(015)	~N(314)	1.049	0.007	6.922	12892	0.03204	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(287)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.15	1.542	1.05	6.929	N	B2(016)	~N(313)	1.049	0.007	6.922	12892	0.03204	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(288)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.148	1.541	1.048	6.923	N	B2(017)	~N(316)	1.049	0.007	6.916	12886	0.03204	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(289)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.148	1.541	1.048	6.923	N	B2(018)	~N(317)	1.049	0.007	6.916	12886	0.03204	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(290)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.147	1.541	1.046	6.918	N	B2(019)	~N(315)	1.049	0.007	6.911	12881	0.03204	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(291)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.147	1.541	1.046	6.918	N	B2(020)	~N(318)	1.049	0.007	6.911	12881	0.03204	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(292)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.145	1.54	1.043	6.912	N	B2(021)	~N(320)	1.049	0.006	6.906	12877	0.03205	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(293)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.145	1.54	1.043	6.912	N	B2(022)	~N(319)	1.049	0.006	6.906	12877	0.03205	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(294)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.144	1.539	1.041	6.908	N	B2(023)	~N(321)	1.049	0.007	6.901	12872	0.03205	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(295)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.144	1.539	1.041	6.908	N	B2(024)	~N(322)	1.049	0.007	6.901	12872	0.03205	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(296)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.142	1.539	1.039	6.903	N	B2(025)	~N(323)	1.049	0.007	6.896	12868	0.03205	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(297)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.142	1.539	1.039	6.903	N	B2(026)	~N(324)	1.049	0.007	6.896	12868	0.03205	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(298)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.141	1.538	1.037	6.899	N	B2(027)	~N(325)	1.049	0.007	6.892	12864	0.03205	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(299)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.141	1.538	1.037	6.899	N	B2(028)	~N(326)	1.049	0.007	6.892	12864	0.03205	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(300)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.14	1.538	1.036	6.895	N	B2(029)	~N(327)	1.049	0.007	6.888	12860	0.03205	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(301)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.14	1.538	1.036	6.895	N	B2(030)	~N(328)	1.049	0.007	6.888	12860	0.03205	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(302)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.139	1.538	1.034	6.891	N	B2(031)	~N(329)	1.049	0.007	6.884	12856	0.03206	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(303)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.139	1.538	1.034	6.891	N	B2(032)	~N(330)	1.049	0.007	6.884	12856	0.03206	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(304)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.137	1.537	1.032	6.887	N	B2(033)	~N(331)	1.049	0.007	6.88	12853	0.03206	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(305)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.137	1.537	1.032	6.887	N	B2(034)	~N(332)	1.049	0.007	6.88	12853	0.03206	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(306)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.136	1.537	1.031	6.884	N	B2(035)	~N(333)	1.049	0.007	6.877	12850	0.03206	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(307)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.136	1.537	1.031	6.884	N	B2(036)	~N(334)	1.049	0.007	6.877	12850	0.03206	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(308)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.135	1.536	1.03	6.88	N	B2(037)	~N(335)	1.049	0.006	6.874	12847	0.03206	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(309)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.135	1.536	1.03	6.88	N	B2(038)	~N(336)	1.049	0.006	6.874	12847	0.03206	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(310)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.135	1.536	1.028	6.877	N	B2(039)	~N(337)	1.049	0.006	6.871	12844	0.03206	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(311)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.135	1.536	1.028	6.877	N	B2(040)	~N(338)	1.049	0.006	6.871	12844	0.03206	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(312)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.134	1.536	1.027	6.875	N	B2(041)	~N(339)	1.049	0.007	6.868	12841	0.03206	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(313)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.134	1.536	1.027	6.875	N	B2(042)	~N(340)	1.049	0.007	6.868	12841	0.03206	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(314)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.133	1.536	1.026	6.872	N	B2(043)	~N(341)	1.049	0.007	6.865	12839	0.03206	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(315)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.133	1.536	1.026	6.872	N	B2(044)	~N(342)	1.049	0.007	6.865	12839	0.03206	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(316)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.132	1.535	1.025	6.87	N	B2(045)	~N(343)	1.049	0.007	6.863	12837	0.03207	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(317)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.132	1.535	1.025	6.87	N	B2(046)	~N(344)	1.049	0.007	6.863	12837	0.03207	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(318)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.132	1.535	1.024	6.867	N	B2(047)	~N(345)	1.049	0.006	6.861	12835	0.03207	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(319)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.132	1.535	1.024	6.867	N	B2(048)	~N(346)	1.049	0.006	6.861	12835	0.03207	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(320)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.131	1.535	1.023	6.865	N	B2(049)	~N(347)	1.049	0.006	6.859	12833	0.03207	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(321)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.131	1.535	1.023	6.865	N	B2(050)	~N(348)	1.049	0.006	6.859	12833	0.03207	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(322)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.13	1.535	1.022	6.864	N	B2(051)	~N(349)	1.049	0.007	6.857	12831	0.03207	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(323)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.13	1.535	1.022	6.864	N	B2(052)	~N(350)	1.049	0.007	6.857	12831	0.03207	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(324)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.13	1.534	1.022	6.862	N	B2(053)	~N(351)	1.049	0.007	6.855	12829	0.03207	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(325)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.13	1.534	1.022	6.862	N	B2(054)	~N(352)	1.049	0.007	6.855	12829	0.03207	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(326)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.129	1.534	1.021	6.86	N	B2(055)	~N(353)	1.049	0.006	6.854	12828	0.03207	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(327)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.129	1.534	1.021	6.86	N	B2(056)	~N(354)	1.049	0.006	6.854	12828	0.03207	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(328)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.129	1.534	1.02	6.859	N	B2(057)	~N(355)	1.049	0.007	6.852	12827	0.03207	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(329)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.129	1.534	1.02	6.859	N	B2(058)	~N(356)	1.049	0.007	6.852	12827	0.03207	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(330)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.129	1.534	1.02	6.858	N	B2(059)	~N(357)	1.049	0.007	6.851	12826	0.03207	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(331)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.129	1.534	1.02	6.858	N	B2(060)	~N(358)	1.049	0.007	6.851	12826	0.03207	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(332)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.128	1.534	1.019	6.857	N	B2(061)	~N(359)	1.049	0.007	6.85	12825	0.03207	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(333)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.128	1.534	1.019	6.857	N	B2(062)	~N(360)	1.049	0.007	6.85	12825	0.03207	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(334)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.128	1.534	1.019	6.856	N	B2(063)	~N(361)	1.049	0.007	6.849	12824	0.03207	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(335)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	<—>	4.128	1.534	1.019	6.856	N	B2(064)	~N(362)	1.049	0.007	6.849	12824	0.03207	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1

Pipe(336)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	—	[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	1.049	[illegible]	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(337)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	—	[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	1.049	[illegible]	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(338)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	—	[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	1.049	[illegible]	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(339)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	—	[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	1.049	[illegible]	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(340)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	—	[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	1.049	[illegible]	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(341)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	—	[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	1.049	[illegible]	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(342)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	—	[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	1.049	[illegible]	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(343)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	—	[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	1.049	[illegible]	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(344)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	—	[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	1.049	[illegible]	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(345)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	—	[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	1.049	[illegible]	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(346)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	—	[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	1.049	[illegible]	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(347)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	—	[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	1.049	[illegible]	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(348)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	—	[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	1.049	[illegible]	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(349)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	—	[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	1.049	[illegible]	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(350)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	—	[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	1.049	[illegible]	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(351)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	—	[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	1.049	[illegible]	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(352)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	—	[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	1.049	[illegible]	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(353)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	—	[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	1.049	[illegible]	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(354)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	—	[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	1.049	[illegible]	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(355)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	—	[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	1.049	[illegible]	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(356)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	—	[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	1.049	[illegible]	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(357)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	—	[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	1.049	[illegible]	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(358)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	—	[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	1.049	[illegible]	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(359)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	—	[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	1.049	[illegible]	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(360)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7	—	[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	1.049	[illegible]	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(361)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	1.049	[illegible]	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(362)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	1.049	[illegible]	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(363)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	1.049	[illegible]	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(364)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	1.049	[illegible]	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(365)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	1.049	[illegible]	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(366)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	1.049	[illegible]	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(367)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	1.049	[illegible]	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(368)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	1.049	[illegible]	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(369)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	1.049	[illegible]	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(370)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	1.049	[illegible]	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(371)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	1.049	[illegible]	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(372)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	1.049	[illegible]	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(373)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	1.049	[illegible]	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(374)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	1.049	[illegible]	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(375)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	1.049	[illegible]	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(376)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	1.049	[illegible]	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(377)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	1.049	[illegible]	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(378)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.288	1.965	4.865	11.25	N	~N(407)	B1(017)	1.049	0.01	11.24	16427	0.03059	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(379)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.288	1.965	4.866	11.25	N	~N(408)	B1(018)	1.049	0.01	11.24	16427	0.03059	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(380)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.287	1.964	4.863	11.25	N	~N(409)	B1(019)	1.049	0.02	11.23	16424	0.03059	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(381)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.287	1.964	4.864	11.25	N	~N(410)	B1(020)	1.049	0.02	11.23	16424	0.03059	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(382)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.286	1.964	4.862	11.24	N	~N(411)	B1(021)	1.049	0.01	11.23	16421	0.03059	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(383)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.286	1.964	4.862	11.24	N	~N(412)	B1(022)	1.049	0.01	11.23	16421	0.03059	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(384)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.285	1.964	4.86	11.24	N	~N(413)	B1(023)	1.049	0.01	11.23	16418	0.03059	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(385)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.285	1.964	4.86	11.24	N	~N(414)	B1(024)	1.049	0.01	11.23	16418	0.03059	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(386)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.284	1.963	4.858	11.23	N	~N(415)	B1(025)	1.049	0.01	11.22	16416	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(387)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.284	1.963	4.858	11.23	N	~N(416)	B1(026)	1.049	0.01	11.22	16416	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(388)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.284	1.963	4.857	11.23	N	~N(417)	B1(027)	1.049	0.01	11.22	16413	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(389)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.284	1.963	4.857	11.23	N	~N(418)	B1(028)	1.049	0.01	11.22	16413	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(390)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.283	1.963	4.856	11.23	N	~N(419)	B1(029)	1.049	0.01	11.22	16411	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(391)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.283	1.963	4.856	11.23	N	~N(420)	B1(030)	1.049	0.01	11.22	16411	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(392)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.282	1.962	4.854	11.22	N	~N(421)	B1(031)	1.049	0.01	11.21	16408	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(393)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.282	1.962	4.854	11.22	N	~N(422)	B1(032)	1.049	0.01	11.21	16408	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(394)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.281	1.962	4.853	11.22	N	~N(423)	B1(033)	1.049	0.01	11.21	16406	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(395)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.281	1.962	4.853	11.22	N	~N(424)	B1(034)	1.049	0.01	11.21	16406	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(396)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.281	1.962	4.852	11.22	N	~N(425)	B1(035)	1.049	0.01	11.21	16404	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(397)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.281	1.962	4.852	11.22	N	~N(426)	B1(036)	1.049	0.01	11.21	16404	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(398)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.28	1.962	4.851	11.22	N	~N(427)	B1(037)	1.049	0.02	11.2	16402	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(399)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.28	1.962	4.851	11.22	N	~N(428)	B1(038)	1.049	0.02	11.2	16402	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(400)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.279	1.961	4.849	11.21	N	~N(429)	B1(039)	1.049	0.01	11.2	16400	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(401)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.279	1.961	4.849	11.21	N	~N(430)	B1(040)	1.049	0.01	11.2	16400	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(402)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.279	1.961	4.848	11.21	N	~N(431)	B1(041)	1.049	0.01	11.2	16398	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(403)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.279	1.961	4.848	11.21	N	~N(432)	B1(042)	1.049	0.01	11.2	16398	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(404)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.278	1.961	4.847	11.21	N	~N(433)	B1(043)	1.049	0.01	11.2	16397	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(405)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.278	1.961	4.847	11.21	N	~N(434)	B1(044)	1.049	0.01	11.2	16397	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(406)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.278	1.961	4.846	11.21	N	~N(435)	B1(045)	1.049	0.01	11.2	16395	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(407)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.278	1.961	4.846	11.21	N	~N(436)	B1(046)	1.049	0.01	11.2	16395	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(408)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.277	1.961	4.845	11.2	N	~N(437)	B1(047)	1.049	0.01	11.19	16393	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(409)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.277	1.961	4.845	11.2	N	~N(438)	B1(048)	1.049	0.01	11.19	16394	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(410)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.277	1.96	4.845	11.2	N	~N(439)	B1(049)	1.049	0.01	11.19	16392	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(411)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.277	1.96	4.845	11.2	N	~N(440)	B1(050)	1.049	0.01	11.19	16392	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(412)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.276	1.96	4.844	11.2	N	~N(441)	B1(051)	1.049	0.01	11.19	16391	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(413)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.276	1.96	4.844	11.2	N	~N(442)	B1(052)	1.049	0.01	11.19	16391	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(414)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.276	1.96	4.843	11.2	N	~N(443)	B1(053)	1.049	0.01	11.19	16389	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(415)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.276	1.96	4.843	11.2	N	~N(444)	B1(054)	1.049	0.01	11.19	16389	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(416)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.275	1.96	4.842	11.2	N	~N(445)	B1(055)	1.049	0.01	11.19	16388	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(417)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.275	1.96	4.842	11.2	N	~N(446)	B1(056)	1.049	0.01	11.19	16388	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(418)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.275	1.96	4.842	11.19	N	~N(447)	B1(057)	1.049	0.01	11.18	16387	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(419)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.275	1.96	4.842	11.19	N	~N(448)	B1(058)	1.049	0.01	11.18	16387	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(420)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.275	1.96	4.841	11.19	N	~N(449)	B1(059)	1.049	0.01	11.18	16386	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(421)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.275	1.96	4.841	11.19	N	~N(450)	B1(060)	1.049	0.01	11.18	16386	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(422)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.274	1.96	4.84	11.19	N	~N(451)	B1(061)	1.049	0.01	11.18	16385	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(423)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.274	1.96	4.84	11.19	N	~N(452)	B1(062)	1.049	0.01	11.18	16385	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(424)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.274	1.959	4.84	11.19	N	~N(453)	B1(063)	1.049	0.01	11.18	16384	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(425)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.274	1.959	4.84	11.19	N	~N(454)	B1(064)	1.049	0.01	11.18	16384	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(426)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.274	1.959	4.839	11.19	N	~N(455)	B1(065)	1.049	0.01	11.18	16383	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(427)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.274	1.959	4.839	11.18	N	~N(456)	B1(066)	1.049	0.01	11.18	16383	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(428)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.274	1.959	4.839	11.19	N	~N(457)	B1(067)	1.049	0.01	11.18	16382	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(429)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.274	1.959	4.839	11.19	N	~N(458)	B1(068)	1.049	0.01	11.18	16382	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(430)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.273	1.959	4.838	11.19	N	~N(459)	B1(069)	1.049	0.01	11.18	16382	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(431)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.273	1.959	4.838	11.19	N	~N(460)	B1(070)	1.049	0.01	11.18	16382	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(432)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.273	1.959	4.838	11.19	N	~N(461)	B1(071)	1.049	0.01	11.18	16381	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(433)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.273	1.959	4.838	11.19	N	~N(462)	B1(072)	1.049	0.01	11.18	16381	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(434)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.273	1.959	4.838	11.19	N	~N(463)	B1(073)	1.049	0.02	11.17	16380	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(435)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.273	1.959	4.838	11.19	N	~N(464)	B1(074)	1.049	0.02	11.17	16380	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(436)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.273	1.959	4.837	11.18	N	~N(465)	B1(075)	1.049	0.01	11.17	16380	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(437)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.273	1.959	4.837	11.18	N	~N(466)	B1(076)	1.049	0.01	11.17	16380	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(438)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.273	1.959	4.837	11.18	N	~N(467)	B1(077)	1.049	0.01	11.17	16379	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(439)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.273	1.959	4.837	11.18	N	~N(468)	B1(078)	1.049	0.01	11.17	16379	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(440)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.272	1.959	4.837	11.18	N	~N(469)	B1(079)	1.049	0.01	11.17	16379	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(441)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.272	1.959	4.837	11.18	N	~N(470)	B1(080)	1.049	0.01	11.17	16379	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(442)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.272	1.959	4.836	11.18	N	~N(471)	B1(081)	1.049	0.01	11.17	16378	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(443)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.272	1.959	4.836	11.18	N	~N(472)	B1(082)	1.049	0.01	11.17	16378	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(444)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.272	1.959	4.836	11.18	N	~N(473)	B1(083)	1.049	0.01	11.17	16378	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(445)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.272	1.959	4.836	11.18	N	~N(474)	B1(084)	1.049	0.01	11.17	16378	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(446)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.272	1.959	4.836	11.18	N	~N(475)	B1(085)	1.049	0.01	11.17	16378	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(447)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.272	1.959	4.836	11.18	N	~N(476)	B1(086)	1.049	0.01	11.17	16378	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(448)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.272	1.959	4.836	11.18	N	~N(477)	B1(087)	1.049	0.01	11.17	16377	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(449)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.272	1.959	4.836	11.18	N	~N(478)	B1(088)	1.049	0.01	11.17	16377	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(450)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.272	1.959	4.836	11.18	N	~N(479)	B1(089)	1.049	0.01	11.17	16377	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(451)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.272	1.959	4.836	11.18	N	~N(480)	B1(090)	1.049	0.01	11.17	16377	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(452)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.272	1.959	4.836	11.18	N	~N(481)	B1(091)	1.049	0.01	11.17	16377	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(453)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.272	1.959	4.836	11.18	N	~N(482)	B1(092)	1.049	0.01	11.17	16377	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(454)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.272	1.959	4.835	11.18	N	~N(483)	B1(093)	1.049	0.01	11.17	16377	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(455)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.272	1.959	4.835	11.18	N	~N(484)	B1(094)	1.049	0.01	11.17	16377	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(456)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.272	1.959	4.835	11.18	N	~N(485)	B1(095)	1.049	0.01	11.17	16376	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(457)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.272	1.959	4.835	11.18	N	~N(486)	B1(096)	1.049	0.01	11.17	16376	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(458)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.272	1.959	4.835	11.18	N	~N(487)	B1(097)	1.049	0.01	11.17	16376	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(459)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.272	1.959	4.835	11.18	N	~N(488)	B1(098)	1.049	0.01	11.17	16376	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(460)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.272	1.959	4.835	11.18	N	~N(489)	B1(099)	1.049	0.01	11.17	16376	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(461)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.272	1.959	4.835	11.18	N	~N(490)	B1(100)	1.049	0.01	11.17	16376	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(462)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.272	1.959	4.835	11.18	N	~N(491)	B1(101)	1.049	0.01	11.17	16376	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(463)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.272	1.959	4.835	11.18	N	~N(492)	B1(102)	1.049	0.01	11.17	16376	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(464)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.272	1.959	4.835	11.18	N	~N(493)	B1(103)	1.049	0.01	11.17	16376	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(465)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.272	1.959	4.835	11.18	N	~N(494)	B1(104)	1.049	0.01	11.17	16376	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(466)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.272	1.959	4.835	11.18	N	~N(495)	B1(105)	1.049	0.01	11.17	16376	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(467)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.272	1.959	4.835	11.18	N	~N(496)	B1(106)	1.049	0.01	11.17	16376	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(468)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.272	1.959	4.835	11.18	N	~N(497)	B1(107)	1.049	0.01	11.17	16376	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(469)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.272	1.959	4.835	11.18	N	~N(498)	B1(108)	1.049	0.01	11.17	16376	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(470)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.272	1.959	4.835	11.18	N	~N(499)	B1(109)	1.049	0.01	11.17	16376	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(471)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.272	1.959	4.835	11.18	N	~N(500)	B1(110)	1.049	0.01	11.17	16376	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(472)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.272	1.959	4.835	11.18	N	~N(501)	B1(111)	1.049	0.01	11.17	16376	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(473)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		5.272	1.959	4.835	11.18	N	~N(502)	B1(112)	1.049	0.01	11.17	16376	0.03061	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(474)	Steel Sch 40 (clean)	Outage Recirc Water	1	0.5	187.7		3.78	1.404	2.313	5.748	N	~N(113)	A1(001)	1.049	0.006	5.742	11742	0.03265	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
RC04AA	Steel Sch 140 (clean)	Outage Recirc Water	12	13.6	0.318		0	0	2.854	0	N	~N(546)	Hot Leg A(002)	10.5	0	0	0	0	1 x Pipe Bend - r/d 1.5 (90)	0.1862	1 x Pipe Bend - r/d 1.5 (45)	0.1318	1 x Diverging Tee (Through)	1.00E-05				
RC04AA/RH01AA	Steel Sch 140 (clean)	Outage Recirc Water	12	149.6	2.723	XXX	—	—	—	—	N	~N(546)	~N(548)	10.5	—	—	—	—	13 x Pipe Bend - r/d 1.5 (90)	0.1862	1 x Pipe Bend - r/d 1.5 (45)	0.1318	1 x RH8701B-2	0.17				
RC04AB	Steel Sch 140 (clean)	Outage Recirc Water	12	9.4	0.318	XXX	—	—	—	—	N	~N(542)	Hot Leg C(002)	10.5	—	—	—	—	1 x Pipe Bend - r/d 1.5 (90)	0.1862	1 x Pipe Bend - r/d 1.5 (45)	0.1318	1 x Converging Tee (Through)	1.00E-05				
RC04AB/RH01AB	Steel Sch 140 (clean)	Outage Recirc Water	12	148.4	3.227		0	0	-3.373	0	N	~N(542)	~N(551)	10.5	0	0	0	0	15 x Pipe Bend - r/d 1.5 (90)	0.1862	2 x Pipe Bend - r/d 1.5 (45)	0.1318	1 x RH8702B-2	0.17	1 x Diverging* Tee (Branch)	1.00E-05		
RC05AA	Steel Sch 160 (clean)	Outage Recirc Water	6	7	2.841		0	0	-1.297	0	N	~N(610)	Hot Leg B(002)	5.187	0	0	0.006282	0	1 x Pipe Bend - r/d 1.5 (90)	0.2156	1 x S8949B	2.625						
RC05AB	Steel Sch 160 (clean)	Outage Recirc Water	6	12.9	3.656	XXX	—	—	—	—	N	~N(541)	~N(542)	5.187	—	—	—	—	2 x Pipe Bend - r/d 1.5 (90)	0.2156	1 x S8949C (Check Valve)	2.625	1 x Converging Tee (Branch)	0.8				
RC35AA	Steel Sch 160 (clean)	Outage Recirc Water	6	7.5	4.056	XXX	—	—	—	—	N	~N(545)	~N(546)	5.187	—	—	—	—	2 x Pipe Bend - r/d 1.5 (90)	0.2156	1 x S8949A (Check Valve)	2.625	1 x Diverging Tee (Branch)	1				
RC35AB	Steel Sch 160 (clean)	Outage Recirc Water	6	7	2.841		0	0	-1.297	0	N	~N(603)	Hot Leg D(002)	5.187	0	0	0.006282	0	1 x Pipe Bend - r/d 1.5 (90)	0.2156	1 x S8949D	2.625						
RC45AA	Steel Sch 160 (clean)	Outage Recirc Water	3	0.6	3.806		116.5	6.917	1.24	2.858	N	~N(560)	Cold Leg A(001)	2.624	0.041	2.825	144678	0.02039	1 x Reducer - Enlargement (3 x 1.5 - 3.5)	3.805								
RC45AB	Steel Sch 160 (clean)	Outage Recirc Water	3	0.6	3.805		116	6.888	1.229	2.842	N	~N(566)	Cold Leg B(001)	2.624	0.042	2.8	144057	0.0204	1 x Reducer - Enlargement (3 x 1.5 - 3.5)	3.805								
RC45AC	Steel Sch 160 (clean)	Outage Recirc Water	3	0.6	3.805		116.1	6.894	1.231	2.847	N	~N(552)	Cold Leg C(001)	2.624	0.042	2.805	144181	0.0204	1 x Reducer - Enlargement (3 x 1.5 - 3.6)	3.805								
RC45AD	Steel Sch 160 (clean)	Outage Recirc Water	3	0.6	3.805		116	6.888	1.229	2.842	N	~N(561)	Cold Leg D(001)	2.624	0.042	2.8	144057	0.0204	1 x Reducer - Enlargement (3 x 1.5 - 3.6)	3.805								
RH01BA(001)	Steel Sch 40S (clean)	Outage Recirc Water	12	81	1.439	isolated	—	—	—	—	N	~N(548)	~N(549)	12	—	—	—	—	7 x Pipe Bend - r/d 1.5 (90)	0.1813	1 x RH8701A-1	0.17	1 x Converging Tee (Through)	1.00E-05				
RH01BA(002)	Steel Sch 40S (clean)	Outage Recirc Water	12	1.8	1.00E-05	isolated	—	—	—	—	N	~N(549)	~N(004)	12	—	—	—	—	1 x Converging Tee (Branch)	1.00E-05								
RH01BB(001)	Steel Sch 40S (clean)	Outage Recirc Water	12	76.5	1.077		0	0	-12.67	0	N	~N(551)	~N(552)	12	0	0	0	0	5 x Pipe Bend - r/d 1.5 (90)	0.1813	1 x RH8701A-1	0.17						
RH01BB(002)	Steel Sch 40S (clean)	Outage Recirc Water	12	4.5	1.17		0	0	0	0	N	~N(552)	~N(553)	12	0	0	0	0	1 x Reducer - Enlargement (16 x 12 - 14)	0.07038	1 x Converging Tee (Branch)	1.1	1 x Converging Tee (Through)	1.00E-05				
RH01BB(003)	Steel Sch 40 (clean)	Outage Recirc Water	16	1	0.335		0	0	0	0	N	~N(553)	~N(235)	15	0	0	0	0	1 x Reducer - Enlargement (12 x 16 - 0)	0.335								
RH01CA(001)	Steel Sch 40 (clean)	Outage Recirc Water	16	6.4	0.5229	XXX	—	—	—	—	N	~N(002)	~N(004)	15	—	—	—	—	1 x Pipe Bend - r/d 1.5 (45)	0.1229	1 x Diverging Tee (Branch)	0.4	1 x Converging Tee (Through)	1.00E-05				
RH01CA(002)	Steel Sch 40 (clean)	Outage Recirc Water	16	18.7	0.1738	isolated	—	—	—	—	N	~N(004)	~N(512)	15	—	—	—	—	1 x Pipe Bend - r/d 1.5 (90)	0.1736	1 x Converging Tee (Through)	1.00E-05						
RH01CA(003)	Steel Sch 40 (clean)	Outage Recirc Water	16	13.2	0.1736	isolated	—	—	—	—	N	~N(512)	~N(535)	15	—	—	—	—	1 x Pipe Bend - r/d 1.5 (90)	0.1736								
RH01CA(004)	Steel Sch 40 (clean)	Outage Recirc Water	14	6.6	0.1807	isolated	—	—	—	—	N	~N(535)	Residual Heat Removal Pump A	13.124	—	—	—	—	1 x Pipe Bend - r/d 1.5 (90)	0.1782	1 x Reducer - Contraction (16 x 14 - 14)	0.01254						
RH01CB(001)	Steel Sch 40 (clean)	Outage Recirc Water	16	6.3	0.8229	XXX	—	—	—	—	N	~N(234)	~N(236)	15	—	—	—	—	1 x Pipe Bend - r/d 1.5 (45)	0.1229	1 x Diverging Tee (Branch)	0.5	1 x Converging Tee (Through)	1.00E-05				
RH01CB(002)	Steel Sch 40 (clean)	Outage Recirc Water	16	19.1	0.3472		0	0	-2.422	0	N	~N(235)	~N(524)	15	0	0	0	0	2 x Pipe Bend - r/d 1.5 (90)	0.1736	1 x Converging Tee (Through)	1.00E-05						
RH01CB(003)	Steel Sch 40 (clean)	Outage Recirc Water	16	9.1	0		0	0	0	0	N	~N(524)	~N(536)	15	0	0	0	0										
RH01CB(004)	Steel Sch 40 (clean)	Outage Recirc Water	14	5.4	0.1907		0	0	0.735	0	N	~N(536)	Residual Heat Removal Pump B	13.124	0	0	0	0	1 x Pipe Bend - r/d 1.5 (90)	0.1782	1 x Reducer - Contraction (16 x 14 - 14)	0.01254						
RH02AA(001)	Steel Sch 40 (clean)	Outage Recirc Water	8	99.7	5.544	isolated	—	—	—	—	N	Residual Heat Removal Pump A	~N(513)	7.981	—	—	—	—	1 x FE610	1.7	1 x RH8724A (Gate Valve)	0.182	1 x RH8730A (Check Valve)	1.89	9 x Pipe Bend - r/d 1.5 (90)	0.1969		
RH02AA(002)	Steel Sch 40 (clean)	Outage Recirc Water	8	23	0.8719	isolated	—	—	—	—	N	~N(513)	~N(514)	7.981	—	—	—	—	1 x Pipe Bend - r/d 1 (90)	0.2813	3 x Pipe Bend - r/d 1.5 (90)	0.1969	1 x Diverging Tee (Through)	1.00E-05				
RH02AA(003)	Steel Sch 40 (clean)	Outage Recirc Water	14	1	1.465	isolated	—	—	—	—	N	~N(514)	Residual HX A	13.124	—	—	—	—	1 x Reducer - Enlargement (14 x 8 - 13)	1.465								
RH02AB(001)	Steel Sch 40 (clean)	Outage Recirc Water	8	115.7	8.217		0	0	8.78	0	N	Residual Heat Removal Pump B	~N(525)	7.981	0	0	0	0	1 x FE611	1.7	1 x RH8724B (Gate Valve)	0.182	1 x RH8730B (Check Valve)	1.89	11 x Pipe Bend - r/d 1.5 (90)	0.1969	2 x Pipe Bend - r/d 1.5 (45)	0.1394
RH02AB(002)	Steel Sch 40 (clean)	Outage Recirc Water	8	18.3	0.73		0	0	-3.287	0	N	~N(525)	~N(526)	7.981	0	0	0	0	3 x Pipe Bend - r/d 1.5 (90)	0.1969	1 x Diverging Tee (Through)	1.00E-05	1 x Pipe Bend - r/d 1.5 (45)	0.1394				
RH02AB(003)	Steel Sch 40 (clean)	Outage Recirc Water	14	1	1.465		0	0	0	0	N	~N(526)	Residual HX B	13.124	0	0	0	0	1 x Reducer - Enlargement (14 x 8 - 13)	1.465								
RH03AA(001)	Steel Sch 40 (clean)	Outage Recirc Water	14	1	0.7153	isolated	—	—	—	—	N	Residual HX A	~N(515)	13.124	—	—	—	—	1 x Reducer - Contraction (14 x 8 - 13)	0.7153								
RH03AA(002)	Steel Sch 40 (clean)	Outage Recirc Water	8	17.1	0.8144	isolated	—	—	—	—	N	~N(515)	~N(516)	7.981	—	—	—	—	1 x Elbow - Short radius r/d 1 (90)	0.2813	2 x Pipe Bend - r/d 1.5 (90)	0.1969	1 x Pipe Bend - r/d 1.5 (45)	0.1394				
RH03AA(003)	Steel Sch 40 (clean)	Outage Recirc Water	8	7.5	3.846	XXX	—	—	—	—	N	~N(516)	~N(517)	7.981	—	—	—	—	2 x Pipe Bend - r/d 1.5 (90)	0.1969	1 x RH606 (Butterfly Valve)	2.252	1 x Diverging Tee (Through)	1.00E-05	1 x Converging* Tee (Branch)	1.2		
RH03AA(004)	Steel Sch 40 (clean)	Outage Recirc Water	8	64.4	2.781		0	0	3.33	0	N	~N(517)	~N(518)	7.981	0	0	0	0	6 x Pipe Bend - r/d 1.5 (90)	0.1969	1 x FE618	1.6						
RH03AA(005)	Steel Sch 40 (clean)	Outage Recirc Water	8	11.4	0.1969		0	0	0	0	N	~N(518)	~N(519)	7.981	0	0	0	0	1 x Pipe Bend - r/d 1.5 (90)	0.1969	1 x Diverging Tee (Through)	1.00E-05						
RH03AA(006)	Steel Sch 40 (clean)	Outage Recirc Water	8	9.3	2.282		0	0	0	0	N	~N(519)	~N(520)	7.981	0	0	0	0	1 x RH8716A-1(Gate Valve)	0.182	1 x Diverging Tee (Through)	2.1						
RH03AA(007)	Steel Sch 40 (clean)	Outage Recirc Water	8	1.1	5.991		0	0	0	0	N	~N(520)	~N(521)	7.981	0	0	0	0	1 x Reducer - Enlargement (12 x 8 - 8)	0.1909	1 x Diverging Tee (Through)	5.8						
RH03AA(008)	Steel Sch 40S (clean)	Outage Recirc Water	12	1	1.2		0	0	0	0	N	~N(521)	~N(522)	12	0	0	0	0	1 x Converging* Tee (Branch)	1.2								
RH03AB(001)	Steel Sch 40 (clean)	Outage Recirc Water	14	1	0.7153		0	0	0	0	N	Residual HX B	~N(527)	13.124	0	0	0	0	1 x Reducer - Contraction (14 x 8 - 13)	0.7153								
RH03AB(002)	Steel Sch 40 (clean)	Outage Recirc Water	8	17	0.7875		0	0	3.287	0	N	~N(527)	~N(528)	7.981	0	0	0	0	4 x Pipe Bend - r/d 1.5 (90)	0.1969								
RH03AB(003)	Steel Sch 40 (clean)	Outage Recirc Water	8	2	3.452		0	0	0	0	N	~N(528)	~N(529)	7.981	0	0	0	0	1 x RH607(Butterfly Valve)	2.252	1 x Diverging Tee (Through)	1.00E-05	1 x Converging* Tee (Branch)	1.2				

RH03AB(004)	Steel Sch 40 (clean)	Outage Recirc Water	8	70.6	2.781		0	0	3.287
RH03AB(005)	Steel Sch 40 (clean)	Outage Recirc Water	8	36.3	0.3729		0	0	0
RH03AB(006)	Steel Sch 40S (clean)	Outage Recirc Water	12	1.5	1.00E-05		0	0	0
RH09AA(001)	Steel Sch 40 (clean)	Outage Recirc Water	8	1	1.00E-05	Isolated	—	—	—
RH09AA(002)	Steel Sch 40 (clean)	Outage Recirc Water	8	1	1.00E-05	XXX	—	—	—
RH09AB(001)	Steel Sch 40 (clean)	Outage Recirc Water	8	1	1.00E-05		0	0	0
RH09AB(002)	Steel Sch 40 (clean)	Outage Recirc Water	8	1	1.00E-05	XXX	—	—	—
RH10AA(001)	Steel Sch 40 (clean)	Outage Recirc Water	3	1	1.00E-05	Isolated	—	—	—
RH10AA(002)	Steel Sch 40 (clean)	Outage Recirc Water	3	1	1.00E-05	Isolated	—	—	—
RH10AB(001)	Steel Sch 40 (clean)	Outage Recirc Water	3	1	1.00E-05	XXX	—	—	—
RH10AB(002)	Steel Sch 40 (clean)	Outage Recirc Water	3	1	1.00E-05		0	0	-9.991
RH12A/CV99A	Steel Sch 40 (clean)	Outage Recirc Water	8	28.6	5.572	XXX	—	—	—
RH14A	Steel Sch 40 (clean)	Outage Recirc Water	8	4.4	1.979	XXX	—	—	—
SI01A	Steel Sch 40 (clean)	Outage Recirc Water	8	28.4	0.9844		0	0	3.46
SI01B(001)	Steel Sch 20 (clean)	Outage Recirc Water	24	113.2	0.3195		544.6	0.412	-5.275
SI01B(002)	Steel Sch 20 (clean)	Outage Recirc Water	24	56	0.3195		544.6	0.412	0.52
SI01B(003)	Steel Sch 20 (clean)	Outage Recirc Water	24	4.6	1.00E-05		544.6	0.412	0
SI01B(004)	Steel Sch 20 (clean)	Outage Recirc Water	24	80.3	0.4524		544.6	0.412	0.001
SI01B(005)	Steel Sch 20 (clean)	Outage Recirc Water	24	7	2.00E-05		544.6	0.412	0
SI01B(006)	Steel Sch 20 (clean)	Outage Recirc Water	24	2	2.00E-05	<—>	544.6	0.412	0
SI01B(007)	Steel Sch 20 (clean)	Outage Recirc Water	24	1	31.43		544.6	0.412	0.036
SI02A/SIF9A	Steel Sch 40 (clean)	Outage Recirc Water	8	28.3	2.888	XXX	—	—	—
SI02BA(001)	Steel Sch 40 (clean)	Outage Recirc Water	6	1.7	0.1589		0	0	0
SI02BA(002)	Steel Sch 40 (clean)	Outage Recirc Water	6	174.8	2.749		0	0	-4.282
SI02BA(003)	Steel Sch 40 (clean)	Outage Recirc Water	6	3.4	0.6296		0	0	0.043
SI02BA(004)	Steel Sch 40 (clean)	Outage Recirc Water	4	1	0		0	0	0
SI02BB(001)	Steel Sch 40 (clean)	Outage Recirc Water	6	4.7	1.104		0	0	0
SI02BB(002)	Steel Sch 40 (clean)	Outage Recirc Water	6	14.7	14.14		0	0	-4.282
SI02BB(003)	Steel Sch 40 (clean)	Outage Recirc Water	4	1	0		0	0	0.043

[illegible]																							

Node List	Status	Pressure	Grade	Elev
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

~N(174)	16.99	581.1	575.8
~N(175)	16.99	581.1	575.8
~N(176)	16.99	581.1	575.8
~N(177)	16.99	581.1	575.8
~N(178)	16.99	581.1	575.8
~N(179)	16.99	581.1	575.8
~N(180)	16.99	581.1	575.8
~N(181)	16.99	581.1	575.8
~N(182)	16.99	581.1	575.8
~N(183)	16.99	581.1	575.8
~N(184)	16.99	581.1	575.8
~N(185)	16.99	581.1	575.8
~N(186)	16.99	581.1	575.8
~N(187)	16.99	581.1	575.8
~N(188)	16.99	581.1	575.8
~N(189)	16.99	581.1	575.8
~N(190)	16.99	581.1	575.8
~N(191)	16.99	581.1	575.8
~N(192)	16.99	581.1	575.8
~N(193)	16.99	581.1	575.8
~N(194)	16.99	581.1	575.8
~N(195)	16.99	581.1	575.8
~N(196)	16.99	581.1	575.8
~N(197)	16.99	581.1	575.8
~N(198)	16.99	581.1	575.8
~N(199)	16.99	581.1	575.8
~N(200)	16.99	581.1	575.8
~N(201)	16.99	581.1	575.8
~N(202)	16.99	581.1	575.8
~N(203)	17.01	581.1	575.8
~N(204)	17.01	581.1	575.8
~N(205)	17.01	581.1	575.8
~N(206)	17.01	581.1	575.8
~N(207)	17.01	581.1	575.8
~N(208)	17.01	581.1	575.8
~N(209)	17.01	581.1	575.8
~N(210)	17.01	581.1	575.8
~N(211)	17	581.1	575.8
~N(212)	17	581.1	575.8
~N(213)	17	581.1	575.8
~N(214)	17	581.1	575.8
~N(215)	17	581.1	575.8
~N(216)	17	581.1	575.8
~N(217)	17	581.1	575.8
~N(218)	17	581.1	575.8
~N(219)	17	581.1	575.8
~N(220)	16.99	581.1	575.8
~N(221)	16.99	581.1	575.8
~N(222)	16.99	581.1	575.8
~N(223)	16.99	581.1	575.8
~N(224)	16.99	581.1	575.8
~N(225)	16.99	581.1	575.8
~N(226)	16.99	581.1	575.8
~N(227)	17	581.1	575.8
~N(228)	17	581.1	575.8
~N(229)	17	581.1	575.8
~N(230)	17	581.1	575.8
~N(231)	17	581.1	575.8
~N(232)	17	581.1	575.8
~N(234)	22.61	373.2	354.9
~N(235)	41.9	412.8	349.9
~N(236)	27.16	373.2	344.4
~N(237)	27.16	373.2	344.4
~N(238)	27.16	373.2	344.4
~N(239)	118.3	581.3	346.3
~N(240)	118.1	581.3	348.8
~N(241)	101.2	581.3	381.3
~N(242)	81	581.3	428
~N(243)	21.74	581.3	565
~N(244)	14.2	581.3	582.5
~N(245)	10.23	581.5	591.8
~N(246)	10.28	581.6	591.8
~N(247)	10.28	581.6	591.8
~N(248)	10.28	581.6	591.8
~N(249)	10.28	581.6	591.8
~N(250)	10.28	581.6	591.8
~N(251)	10.28	581.6	591.8
~N(252)	10.28	581.6	591.8
~N(253)	10.28	581.6	591.8
~N(254)	10.28	581.6	591.8
~N(255)	10.28	581.6	591.8
~N(256)	10.28	581.6	591.8
~N(257)	10.28	581.6	591.8
~N(258)	10.28	581.6	591.8
~N(259)	10.28	581.6	591.8
~N(260)	10.28	581.6	591.8
~N(261)	10.28	581.6	591.8
~N(262)	10.28	581.6	591.8
~N(263)	10.28	581.6	591.8
~N(264)	10.28	581.6	591.8
~N(265)	10.28	581.6	591.8
~N(266)	10.29	581.6	591.8
~N(267)	10.29	581.6	591.8
~N(268)	10.29	581.6	591.8
~N(269)	10.29	581.6	591.8
~N(270)	10.29	581.6	591.8
~N(271)	10.29	581.6	591.8
~N(272)	10.29	581.6	591.8
~N(273)	10.29	581.6	591.8
~N(274)	10.29	581.6	591.8
~N(275)	10.29	581.6	591.8
~N(276)	10.29	581.6	591.8
~N(277)	10.29	581.6	591.8
~N(278)	10.29	581.6	591.8
~N(279)	10.29	581.6	591.8
~N(280)	10.29	581.6	591.8
~N(281)	10.29	581.6	591.8
~N(282)	10.29	581.6	591.8
~N(283)	10.29	581.6	591.8
~N(284)	10.29	581.6	591.8
~N(285)	10.29	581.6	591.8
~N(286)	10.29	581.6	591.8
~N(287)	10.29	581.6	591.8
~N(288)	10.29	581.6	591.8
~N(289)	10.29	581.6	591.8
~N(290)	10.29	581.6	591.8
~N(291)	10.29	581.6	591.8
~N(292)	10.29	581.6	591.8
~N(293)	10.29	581.6	591.8
~N(294)	10.29	581.6	591.8
~N(295)	10.29	581.6	591.8
~N(296)	10.29	581.6	591.8
~N(297)	13.5	581.7	584.5
~N(298)	13.63	582	584.5
~N(300)	13.63	582	584.5
~N(301)	13.63	582	584.5
~N(302)	13.63	582	584.5
~N(303)	13.64	582	584.5
~N(304)	13.64	582	584.5
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~N(307)	13.64	582.1	584.5
~N(308)	13.64	582.1	584.5
~N(309)	13.64	582.1	584.5
~N(310)	13.64	582.1	584.5
~N(311)	13.65	582.1	584.5
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~N(313)	13.65	582.1	584.5
~N(314)	13.65	582.1	584.5
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~N(316)	13.65	582.1	584.5
~N(317)	13.65	582.1	584.5
~N(318)	13.65	582.1	584.5
~N(319)	13.65	582.1	584.5
~N(320)	13.66	582.1	584.5
~N(321)	13.66	582.1	584.5
~N(322)	13.66	582.1	584.5
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~N(324)	13.66	582.1	584.5
~N(325)	13.66	582.1	584.5
~N(326)	13.66	582.1	584.5
~N(327)	13.66	582.1	584.5
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~N(330)	13.67	582.1	584.5
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~N(333)	13.67	582.1	584.5
~N(334)	13.67	582.1	584.5
~N(335)	13.67	582.1	584.5
~N(336)	13.67	582.1	584.5
~N(337)	13.67	582.1	584.5
~N(338)	13.67	582.1	584.5
~N(339)	13.67	582.1	584.5
~N(340)	13.67	582.1	584.5
~N(341)	13.67	582.1	584.5
~N(342)	13.67	582.1	584.5
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~N(344)	13.68	582.1	584.5
~N(345)	13.68	582.1	584.5
~N(346)	13.68	582.1	584.5
~N(347)	13.68	582.1	584.5
~N(348)	13.68	582.1	584.5
~N(349)	13.68	582.1	584.5
~N(350)	13.68	582.1	584.5
~N(351)	13.68	582.1	584.5
~N(352)	13.68	582.1	584.5
~N(353)	13.68	582.1	584.5
~N(354)	13.68	582.1	584.5
~N(355)	13.68	582.1	584.5
~N(356)	13.68	582.1	584.5

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-N(359)		13.68	582.1	584.5
-N(360)		13.68	582.1	584.5
-N(361)		13.68	582.1	584.5
-N(362)		13.68	582.1	584.5
-N(363)		13.68	582.1	584.5
-N(364)		13.68	582.1	584.5
-N(365)		13.68	582.1	584.5
-N(366)		13.68	582.1	584.5
-N(367)		13.68	582.1	584.5
-N(368)		13.68	582.1	584.5
-N(369)		13.68	582.1	584.5
-N(370)		13.68	582.1	584.5
-N(371)		13.68	582.1	584.5
-N(372)		13.68	582.1	584.5
-N(373)		13.68	582.1	584.5
-N(374)		13.68	582.1	584.5
-N(375)		13.68	582.1	584.5
-N(376)		13.68	582.1	584.5
-N(377)		13.68	582.1	584.5
-N(378)		13.68	582.1	584.5
-N(379)		13.68	582.1	584.5
-N(380)		13.68	582.1	584.5
-N(381)		13.68	582.1	584.5
-N(382)		13.68	582.1	584.5
-N(383)		13.68	582.1	584.5
-N(384)		13.68	582.1	584.5
-N(385)		13.68	582.1	584.5
-N(387)		13.68	582.1	584.5
-N(388)		13.68	582.1	584.5
-N(389)		13.68	582.1	584.5
-N(390)		19.63	578.4	567
-N(391)		19.58	578.3	567
-N(392)		19.58	578.3	567
-N(393)		19.58	578.3	567
-N(394)		19.58	578.3	567
-N(395)		19.58	578.3	567
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-N(397)		19.58	578.3	567
-N(398)		19.58	578.3	567
-N(399)		19.57	578.3	567
-N(400)		19.57	578.3	567
-N(401)		19.57	578.3	567
-N(402)		19.57	578.3	567
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-N(412)		19.56	578.2	567
-N(413)		19.56	578.2	567
-N(414)		19.56	578.2	567
-N(415)		19.56	578.2	567
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-N(469)		19.54	578.2	567
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-N(491)		19.54	578.2	567
-N(492)		19.54	578.2	567
-N(493)		19.54	578.2	567
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-N(497)		19.54	578.2	567
-N(498)		19.54	578.2	567
-N(499)		19.54	578.2	567
-N(500)		19.54	578.2	567
-N(501)		19.54	578.2	567
-N(502)		19.54	578.2	567
-N(503)		28.42	413.5	361.6
-N(504)		27.9	413.5	383
-N(505)		27.9	413.5	383
-N(506)		27.9	413.5	383
-N(507)		27.9	413.5	383
-N(508)		27.87	413.4	383
-N(509)		27.9	413.5	383
-N(512)	isolated	—	—	344.3
-N(513)	isolated	—	—	367.3
-N(514)	isolated	—	—	358.6
-N(515)	isolated	—	—	359.8
-N(516)	isolated	—	—	365.3
-N(517)		34.37	412.8	367.3
-N(518)		31.04	412.8	375
-N(519)		31.04	412.8	375
-N(520)		31.04	412.8	375
-N(521)		31.04	412.8	375
-N(522)		31.04	412.8	375
-N(524)		44.32	412.8	344.5
-N(525)		34.33	412.8	367.4
-N(526)		37.62	412.8	359.6
-N(527)		37.62	412.8	359.6
-N(528)		34.33	412.8	367.4
-N(529)		34.33	412.8	367.4
-N(530)		31.04	412.8	375
-N(531)		31.04	412.8	375
-N(535)	isolated	—	—	344.3
-N(536)		44.32	412.8	344.3
-N(537)		34.25	424.2	379
-N(538)		31.38	413.5	375
-N(539)		34.25	424.2	379
-N(540)		34.25	424.2	379
-N(541)		31.88	424.2	384.5
-N(542)		25.85	412.8	387
-N(544)		31.7	424.2	384.9
-N(545)		31.88	424.2	384.5

~N(546)		31.05	424.2	386.4
~N(548)	Isolated	—	—	379
~N(549)	Isolated	—	—	349.9
~N(551)		29.23	412.8	378.2
~N(552)		41.9	412.8	349.9
~N(553)		41.9	412.8	349.9
~N(556)		21.79	373.2	356.8
~N(557)		25.04	373.2	349.3
~N(558)	Isolated	—	—	367.3
~N(559)	Isolated	—	—	344.3
~N(560)		34.33	412.8	367.4
~N(561)		34.33	412.8	367.4
~N(564)		29.71	424.2	389.5
~N(565)		15.87	424.2	421.5
~N(566)		17.6	424.2	417.5
~N(569)		29.71	424.2	389.5
~N(570)		29.71	424.2	389.5
~N(571)		28.72	424.2	391.8
~N(572)		31.04	412.8	375
~N(573)		25.85	412.8	387
~N(574)		12.88	412.8	417
~N(575)		17.82	424.2	417
~N(576)		30.15	424.2	388.5
~N(577)		31.88	424.2	384.5
~N(578)		30.36	424.2	388
~N(579)		31.88	424.2	384.5
~N(580)		1007	2707	413.1
~N(581)		29.58	424.2	389.8
~N(583)		1007	2707	413.3
~N(588)		1007	2707	413.3
~N(589)		1007	2707	413.3
~N(590)		30.48	412.8	376.3
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
~N(644)		801.5	2217	387.5
~N(645)		800.3	2213	386.5
~N(646)		800	2212	386.5
~N(647)		771.7	2145	395
~N(648)		729.3	2072	420.1
~N(649)		780.4	2130	385
~N(650)		757.6	2100	382.4
~N(651)		733.9	2045	382.4
~N(652)		29.43	427.1	393
~N(654)		717.6	2049	423.2
~N(655)		695.1	1996	423.2
~N(656)		29.44	427.1	393
~N(659)		761.9	2113	385.8
~N(660)		740.5	2064	385.8
~N(661)		29.43	427.1	393
~N(664)		684.3	1961	413
~N(665)		658.7	1904	413
~N(666)		29.43	427.1	393
~N(667)		835.3	2276	378.4
~N(669)		833.4	2276	382.9
~N(670)		833.1	2276	383.8
~N(671)		831.9	2276	386.4
~N(672)		29.31	412.8	379
~N(673)		25.85	412.8	387
~N(674)		25.85	412.8	387
~N(675)		32.52	424.2	383
~N(676)		34.25	424.2	379
~N(677)	Isolated	—	—	383
~N(678)		839.1	2275	370.8
~N(680)		659.3	1903	412.9
~N(682)		129.4	659.9	397
~N(683)		129.4	659.9	397
~N(684)		685.8	1965	413
~N(686)		141.2	705.6	413
~N(687)		141.2	705.4	413
~N(688)		733.7	2045	382.4
~N(690)		188.2	733.1	382.9
~N(691)		165.2	732.9	384.9
~N(692)		739.9	2062	385.6
~N(694)		136.3	668.7	387.5
~N(695)		136.2	668.5	387.5
~N(696)	Isolated	—	—	414.5
~N(697)	Isolated	—	—	414.5
~N(698)	Isolated	—	—	414.5
~N(700)	Isolated	—	—	414.5
~N(701)	Isolated	—	—	381.4
~N(702)	Isolated	—	—	381.4
~N(703)	Isolated	—	—	381.4
~N(705)	Isolated	—	—	381.4
~N(706)	Isolated	—	—	381.4
~N(707)	Isolated	—	—	414.5
~N(708)	Isolated	—	—	414.9
~N(709)	Isolated	—	—	414.9
~N(710)	Isolated	—	—	414.9
~N(712)	Isolated	—	—	414.9
~N(713)	Isolated	—	—	414.9
~N(714)	Isolated	—	—	387
~N(715)	Isolated	—	—	387
~N(716)	Isolated	—	—	387
~N(718)	Isolated	—	—	387
~N(719)	Isolated	—	—	387
~N(720)		33.52	424.2	380.7
~N(721)		33.52	424.2	380.7
~N(722)		33.52	424.2	380.7
~N(724)		33.52	424.2	380.7
~N(725)		33.52	424.2	380.7
~N(726)		34.69	424.2	378
~N(727)		34.69	424.2	378
~N(728)		34.69	424.2	378
~N(730)		34.69	424.2	378
~N(731)		34.69	424.2	378
~N(732)		34.64	424.2	378.1
~N(733)		34.64	424.2	378.1
~N(734)		34.64	424.2	378.1
~N(736)		34.64	424.2	378.1
~N(737)		34.64	424.2	378.1
~N(738)		33.35	424.2	381.1
~N(739)		33.35	424.2	381.1
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Tank List	Surface Pressure	Level	Status	Flow	Pressure	Grade	Elev
Accumulator Tank A	1000	0		0	1000	2707	428.7
Accumulator Tank B	1000	0		0	1000	2707	428.5
Accumulator Tank C	1000	0		0	1000	2707	428.5
Accumulator Tank D	1000	0		0	1000	2707	428.5
Cont. Recirc. Sump A	14.7	0		0	16.88	373.2	368.2
Cont. Recirc. Sump B	14.7	0		0	16.88	373.2	368.2
Refueling Water Storage Tank	14.7	12.8		544.8	23.15	413.5	384

Demand List	Demand Type	Flow	Pressure	Status	Grade	Elev
[illegible]	Flow out	0	[illegible]		[illegible]	[illegible]
[illegible]	Flow out	0	[illegible]		[illegible]	[illegible]
[illegible]	Flow in	0	[illegible]		[illegible]	[illegible]
[illegible]	Flow in	0	[illegible]		[illegible]	[illegible]
[illegible]	Flow out	0	[illegible]		[illegible]	[illegible]
[illegible]	Flow out	0	[illegible]		[illegible]	[illegible]
[illegible]	Flow out	0	[illegible]		[illegible]	[illegible]
[illegible]	Flow out	0	[illegible]		[illegible]	[illegible]
[illegible]	Flow out	[illegible]	[illegible]		[illegible]	[illegible]
[illegible]	Spray	[illegible]	14.7		[illegible]	[illegible]
[illegible]	Spray	[illegible]	14.7		[illegible]	[illegible]
[illegible]	Spray	[illegible]	14.7		[illegible]	[illegible]
[illegible]	Spray	[illegible]	14.7		[illegible]	[illegible]
[illegible]	Spray	[illegible]	14.7		[illegible]	[illegible]
[illegible]	Spray	[illegible]	14.7		[illegible]	[illegible]
[illegible]	Spray	[illegible]	14.7		[illegible]	[illegible]
[illegible]	Spray	[illegible]	14.7		[illegible]	[illegible]
[illegible]	Spray	[illegible]	14.7		[illegible]	[illegible]
[illegible]	Spray	[illegible]	14.7		[illegible]	[illegible]

A1(011)	Spray	3.467	14.7	576.3	576.3
A1(012)	Spray	3.776	14.7	575.4	575.4
A1(013)	Spray	3.775	14.7	575.4	575.4
A1(014)	Spray	3.466	14.7	576.3	576.3
A1(015)	Spray	3.64	14.7	575.8	575.8
A1(016)	Spray	3.64	14.7	575.8	575.8
A1(017)	Spray	3.465	14.7	576.3	576.3
A1(018)	Spray	3.774	14.7	575.4	575.4
A1(019)	Spray	3.775	14.7	575.4	575.4
A1(020)	Spray	3.464	14.7	576.3	576.3
A1(021)	Spray	3.638	14.7	575.8	575.8
A1(022)	Spray	3.636	14.7	575.8	575.8
A1(023)	Spray	3.463	14.7	576.3	576.3
A1(024)	Spray	3.772	14.7	575.4	575.4
A1(025)	Spray	3.771	14.7	575.4	575.4
A1(026)	Spray	3.462	14.7	576.3	576.3
A1(027)	Spray	3.637	14.7	575.8	575.8
A1(028)	Spray	3.637	14.7	575.8	575.8
A1(029)	Spray	3.461	14.7	576.3	576.3
A1(030)	Spray	3.77	14.7	575.4	575.4
A1(031)	Spray	3.77	14.7	575.4	575.4
A1(032)	Spray	3.46	14.7	576.3	576.3
A1(033)	Spray	3.635	14.7	575.8	575.8
A1(034)	Spray	3.635	14.7	575.8	575.8
A1(035)	Spray	3.459	14.7	576.3	576.3
A1(036)	Spray	3.769	14.7	575.4	575.4
A1(037)	Spray	3.768	14.7	575.4	575.4
A1(038)	Spray	3.459	14.7	576.3	576.3
A1(039)	Spray	3.634	14.7	575.8	575.8
A1(040)	Spray	3.634	14.7	575.8	575.8
A1(041)	Spray	3.458	14.7	576.3	576.3
A1(042)	Spray	3.767	14.7	575.4	575.4
A1(043)	Spray	3.767	14.7	575.4	575.4
A1(044)	Spray	3.457	14.7	576.3	576.3
A1(045)	Spray	3.632	14.7	575.8	575.8
A1(046)	Spray	3.632	14.7	575.8	575.8
A1(047)	Spray	3.457	14.7	576.3	576.3
A1(048)	Spray	3.766	14.7	575.4	575.4
A1(049)	Spray	3.766	14.7	575.4	575.4
A1(050)	Spray	3.456	14.7	576.3	576.3
A1(051)	Spray	3.631	14.7	575.8	575.8
A1(052)	Spray	3.631	14.7	575.8	575.8
A1(053)	Spray	3.456	14.7	576.3	576.3
A1(054)	Spray	3.765	14.7	575.4	575.4
A1(055)	Spray	3.765	14.7	575.4	575.4
A1(056)	Spray	3.455	14.7	576.3	576.3
A1(057)	Spray	3.63	14.7	575.8	575.8
A1(058)	Spray	3.63	14.7	575.8	575.8
A1(059)	Spray	3.455	14.7	576.3	576.3
A1(060)	Spray	3.765	14.7	575.4	575.4
A1(061)	Spray	3.764	14.7	575.4	575.4
A1(062)	Spray	3.454	14.7	576.3	576.3
A1(063)	Spray	3.63	14.7	575.8	575.8
A1(064)	Spray	3.63	14.7	575.8	575.8
A1(065)	Spray	3.454	14.7	576.3	576.3
A1(066)	Spray	3.764	14.7	575.4	575.4
A1(067)	Spray	3.764	14.7	575.4	575.4
A1(068)	Spray	3.454	14.7	576.3	576.3
A1(069)	Spray	3.629	14.7	575.8	575.8
A1(070)	Spray	3.629	14.7	575.8	575.8
A1(071)	Spray	3.453	14.7	576.3	576.3
A1(072)	Spray	3.763	14.7	575.4	575.4
A1(073)	Spray	3.763	14.7	575.4	575.4
A1(074)	Spray	3.453	14.7	576.3	576.3
A1(075)	Spray	3.628	14.7	575.8	575.8
A1(076)	Spray	3.628	14.7	575.8	575.8
A1(077)	Spray	3.453	14.7	576.3	576.3
A1(078)	Spray	3.763	14.7	575.4	575.4
A1(079)	Spray	3.763	14.7	575.4	575.4
A1(080)	Spray	3.453	14.7	576.3	576.3
A1(081)	Spray	3.628	14.7	575.8	575.8
A1(082)	Spray	3.628	14.7	575.8	575.8
A1(083)	Spray	3.452	14.7	576.3	576.3
A1(084)	Spray	3.762	14.7	575.4	575.4
A1(085)	Spray	3.762	14.7	575.4	575.4
A1(086)	Spray	3.452	14.7	576.3	576.3
A1(087)	Spray	3.628	14.7	575.8	575.8
A1(088)	Spray	3.628	14.7	575.8	575.8
A1(089)	Spray	3.452	14.7	576.3	576.3
A1(090)	Spray	3.762	14.7	575.4	575.4
A1(091)	Spray	3.762	14.7	575.4	575.4
A1(092)	Spray	3.452	14.7	576.3	576.3
A1(093)	Spray	3.627	14.7	575.8	575.8
A1(094)	Spray	3.627	14.7	575.8	575.8
A1(095)	Spray	3.452	14.7	576.3	576.3
A1(096)	Spray	3.762	14.7	575.4	575.4
A1(097)	Spray	3.762	14.7	575.4	575.4
A1(098)	Spray	3.452	14.7	576.3	576.3
A1(099)	Spray	3.627	14.7	575.8	575.8
A1(100)	Spray	3.627	14.7	575.8	575.8
A1(101)	Spray	3.452	14.7	576.3	576.3
A1(102)	Spray	3.762	14.7	575.4	575.4
A1(103)	Spray	3.762	14.7	575.4	575.4
A1(104)	Spray	3.452	14.7	576.3	576.3
A1(105)	Spray	3.627	14.7	575.8	575.8
A1(106)	Spray	3.627	14.7	575.8	575.8
A1(107)	Spray	3.452	14.7	576.3	576.3
A1(108)	Spray	3.762	14.7	575.4	575.4
A1(109)	Spray	3.762	14.7	575.4	575.4
A1(110)	Spray	3.452	14.7	576.3	576.3
A1(111)	Spray	3.627	14.7	575.8	575.8
A1(112)	Spray	3.627	14.7	575.8	575.8
A1(113)	Spray	3.452	14.7	576.3	576.3
A1(114)	Spray	3.762	14.7	575.4	575.4
A1(115)	Spray	3.762	14.7	575.4	575.4
A1(116)	Spray	3.452	14.7	576.3	576.3
A1(117)	Spray	3.627	14.7	575.8	575.8
A1(118)	Spray	3.627	14.7	575.8	575.8
A1(119)	Spray	3.452	14.7	576.3	576.3
A1(120)	Spray	3.762	14.7	575.4	575.4
A2(001)	Spray	4.078	14.7	589.5	589.5
A2(002)	Spray	3.826	14.7	588.7	588.7
A2(003)	Spray	3.921	14.7	589	589
A2(004)	Spray	3.921	14.7	589	589
A2(005)	Spray	3.824	14.7	588.7	588.7
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

A3(012)	Spray	5.071	14.7	593.3	593.3
A3(013)	Spray	5.069	14.7	593.3	593.3
A3(014)	Spray	5.118	14.7	593.5	593.5
A3(015)	Spray	5.067	14.7	593.3	593.3
A3(016)	Spray	5.067	14.7	593.3	593.3
A3(017)	Spray	5.114	14.7	593.5	593.5
A3(018)	Spray	5.065	14.7	593.3	593.3
A3(019)	Spray	5.063	14.7	593.3	593.3
A3(020)	Spray	5.112	14.7	593.5	593.5
A3(021)	Spray	5.062	14.7	593.3	593.3
A3(022)	Spray	5.062	14.7	593.3	593.3
A3(023)	Spray	5.11	14.7	593.5	593.5
A3(024)	Spray	5.061	14.7	593.3	593.3
A3(025)	Spray	5.06	14.7	593.3	593.3
A3(026)	Spray	5.109	14.7	593.5	593.5
A3(027)	Spray	5.06	14.7	593.3	593.3
A3(028)	Spray	5.059	14.7	593.3	593.3
A3(029)	Spray	5.108	14.7	593.5	593.5
A3(030)	Spray	5.059	14.7	593.3	593.3
A3(031)	Spray	5.059	14.7	593.3	593.3
A3(032)	Spray	5.108	14.7	593.5	593.5
A3(033)	Spray	5.059	14.7	593.3	593.3
A3(034)	Spray	5.059	14.7	593.3	593.3
A3(035)	Spray	5.107	14.7	593.5	593.5
A3(036)	Spray	5.058	14.7	593.3	593.3
A3(037)	Spray	5.058	14.7	593.3	593.3
A3(038)	Spray	5.107	14.7	593.5	593.5
A3(039)	Spray	5.058	14.7	593.3	593.3
B1(001)	Spray	5.297	14.7	567	567
B1(002)	Spray	5.297	14.7	567	567
B1(003)	Spray	5.296	14.7	567	567
B1(004)	Spray	5.296	14.7	567	567
B1(005)	Spray	5.295	14.7	567	567
B1(006)	Spray	5.295	14.7	567	567
B1(007)	Spray	5.293	14.7	567	567
B1(008)	Spray	5.293	14.7	567	567
B1(009)	Spray	5.292	14.7	567	567
B1(010)	Spray	5.292	14.7	567	567
B1(011)	Spray	5.291	14.7	567	567
B1(012)	Spray	5.291	14.7	567	567
B1(013)	Spray	5.29	14.7	567	567
B1(014)	Spray	5.29	14.7	567	567
B1(015)	Spray	5.289	14.7	567	567
B1(016)	Spray	5.289	14.7	567	567
B1(017)	Spray	5.288	14.7	567	567
B1(018)	Spray	5.288	14.7	567	567
B1(019)	Spray	5.287	14.7	567	567
B1(020)	Spray	5.287	14.7	567	567
B1(021)	Spray	5.286	14.7	567	567
B1(022)	Spray	5.286	14.7	567	567
B1(023)	Spray	5.285	14.7	567	567
B1(024)	Spray	5.285	14.7	567	567
B1(025)	Spray	5.284	14.7	567	567
B1(026)	Spray	5.284	14.7	567	567
B1(027)	Spray	5.284	14.7	567	567
B1(028)	Spray	5.284	14.7	567	567
B1(029)	Spray	5.283	14.7	567	567
B1(030)	Spray	5.283	14.7	567	567
B1(031)	Spray	5.282	14.7	567	567
B1(032)	Spray	5.282	14.7	567	567
B1(033)	Spray	5.281	14.7	567	567
B1(034)	Spray	5.281	14.7	567	567
B1(035)	Spray	5.281	14.7	567	567
B1(036)	Spray	5.281	14.7	567	567
B1(037)	Spray	5.28	14.7	567	567
B1(038)	Spray	5.28	14.7	567	567
B1(039)	Spray	5.279	14.7	567	567
B1(040)	Spray	5.279	14.7	567	567
B1(041)	Spray	5.279	14.7	567	567
B1(042)	Spray	5.279	14.7	567	567
B1(043)	Spray	5.278	14.7	567	567
B1(044)	Spray	5.278	14.7	567	567
B1(045)	Spray	5.278	14.7	567	567
B1(046)	Spray	5.278	14.7	567	567
B1(047)	Spray	5.277	14.7	567	567
B1(048)	Spray	5.277	14.7	567	567
B1(049)	Spray	5.277	14.7	567	567
B1(050)	Spray	5.277	14.7	567	567
B1(051)	Spray	5.276	14.7	567	567
B1(052)	Spray	5.276	14.7	567	567
B1(053)	Spray	5.276	14.7	567	567
B1(054)	Spray	5.276	14.7	567	567
B1(055)	Spray	5.275	14.7	567	567
B1(056)	Spray	5.275	14.7	567	567
B1(057)	Spray	5.275	14.7	567	567
B1(058)	Spray	5.275	14.7	567	567
B1(059)	Spray	5.275	14.7	567	567
B1(060)	Spray	5.275	14.7	567	567
B1(061)	Spray	5.274	14.7	567	567
B1(062)	Spray	5.274	14.7	567	567
B1(063)	Spray	5.274	14.7	567	567
B1(064)	Spray	5.274	14.7	567	567
B1(065)	Spray	5.274	14.7	567	567
B1(066)	Spray	5.274	14.7	567	567
B1(067)	Spray	5.274	14.7	567	567
B1(068)	Spray	5.274	14.7	567	567
B1(069)	Spray	5.273	14.7	567	567
B1(070)	Spray	5.273	14.7	567	567
B1(071)	Spray	5.273	14.7	567	567
B1(072)	Spray	5.273	14.7	567	567
B1(073)	Spray	5.273	14.7	567	567
B1(074)	Spray	5.273	14.7	567	567
B1(075)	Spray	5.273	14.7	567	567
B1(076)	Spray	5.273	14.7	567	567
B1(077)	Spray	5.273	14.7	567	567
B1(078)	Spray	5.273	14.7	567	567
B1(079)	Spray	5.272	14.7	567	567
B1(080)	Spray	5.272	14.7	567	567
B1(081)	Spray	5.272	14.7	567	567
B1(082)	Spray	5.272	14.7	567	567
B1(083)	Spray	5.272	14.7	567	567
B1(084)	Spray	5.272	14.7	567	567
B1(085)	Spray	5.272	14.7	567	567
B1(086)	Spray	5.272	14.7	567	567
B1(087)	Spray	5.272	14.7	567	567
B1(088)	Spray	5.272	14.7	567	567
B1(089)	Spray	5.272	14.7	567	567
B1(090)	Spray	5.272	14.7	567	567
B1(091)	Spray	5.272	14.7	567	567
B1(092)	Spray	5.272	14.7	567	567
B1(093)	Spray	5.272	14.7	567	567
B1(094)	Spray	5.272	14.7	567	567
B1(095)	Spray	5.272	14.7	567	567
B1(096)	Spray	5.272	14.7	567	567
B1(097)	Spray	5.272	14.7	567	567
B1(098)	Spray	5.272	14.7	567	567
B1(099)	Spray	5.272	14.7	567	567
B1(100)	Spray	5.272	14.7	567	567
B1(101)	Spray	5.272	14.7	567	567
B1(102)	Spray	5.272	14.7	567	567
B1(103)	Spray	5.272	14.7	567	567
B1(104)	Spray	5.272	14.7	567	567
B1(105)	Spray	5.272	14.7	567	567
B1(106)	Spray	5.272	14.7	567	567
B1(107)	Spray	5.272	14.7	567	567
B1(108)	Spray	5.272	14.7	567	567
B1(109)	Spray	5.272	14.7	567	567
B1(110)	Spray	5.272	14.7	567	567
B1(111)	Spray	5.272	14.7	567	567
B1(112)	Spray	5.272	14.7	567	567
B2(001)	Spray	4.164	14.7	589	589
B2(002)	Spray	4.164	14.7	589	589
B2(003)	Spray	4.162	14.7	589	589
B2(004)	Spray	4.162	14.7	589	589
B2(005)	Spray	4.16	14.7	589	589
B2(006)	Spray	4.16	14.7	589	589
B2(007)	Spray	4.158	14.7	589	589
B2(008)	Spray	4.158	14.7	589	589
B2(009)	Spray	4.156	14.7	589	589
B2(010)	Spray	4.156	14.7	589	589
B2(011)	Spray	4.154	14.7	589	589
B2(012)	Spray	4.154	14.7	589	589
B2(013)	Spray	4.152	14.7	589	589
B2(014)	Spray	4.152	14.7	589	589
B2(015)	Spray	4.15	14.7	589	589
B2(016)	Spray	4.15	14.7	589	589
B2(017)	Spray	4.148	14.7	589	589
B2(018)	Spray	4.148	14.7	589	589
B2(019)	Spray	4.147	14.7	589	589
B2(020)	Spray	4.147	14.7	589	589
B2(021)	Spray	4.145	14.7	589	589
B2(022)	Spray	4.145	14.7	589	589
B2(023)	Spray	4.144	14.7	589	589
B2(024)	Spray	4.144	14.7	589	589
B2(025)	Spray	4.142	14.7	589	589
B2(026)	Spray	4.142	14.7	589	589
B2(027)	Spray	4.141	14.7	589	589
B2(028)	Spray	4.141	14.7	589	589
B2(029)	Spray	4.14	14.7	589	589
B2(030)	Spray	4.14	14.7	589	589
B2(031)	Spray	4.139	14.7	589	589
B2(032)	Spray	4.139	14.7	589	589
B2(033)	Spray	4.137	14.7	589	589
B2(034)	Spray	4.137	14.7	589	589
B2(035)	Spray	4.136	14.7	589	589
B2(036)	Spray	4.136	14.7	589	589
B2(037)	Spray	4.135	14.7	589	589
B2(038)	Spray	4.135	14.7	589	589
B2(039)	Spray	4.135	14.7	589	589
B2(040)	Spray	4.135	14.7	589	589
B2(041)	Spray	4.134	14.7	589	589

B2(042)	Spray	4.134	14.7		589	589
B2(043)	Spray	4.133	14.7		589	589
B2(044)	Spray	4.133	14.7		589	589
B2(045)	Spray	4.132	14.7		589	589
B2(046)	Spray	4.132	14.7		589	589
B2(047)	Spray	4.132	14.7		589	589
B2(048)	Spray	4.132	14.7		589	589
B2(049)	Spray	4.131	14.7		589	589
B2(050)	Spray	4.131	14.7		589	589
B2(051)	Spray	4.13	14.7		589	589
B2(052)	Spray	4.13	14.7		589	589
B2(053)	Spray	4.13	14.7		589	589
B2(054)	Spray	4.13	14.7		589	589
B2(055)	Spray	4.129	14.7		589	589
B2(056)	Spray	4.129	14.7		589	589
B2(057)	Spray	4.129	14.7		589	589
B2(058)	Spray	4.129	14.7		589	589
B2(059)	Spray	4.129	14.7		589	589
B2(060)	Spray	4.129	14.7		589	589
B2(061)	Spray	4.128	14.7		589	589
B2(062)	Spray	4.129	14.7		589	589
B2(063)	Spray	4.128	14.7		589	589
B2(064)	Spray	4.128	14.7		589	589
B2(065)	Spray	4.128	14.7		589	589
B2(066)	Spray	4.128	14.7		589	589
B2(067)	Spray	4.128	14.7		589	589
B2(068)	Spray	4.128	14.7		589	589
B2(069)	Spray	4.127	14.7		589	589
B2(070)	Spray	4.127	14.7		589	589
B2(071)	Spray	4.127	14.7		589	589
B2(072)	Spray	4.127	14.7		589	589
B2(073)	Spray	4.127	14.7		589	589
B2(074)	Spray	4.127	14.7		589	589
B2(075)	Spray	4.127	14.7		589	589
B2(076)	Spray	4.127	14.7		589	589
B2(077)	Spray	4.127	14.7		589	589
B2(078)	Spray	4.127	14.7		589	589
B2(079)	Spray	4.127	14.7		589	589
B2(080)	Spray	4.127	14.7		589	589
B2(081)	Spray	4.127	14.7		589	589
B2(082)	Spray	4.127	14.7		589	589
B2(083)	Spray	4.127	14.7		589	589
B2(084)	Spray	4.127	14.7		589	589
B2(085)	Spray	4.127	14.7		589	589
B2(086)	Spray	4.127	14.7		589	589
B2(087)	Spray	4.127	14.7		589	589
B2(088)	Spray	4.127	14.7		589	589
B2(089)	Spray	4.127	14.7		589	589
B2(090)	Spray	4.127	14.7		589	589
B3(001)	Spray	4.296	14.7		589	589
B3(002)	Spray	4.296	14.7		589	589
B3(003)	Spray	4.296	14.7		589	589
B3(004)	Spray	4.296	14.7		589	589
B3(005)	Spray	4.295	14.7		589	589
B3(006)	Spray	4.295	14.7		589	589
B3(007)	Spray	4.294	14.7		589	589
B3(008)	Spray	4.294	14.7		589	589
B3(009)	Spray	4.294	14.7		589	589
B3(010)	Spray	4.294	14.7		589	589
B3(011)	Spray	4.293	14.7		589	589
B3(012)	Spray	4.293	14.7		589	589
B3(013)	Spray	4.293	14.7		589	589
B3(014)	Spray	4.293	14.7		589	589
B3(015)	Spray	4.292	14.7		589	589
B3(016)	Spray	4.292	14.7		589	589
B3(017)	Spray	4.292	14.7		589	589
B3(018)	Spray	4.292	14.7		589	589
B3(019)	Spray	4.291	14.7		589	589
B3(020)	Spray	4.291	14.7		589	589
B3(021)	Spray	4.291	14.7		589	589
B3(022)	Spray	4.291	14.7		589	589
B3(023)	Spray	4.291	14.7		589	589
B3(024)	Spray	4.291	14.7		589	589
B3(025)	Spray	4.291	14.7		589	589
B3(026)	Spray	4.291	14.7		589	589
B3(027)	Spray	4.29	14.7		589	589
B3(028)	Spray	4.29	14.7		589	589
B3(029)	Spray	4.29	14.7		589	589
B3(030)	Spray	4.29	14.7		589	589
B3(031)	Spray	4.29	14.7		589	589
B3(032)	Spray	4.29	14.7		589	589
B3(033)	Spray	4.29	14.7		589	589
B3(034)	Spray	4.29	14.7		589	589
B3(035)	Spray	4.29	14.7		589	589
B3(036)	Spray	4.29	14.7		589	589
B3(037)	Spray	4.29	14.7		589	589
B3(038)	Spray	4.29	14.7		589	589
B3(039)	Spray	4.29	14.7		589	589
B3(040)	Spray	4.29	14.7		589	589
B3(041)	Spray	4.29	14.7		589	589
B3(042)	Spray	4.29	14.7		589	589
B3(043)	Spray	4.29	14.7		589	589
B3(044)	Spray	4.29	14.7		589	589
B3(045)	Spray	4.289	14.7		589	589
B3(046)	Spray	4.289	14.7		589	589
B3(047)	Spray	4.289	14.7		589	589
B3(048)	Spray	4.289	14.7		589	589
B3(049)	Spray	4.289	14.7		589	589
B3(050)	Spray	4.289	14.7		589	589
B3(051)	Spray	4.289	14.7		589	589
Cold Leg A(001)	Boundary pressure	116.5	28.2		424.2	393
Cold Leg A(002)	Boundary pressure	0	28.2		424.2	393
Cold Leg B(001)	Boundary pressure	116	28.2		424.2	393
Cold Leg B(002)	Boundary pressure	0	28.2		424.2	393
Cold Leg C(001)	Boundary pressure	116.1	28.2		424.2	393
Cold Leg C(002)	Boundary pressure	0	28.2		424.2	393
Cold Leg D(001)	Boundary pressure	116	28.2		424.2	393
Cold Leg D(002)	Boundary pressure	0	28.2		424.2	393
Hot Leg A(001)	Boundary pressure	—	28.2	Isolated	—	392.7
Hot Leg A(002)	Boundary pressure	0	28.2		424.2	393
Hot Leg B(001)	Boundary pressure	—	28.2	Isolated	—	392.7
Hot Leg B(002)	Boundary pressure	0	28.2		424.2	393
Hot Leg C(001)	Boundary pressure	—	28.2	Isolated	—	392.7
Hot Leg C(002)	Boundary pressure	—	28.2	Isolated	—	393
Hot Leg D(001)	Boundary pressure	—	28.2	Isolated	—	392.7
Hot Leg D(002)	Boundary pressure	0	28.2		424.2	393

Pump List	Operation	Flow	Status	TDH	dP	NPSHa	Suction Pressure	Discharge Pressure	Suction Elev	Discharge Elev
Centrifugal Charging Pump A	Curve	544.8		1900	821.6	79.69	33.1	854.7	368.6	368.7
Centrifugal Charging Pump B	Fixed Flow	1.00E-06	Off	—	—	—	—	—	368.9	368.7
Containment Spray Pump A	Fixed Flow	1.00E-06	Off	—	—	—	—	—	340.3	347.3
Containment Spray Pump B	Fixed Flow	1.00E-06	Off	—	—	—	—	—	340.3	347.3
Positive Dis. Charging Pump	Fixed Flow	1.00E-06	Off	—	—	—	—	—	366.7	367.9
Residual Heat Removal Pump A	Curve	—	Isolated	—	—	—	—	—	346	347.1
Residual Heat Removal Pump B	Curve	—	Off	—	—	—	—	—	346	347.1
Safety Injection Pump A	Fixed Flow	1.00E-06	Off	—	—	—	—	—	366.5	366.5
Safety Injection Pump B	Fixed Flow	1.00E-06	Off	—	—	—	—	—	366.5	366.5

Component List	Flow	Status	HL	dP	Inlet Pressure	Outlet Pressure	Inlet Elev	Outlet Elev
Residual HX A	—	Isolated	—	—	—	—	398.8	398.8
Residual HX B	—	Off	—	—	—	—	398.8	398.8

Control List	Type	Set Value	Status	Flow	dP	HL	Inlet Pressure	Outlet Pressure	Elev	Cv	Fp	Other
~H(562)	FCV	0		0	—	—	116.1	36.12	348.9	—	—	—
~H(563)	FCV	0		0	—	—	118.8	20.41	380	—	—	—
~H(581)	FCV	116		116	482.2	1009	658.3	196.1	412.9	—	—	—
~H(582)	FCV	116.5		118.5	540.4	1250	884.8	144.4	413	—	—	—
~H(585)	FCV	116.1		116.1	551.3	1275	732.7	181.4	382.4	—	—	—
~H(600)	FCV	116		116	585.2	1375	739	143.8	383.5	—	—	—
~H(698)	FCV	Fully open	Isolated	—	—	—	—	—	414.9	—	—	—
~H(704)	FCV	Fully open	Isolated	—	—	—	—	—	381.4	—	—	—
~H(711)	FCV	Fully open	Isolated	—	—	—	—	—	414.9	—	—	—
~H(717)	FCV	Fully open	Isolated	—	—	—	—	—	397	—	—	—
~H(723)	FCV	Fully open		0	—	—	33.52	33.53	380.7	—	—	—
~H(729)	FCV	Fully open		0	—	—	34.99	34.99	378	—	—	—
~H(735)	FCV	Fully open		0	—	—	34.84	34.84	378.1	—	—	—
~H(741)	FCV	Fully open		0	—	—	33.35	31.35	381.1	—	—	—
CS8074-1	FCV	Fully open		0	—	—	93.5	93.5	407	—	—	—
CS8074-2	FCV	Fully open		0	—	—	93.54	93.54	399	—	—	—

Pipe Specification	Material	Schedule	Roughness	Sizing	Vel Limits	Press Limits	Valve Table
Steel Sch.40 (clean)	Steel	40	0.0018	not specified	—	—	standard
Steel Sch.80 (clean)	Steel	80	0.0018	not specified	—	—	standard
Steel Sch.140 (clean)	Steel	140	0.0018	not specified	—	—	standard
Steel Sch.40S (clean)	Stainless Pipe IPS	40S	0.0018	not specified	—	—	standard
Steel Sch.160 (clean)	Steel	160	0.0018	not specified	—	—	standard
Steel Sch.30 (clean)	Steel	30	0.0018	not specified	—	—	standard
Steel Sch.20 (clean)	Steel	20	0.0018	not specified	—	—	standard

Fluid Zone	Fluid	Temperature	Pressure	Density	Viscosity	k	Pv	Pc
Outage Restd Water	Water	70	14.7	62.3	0.9805	—	0.3632	3198

PIPE-FLO: ver 9.0 12/7/2009 13:55
System: 6.2 LOCA A1R12 LoLo
Lineup: Cold Leg Injection from Sump

Company: Exelon
Project: 11329-147 Rev. 0
By: Sargent & Lundy L.L.C.
Fader:

UNITS
Flow Rate: US gpm
Pressure: psi g   Atm: 14.7 psi a
Temperature: °F
Viscosity: cP
Density: lb/ft³
Grade: ft
Length: ft
Size: in

CALCULATION
Iteration: 13
Deviation (pressure): 0.003675

Pipe List	Specification	Fluid Zone	Size	Length	K	Status	Flow	Velocity	dP	HL	Tagged	From	To	Inside Dia	Pipe HL	Minor HL	Re	fp	Valves/Fittings							
CS01AA(001)	Steel Sch.30 (clean)	Containment Sump Water	16	12.3	0.446	XXX	---	---	---	---	N	~N(003)	~N(005)	15.25	---	---	---	---	2 x Pipe Bend - r/d 1.5 (90°)	0.173	1 x CS009A-1 (Gate Valve)	0.09688	1 x Converging Tee (Through)	1.00E-05		
CS01AA(002)	Steel Sch.30 (clean)	Containment Sump Water	16	10.6	0.2964		0	0	0	0	N	~N(005)	~N(006)	15.25	0	0	0	0	1 x Reducer - Contraction (16 x 14 - 14)	0.02451	1 x Pipe Bend - r/d 1.5 (90°)	0.173	1 x CS002A	0.09688		
CS01AA(003)	Steel Sch.30 (clean)	Containment Sump Water	14	2	0		0	0	0.864	0	N	~N(006)	Containment Spray Pump A	13.25	0	0	0	0								
CS01AB(001)	Steel Sch.30 (clean)	Containment Sump Water	16	4.3	0.1978	XXX	---	---	---	---	N	~N(236)	~N(237)	15.25	---	---	---	---	1 x Gate - Double Disc	0.09688	1 x CS009B-2 (Gate Valve)	0.09688	1 x Converging Tee (Through)	1.00E-05		
CS01AB(002)	Steel Sch.30 (clean)	Containment Sump Water	16	19.3	1.236		0	0	0	0	N	~N(237)	~N(238)	15.25	0	0	0	0	3 x Elbow - Standard 90°	0.3708	1 x Reducer - Contraction (16 x 14 - 14)	0.02451	1 x CS002B (Gate Valve)	0.09688		
CS01AB(003)	Steel Sch.30 (clean)	Containment Sump Water	14	2	0		0	0	0.821	0	N	~N(238)	Containment Spray Pump B	13.25	0	0	0	0								
CS02AA(001)	Steel Sch.40 (clean)	Containment Sump Water	8	2	0.05008		0	0	0.432	0	N	Containment Spray Pump A	~N(007)	7.981	0	0	0	0	1 x Reducer - Enlargement (10 x 8 - 7)	0.05008						
CS02AA(002)	Steel Sch.40 (clean)	Containment Sump Water	10	25.5	2.148		0	0	5.054	0	N	~N(007)	~N(008)	10.02	0	0	0	0	4 x Pipe Bend - r/d 1.5 (90°)	0.188	1 x CS003A (Check Valve)	1.289	1 x CV004A (Gate Valve)	0.1074		
CS02AA(003)	Steel Sch.40 (clean)	Containment Sump Water	10	101.3	6.852		0	0	15.03	0	N	~N(008)	~N(009)	10.02	0	0	0	0	1 x FE-CS011	4.9	4 x Pipe Bend - r/d 1.5 (90°)	0.188	1 x Diverging Tee (Through)	1.00E-05		
CS02AA(004)	Steel Sch.40 (clean)	Containment Sump Water	10	34.8	0.6713		0	0	6.27	0	N	~N(009)	CS007A-1	10.02	0	0	0	0	3 x Pipe Bend - r/d 1.5 (90°)	0.188	1 x CS007A-1 (Gate Valve)	0.1074	1 x Diverging Tee (Through)	1.00E-05		
CS02AA(005)	Steel Sch.40 (clean)	Containment Sump Water	10	63.7	2.85		0	0	9.072	0	N	CS007A-1	~N(001)	10.02	0	0	0	0	6 x Pipe Bend - r/d 1.5 (90°)	0.188	1 x Pipe Bend - r/d 1.5 (45°)	0.1331	1 x CS008A (Check Valve)	1.289		
CS02AA(006)	Steel Sch.40 (clean)	Containment Sump Water	10	165.7	1.261		0	0	63.2	0	N	~N(001)	~N(001A)	10.02	0	0	0	0	6 x Pipe Bend - r/d 1.5 (90°)	0.188	1 x Pipe Bend - r/d 1.5 (45°)	0.1331				
CS02AB(001)	Steel Sch.40 (clean)	Containment Sump Water	8	2	0.472		0	0	-0.432	0	N	Containment Spray Pump B	~N(239)	7.981	0	0	0	0	1 x Elbow - Standard 90°	0.4219	1 x Reducer - Enlargement (10 x 8 - 7)	0.05008				
CS02AB(002)	Steel Sch.40 (clean)	Containment Sump Water	10	9.9	2.202		0	0	0.216	0	N	~N(239)	~N(240)	10.02	0	0	0	0	2 x Elbow - Standard 90°	0.4028	1 x CV004B (Gate Valve)	0.1074	1 x CV003B (Check Valve)	1.289		
CS02AB(003)	Steel Sch.40 (clean)	Containment Sump Water	10	59.1	6.511		0	0	14.8	0	N	~N(240)	~N(241)	10.02	0	0	0	0	4 x Elbow - Standard 90°	0.4028	1 x FE-CS012	4.9	1 x Diverging Tee (Through)	1.00E-05		
CS02AB(004)	Steel Sch.40 (clean)	Containment Sump Water	10	33.8	1.316		0	0	7.646	0	N	~N(241)	CS007B-2	10.02	0	0	0	0	3 x Elbow - Standard 90°	0.4028	1 x CV007B-2 (Gate Valve)	0.1074	1 x Diverging Tee (Through)	1.00E-05		
CS02AB(005)	Steel Sch.40 (clean)	Containment Sump Water	10	75.4	3.92		0	0	12.53	0	N	CS007B-2	~N(242)	10.02	0	0	0	0	1 x Elbow - Standard 45°	0.2148	6 x Elbow - Standard 90°	0.4028	1 x CS008B (Check Valve)	1.289		
CS02AB(006)	Steel Sch.40 (clean)	Containment Sump Water	10	144.2	1		0	0	59.18	0	N	~N(242)	~N(243)	10.02	0	0	0	0	1 x CS006B (Check Valve)	1	1 x Diverging Tee (Through)	1.00E-05				
CS02AB(007)	Steel Sch.40 (clean)	Containment Sump Water	10	30.8	2.00E-05	<-->	601.7	2.45	-7.536	0.058	N	~N(244)	~N(243)	10.02	0.058	0	278182	0.01828	1 x Diverging Tee (Branch)	1.00E-05	1 x Diverging Tee (Through)	1.00E-05				
CS02B	Steel Sch.40 (clean)	Containment Sump Water	8	26.6	0.04216	<-->	444.5	2.854	-6.535	0.087	N	~N(010)	~N(001A)	7.981	0.082	0.005	258078	0.01678	1 x Reducer - Contraction (10 x 8 - 7)	0.04215	1 x Diverging Tee (Through)	1.00E-05				
CS02C	Steel Sch.40 (clean)	Containment Sump Water	6	21.5	0.0533	<-->	203	2.256	-2.893	0.066	N	~N(011)	~N(010)	6.065	0.062	0.004	155042	0.01832	1 x Reducer - Contraction (8 x 6 - 6)	0.05329	1 x Diverging Tee (Through)	1.00E-05				
CS02D(001)	Steel Sch.40 (clean)	Containment Sump Water	4	1.1	0.08157	<-->	101.5	2.56	0.006	0.015	N	~N(012)	~N(011)	4.026	0.007	0.008	116764	0.01978	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156	1 x Diverging* Tee (Branch)	1.00E-05				
CS02D(002)	Steel Sch.40 (clean)	Containment Sump Water	4	1.1	0.08157	<-->	101.5	2.56	0.006	0.015	N	~N(014)	~N(011)	4.026	0.007	0.008	116800	0.01978	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156	1 x Diverging* Tee (Branch)	1.00E-05				
CS02D(003)	Steel Sch.40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	96.27	2.428	0.008	0.019	N	~N(013)	~N(012)	4.026	0.012	0.007	110768	0.01991	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156						
CS02D(004)	Steel Sch.40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	96.25	2.428	0.008	0.019	N	~N(033)	~N(014)	4.026	0.012	0.007	110749	0.01991	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156						
CS02D(005)	Steel Sch.40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	91.06	2.297	0.007	0.017	N	~N(015)	~N(013)	4.026	0.01	0.007	104777	0.02005	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156						
CS02D(006)	Steel Sch.40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	91.04	2.296	0.007	0.017	N	~N(034)	~N(033)	4.026	0.01	0.007	104758	0.02005	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156						
CS02D(007)	Steel Sch.40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	85.81	2.164	0.007	0.015	N	~N(016)	~N(015)	4.026	0.009	0.006	98736	0.02021	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156						
CS02D(008)	Steel Sch.40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	85.84	2.165	0.007	0.015	N	~N(035)	~N(034)	4.026	0.009	0.006	98771	0.02021	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156						
CS02D(009)	Steel Sch.40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	80.61	2.033	0.006	0.013	N	~N(017)	~N(016)	4.026	0.008	0.005	92753	0.02038	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156						
CS02D(010)	Steel Sch.40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	80.59	2.033	0.006	0.013	N	~N(036)	~N(035)	4.026	0.008	0.005	92734	0.02038	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156						
CS02D(011)	Steel Sch.40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	75.41	1.902	0.005	0.012	N	~N(018)	~N(017)	4.026	0.007	0.005	86775	0.02057	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156						
CS02D(012)	Steel Sch.40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	75.4	1.902	0.005	0.012	N	~N(037)	~N(036)	4.026	0.007	0.005	86756	0.02057	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156						
CS02D(013)	Steel Sch.40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	70.17	1.77	0.004	0.01	N	~N(019)	~N(018)	4.026	0.006	0.004	80745	0.02079	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156						
CS02D(014)	Steel Sch.40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	70.2	1.771	0.004	0.01	N	~N(038)	~N(037)	4.026	0.006	0.004	80780	0.02078	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156						
CS02D(015)	Steel Sch.40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	64.98	1.639	0.004	0.009	N	~N(020)	~N(019)	4.026	0.006	0.003	74772	0.02102	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156						
CS02D(016)	Steel Sch.40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	64.97	1.639	0.004	0.009	N	~N(044)	~N(038)	4.026	0.006	0.003	74753	0.02102	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156						
CS02D(017)	Steel Sch.40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	59.79	1.508	0.003	0.008	N	~N(021)	~N(020)	4.026	0.005	0.003	68802	0.02129	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156						
CS02D(018)	Steel Sch.40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	59.78	1.508	0.003	0.008	N	~N(043)	~N(044)	4.026	0.005	0.003	68783	0.02129	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156						
CS02D(019)	Steel Sch.40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	54.56	1.376	0.003	0.006	N	~N(024)	~N(021)	4.026	0.004	0.002	62779	0.0216	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156						
CS02D(020)	Steel Sch.40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	54.59	1.377	0.003	0.006	N	~N(042)	~N(043)	4.026	0.004	0.002	62815	0.0216	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156						
CS02D(021)	Steel Sch.40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	49.37	1.245	0.002	0.005	N	~N(023)	~N(024)	4.026	0.003	0.002	56813	0.02195	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156						
CS02D(022)	Steel Sch.40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	49.36	1.245	0.002	0.005	N	~N(039)	~N(042)	4.026	0.003	0.002	56794	0.02196	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156						
CS02D(023)	Steel Sch.40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	44.19	1.115	0.002	0.004	N	~N(022)	~N(023)	4.026	0.002	0.002	50848	0.02237	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156						
CS02D(024)	Steel Sch.40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	44.17	1.114	0.002	0.004	N	~N(040)	~N(039)	4.026	0.002	0.002	50829	0.02237	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156						
CS02D(025)	Steel Sch.40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	38.96	0.983	0.001	0.003	N	~N(030)	~N(022)	4.026	0.002	0.001	44829	0.02287	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156						
CS02D(026)	Steel Sch.40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	38.99	0.983	0.001	0.003	N	~N(041)	~N(040)	4.026	0.002	0.001	44865	0.02286	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156						
CS02D(027)	Steel Sch.40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	33.78	0.852	0.001	0.003	N	~N(029)	~N(030)	4.026	0.003	0	38867	0.02347	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156						
CS02D(028)	Steel Sch.40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	33.76	0.852	0.001	0.003	N	~N(045)	~N(041)	4.026	0.003	0	38848	0.02347	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156						
CS02D(029)	Steel Sch.40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	28.6	0.721	0	0.002	N	~N(028)	~N(029)	4.026	0.002	0	32905	0.02423	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156						
CS02D(030)	Steel Sch.40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	28.58	0.721	0	0.002	N	~N(046)	~N(045)	4.026	0.002	0	32886	0.02423	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156						
CS02D(031)	Steel Sch.40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	23.37	0.589	0	0.001	N	~N(025)	~N(028)	4.026	0.001	0	26886	0.02523	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156						
CS02D(032)	Steel Sch.40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	23.4	0.59	0	0.001	N	~N(047)	~N(046)	4.026	0.001	0	26924	0.02523	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156						
CS02D(033)	Steel Sch.40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	18.19	0.459	0	0	N	~N(026)	~N(025)	4.026	0	0	20927	0.02662	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156						
CS02D(034)	Steel Sch.40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	18.17	0.458	0	0	N	~N(050)	~N(047)	4.026	0	0	20906	0.02662	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156						
CS02D(035)	Steel Sch.40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	13.01	0.328	0	0	N	~N(027)	~N(026)	4.026	0	0	14966	0.02873	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156						
CS02D(036)	Steel Sch.40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	12.99	0.328	0	0	N	~N(049)	~N(050)	4.026	0	0	14947	0.02874	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156						
CS02D(037)	Steel Sch.40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	7.779	0.196	0	0	N	~N(031)	~N(027)	4.026	0	0	8951	0.03266	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156						
CS02D(038)	Steel Sch.40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	7.81	0.197	0	0	N	~N(048)	~N(049)	4.026	0	0	8986	0.03263	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156						
CS02D(039)	Steel Sch.40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	2.598	0.066	0	0	N	~N(032)	~N(031)	4.026	0	0	2990	0.04496	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156						
CS02D(040)	Steel Sch.40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	2.582	0.065	0	0	N	~N(032)	~N(048)	4.026	0	0	2971	0.04506	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156						
CS02E	Steel Sch.40 (clean)	Containment Sump Water	6	23.3	0.1378	<-->	220.6	2.451	-3.978	0.091	N	~N(245)	~N(244)	6.065	0.078	0.013	168460	0.01813	1 x Reducer - Contraction (10 x 6 - 7)	0.1378	1 x Diverging Tee (Through)	1.00E-05				
CS02F(001)	Steel Sch.40 (clean)	Containment Sump Water	6	1.4	4.3	<-->	110.3	1.226	0.044	0.102	N	~N(246)	~N(245)	6.065	0.002	0.1	84239	0.02	1 x Diverging* Tee (Branch)	4.3						
CS02F(002)	Steel Sch.40 (clean)	Containment Sump Water	6	1.4	4.3	<-->	110.3	1.225	0.044	0.101	N	~N(247)	~N(245)	6.065	0.001	0.1	84221	0.02	1 x Diverging* Tee (Branch)	4.3						
CS02F(003)	Steel Sch.40 (clean)	Containment Sump Water	6	2.9	0	<-->	106	1.178	0.001	0.002	N	~N(248)	~N(246)	6.065	0.002	0	80935	0.02013								
CS02F(004)	Steel Sch.40 (clean)	Containment Sump Water	6	2.9	0	<-->	105.9	1.177	0.001	0.002	N	~N(249)	~N(247)	6.065	0.002	0	80914	0.02013								
CS02F(005)	Steel Sch.40 (clean)	Containment Sump Water	6	2.9	0	<-->	101.4	1.127	0	0.002	N	~N(250)	~N(248)	6.065	0.002	0	77473	0.02028								
CS02F(006)	Steel Sch.40 (clean)	Containment Sump Water	6	2.9	0	<-->	101.8	1.129	0	0.002	N	~N(251)	~N(249)	6.065	0.002	0	77815	0.02027								
CS02F(007)	Steel Sch.40 (clean)	Containment Sump Water	6	2.9	0	<-->	97.11	1.079	0	0.002	N	~N(252)	~N(250)	6.065	0.002	0	74170	0.02042								
CS02F(008)	Steel Sch.40 (clean)	Containment Sump Water	6	2.9	0	<-->	97.29	1.081	0	0.002	N	~N(253)	~N(251)	6.065	0.002	0	74312	0.02042								
CS02F(009)	Steel Sch.40 (clean)	Containment Sump Water	6	2.9	0	<-->	92.78	1.031	0	0.002	N	~N(254)	~N(252)	6.065	0.002	0	70868	0.02058								
CS02F(010)	Steel Sch.40 (clean)	Containment Sump Water	6	2.9	0	<-->	92.97	1.033	0	0.002	N	~N(255)	~N(253)	6.065	0.002	0	71010	0.02058								
CS02F(011)	Steel Sch.40 (clean)	Containment Sump Water	6	2.9	0	<-->	88.46	0.983	0	0.002	N	~N(256)	~N(254)	6.065	0.002	0	67567	0.02075								
CS02F(012)	Steel Sch.40 (clean)	Containment Sump Water	6	2.9	0	<-->	88.64	0.985	0	0.002	N	~N(257)	~N(255)	6.065	0.002	0	67706	0.02074								
CS02F(013)	Steel Sch.40 (clean)	Containment Sump Water	6	2.9	0	<-->	84.14	0.935	0	0.002	N	~N(258)	~N(256)	6.065	0.002	0	64265	0.02093								
CS02F(014)	Steel Sch.40 (clean)	Containment Sump Water	6	2.9	0	<-->	84.32	0.937	0	0.002	N	~N(259)	~N(257)	6.065	0.002	0	64407	0.02092								
CS02F(015)	Steel Sch.40 (clean)	Containment Sump Water	6	2.9	0	<-->	79.82	0.887	0	0.001	N	~N(260)	~N(258)	6.065	0.001	0	60964	0.02113								
CS02F(016)	Steel Sch.40 (clean)	Containment Sump Water	6	2.9	0	<-->	80	0.889	0	0.001	N	~N(261)	~N(259)	6.065	0.001	0	61106	0.02112								
CS02F(017)	Steel Sch.40 (clean)	Containment Sump Water	6	2.9	0	<-->	75.49	0.839	0	0.001	N	~N(262)	~N(260)	6.065	0.001	0	57664	0.02134								
CS02F(018)	Steel Sch.40 (clean)	Containment Sump Water	6	2.9	0	<-->	75.68	0.841	0	0.001	N	~N(263)	~N(261)	6.065	0.001	0	57805	0.02133								
CS02F(019)	Steel Sch.40 (clean)	Containment Sump Water	6	2.9	0	<-->	71.17	0.791	0	0.001	N	~N(264)	~N(262)	6.065	0.001	0	54363	0.02157								
CS02F(020)	Steel Sch.40 (clean)	Containment Sump Water	6	2.9	0	<-->	71.36	0.793	0	0.001	N	~N(265)	~N(263)	6.065	0.001	0	54505	0.02156								
CS02F(021)	Steel Sch.40 (clean)	Containment Sump Water	6	2.9	0	<-->	66.85	0.743	0	0.001	N	~N(266)	~N(264)	6.065	0.001	0	51063	0.02182								
CS02F(022)	Steel Sch.40 (clean)	Containment Sump Water	6	2.9	0	<-->	67.04	0.745	0	0.001	N	~N(267)	~N(265)	6.065	0.001	0	51205	0.02181								
CS02F(023)	Steel Sch.40 (clean)	Containment Sump Water	6	2.9	0	<-->	62.53	0.695	0	0	N	~N(268)	~N(266)	6.065	0	0	47764	0.02209								
CS02F(024)	Steel Sch.40 (clean)	Containment Sump Water	6	2.9	0	<-->	62.72	0.697	0	0	N	~N(269)	~N(267)	6.065	0	0	47905	0.02208								
CS02F(025)	Steel Sch.40 (clean)	Containment Sump Water	6	2.9	0	<-->	58.21	0.647	0	0	N	~N(270)	~N(268)	6.065	0	0	44464	0.0224								
CS02F(026)	Steel Sch.40 (clean)	Containment Sump Water	6	2.9	0	<-->	58.4	0.649	0	0	N	~N(271)	~N(269)	6.065	0	0	44605	0.02238								
CS02F(027)	Steel Sch.40 (clean)	Containment Sump Water	6	2.9	0	<-->	53.89	0.599	0	0	N	~N(272)	~N(270)	6.065	0	0	41165	0.02274								
CS02F(028)	Steel Sch.40 (clean)	Containment Sump Water	6	2.9	0	<-->	54.08	0.601	0	0	N	~N(273)	~N(271)	6.065	0	0	41306	0.02272								
CS02F(029)	Steel Sch.40 (clean)	Containment Sump Water	6	2.9	0	<-->	49.57	0.551	0	0	N	~N(274)	~N(272)	6.065	0	0	37865	0.02312								
CS02F(030)	Steel Sch.40 (clean)	Containment Sump Water	6	2.9	0	<-->	49.76	0.553	0	0	N	~N(275)	~N(273)	6.065	0	0	38007	0.0231								
CS02F(031)	Steel Sch.40 (clean)	Containment Sump Water	6	2.9	0	<-->	45.25	0.503	0	0	N	~N(276)	~N(274)	6.065	0	0	34566	0.02355								
CS02F(032)	Steel Sch.40 (clean)	Containment Sump Water	6	2.9	0	<-->	45.44	0.505	0	0	N	~N(277)	~N(275)	6.065	0	0	34708	0.02353								
CS02F(033)	Steel Sch.40 (clean)	Containment Sump Water	6	2.9	0	<-->	40.94	0.455	0	0	N	~N(278)	~N(276)	6.065	0	0	31267	0.02404								
CS02F(034)	Steel Sch.40 (clean)	Containment Sump Water	6	2.9	0	<-->	41.12	0.457	0	0	N	~N(279)	~N(277)	6.065	0	0	31409	0.02402								
CS02F(035)	Steel Sch.40 (clean)	Containment Sump Water	6	2.9	0	<-->	36.62	0.407	0	0	N	~N(280)	~N(278)	6.065	0	0	27968	0.02462								
CS02F(036)	Steel Sch.40 (clean)	Containment Sump Water	6	2.9	0	<-->	36.8	0.409	0	0	N	~N(281)	~N(279)	6.065	0	0	28110	0.02459								
CS02F(037)	Steel Sch.40 (clean)	Containment Sump Water	6	2.9	0	<-->	32.3	0.359	0	0	N	~N(282)	~N(280)	6.065	0	0	24669	0.0253								
CS02F(038)	Steel Sch.40 (clean)	Containment Sump Water	6	2.9	0	<-->	32.48	0.361	0	0	N	~N(283)	~N(281)	6.065	0	0	24811	0.02527								
CS02F(039)	Steel Sch.40 (clean)	Containment Sump Water	6	2.9	0	<-->	27.98	0.311	0	0	N	~N(284)	~N(282)	6.065	0	0	21371	0.02613								
CS02F(040)	Steel Sch.40 (clean)	Containment Sump Water	6	2.9	0	<-->	28.16	0.313	0	0	N	~N(285)	~N(283)	6.065	0	0	21512	0.02609								
CS02F(041)	Steel Sch.40 (clean)	Containment Sump Water	6	2.9	0	<-->	23.66	0.263	0	0	N	~N(286)	~N(284)	6.065	0	0	18072	0.02717								
CS02F(042)	Steel Sch.40 (clean)	Containment Sump Water	6	2.9	0	<-->	23.85	0.265	0	0	N	~N(287)	~N(285)	6.065	0	0	18213	0.02712								
CS02F(043)	Steel Sch.40 (clean)	Containment Sump Water	6	2.9	0	<-->	19.34	0.215	0	0	N	~N(288)	~N(286)	6.065	0	0	14773	0.02851								
CS02F(044)	Steel Sch.40 (clean)	Containment Sump Water	6	2.9	0	<-->	19.53	0.217	0	0	N	~N(289)	~N(287)	6.065	0	0	14915	0.02845								
CS02F(045)	Steel Sch.40 (clean)	Containment Sump Water	6	2.9	0	<-->	15.02	0.167	0	0	N	~N(290)	~N(288)	6.065	0	0	11474	0.03038								
CS02F(046)	Steel Sch.40 (clean)	Containment Sump Water	6	2.9	0	<-->	15.21	0.169	0	0	N	~N(291)	~N(289)	6.065	0	0	11616	0.03028								
CS02F(047)	Steel Sch.40 (clean)	Containment Sump Water	6	2.9	0	<-->	10.7	0.119	0	0	N	~N(292)	~N(290)	6.065	0	0	8176	0.03322								
CS02F(048)	Steel Sch.40 (clean)	Containment Sump Water	6	2.9	0	<-->	10.89	0.121	0	0	N	~N(293)	~N(291)	6.065	0	0	8317	0.03307								
CS02F(049)	Steel Sch.40 (clean)	Containment Sump Water	6	2.9	0	<-->	6.385	0.071	0	0	N	~N(294)	~N(292)	6.065	0	0	4877	0.03849								
CS02F(050)	Steel Sch.40 (clean)	Containment Sump Water	6	2.9	0	<-->	6.571	0.073	0	0	N	~N(295)	~N(293)	6.065	0	0	5019	0.03817								
CS02F(051)	Steel Sch.40 (clean)	Containment Sump Water	6	2.9	0	<-->	2.067	0.023	0	0	N	~N(296)	~N(294)	6.065	0	0	1579	0.04054								
CS02F(052)	Steel Sch.40 (clean)	Containment Sump Water	6	2.9	0	<-->	2.252	0.025	0	0	N	~N(296)	~N(295)	6.065	0	0	1720	0.03721								
CS02GA	Steel Sch.40 (clean)	Containment Sump Water	8	2	5.6	<-->	241.6	1.551	-0.686	0.211	N	~N(051)	~N(010)	7.981	0.002	0.209	140257	0.01815	1 x FX-CS035 (Flow Element)	5.6	1 x Diverging Tee (Branch)	1.00E-05				
CS02GB	Steel Sch.40 (clean)	Containment Sump Water	8	2.1	4.3	<-->	381.1	2.446	-0.889	0.404	N	~N(297)	~N(244)	7.981	0.005	0.399	221235	0.01709	1 x FX-CS037 (Flow Element)	2.3	1 x Diverging Tee (Branch)	2				
CS02H(001)	Steel Sch.40 (clean)	Containment Sump Water	6	1.8	0.0533	<-->	120.4	1.338	0.001	0.003	N	~N(073)	~N(051)	6.065	0.002	0.001	91958	0.01973	1 x Reducer - Contraction (8 x 6 - 6)	0.05329	1 x Diverging* Tee (Branch)	1.00E-05				
CS02H(002)	Steel Sch.40 (clean)	Containment Sump Water	6	1.8	0.0533	<-->	121.2	1.348	0.002	0.003	N	~N(070)	~N(051)	6.065	0.001	0.002	92608	0.01971	1 x Reducer - Contraction (8 x 6 - 6)	0.05329	1 x Diverging* Tee (Branch)	1.00E-05				
CS02H(003)	Steel Sch.40 (clean)	Containment Sump Water	6	3.8	0	<-->	116.2	1.291	0.002	0.004	N	~N(072)	~N(073)	6.065	0.004	0	88757	0.01984								
CS02H(004)	Steel Sch.40 (clean)	Containment Sump Water	6	3.8	0	<-->	117.3	1.304	0.002	0.004	N	~N(067)	~N(070)	6.065	0.004	0	89612	0.01981								
CS02H(005)	Steel Sch.40 (clean)	Containment Sump Water	6	3.8	0	<-->	112.2	1.247	0.001	0.003	N	~N(071)	~N(072)	6.065	0.003	0	85690	0.01995								
CS02H(006)	Steel Sch.40 (clean)	Containment Sump Water	6	3.8	0	<-->	113.3	1.259	0.002	0.003	N	~N(068)	~N(067)	6.065	0.003	0	86545	0.01992								
CS02H(007)	Steel Sch.40 (clean)	Containment Sump Water	6	3.8	0	<-->	108.3	1.203	0.001	0.003	N	~N(074)	~N(071)	6.065	0.003	0	82696	0.02006								
CS02H(008)	Steel Sch.40 (clean)	Containment Sump Water	6	3.8	0	<-->	109.1	1.213	0.001	0.003	N	~N(069)	~N(068)	6.065	0.003	0	83363	0.02004								
CS02H(009)	Steel Sch.40 (clean)	Containment Sump Water	6	3.8	0	<-->	104.1	1.157	0.001	0.003	N	~N(075)	~N(074)	6.065	0.003	0	79515	0.02019								
CS02H(010)	Steel Sch.40 (clean)	Containment Sump Water	6	3.8	0	<-->	105.2	1.169	0.001	0.003	N	~N(066)	~N(069)	6.065	0.003	0	80370	0.02016								
CS02H(011)	Steel Sch.40 (clean)	Containment Sump Water	6	3.8	0	<-->	100.1	1.112	0.001	0.003	N	~N(076)	~N(075)	6.065	0.003	0	76451	0.02032								
CS02H(012)	Steel Sch.40 (clean)	Containment Sump Water	6	3.8	0	<-->	101.2	1.125	0.001	0.003	N	~N(065)	~N(066)	6.065	0.003	0	77306	0.02029								
CS02H(013)	Steel Sch.40 (clean)	Containment Sump Water	6	3.8	0	<-->	96.17	1.069	0.001	0.003	N	~N(080)	~N(076)	6.065	0.003	0	73459	0.02046								
CS02H(014)	Steel Sch.40 (clean)	Containment Sump Water	6	3.8	0	<-->	97.05	1.079	0.001	0.003	N	~N(064)	~N(065)	6.065	0.003	0	74126	0.02043								
CS02H(015)	Steel Sch.40 (clean)	Containment Sump Water	6	3.8	0	<-->	92.01	1.023	0.001	0.002	N	~N(081)	~N(080)	6.065	0.002	0	70279	0.02061								
CS02H(016)	Steel Sch.40 (clean)	Containment Sump Water	6	3.8	0	<-->	93.13	1.035	0.001	0.002	N	~N(060)	~N(064)	6.065	0.002	0	71135	0.02057								
CS02H(017)	Steel Sch.40 (clean)	Containment Sump Water	6	3.8	0	<-->	88	0.978	0	0.002	N	~N(082)	~N(081)	6.065	0.002	0	67217	0.02077								
CS02H(018)	Steel Sch.40 (clean)	Containment Sump Water	6	3.8	0	<-->	89.12	0.991	0	0.002	N	~N(058)	~N(060)	6.065	0.002	0	68072	0.02072								
CS02H(019)	Steel Sch.40 (clean)	Containment Sump Water	6	3.8	0	<-->	84.09	0.935	0	0.002	N	~N(079)	~N(082)	6.065	0.002	0	64226	0.02093								
CS02H(020)	Steel Sch.40 (clean)	Containment Sump Water	6	3.8	0	<-->	84.96	0.944	0	0.002	N	~N(059)	~N(058)	6.065	0.002	0	64894	0.0209								
CS02H(021)	Steel Sch.40 (clean)	Containment Sump Water	6	3.8	0	<-->	79.93	0.888	0	0.002	N	~N(078)	~N(079)	6.065	0.002	0	61049	0.02112								
CS02H(022)	Steel Sch.40 (clean)	Containment Sump Water	6	3.8	0	<-->	81.05	0.901	0	0.002	N	~N(061)	~N(059)	6.065	0.002	0	61904	0.02107								
CS02H(023)	Steel Sch.40 (clean)	Containment Sump Water	6	3.8	0	<-->	75.92	0.844	0	0.002	N	~N(077)	~N(078)	6.065	0.002	0	57987	0.02132								
CS02H(024)	Steel Sch.40 (clean)	Containment Sump Water	6	3.8	0	<-->	77.04	0.856	0	0.002	N	~N(062)	~N(061)	6.065	0.002	0	58843	0.02126								
CS02H(025)	Steel Sch.40 (clean)	Containment Sump Water	6	3.8	0	<-->	72.01	0.8	0	0.002	N	~N(085)	~N(077)	6.065	0.002	0	54996	0.02152								
CS02H(026)	Steel Sch.40 (clean)	Containment Sump Water	6	3.8	0	<-->	72.88	0.81	0	0.002	N	~N(063)	~N(062)	6.065	0.002	0	55666	0.02147								
CS02H(027)	Steel Sch.40 (clean)	Containment Sump Water	6	3.8	0	<-->	67.85	0.754	0	0.001	N	~N(084)	~N(085)	6.065	0.001	0	51822	0.02176								
CS02H(028)	Steel Sch.40 (clean)	Containment Sump Water	6	3.8	0	<-->	68.97	0.767	0	0.001	N	~N(055)	~N(063)	6.065	0.001	0	52678	0.02169								
CS02H(029)	Steel Sch.40 (clean)	Containment Sump Water	6	3.8	0	<-->	63.84	0.71	0	0.001	N	~N(083)	~N(084)	6.065	0.001	0	48762	0.02201								
CS02H(030)	Steel Sch.40 (clean)	Containment Sump Water	6	3.8	0	<-->	64.96	0.722	0	0.001	N	~N(056)	~N(055)	6.065	0.001	0	49618	0.02193								
CS02H(031)	Steel Sch.40 (clean)	Containment Sump Water	6	3.8	0	<-->	59.93	0.666	0	0.001	N	~N(086)	~N(083)	6.065	0.001	0	45774	0.02227								
CS02H(032)	Steel Sch.40 (clean)	Containment Sump Water	6	3.8	0	<-->	60.8	0.676	0	0.001	N	~N(057)	~N(056)	6.065	0.001	0	46442	0.02221								
CS02H(033)	Steel Sch.40 (clean)	Containment Sump Water	6	3.8	0	<-->	55.77	0.62	0	0	N	~N(087)	~N(086)	6.065	0	0	42598	0.02258								
CS02H(034)	Steel Sch.40 (clean)	Containment Sump Water	6	3.8	0	<-->	56.89	0.632	0	0	N	~N(054)	~N(057)	6.065	0	0	43455	0.0225								
CS02H(035)	Steel Sch.40 (clean)	Containment Sump Water	6	3.8	0	<-->	51.76	0.575	0	0	N	~N(088)	~N(087)	6.065	0	0	39539	0.02292								
CS02H(036)	Steel Sch.40 (clean)	Containment Sump Water	6	3.8	0	<-->	52.89	0.588	0	0	N	~N(053)	~N(054)	6.065	0	0	40396	0.02282								
CS02H(037)	Steel Sch.40 (clean)	Containment Sump Water	6	3.8	0	<-->	47.85	0.532	0	0	N	~N(096)	~N(088)	6.065	0	0	36551	0.02328								
CS02H(038)	Steel Sch.40 (clean)	Containment Sump Water	6	3.8	0	<-->	48.73	0.542	0	0	N	~N(052)	~N(053)	6.065	0	0	37220	0.0232								
CS02H(039)	Steel Sch.40 (clean)	Containment Sump Water	6	3.8	0	<-->	43.7	0.486	0	0	N	~N(095)	~N(096)	6.065	0	0	33376	0.02372								
CS02H(040)	Steel Sch.40 (clean)	Containment Sump Water	6	3.8	0	<-->	44.82	0.498	0	0	N	~N(104)	~N(052)	6.065	0	0	34234	0.02359								
CS02H(041)	Steel Sch.40 (clean)	Containment Sump Water	6	3.8	0	<-->	39.69	0.441	0	0	N	~N(097)	~N(095)	6.065	0	0	30317	0.0242								
CS02H(042)	Steel Sch.40 (clean)	Containment Sump Water	6	3.8	0	<-->	40.81	0.454	0	0	N	~N(103)	~N(104)	6.065	0	0	31175	0.02406								
CS02H(043)	Steel Sch.40 (clean)	Containment Sump Water	6	3.6	0.42	<-->	35.78	0.398	0	0.001	N	~N(098)	~N(097)	6.065	0	0.001	27331	0.02474	1 x Reducer - Contraction (6 x 4 - 5.5)	0.42						

CS02H(044)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	36.86	0.407	0	0	N	~N(102)
CS02H(045)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	31.63	0.351	0	0	N	~N(099)
CS02H(046)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	32.75	0.364	0	0	N	~N(101)
CS02H(047)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	27.62	0.307	0	0	N	~N(092)
CS02H(048)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	28.74	0.319	0	0	N	~N(107)
CS02H(049)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	23.71	0.264	0	0	N	~N(093)
CS02H(050)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	24.59	0.273	0	0	N	~N(106)
CS02H(051)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	19.56	0.217	0	0	N	~N(094)
CS02H(052)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	20.68	0.23	0	0	N	~N(105)
CS02H(053)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	15.55	0.173	0	0	N	~N(091)
CS02H(054)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	16.68	0.185	0	0	N	~N(104)
CS02H(055)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	11.64	0.129	0	0	N	~N(090)
CS02H(056)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	12.52	0.139	0	0	N	~N(109)
CS02H(057)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	7.487	0.083	0	0	N	~N(089)
CS02H(058)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	8.61	0.096	0	0	N	~N(110)
CS02H(059)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	3.483	0.039	0	0	N	~N(100)
CS02H(060)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	4.606	0.051	0	0	N	~N(111)
CS02H(061)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	0.427	0.005	0	0	N	~N(100)
CS02J(001)	Steel Sch 40 (clean)	Containment Sump Water	6	1.8	0.0533	<-->	190.6	2.118	0.003	0.008	N	~N(298)
CS02J(002)	Steel Sch 40 (clean)	Containment Sump Water	6	1.8	0.0533	<-->	190.6	2.118	0.003	0.008	N	~N(300)
CS02J(003)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	186.3	2.071	0.003	0.008	N	~N(301)
CS02J(004)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	186.3	2.071	0.003	0.008	N	~N(302)
CS02J(005)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	182.1	2.023	0.003	0.007	N	~N(303)
CS02J(006)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	182.1	2.023	0.003	0.007	N	~N(304)
CS02J(007)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	177.8	1.976	0.003	0.007	N	~N(305)
CS02J(008)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	177.8	1.976	0.003	0.007	N	~N(306)
CS02J(009)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	173.5	1.929	0.003	0.007	N	~N(307)
CS02J(010)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	173.5	1.929	0.003	0.007	N	~N(308)
CS02J(011)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	169.3	1.881	0.003	0.007	N	~N(310)
CS02J(012)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	169.3	1.881	0.003	0.007	N	~N(309)
CS02J(013)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	165	1.834	0.003	0.006	N	~N(311)
CS02J(014)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	165	1.834	0.003	0.006	N	~N(312)
CS02J(015)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	160.8	1.787	0.003	0.006	N	~N(314)

CS02L071	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	92.46	0.593	0	0	N	-N(148)
CS02L072	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	92.56	0.594	0	0	N	-N(179)
CS02L073	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	88.92	0.571	0	0	N	-N(149)
CS02L074	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	88.72	0.569	0	0	N	-N(178)
CS02L075	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	85.07	0.546	0	0	N	-N(150)
CS02L076	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	85.17	0.547	0	0	N	-N(183)
CS02L077	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	81.36	0.522	0	0	N	-N(151)
CS02L078	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	81.46	0.523	0	0	N	-N(182)
CS02L079	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	77.81	0.499	0	0	N	-N(153)
CS02L080	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	77.61	0.498	0	0	N	-N(180)
CS02L081	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	73.97	0.475	0	0	N	-N(152)
CS02L082	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	74.07	0.475	0	0	N	-N(181)
CS02L083	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	70.25	0.451	0	0	N	-N(154)
CS02L084	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	70.36	0.452	0	0	N	-N(191)
CS02L085	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	66.71	0.428	0	0	N	-N(155)
CS02L086	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	66.51	0.427	0	0	N	-N(190)
CS02L087	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	62.86	0.403	0	0	N	-N(157)
CS02L088	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	62.97	0.404	0	0	N	-N(188)
CS02L089	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	59.15	0.38	0	0	N	-N(156)
CS02L090	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	59.25	0.38	0	0	N	-N(189)
CS02L091	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	55.61	0.357	0	0	N	-N(161)
CS02L092	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	55.41	0.356	0	0	N	-N(184)
CS02L093	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	51.76	0.332	0	0	N	-N(160)
CS02L094	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	51.86	0.333	0	0	N	-N(185)
CS02L095	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	48.05	0.308	0	0	N	-N(158)
CS02L096	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	48.15	0.309	0	0	N	-N(187)
CS02L097	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	44.5	0.286	0	0	N	-N(159)
CS02L098	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	44.31	0.284	0	0	N	-N(186)
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

CV08AA(001)	Steel Sch.160 (clean)	Water After RHR HX	4	2.8	0.4721		397.8	13.76	1.209	1.899	N	Centrifugal Charging Pump A	-N(637)	3.438	0.513	1.386	535970	0.01786
CV08AA(002)	Steel Sch.160 (clean)	Water After RHR HX	4	4.8	2.975		332.8	11.51	2.909	6.734	N	-N(637)	-N(638)	3.438	0.62	6.114	446386	0.01801
CV08AA(003)	Steel Sch.40 (clean)	Water After RHR HX	4	12.8	0.9047		332.8	8.393	1.567	1.727	N	-N(638)	-N(639)	4.026	0.736	0.889	382899	0.01771
CV08BA(001)	Steel Sch.160 (clean)	Water After RHR HX	4	1.7	0.2361		382	13.21	0.789	0.927	N	Centrifugal Charging Pump B	-N(634)	3.438	0.288	0.639	514707	0.01789
CV08BA(002)	Steel Sch.160 (clean)	Water After RHR HX	4	3.7	3.211		317	10.96	2.775	6.423	N	-N(634)	-N(635)	3.438	0.435	5.988	427123	0.01806
CV08BA(003)	Steel Sch.40 (clean)	Water After RHR HX	4	103.1	3.333		317	7.995	4.587	6.718	N	-N(635)	-N(636)	4.026	5.413	3.306	364741	0.01776
CV09A(001)	Steel Sch.160 (clean)	Water After RHR HX	4	13.3	5		252.8	8.743	2.996	6.936	N	-N(639)	-N(636)	3.438	1.007	5.929	340590	0.0183
CV09A(002)	Steel Sch.160 (clean)	Water After RHR HX	4	23.3	9.156		569.8	19.71	34.81	63.78	N	-N(636)	-N(643)	3.438	8.62	55.18	767713	0.0176
CV09C(001)	Steel Sch.160 (clean)	Water After RHR HX	3	2.6	0.2638		80	4.75	0.077	0.177	N	-N(642)	-N(640)	2.624	0.085	0.092	141236	0.02044
CV09C(002)	Steel Sch.160 (clean)	Water After RHR HX	3	8.6	12.83		80	4.75	2.062	4.772	N	-N(639)	-N(642)	2.624	0.281	4.491	141236	0.02044
CV09C(003)	Steel Sch.160 (clean)	Water After RHR HX	3	23	11.4		80	4.75	5.03	4.743	N	-N(640)	-N(667)	2.624	0.753	3.99	141236	0.02044
CV09C(004)	Steel Sch.160 (clean)	Water After RHR HX	3	12.5	1.00E-05		0	0	0	0	N	-N(667)	-N(668)	2.624	0	0	0	0
CV12AA	Steel Sch.160 (clean)	Water After RHR HX	3	15.8	7.74	XXX	—	—	—	—	N	-N(638)	-N(678)	2.624	—	—	—	—
CV12AB	Steel Sch.160 (clean)	Water After RHR HX	3	116.7	3.347	XXX	—	—	—	—	N	-N(635)	-N(678)	2.624	—	—	—	—
CV12B	Steel Sch.160 (clean)	Water After RHR HX	3	0.8	0		0	0	0	0	N	-N(678)	-N(679)	2.624	0	0	0	0
CV13D	Steel Sch.160 (clean)	Water After RHR HX	3	13.8	2.251		80	4.75	-2.748	1.239	N	-N(667)	-N(679)	2.624	0.451	0.788	141236	0.02044
CV43A(001)	Steel Sch.160 (clean)	Water After RHR HX	2	92	49.04		0	0	1.944	0	N	-N(668)	-N(680)	1.687	0	0	0	0
CV43A(002)	Steel Sch.160 (clean)	Water After RHR HX	2	60.5	1.116		0	0	0.302	0	N	-N(669)	-N(670)	1.687	0	0	0	0
CV43A(003)	Steel Sch.160 (clean)	Water After RHR HX	2	117.8	2.151		0	0	1.21	0	N	-N(670)	-N(671)	1.687	0	0	0	0
CV43BA/RC16AA	Steel Sch.160 (clean)	Water After RHR HX	2	134.4	15.41	XXX	—	—	—	—	N	-N(671)	Hot Leg A(001)	1.687	—	—	—	—
CV43BB/RC16AB	Steel Sch.160 (clean)	Water After RHR HX	2	19	13.29	XXX	—	—	—	—	N	-N(671)	Hot Leg B(001)	1.687	—	—	—	—
CV43BC/RC16AC	Steel Sch 160 (clean)	Water After RHR HX	2	59.1	13.48	XXX	—	—	—	—	N	-N(670)	Hot Leg C(001)	1.687	—	—	—	—
CV43BD/RC16AD	Steel Sch.160 (clean)	Water After RHR HX	2	51.7	12.9	XXX	—	—	—	—	N	-N(669)	Hot Leg D(001)	1.687	—	—	—	—
CV98A	Steel Sch.40 (clean)	Water After RHR HX	8	5.5	0		649.8	4.17	-2.36	0.036	N	-N(508)	-N(616)	7.981	0.036	0	377145	0.01613
CV98BA	Steel Sch.40 (clean)	Water After RHR HX	8	8.8	0.3769		324.9	2.085	-2.142	0.041	N	-N(618)	-N(621)	7.981	0.018	0.025	188573	0.01743
CV98BB	Steel Sch.40 (clean)	Water After RHR HX	8	8.8	0.3769		324.9	2.085	-2.142	0.041	N	-N(618)	-N(621)	7.981	0.016	0.025	188573	0.01743
CV98C	Steel Sch.40 (clean)	Water After RHR HX	8	6.5	3.2		649.8	4.17	0.391	0.906	N	-N(621)	-N(622)	7.981	0.043	0.863	377145	0.01613
CVA1A/SI13C	Steel Sch.40 (clean)	Water After RHR HX	6	22.5	1.521	XXX	—	—	—	—	N	-N(626)	-N(624)	6.065	—	—	—	—
CVJ4A	Steel Sch.160 (clean)	Water After RHR HX	4	19.8	1.72		569.8	19.71	11.62	17.69	N	-N(643)	-N(644)	3.438	7.33	10.36	767713	0.0176
Pipe(002)	Steel Sch.40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.19	1.557	2.835	7.063	N	A2(001)	-N(073)	1.049	0.006	7.057	18504	0.02995
Pipe(003)	Steel Sch.40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.015	1.492	2.802	6.485	N	A2(003)	-N(072)	1.049	0.006	6.479	17731	0.03018
Pipe(004)	Steel Sch.40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	3.92	1.456	2.8	6.182	N	A2(005)	-N(071)	1.049	0.006	6.176	17311	0.0303
Pipe(005)	Steel Sch.40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	3.922	1.457	2.803	6.189	N	A2(002)	-N(070)	1.049	0.006	6.183	17321	0.0303
Pipe(007)	Steel Sch.40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.015	1.492	2.802	6.485	N	A2(004)	-N(067)	1.049	0.006	6.479	17731	0.03018
Pipe(008)	Steel Sch.40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.185	1.548	2.8	6.981	N	A2(006)	-N(068)	1.049	0.006	6.975	18387	0.02998
Pipe(009)	Steel Sch.40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.165	1.547	2.799	6.978	N	A2(007)	-N(074)	1.049	0.005	6.972	18383	0.02998
Pipe(010)	Steel Sch.40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	3.919	1.456	2.799	6.178	N	A2(008)	-N(069)	1.049	0.006	6.172	17306	0.03031
Pipe(011)	Steel Sch.40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.012	1.491	2.797	6.475	N	A2(009)	-N(075)	1.049	0.006	6.469	17718	0.03018
Pipe(012)	Steel Sch.40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.012	1.491	2.797	6.475	N	A2(010)	-N(066)	1.049	0.006	6.469	17717	0.03018
Pipe(013)	Steel Sch.40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	3.917	1.455	2.796	6.173	N	A2(011)	-N(076)	1.049	0.006	6.167	17299	0.03031
Pipe(014)	Steel Sch.40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.163	1.547	2.796	6.972	N	A2(012)	-N(065)	1.049	0.006	6.966	18385	0.02998

CV08AA(001)	2 x Pipe Bend - r/d 1.5 (90°)	0.2361														
CV08AA(002)	1 x CV8481A(Check Valve)	2.975	1 x Diverging Tee (Through)	1.00E-05												
CV08AA(003)	3 x Pipe Bend - r/d 1.5 (90°)	0.2279	1 x CV8485A	0.221	1 x Diverging Tee (Through)	1.00E-05	1 x Converging Tee (Branch)	1.00E-05								
CV08BA(001)	1 x Pipe Bend - r/d 1.5 (90°)	0.2361														
CV08BA(002)	1 x Pipe Bend - r/d 1.5 (90°)	0.2361	1 x CV8481B(Check Valve)	2.975	1 x Diverging Tee (Through)	1.00E-05										
CV08BA(003)	4 x Pipe Bend - r/d 1.5 (90°)	0.2279	1 x CV8485B (Gate Valve)	0.221	1 x Diverging Tee (Through)	1.00E-05	1 x Converging' Tee (Branch)	2.2								
CV09A(001)	1 x Converging' Tee (Branch)	3.2	1 x Diverging' Tee (Branch)	1.8												
CV09A(002)	4 x Pipe Bend - r/d 1.5 (90°)	0.2361	1 x FE917	7.2	1 x Tee - Flow Thru Branch	1.012										
CV09C(001)	1 x Reducer - Contraction (4 x 3 - 4)	0.03381	1 x CV8483A(Gate Valve)	0.23	1 x Diverging Tee (Through)	1.00E-05										
CV09C(002)	1 x CV8483B(Gate Valve)	0.23	1 x Converging Tee (Through)	1.00E-05	1 x Diverging' Tee (Branch)	12.8										
CV09C(003)	1 x FE121	8.4	1 x Diverging Tee (Branch)	2	1 x Converging Tee (Through)	1.00E-05										
CV09C(004)	1 x Diverging Tee (Through)	1.00E-05														
CV12AA	3 x Pipe Bend - r/d 1.5 (90°)	0.2511	1 x CV8387A(Globe Valve)	6.888	1 x Diverging Tee (Branch)	1.00E-05	1 x Converging' Tee (Branch)	1.00E-05								
CV12AB	9 x Pipe Bend - r/d 1.5 (90°)	0.2511	1 x CV8387B(Globe Valve)	6.888	1 x Diverging Tee (Branch)	1.00E-05	1 x Converging' Tee (Branch)	1.00E-05								
CV12B																
CV13D	1 x Pipe Bend - r/d 1.5 (90°)	0.2511	1 x Converging Tee (Branch)	1.00E-05	1 x Diverging' Tee (Branch)	1.00E-05	1 x Diverging Tee (Branch)	2								
CV43A(001)	13 x Pipe Bend - r/d 1.5 (90°)	0.2791	5 x Pipe Bend - r/d 1.5 (45°)	0.1976	1 x FE139	8.8	1 x CV8345(Globe Valve)	6.891	1 x CV8346(Globe Valve)	6.891	1 x CV8348(Check Valve)	2.005	1 x CV184 (Globe Valve)	23.84	1 x Diverging Tee (Branch)	1.00E-05
CV43A(002)	4 x Pipe Bend - r/d 1.5 (90°)	0.2791	1 x Diverging' Tee (Branch)	1.00E-05												
CV43A(003)	7 x Pipe Bend - r/d 1.5 (90°)	0.2791	1 x Pipe Bend - r/d 1.5 (45°)	0.1976	1 x Diverging Tee (Through)	1.00E-05										
CV43BA/RC16AA	13 x Pipe Bend - r/d 1.5 (90°)	0.2791	1 x RC8038A (Y Globe Valve)	6.891	1 x RC8036A (Globe Valve)	6.891	1 x Diverging Tee (Through)	1.00E-05								
CV43BB/RC16AB	4 x Pipe Bend - r/d 1.5 (90°)	0.2791	2 x Pipe Bend - r/d 1.5 (45°)	0.1976	1 x RC8038B (Y Globe Valve)	6.891	1 x RC8036B (Globe Valve)	6.891	1 x Diverging Tee (Branch)	1.00E-05						
CV43BC/RC16AC	6 x Pipe Bend - r/d 1.5 (90°)	0.2791	1 x RC8038C (Y Globe Valve)	6.891	1 x RC8036C (Globe Valve)	6.891	1 x Diverging Tee (Branch)	1.00E-05								
CV43BD/RC16AD	4 x Pipe Bend - r/d 1.5 (90°)	0.2791	1 x RC8038D (Y Globe Valve)	6.891	1 x RC8036D (Globe Valve)	6.891	1 x Diverging' Tee (Branch)	1.00E-05								
CV98A																
CV98BA	1 x Pipe Bend - r/d 1.5 (90°)	0.1969	1 x CV112D(Gate Valve)	0.18	1 x Converging Tee (Branch)	1.00E-05	1 x Diverging Tee (Branch)	1.00E-05								
CV98BB	1 x Pipe Bend - r/d 1.5 (90°)	0.1969	1 x CV112E(Gate Valve)	0.18	1 x Converging Tee (Through)	1.00E-05	1 x Diverging Tee (Through)	1.00E-05								
CV98C	1 x CV8546(Check Valve)	1.9	1 x Converging Tee (Branch)	1.3												
CVA1A/SI13C	1 x SI8924 (Gate Valve)	0.195	3 x Pipe Bend - r/d 1.5 (90°)	0.2065	1 x Converging Tee (Branch)	0.7										
CVJ4A	3 x Pipe Bend - r/d 1.5 (90°)	0.2361	1 x Tee - Flow Thru Branch	1.012												
Pipe(002)	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1												
Pipe(003)	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1												
Pipe(004)	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1												
Pipe(005)	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1												
Pipe(007)	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1												
Pipe(008)	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1												
Pipe(009)	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1												
Pipe(010)	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1												
Pipe(011)	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1												
Pipe(012)	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1												
Pipe(013)	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1												
Pipe(014)	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1												

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]																												
Pipe(413)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.37	1.995	6.012	11.6	N	~N(442)	B1(052)	1.049	0.01	11.59	23716	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(414)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.37	1.995	6.011	11.6	N	~N(443)	B1(053)	1.049	0.01	11.59	23714	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(415)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.37	1.995	6.011	11.6	N	~N(444)	B1(054)	1.049	0.01	11.59	23714	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(416)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.369	1.995	6.01	11.6	N	~N(445)	B1(055)	1.049	0.01	11.59	23712	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(417)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.369	1.995	6.01	11.6	N	~N(446)	B1(056)	1.049	0.01	11.59	23712	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(418)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.369	1.995	6.01	11.6	N	~N(447)	B1(057)	1.049	0.01	11.59	23711	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(419)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.369	1.995	6.01	11.6	N	~N(448)	B1(058)	1.049	0.01	11.59	23711	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(420)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.369	1.995	6.009	11.59	N	~N(449)	B1(059)	1.049	0.01	11.58	23709	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(421)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.369	1.995	6.009	11.59	N	~N(450)	B1(060)	1.049	0.01	11.58	23709	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(422)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.369	1.995	6.009	11.59	N	~N(451)	B1(061)	1.049	0.01	11.58	23709	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(423)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.368	1.995	6.008	11.59	N	~N(452)	B1(062)	1.049	0.01	11.58	23708	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(424)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.368	1.994	6.008	11.59	N	~N(453)	B1(063)	1.049	0.01	11.58	23707	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(425)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.368	1.994	6.008	11.59	N	~N(454)	B1(064)	1.049	0.01	11.58	23707	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(426)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.368	1.994	6.007	11.59	N	~N(455)	B1(065)	1.049	0.01	11.58	23706	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(427)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.368	1.994	6.007	11.59	N	~N(456)	B1(066)	1.049	0.01	11.58	23706	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(428)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.368	1.994	6.007	11.59	N	~N(457)	B1(067)	1.049	0.01	11.58	23704	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(429)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.368	1.994	6.007	11.59	N	~N(458)	B1(068)	1.049	0.01	11.58	23704	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(430)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.367	1.994	6.007	11.59	N	~N(459)	B1(069)	1.049	0.01	11.58	23703	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(431)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.367	1.994	6.007	11.59	N	~N(460)	B1(070)	1.049	0.01	11.58	23703	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(432)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.367	1.994	6.006	11.59	N	~N(461)	B1(071)	1.049	0.01	11.58	23703	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(433)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.367	1.994	6.006	11.59	N	~N(462)	B1(072)	1.049	0.01	11.58	23703	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(434)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.367	1.994	6.006	11.59	N	~N(463)	B1(073)	1.049	0.01	11.58	23702	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(435)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.367	1.994	6.006	11.59	N	~N(464)	B1(074)	1.049	0.01	11.58	23702	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(436)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.367	1.994	6.006	11.59	N	~N(465)	B1(075)	1.049	0.01	11.58	23701	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(437)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.367	1.994	6.006	11.59	N	~N(466)	B1(076)	1.049	0.01	11.58	23701	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(438)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.367	1.994	6.005	11.59	N	~N(467)	B1(077)	1.049	0.01	11.58	23700	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(439)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.367	1.994	6.005	11.59	N	~N(468)	B1(078)	1.049	0.01	11.58	23700	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(440)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.367	1.994	6.005	11.59	N	~N(469)	B1(079)	1.049	0.01	11.58	23700	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(441)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.367	1.994	6.005	11.59	N	~N(470)	B1(080)	1.049	0.01	11.58	23700	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(442)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	6.005	11.58	N	~N(471)	B1(081)	1.049	0.01	11.57	23699	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(443)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	6.005	11.58	N	~N(472)	B1(082)	1.049	0.01	11.57	23699	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(444)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	6.005	11.58	N	~N(473)	B1(083)	1.049	0.01	11.57	23699	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(445)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	6.005	11.58	N	~N(474)	B1(084)	1.049	0.01	11.57	23699	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(446)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	6.004	11.58	N	~N(475)	B1(085)	1.049	0.01	11.57	23698	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(447)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	6.004	11.58	N	~N(476)	B1(086)	1.049	0.01	11.57	23698	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(448)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	6.004	11.58	N	~N(477)	B1(087)	1.049	0.01	11.57	23698	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(449)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	6.004	11.58	N	~N(478)	B1(088)	1.049	0.01	11.57	23698	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(450)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	6.004	11.58	N	~N(479)	B1(089)	1.049	0.01	11.57	23697	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(451)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	6.004	11.58	N	~N(480)	B1(090)	1.049	0.01	11.57	23697	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(452)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	6.004	11.58	N	~N(481)	B1(091)	1.049	0.01	11.57	23697	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(453)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	6.004	11.58	N	~N(482)	B1(092)	1.049	0.01	11.57	23697	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(454)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	6.004	11.58	N	~N(483)	B1(093)	1.049	0.01	11.57	23697	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(455)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	6.004	11.58	N	~N(484)	B1(094)	1.049	0.01	11.57	23697	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(456)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	6.004	11.58	N	~N(485)	B1(095)	1.049	0.01	11.57	23697	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(457)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	6.004	11.58	N	~N(486)	B1(096)	1.049	0.01	11.57	23697	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(458)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	6.004	11.58	N	~N(487)	B1(097)	1.049	0.01	11.57	23696	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(459)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	6.004	11.58	N	~N(488)	B1(098)	1.049	0.01	11.57	23696	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(460)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	6.004	11.58	N	~N(489)	B1(099)	1.049	0.01	11.57	23696	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(461)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	6.004	11.58	N	~N(490)	B1(100)	1.049	0.01	11.57	23696	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(462)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	6.004	11.58	N	~N(491)	B1(101)	1.049	0.01	11.57	23696	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(463)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	6.004	11.58	N	~N(492)	B1(102)	1.049	0.01	11.57	23696	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(464)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	6.004	11.58	N	~N(493)	B1(103)	1.049	0.01	11.57	23696	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(465)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	6.004	11.58	N	~N(494)	B1(104)	1.049	0.01	11.57	23696	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(466)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	6.003	11.58	N	~N(495)	B1(105)	1.049	0.01	11.57	23696	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(467)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	6.003	11.58	N	~N(496)	B1(106)	1.049	0.01	11.57	23696	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(468)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	6.003	11.58	N	~N(497)	B1(107)	1.049	0.01	11.57	23696	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(469)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	6.003	11.58	N	~N(498)	B1(108)	1.049	0.01	11.57	23696	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(470)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	6.003	11.58	N	~N(499)	B1(109)	1.049	0.01	11.57	23696	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(471)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	6.003	11.58	N	~N(500)	B1(110)	1.049	0.01	11.57	23696	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(472)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	6.003	11.58	N	~N(501)	B1(111)	1.049	0.01	11.57	23696	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(473)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	6.003	11.58	N	~N(502)	B1(112)	1.049	0.01	11.57	23696	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(474)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.863	1.435	2.42	6.602	N	~N(113)	A1(001)	1.049	0.006	5.998	17064	0.03036	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
RC04AA	Steel Sch.140 (clean)	Water After RHR HX	12	10.3	0.318	XXX	—	—	—	—	N	~N(546)	Hot Leg A(002)	10.5	—	—	—	—	1 x Pipe Bend - r/d 1.5 (90°)	0.1862	1 x Pipe Bend - r/d 1.5 (45°)	0.1318	1 x Diverging Tee (Through)	1.00E-05				
RC04AA/RH01AA	Steel Sch.140 (clean)	Water After RHR HX	12	149.6	2.723	XXX	—	—	—	—	N	~N(548)	~N(546)	10.5	—	—	—	—	13 x Pipe Bend - r/d 1.5 (90°)	0.1862	1 x Pipe Bend - r/d 1.5 (45°)	0.1318	1 x RH8701B-2	0.17				
RC04AB	Steel Sch.140 (clean)	Water After RHR HX	12	9.7	1.118	XXX	—	—	—	—	N	~N(542)	Hot Leg C(002)	10.5	—	—	—	—	1 x Pipe Bend - r/d 1.5 (90°)	0.1862	1 x Pipe Bend - r/d 1.5 (45°)	0.1318	1 x Diverging* Tee (Branch)	0.8				
RC04AB/RH01AB	Steel Sch.140 (clean)	Water After RHR HX	12	148.4	3.227	XXX	—	—	—	—	N	~N(542)	~N(551)	10.5	—	—	—	—	15 x Pipe Bend - r/d 1.5 (90°)	0.1862	2 x Pipe Bend - r/d 1.5 (45°)	0.1318	1 x RH8702B-2	0.17	1 x Diverging* Tee (Branch)	1.00E-05		
RC05AA	Steel Sch.160 (clean)	Water After RHR HX	6	7	2.841		0	0	-1.298	0	N	~N(510)	Hot Leg B(002)	5.187	0	0	0	0	1 x Pipe Bend - r/d 1.5 (90°)	0.2156	1 x BI8949B	2.625						
RC05AB	Steel Sch.160 (clean)	Water After RHR HX	6	12.8	3.656		0	0	1.08	0	N	~N(541)	~N(542)	5.187	0	0	0	0	2 x Pipe Bend - r/d 1.5 (90°)	0.2156	1 x BI8949C (Check Valve)	2.625	1 x Converging Tee (Branch)	0.6				
RC35AA	Steel Sch.160 (clean)	Water After RHR HX	6	7.8	4.056		0	0	0.907	0	N	~N(545)	~N(546)	5.187	0	0	0	0	2 x Pipe Bend - r/d 1.5 (90°)	0.2156	1 x BI8949A (Check Valve)	2.625	1 x Diverging Tee (Branch)	1				
RC35AB	Steel Sch.160 (clean)	Water After RHR HX	6	7	2.841		0	0	-1.296	0	N	~N(503)	Hot Leg D(002)	5.187	0	0	0	0	1 x Pipe Bend - r/d 1.5 (90°)	0.2156	1 x BI8949D	2.625						
RC45AA	Steel Sch.160 (clean)	Water After RHR HX	3	0.6	3.805		143.4	8.513	1.874	4.338	N	~N(556)	Cold Leg A(001)	2.624	0.08	4.278	253117	0.01952	1 x Reducer - Enlargement (3 x 1.5 - 3.5)	3.805								
RC45AB	Steel Sch.160 (clean)	Water After RHR HX	3	0.6	3.805		142.9	8.486	1.862	4.311	N	~N(558)	Cold Leg B(001)	2.624	0.08	4.251	252328	0.01952	1 x Reducer - Enlargement (3 x 1.5 - 3.5)	3.805								
RC45AC	Steel Sch.160 (clean)	Water After RHR HX	3	0.6	3.805		141.8	8.418	1.833	4.242	N	~N(552)	Cold Leg C(001)	2.624	0.058	4.184	250304	0.01953	1 x Reducer - Enlargement (3 x 1.5 - 3.5)	3.805								
RC45AD	Steel Sch.160 (clean)	Water After RHR HX	3	0.6	3.805		141.7	8.412	1.83	4.236	N	~N(561)	Cold Leg D(001)	2.624	0.058	4.177	250118	0.01953	1 x Reducer - Enlargement (3 x 1.5 - 3.5)	3.805								
RH01BA(001)	Steel Sch 40S (clean)	Containment Sump Water	12	81	1.439		0	0	-12.57	0	N	~N(548)	~N(549)	12	0	0	0	0	7 x Pipe Bend - r/d 1.5 (90°)	0.1813	1 x RH8701A-1	0.17	1 x Converging Tee (Through)	1.00E-05				
RH01BA(002)	Steel Sch 40S (clean)	Containment Sump Water	12	1.8	1.00E-05		6190	17.58	0.051	0.117	N	~N(549)	~N(004)	12	0.117	0	2.39E+06	0.01356	1 x Converging Tee (Branch)	1.00E-05								
RH01BB(001)	Steel Sch 40S (clean)	Containment Sump Water	12	76.5	1.077		0	0	-12.86	0	N	~N(551)	~N(552)	12	0	0	0	0	5 x Pipe Bend - r/d 1.5 (90°)	0.1813	1 x RH8701A-1	0.17	1 x Converging Tee (Through)	1.00E-05				
RH01BB(002)	Steel Sch 40S (clean)	Containment Sump Water	12	4.5	0.0704		8421	18.23	0.293	6.677	N	~N(552)	~N(553)	12	0.314	0.363	2.48E+06	0.01354	1 x Reducer - Enlargement (16 x 12 - 14)	0.07036	1 x Converging Tee (Branch)	1.00E-05	1 x Converging Tee (Through)	1.00E-05				
RH01BB(003)	Steel Sch 40 (clean)	Containment Sump Water	16	1	0.335		8421	11.87	0.315	0.73	N	~N(553)	~N(235)	15	0.023	0.707	1.96E+06	0.01321	1 x Reducer - Enlargement (12 x 16 - 0)	0.335	1 x Converging Tee (Branch)	1.00E-05						
RH01CA(001)	Steel Sch 40 (clean)	Containment Sump Water	16	64	14.52	<-->	2933	5.329	5.024	6.43	N	~N(502)	~N(004)	15	0.031	8.399	905830	0.01389	1 x Pipe Bend - r/d 1.5 (90°)	0.1229	1 x Diverging* Tee (Branch)	14.4	1 x Converging Tee (Through)	1.00E-05				
RH01CA(002)	Steel Sch 40 (clean)	Containment Sump Water	16	16.2	11.87		3257	5.919	0.41	6.549	N	~N(004)	~N(512)	15	0.097	6.452	1.01E+06	0.01378	1 x Converging Tee (Through)	1.00E-05	1 x Diverging* Tee (Branch)	11.7						
RH01CA(003)	Steel Sch 40 (clean)	Containment Sump Water	16	13.2	0.1736		3257	5.919	0.075	0.173	N	~N(512)	~N(535)	15	0.078	0.094	1.01E+06	0.01378	1 x Pipe Bend - r/d 1.5 (90°)	0.1736								
RH01CA(004)	Steel Sch 40 (clean)	Containment Sump Water	14	8.8	0.1907		3257	7.732	0.645	0.257	N	~N(535)	Residual Heat Removal Pump A	13.124	0.08	0.177	1.15E+06	0.01389	1 x Pipe Bend - r/d 1.5 (90°)	0.1782	1 x Reducer - Contraction (16 x 14 - 14)	0.01254						
RH01CB(001)	Steel Sch 40 (clean)	Containment Sump Water	16	8.3	4.423	<-->	3180	5.778	3.165	2.327	N	~N(230)	~N(234)	15	0.036	2.291	982174	0.01381	1 x Pipe Bend - r/d 1.5 (45°)	0.1229	1 x Converging Tee (Through)	1.00E-05	1 x Diverging* Tee (Branch)	4.3				
RH01CB(002)	Steel Sch 40 (clean)	Containment Sump Water	16	19.1	4.547		3241	5.889	-1.313	2.56	N	~N(235)	~N(524)	15	0.114	2.446	1.00E+06	0.01379	2 x Pipe Bend - r/d 1.5 (90°)	0.1736	1 x Converging Tee (Through)	1.00E-05	1 x Diverging* Tee (Branch)	4.2				
RH01CB(003)	Steel Sch 40 (clean)	Containment Sump Water	16	9.1	0		3241	5.889	0.023	0.054	N	~N(524)	~N(530)	15	0.054	0	1.00E+06	0.01379										
RH01CB(004)	Steel Sch 40 (clean)	Containment Sump Water	14	5.4	0.1907		3241	7.693	0.637	0.238	N	~N(536)	Residual Heat Removal Pump B	13.124	0.063	0.175	1.14E+06	0.01389	1 x Pipe Bend - r/d 1.5 (90°)	0.1782	1 x Reducer - Contraction (16 x 14 - 14)	0.01254						
RH02AA(001)	Steel Sch 40 (clean)	Containment Sump Water	8	67.2	5.15		3257	20.91	28.15	44.95	N	Residual Heat Removal Pump A	~N(513)	7.981	10.03	34.92	1.89E+06	0.01464	1 x FE610	1.7	1 x RH8724A (Gate Valve)	0.182	1 x RH8730A (Check Valve)	1.89	7 x Pipe Bend - r/d 1.5 (90°)	0.1969		
RH02AA(002)	Steel Sch 40 (clean)	Containment Sump Water	8	27.2	0.8694		3257	20.91	1.017	9.955	N	~N(513)	~N(514)	7.981	4.06	5.895	1.89E+06	0.01464	3 x Pipe Bend - r/d 1.5 (90°)	0.1969	1 x Diverging Tee (Through)	1.00E-05	2 x Pipe Bend - r/d 1.5 (45°)	0.1394				
RH02AA(003)	Steel Sch 40 (clean)	Containment Sump Water	14	1	1.465		3257	7.732	0.592	1.37	N	~N(514)	Residual HX A	13.124	0.011	1.359	1.15E+06	0.01389	1 x Reducer - Enlargement (14 x 8 - 13)	1.465								
RH02AB(001)	Steel Sch 40 (clean)	Containment Sump Water	8	126.8	6.02		3241	20.8	34.36	59.15	N	Residual Heat Removal Pump B	~N(525)	7.981	18.74	40.41	1.88E+06	0.01464	1 x FE611	1.7	1 x RH8724B (Gate Valve)	0.182	1 x RH8730B (Check Valve)	1.89	10 x Pipe Bend - r/d 1.5 (90°)	0.1969	2 x Pipe Bend - r/d 1.5 (45°)	0.1394
RH02AB(002)	Steel Sch 40 (clean)	Containment Sump Water	8	25.6	0.8694		3241	20.8	0.829	9.819	N	~N(525)	~N(526)	7.981	3.783	5.836	1.88E+06	0.01464	3 x Pipe Bend - r/d 1.5 (90°)	0.1969	1 x Diverging Tee (Through)	1.00E-05	2 x Pipe Bend - r/d 1.5 (45°)	0.1394				
RH02AB(003)	Steel Sch 40 (clean)	Containment Sump Water	14	1	1.465		3241	7.693	0.586	1.357	N	~N(526)	Residual HX B	13.124	0.012	1.345	1.14E+06	0.01389	1 x Reducer - Enlargement (14 x 8 - 13)	1.465								
RH03AA(001)	Steel Sch 40 (clean)	Water After RHR HX	14	1	0.7153		3257	7.732	0.292	0.675	N	Residual HX A	~N(515)	13.124	0.012	0.663	1.15E+06	0.01389	1 x Reducer - Contraction (14 x 8 - 13)	0.7153								
RH03AA(002)	Steel Sch 40 (clean)	Water After RHR HX	8	22.4	0.8694		3257	20.91	6.41	9.239	N	~N(515)	~N(516)	7.981	3.344	5.895	1.89E+06	0.01464	3 x Pipe Bend - r/d 1.5 (45°)	0.1969	2 x Pipe Bend - r/d 1.5 (45°)	0.1394						
RH03AA(003)	Steel Sch 40 (clean)	Water After RHR HX	8	8.1	3.846		3257	20.91	12.65	27.29	N	~N(516)	~N(517)	7.981	1.21	26.08	1.89E+06	0.01464	2 x Pipe Bend - r/d 1.5 (90°)	0.1969	1 x RH606 (Butterfly Valve)	2.252	1 x Diverging Tee (Through)	1.00E-05	1 x Converging* Tee (Branch)	1.2		
RH03AA(004)	Steel Sch 40 (clean)	Water After RHR HX	8	84.6	2.781		3257	20.91	15.84	28.5	N	~N(517)	~N(518)	7.981	8.64	19.88	1.89E+06	0.01464	6 x Pipe Bend - r/d 1.5 (90°)	0.1969	1 x FE618	1.6	[illegible]					
[illegible]																												

RH03AB(004)	Steel Sch.40 (clean)	Water After RHR HX	6	28.9	2.472		3241
RH03AB(005)	Steel Sch.40 (clean)	Water After RHR HX	6	36.3	14000		27.74
RH03AB(006)	Steel Sch.40S (clean)	Water After RHR HX	12	1.5	1.00E-05		27.74
RH09AA(001)	Steel Sch.40 (clean)	Containment Sump Water	6	1	1.00E-05	XXX	---
RH09AA(002)	Steel Sch.40 (clean)	Containment Sump Water	6	1	1.00E-05	XXX	---
RH09AB(001)	Steel Sch.40 (clean)	Containment Sump Water	6	1	1.00E-05	XXX	---
RH09AB(002)	Steel Sch.40 (clean)	Containment Sump Water	6	1	1.00E-05	XXX	---
RH10AA(001)	Steel Sch.40 (clean)	Water After RHR HX	3	1	1.00E-05	XXX	---
RH10AA(002)	Steel Sch.40 (clean)	Water After RHR HX	3	1	1.00E-05		0
RH10AB(001)	Steel Sch.40 (clean)	Water After RHR HX	3	1	1.00E-05	XXX	---
RH10AB(002)	Steel Sch.40 (clean)	Water After RHR HX	3	1	1.00E-05		0
RH12A/CV8BA	Steel Sch.40 (clean)	Water After RHR HX	8	28.6	5.573	XXX	---
RH14A	Steel Sch.40 (clean)	Water After RHR HX	8	4.4	1.879	XXX	---
SI01A	Steel Sch.40 (clean)	Water After RHR HX	8	28.4	0.8844		0
SI01B(001)	Steel Sch.20 (clean)	Water After RHR HX	24	113.2	0.3195		13959
SI01B(002)	Steel Sch.20 (clean)	Water After RHR HX	24	58	0.3195		13261
SI01B(003)	Steel Sch.20 (clean)	Water After RHR HX	24	4.8	0.4		8840
SI01B(004)	Steel Sch.20 (clean)	Water After RHR HX	24	60.3	0.4524		8840
SI01B(005)	Steel Sch.20 (clean)	Water After RHR HX	24	7	2.00E-05		8840
SI01B(006)	Steel Sch.20 (clean)	Water After RHR HX	24	2	36.3		649.8
SI01B(007)	Steel Sch.20 (clean)	Water After RHR HX	24	1	29.43		649.8
SI02A/SWF9A	Steel Sch.40 (clean)	Water After RHR HX	8	26.3	8.768		897.5

SI82AB/BB	Steel Sch 40 (clean)	Water After RHR HX	12	57.1	4.915	8421	18.42	-1.356	29.96	N	~N(504)	~N(562)	11.938	4.08	25.87	2.49E+06	0.01365	3 x Pipe Bend - r/d 1.5 (90°)	0.1815	1 x SI8858B(Check Valve)	1.8	1 x SI8812B(Gate Valve)	0.17	1 x Diverging Tee (Branch)	1.3	1 x Converging Tee (Branch)	1.1
SI44A	Steel Sch.160 (clean)	Water After RHR HX	8	15.1	1.847	0	0	2.502	0	N	~N(537)	~N(544)	6.815	0	0	0	0	2 x Pipe Bend - r/d 1.5 (90°)	0.2035	1 x SI8841A (Check Valve)	0.84	1 x Diverging Tee (Branch)	1.00E-05	1 x Converging Tee (Through)	9.6		
SI44B	Steel Sch.160 (clean)	Water After RHR HX	8	85.1	2.11	0	0	-0.259	0	N	~N(544)	~N(545)	6.813	0	0	0	0	9 x Pipe Bend - r/d 1.5 (90°)	0.2035	1 x Pipe Bend - r/d 1.5 (45°)	0.144	1 x Reducer - Contraction (8 x 6 - 8)	0.1344				

Node List	Status	Pressure	Grade	Elev
~N(001)		121.8	675.5	428
~N(001A)		58.42	675.5	574.3
~N(002)		30.1	390.8	355.1
~N(003)		33.04	390.8	348.3
~N(004)		35.13	397.2	349.9
~N(005)		157.8	675.5	344.3
~N(006)		157.8	675.5	344.3
~N(007)		156.1	675.5	348.3
~N(008)		151	675.5	360
~N(009)		136	675.5	394.8
~N(010)		62.85	675.5	587.2
~N(011)		50.19	675.6	593.5
~N(012)		50.2	675.7	593.5
~N(013)		50.2	675.7	593.5
~N(014)		50.2	675.7	593.5
~N(015)		50.21	675.7	593.5
~N(016)		50.22	675.7	593.5
~N(017)		50.22	675.7	593.5
~N(018)		50.23	675.7	593.5
~N(019)		50.23	675.7	593.5
~N(020)		50.24	675.8	593.5
~N(021)		50.24	675.8	593.5
~N(022)		50.25	675.8	593.5
~N(023)		50.24	675.8	593.5
~N(024)		50.24	675.8	593.5
~N(025)		50.25	675.8	593.5
~N(026)		50.25	675.8	593.5
~N(027)		50.25	675.8	593.5
~N(028)		50.25	675.8	593.5
~N(029)		50.25	675.8	593.5
~N(030)		50.25	675.8	593.5
~N(031)		50.25	675.8	593.5
~N(032)		50.25	675.8	593.5
~N(033)		50.2	675.7	593.5
~N(034)		50.21	675.7	593.5
~N(035)		50.22	675.7	593.5
~N(036)		50.23	675.7	593.5
~N(037)		50.23	675.7	593.5
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~N(476)	60	671.9	567
~N(477)	60	671.9	567
~N(478)	60	671.9	567
~N(479)	60	671.9	567
~N(480)	60	671.9	567
~N(481)	60	671.9	567
~N(482)	60	671.9	567
~N(483)	60	671.9	567
~N(484)	60	671.9	567
~N(485)	60	671.9	567
~N(486)	60	671.9	567
~N(487)	60	671.9	567
~N(488)	60	671.9	567
~N(489)	60	671.9	567
~N(490)	60	671.9	567
~N(491)	60	671.9	567
~N(492)	60	671.9	567
~N(493)	60	671.9	567
~N(494)	60	671.9	567
~N(495)	60	671.9	567
~N(496)	60	671.9	567
~N(497)	60	671.9	567
~N(498)	60	671.9	567
~N(499)	60	671.9	567
~N(500)	60	671.9	567
~N(501)	60	671.9	567
~N(502)	60	671.9	567
~N(503)	33.58	425.6	381.8
~N(504)	32.6	424.4	383
~N(505)	32.53	424.3	383
~N(506)	32.37	423.9	383
~N(507)	32.37	423.9	383
~N(508)	32.26	423.6	383
~N(509)	32.31	423.8	383
~N(512)	34.72	390.6	344.3
~N(513)	164.1	713.2	367.3
~N(514)	163.1	703.2	358.7
[illegible]	147.5	856.6	358.7
[illegible]	135.1	846.5	365.3
[illegible]	123.5	818	367.3
[illegible]	107.8	590.5	375
[illegible]	103	578.6	375
[illegible]	105.3	584.6	375
[illegible]	105.3	584.6	375
[illegible]	105.2	584.6	375
[illegible]	34.66	390.5	344.3
[illegible]	159.2	702	357.5
[illegible]	154.4	867.4	358.8
[illegible]	138	843.2	358.8
[illegible]	130.7	836	357.4
[illegible]	129.8	812.8	367.4
[illegible]	106.3	667.7	375
[illegible]	105.3	584.6	375
[illegible]	34.64	390.5	344.3
[illegible]	34.64	390.5	344.3
[illegible]	103.6	584.6	375
[illegible]	35.78	423.6	375
[illegible]	103.6	584.6	379
[illegible]	103.6	584.6	379
[illegible]	101.2	584.6	384.5
[illegible]	100.1	584.6	387
[illegible]	101	584.6	385
[illegible]	101.5	584.6	384.4

Tank List	Surface Pressure	Level	Status	Flow	Pressure	Grade	Elev
Accumulator Tank A	1000	0		0	1000	2709	[illegible]
Accumulator Tank B	1000	0		0	1000	2709	[illegible]
Accumulator Tank C	1000	0		0	1000	2709	[illegible]
Accumulator Tank D	1000	0		0	1000	2709	[illegible]
Cont. Recirc. Sump A	19.3	10.8		[illegible]	[illegible]	[illegible]	[illegible]
Cont. Recirc. Sump B	19.3	10.8		[illegible]	[illegible]	[illegible]	[illegible]
Refueling Water Storage Tank	14.7	33.3		[illegible]	[illegible]	[illegible]	384

Demand List	Demand Type	Flow	Pressure	Status	Grade	Elev
[illegible]	Flow in	[illegible]	[illegible]		[illegible]	[illegible]
[illegible]	Flow in	[illegible]	[illegible]		[illegible]	[illegible]
[illegible]	Flow out	[illegible]	[illegible]		[illegible]	[illegible]
[illegible]	Flow out	[illegible]	[illegible]		[illegible]	[illegible]
[illegible]	Flow in	[illegible]	[illegible]		[illegible]	[illegible]
[illegible]	Flow in	[illegible]	[illegible]		[illegible]	[illegible]
[illegible]	Flow out	[illegible]	[illegible]		[illegible]	[illegible]
[illegible]	Flow out	[illegible]	[illegible]		[illegible]	[illegible]
[illegible]	Flow out	[illegible]	[illegible]		[illegible]	[illegible]
[illegible]	Flow out	[illegible]	[illegible]		[illegible]	[illegible]
[illegible]	Flow out	[illegible]	[illegible]		[illegible]	[illegible]
[illegible]	Spray	[illegible]	55		[illegible]	[illegible]
[illegible]	Spray	[illegible]	55		[illegible]	[illegible]
[illegible]	Spray	[illegible]	55		[illegible]	[illegible]
[illegible]	Spray	[illegible]	55		[illegible]	[illegible]
[illegible]	Spray	[illegible]	55		[illegible]	[illegible]
[illegible]	Spray	[illegible]	55		[illegible]	[illegible]
[illegible]	Spray	[illegible]	55		[illegible]	[illegible]
[illegible]	Spray	[illegible]	55		[illegible]	[illegible]
[illegible]	Spray	[illegible]	55		[illegible]	[illegible]
[illegible]	Spray	[illegible]	55		[illegible]	[illegible]

A1(011)	Spray	3.557	55	669.6	576.3
A1(012)	Spray	3.856	55	668.7	575.4
A1(013)	Spray	3.858	55	668.7	575.4
A1(014)	Spray	3.556	55	669.6	576.3
A1(015)	Spray	3.726	55	669.1	575.8
A1(016)	Spray	3.726	55	669.1	575.8
A1(017)	Spray	3.555	55	669.6	576.3
A1(018)	Spray	3.857	55	668.7	575.4
A1(019)	Spray	3.856	55	668.7	575.4
A1(020)	Spray	3.554	55	669.6	576.3
A1(021)	Spray	3.724	55	669.1	575.8
A1(022)	Spray	3.724	55	669.1	575.8
A1(023)	Spray	3.553	55	669.6	576.3
A1(024)	Spray	3.855	55	668.7	575.4
A1(025)	Spray	3.854	55	668.7	575.4
A1(026)	Spray	3.552	55	669.6	576.3
A1(027)	Spray	3.723	55	669.1	575.8
A1(028)	Spray	3.723	55	669.1	575.8
A1(029)	Spray	3.551	55	669.6	576.3
A1(030)	Spray	3.853	55	668.7	575.4
A1(031)	Spray	3.853	55	668.7	575.4
A1(032)	Spray	3.551	55	669.6	576.3
A1(033)	Spray	3.721	55	669.1	575.8
A1(034)	Spray	3.721	55	669.1	575.8
A1(035)	Spray	3.55	55	669.6	576.3
A1(036)	Spray	3.852	55	668.7	575.4
A1(037)	Spray	3.851	55	668.7	575.4
A1(038)	Spray	3.549	55	669.6	576.3
A1(039)	Spray	3.72	55	669.1	575.8
A1(040)	Spray	3.72	55	669.1	575.8
A1(041)	Spray	3.548	55	669.6	576.3
A1(042)	Spray	3.851	55	668.7	575.4
A1(043)	Spray	3.85	55	668.7	575.4
A1(044)	Spray	3.548	55	669.6	576.3
A1(045)	Spray	3.718	55	669.1	575.8
A1(046)	Spray	3.718	55	669.1	575.8
A1(047)	Spray	3.547	55	669.6	576.3
A1(048)	Spray	3.85	55	668.7	575.4
A1(049)	Spray	3.849	55	668.7	575.4
A1(050)	Spray	3.547	55	669.6	576.3
A1(051)	Spray	3.717	55	669.1	575.8
A1(052)	Spray	3.717	55	669.1	575.8
A1(053)	Spray	3.546	55	669.6	576.3
A1(054)	Spray	3.849	55	668.7	575.4
A1(055)	Spray	3.849	55	668.7	575.4
A1(056)	Spray	3.546	55	669.6	576.3
A1(057)	Spray	3.717	55	669.1	575.8
A1(058)	Spray	3.717	55	669.1	575.8
A1(059)	Spray	3.545	55	669.6	576.3
A1(060)	Spray	3.848	55	668.7	575.4
A1(061)	Spray	3.848	55	668.7	575.4
A1(062)	Spray	3.545	55	669.6	576.3
A1(063)	Spray	3.716	55	669.1	575.8
A1(064)	Spray	3.716	55	669.1	575.8
A1(065)	Spray	3.544	55	669.6	576.3
A1(066)	Spray	3.847	55	668.7	575.4
A1(067)	Spray	3.847	55	668.7	575.4
A1(068)	Spray	3.544	55	669.6	576.3
A1(069)	Spray	3.715	55	669.1	575.8
A1(070)	Spray	3.715	55	669.1	575.8
A1(071)	Spray	3.544	55	669.6	576.3
A1(072)	Spray	3.847	55	668.7	575.4
A1(073)	Spray	3.846	55	668.7	575.4
A1(074)	Spray	3.544	55	669.6	576.3
A1(075)	Spray	3.715	55	669.1	575.8
A1(076)	Spray	3.715	55	669.1	575.8
A1(077)	Spray	3.543	55	669.6	576.3
A1(078)	Spray	3.846	55	668.7	575.4
A1(079)	Spray	3.846	55	668.7	575.4
A1(080)	Spray	3.543	55	669.6	576.3
A1(081)	Spray	3.714	55	669.1	575.8
A1(082)	Spray	3.714	55	669.1	575.8
A1(083)	Spray	3.543	55	669.6	576.3
A1(084)	Spray	3.846	55	668.7	575.4
A1(085)	Spray	3.846	55	668.7	575.4
A1(086)	Spray	3.543	55	669.6	576.3
A1(087)	Spray	3.714	55	669.1	575.8
A1(088)	Spray	3.714	55	669.1	575.8
A1(089)	Spray	3.543	55	669.6	576.3
A1(090)	Spray	3.846	55	668.7	575.4
A1(091)	Spray	3.846	55	668.7	575.4
A1(092)	Spray	3.542	55	669.6	576.3
A1(093)	Spray	3.714	55	669.1	575.8
A1(094)	Spray	3.714	55	669.1	575.8
A1(095)	Spray	3.542	55	669.6	576.3
A1(096)	Spray	3.845	55	668.7	575.4
A1(097)	Spray	3.845	55	668.7	575.4
A1(098)	Spray	3.542	55	669.6	576.3
A1(099)	Spray	3.714	55	669.1	575.8
A1(100)	Spray	3.714	55	669.1	575.8
A1(101)	Spray	3.542	55	669.6	576.3
A1(102)	Spray	3.845	55	668.7	575.4
A1(103)	Spray	3.845	55	668.7	575.4
A1(104)	Spray	3.542	55	669.6	576.3
A1(105)	Spray	3.714	55	669.1	575.8
A1(106)	Spray	3.714	55	669.1	575.8
A1(107)	Spray	3.542	55	669.6	576.3
A1(108)	Spray	3.845	55	668.7	575.4
A1(109)	Spray	3.845	55	668.7	575.4
A1(110)	Spray	3.542	55	669.6	576.3
A1(111)	Spray	3.714	55	669.1	575.8
A1(112)	Spray	3.714	55	669.1	575.8
A1(113)	Spray	3.542	55	669.6	576.3
A1(114)	Spray	3.845	55	668.7	575.4
A1(115)	Spray	3.845	55	668.7	575.4
A1(116)	Spray	3.542	55	669.6	576.3
A1(117)	Spray	3.714	55	669.1	575.8
A1(118)	Spray	3.714	55	669.1	575.8
A1(119)	Spray	3.542	55	669.6	576.3
A1(120)	Spray	3.845	55	668.7	575.4
A2(001)	Spray	4.19	55	682.8	589.5
A2(002)	Spray	3.922	55	682	588.7
A2(003)	Spray	4.015	55	682.3	589
A2(004)	Spray	4.015	55	682.3	589
A2(005)	Spray	3.92	55	682	588.7
A2(006)	Spray	4.166	55	682.8	589.5
A2(007)	Spray	4.165	55	682.8	589.5
A2(008)	Spray	3.918	55	682	588.7
A2(009)	Spray	4.012	55	682.3	589
A2(010)	Spray	4.012	55	682.3	589
A2(011)	Spray	3.917	55	682	588.7
A2(012)	Spray	4.163	55	682.8	589.5
A2(013)	Spray	4.162	55	682.8	589.5
A2(014)	Spray	3.916	55	682	588.7
A2(015)	Spray	4.01	55	682.3	589
A2(016)	Spray	4.01	55	682.3	589
A2(017)	Spray	3.915	55	682	588.7
A2(018)	Spray	4.161	55	682.8	589.5
A2(019)	Spray	4.161	55	682.8	589.5
A2(020)	Spray	3.914	55	682	588.7
A2(021)	Spray	4.008	55	682.3	589
A2(022)	Spray	4.008	55	682.3	589
A2(023)	Spray	3.913	55	682	588.7
A2(024)	Spray	4.159	55	682.8	589.5
A2(025)	Spray	4.159	55	682.8	589.5
A2(026)	Spray	3.912	55	682	588.7
A2(027)	Spray	4.006	55	682.3	589
A2(028)	Spray	4.006	55	682.3	589
A2(029)	Spray	3.912	55	682	588.7
A2(030)	Spray	4.158	55	682.8	589.5
A2(031)	Spray	4.158	55	682.8	589.5
A2(032)	Spray	3.911	55	682	588.7
A2(033)	Spray	4.005	55	682.3	589
A2(034)	Spray	4.005	55	682.3	589
A2(035)	Spray	3.911	55	682	588.7
A2(036)	Spray	4.157	55	682.8	589.5
A2(037)	Spray	4.157	55	682.8	589.5
A2(038)	Spray	3.91	55	682	588.7
A2(039)	Spray	4.005	55	682.3	589
A2(040)	Spray	4.004	55	682.3	589
A2(041)	Spray	3.91	55	682	588.7
A2(042)	Spray	4.157	55	682.8	589.5
A2(043)	Spray	4.156	55	682.8	589.5
A2(044)	Spray	3.91	55	682	588.7
A2(045)	Spray	4.004	55	682.3	589
A2(046)	Spray	4.004	55	682.3	589
A2(047)	Spray	3.91	55	682	588.7
A2(048)	Spray	4.156	55	682.8	589.5
A2(049)	Spray	4.156	55	682.8	589.5
A2(050)	Spray	3.91	55	682	588.7
A2(051)	Spray	4.004	55	682.3	589
A2(052)	Spray	4.004	55	682.3	589
A2(053)	Spray	3.909	55	682	588.7
A2(054)	Spray	4.156	55	682.8	589.5
A2(055)	Spray	4.156	55	682.8	589.5
A2(056)	Spray	3.909	55	682	588.7
A2(057)	Spray	4.004	55	682.3	589
A2(058)	Spray	4.004	55	682.3	589
A2(059)	Spray	3.909	55	682	588.7
A2(060)	Spray	4.179	55	682.8	589.5
A3(001)	Spray	5.211	55	686.6	593.3
A3(002)	Spray	5.258	55	686.8	593.5
A3(003)	Spray	5.207	55	686.6	593.3
A3(004)	Spray	5.207	55	686.6	593.3
A3(005)	Spray	5.29	55	686.8	593.5
A3(006)	Spray	5.203	55	686.6	593.3
A3(007)	Spray	5.199	55	686.6	593.3
A3(008)	Spray	5.247	55	686.8	593.5
A3(009)	Spray	5.196	55	686.6	593.3
A3(010)	Spray	5.196	55	686.6	593.3
A3(011)	Spray	5.241	55	686.8	593.5

A3(012)	Spray	5.193	55	686.6	593.3
A3(013)	Spray	5.191	55	686.6	593.3
A3(014)	Spray	5.238	55	686.8	593.5
A3(015)	Spray	5.188	55	686.6	593.3
A3(016)	Spray	5.188	55	686.6	593.3
A3(017)	Spray	5.234	55	686.8	593.5
A3(018)	Spray	5.187	55	686.6	593.3
A3(019)	Spray	5.185	55	686.6	593.3
A3(020)	Spray	5.233	55	686.8	593.5
A3(021)	Spray	5.184	55	686.6	593.3
A3(022)	Spray	5.184	55	686.6	593.3
A3(023)	Spray	5.231	55	686.8	593.5
A3(024)	Spray	5.183	55	686.6	593.3
A3(025)	Spray	5.182	55	686.6	593.3
A3(026)	Spray	5.23	55	686.8	593.5
A3(027)	Spray	5.181	55	686.6	593.3
A3(028)	Spray	5.181	55	686.6	593.3
A3(029)	Spray	5.229	55	686.8	593.5
A3(030)	Spray	5.181	55	686.6	593.3
A3(031)	Spray	5.181	55	686.6	593.3
A3(032)	Spray	5.228	55	686.8	593.5
A3(033)	Spray	5.18	55	686.6	593.3
A3(034)	Spray	5.18	55	686.6	593.3
A3(035)	Spray	5.228	55	686.8	593.5
A3(036)	Spray	5.18	55	686.6	593.3
A3(037)	Spray	5.18	55	686.6	593.3
A3(038)	Spray	5.228	55	686.8	593.5
A3(039)	Spray	5.18	55	686.6	593.3
B1(001)	Spray	5.39	55	660.3	567
B1(002)	Spray	5.39	55	660.3	567
B1(003)	Spray	5.389	55	660.3	567
B1(004)	Spray	5.389	55	660.3	567
B1(005)	Spray	5.388	55	660.3	567
B1(006)	Spray	5.388	55	660.3	567
B1(007)	Spray	5.387	55	660.3	567
B1(008)	Spray	5.387	55	660.3	567
B1(009)	Spray	5.385	55	660.3	567
B1(010)	Spray	5.385	55	660.3	567
B1(011)	Spray	5.384	55	660.3	567
B1(012)	Spray	5.384	55	660.3	567
B1(013)	Spray	5.383	55	660.3	567
B1(014)	Spray	5.383	55	660.3	567
B1(015)	Spray	5.382	55	660.3	567
B1(016)	Spray	5.382	55	660.3	567
B1(017)	Spray	5.381	55	660.3	567
B1(018)	Spray	5.381	55	660.3	567
B1(019)	Spray	5.381	55	660.3	567
B1(020)	Spray	5.381	55	660.3	567
B1(021)	Spray	5.38	55	660.3	567
B1(022)	Spray	5.38	55	660.3	567
B1(023)	Spray	5.379	55	660.3	567
B1(024)	Spray	5.379	55	660.3	567
B1(025)	Spray	5.378	55	660.3	567
B1(026)	Spray	5.378	55	660.3	567
B1(027)	Spray	5.377	55	660.3	567
B1(028)	Spray	5.377	55	660.3	567
B1(029)	Spray	5.376	55	660.3	567
B1(030)	Spray	5.376	55	660.3	567
B1(031)	Spray	5.376	55	660.3	567
B1(032)	Spray	5.376	55	660.3	567
B1(033)	Spray	5.375	55	660.3	567
B1(034)	Spray	5.375	55	660.3	567
B1(035)	Spray	5.374	55	660.3	567
B1(036)	Spray	5.374	55	660.3	567
B1(037)	Spray	5.374	55	660.3	567
B1(038)	Spray	5.374	55	660.3	567
B1(039)	Spray	5.373	55	660.3	567
B1(040)	Spray	5.373	55	660.3	567
B1(041)	Spray	5.373	55	660.3	567
B1(042)	Spray	5.373	55	660.3	567
B1(043)	Spray	5.372	55	660.3	567
B1(044)	Spray	5.372	55	660.3	567
B1(045)	Spray	5.372	55	660.3	567
B1(046)	Spray	5.372	55	660.3	567
B1(047)	Spray	5.371	55	660.3	567
B1(048)	Spray	5.371	55	660.3	567
B1(049)	Spray	5.371	55	660.3	567
B1(050)	Spray	5.371	55	660.3	567
B1(051)	Spray	5.37	55	660.3	567
B1(052)	Spray	5.37	55	660.3	567
B1(053)	Spray	5.37	55	660.3	567
B1(054)	Spray	5.37	55	660.3	567
B1(055)	Spray	5.369	55	660.3	567
B1(056)	Spray	5.369	55	660.3	567
B1(057)	Spray	5.369	55	660.3	567
B1(058)	Spray	5.369	55	660.3	567
B1(059)	Spray	5.369	55	660.3	567
B1(060)	Spray	5.368	55	660.3	567
B1(061)	Spray	5.368	55	660.3	567
B1(062)	Spray	5.368	55	660.3	567
B1(063)	Spray	5.368	55	660.3	567
B1(064)	Spray	5.368	55	660.3	567
B1(065)	Spray	5.368	55	660.3	567
B1(066)	Spray	5.368	55	660.3	567
B1(067)	Spray	5.368	55	660.3	567
B1(068)	Spray	5.368	55	660.3	567
B1(069)	Spray	5.367	55	660.3	567
B1(070)	Spray	5.367	55	660.3	567
B1(071)	Spray	5.367	55	660.3	567
B1(072)	Spray	5.367	55	660.3	567
B1(073)	Spray	5.367	55	660.3	567
B1(074)	Spray	5.367	55	660.3	567
B1(075)	Spray	5.367	55	660.3	567
B1(076)	Spray	5.367	55	660.3	567
B1(077)	Spray	5.367	55	660.3	567
B1(078)	Spray	5.367	55	660.3	567
B1(079)	Spray	5.367	55	660.3	567
B1(080)	Spray	5.367	55	660.3	567
B1(081)	Spray	5.366	55	660.3	567
B1(082)	Spray	5.366	55	660.3	567
B1(083)	Spray	5.366	55	660.3	567
B1(084)	Spray	5.366	55	660.3	567
B1(085)	Spray	5.366	55	660.3	567
B1(086)	Spray	5.366	55	660.3	567
B1(087)	Spray	5.366	55	660.3	567
B1(088)	Spray	5.366	55	660.3	567
B1(089)	Spray	5.366	55	660.3	567
B1(090)	Spray	5.366	55	660.3	567
B1(091)	Spray	5.366	55	660.3	567
B1(092)	Spray	5.366	55	660.3	567
B1(093)	Spray	5.366	55	660.3	567
B1(094)	Spray	5.366	55	660.3	567
B1(095)	Spray	5.366	55	660.3	567
B1(096)	Spray	5.366	55	660.3	567
B1(097)	Spray	5.366	55	660.3	567
B1(098)	Spray	5.366	55	660.3	567
B1(099)	Spray	5.366	55	660.3	567
B1(100)	Spray	5.366	55	660.3	567
B1(101)	Spray	5.366	55	660.3	567
B1(102)	Spray	5.366	55	660.3	567
B1(103)	Spray	5.366	55	660.3	567
B1(104)	Spray	5.366	55	660.3	567
B1(105)	Spray	5.366	55	660.3	567
B1(106)	Spray	5.366	55	660.3	567
B1(107)	Spray	5.366	55	660.3	567
B1(108)	Spray	5.366	55	660.3	567
B1(109)	Spray	5.366	55	660.3	567
B1(110)	Spray	5.366	55	660.3	567
B1(111)	Spray	5.366	55	660.3	567
B1(112)	Spray	5.366	55	660.3	567
B2(001)	Spray	4.262	55	682.3	589
B2(002)	Spray	4.262	55	682.3	589
B2(003)	Spray	4.259	55	682.3	589
B2(004)	Spray	4.259	55	682.3	589
B2(005)	Spray	4.257	55	682.3	589
B2(006)	Spray	4.257	55	682.3	589
B2(007)	Spray	4.256	55	682.3	589
B2(008)	Spray	4.255	55	682.3	589
B2(009)	Spray	4.253	55	682.3	589
B2(010)	Spray	4.253	55	682.3	589
B2(011)	Spray	4.251	55	682.3	589
B2(012)	Spray	4.251	55	682.3	589
B2(013)	Spray	4.249	55	682.3	589
B2(014)	Spray	4.249	55	682.3	589
B2(015)	Spray	4.248	55	682.3	589
B2(016)	Spray	4.246	55	682.3	589
B2(017)	Spray	4.246	55	682.3	589
B2(018)	Spray	4.246	55	682.3	589
B2(019)	Spray	4.244	55	682.3	589
B2(020)	Spray	4.244	55	682.3	589
B2(021)	Spray	4.243	55	682.3	589
B2(022)	Spray	4.243	55	682.3	589
B2(023)	Spray	4.241	55	682.3	589
B2(024)	Spray	4.241	55	682.3	589
B2(025)	Spray	4.24	55	682.3	589
B2(026)	Spray	4.24	55	682.3	589
B2(027)	Spray	4.239	55	682.3	589
B2(028)	Spray	4.238	55	682.3	589
B2(029)	Spray	4.238	55	682.3	589
B2(030)	Spray	4.237	55	682.3	589
B2(031)	Spray	4.237	55	682.3	589
B2(032)	Spray	4.237	55	682.3	589
B2(033)	Spray	4.235	55	682.3	589
B2(034)	Spray	4.235	55	682.3	589
B2(035)	Spray	4.234	55	682.3	589
B2(036)	Spray	4.234	55	682.3	589
B2(037)	Spray	4.234	55	682.3	589
B2(038)	Spray	4.233	55	682.3	589
B2(039)	Spray	4.233	55	682.3	589
B2(040)	Spray	4.233	55	682.3	589
B2(041)	Spray	4.232	55	682.3	589

B2(042)	Spray	4.232	55		682.3	589
B2(043)	Spray	4.231	55		682.3	589
B2(044)	Spray	4.231	55		682.3	589
B2(045)	Spray	4.23	55		682.3	589
B2(046)	Spray	4.23	55		682.3	589
B2(047)	Spray	4.23	55		682.3	589
B2(048)	Spray	4.23	55		682.3	589
B2(049)	Spray	4.229	55		682.3	589
B2(050)	Spray	4.229	55		682.3	589
B2(051)	Spray	4.229	55		682.3	589
B2(052)	Spray	4.229	55		682.3	589
B2(053)	Spray	4.228	55		682.3	589
B2(054)	Spray	4.228	55		682.3	589
B2(055)	Spray	4.228	55		682.3	589
B2(056)	Spray	4.228	55		682.3	589
B2(057)	Spray	4.227	55		682.3	589
B2(058)	Spray	4.227	55		682.3	589
B2(059)	Spray	4.227	55		682.3	589
B2(060)	Spray	4.227	55		682.3	589
B2(061)	Spray	4.227	55		682.3	589
B2(062)	Spray	4.227	55		682.3	589
B2(063)	Spray	4.226	55		682.3	589
B2(064)	Spray	4.226	55		682.3	589
B2(065)	Spray	4.226	55		682.3	589
B2(066)	Spray	4.226	55		682.3	589
B2(067)	Spray	4.226	55		682.3	589
B2(068)	Spray	4.226	55		682.3	589
B2(069)	Spray	4.226	55		682.3	589
B2(070)	Spray	4.226	55		682.3	589
B2(071)	Spray	4.226	55		682.3	589
B2(072)	Spray	4.226	55		682.3	589
B2(073)	Spray	4.226	55		682.3	589
B2(074)	Spray	4.226	55		682.3	589
B2(075)	Spray	4.225	55		682.3	589
B2(076)	Spray	4.225	55		682.3	589
B2(077)	Spray	4.225	55		682.3	589
B2(078)	Spray	4.225	55		682.3	589
B2(079)	Spray	4.225	55		682.3	589
B2(080)	Spray	4.225	55		682.3	589
B2(081)	Spray	4.225	55		682.3	589
B2(082)	Spray	4.225	55		682.3	589
B2(083)	Spray	4.225	55		682.3	589
B2(084)	Spray	4.225	55		682.3	589
B2(085)	Spray	4.225	55		682.3	589
B2(086)	Spray	4.225	55		682.3	589
B2(087)	Spray	4.225	55		682.3	589
B2(088)	Spray	4.225	55		682.3	589
B2(089)	Spray	4.225	55		682.3	589
B2(090)	Spray	4.225	55		682.3	589
B3(001)	Spray	4.325	55		682.3	589
B3(002)	Spray	4.325	55		682.3	589
B3(003)	Spray	4.325	55		682.3	589
B3(004)	Spray	4.324	55		682.3	589
B3(005)	Spray	4.324	55		682.3	589
B3(006)	Spray	4.324	55		682.3	589
B3(007)	Spray	4.323	55		682.3	589
B3(008)	Spray	4.323	55		682.3	589
B3(009)	Spray	4.323	55		682.3	589
B3(010)	Spray	4.323	55		682.3	589
B3(011)	Spray	4.322	55		682.3	589
B3(012)	Spray	4.322	55		682.3	589
B3(013)	Spray	4.322	55		682.3	589
B3(014)	Spray	4.322	55		682.3	589
B3(015)	Spray	4.321	55		682.3	589
B3(016)	Spray	4.321	55		682.3	589
B3(017)	Spray	4.321	55		682.3	589
B3(018)	Spray	4.321	55		682.3	589
B3(019)	Spray	4.321	55		682.3	589
B3(020)	Spray	4.321	55		682.3	589
B3(021)	Spray	4.32	55		682.3	589
B3(022)	Spray	4.32	55		682.3	589
B3(023)	Spray	4.32	55		682.3	589
B3(024)	Spray	4.32	55		682.3	589
B3(025)	Spray	4.32	55		682.3	589
B3(026)	Spray	4.32	55		682.3	589
B3(027)	Spray	4.319	55		682.3	589
B3(028)	Spray	4.319	55		682.3	589
B3(029)	Spray	4.319	55		682.3	589
B3(030)	Spray	4.319	55		682.3	589
B3(031)	Spray	4.319	55		682.3	589
B3(032)	Spray	4.319	55		682.3	589
B3(033)	Spray	4.319	55		682.3	589
B3(034)	Spray	4.319	55		682.3	589
B3(035)	Spray	4.319	55		682.3	589
B3(036)	Spray	4.319	55		682.3	589
B3(037)	Spray	4.319	55		682.3	589
B3(038)	Spray	4.319	55		682.3	589
B3(039)	Spray	4.319	55		682.3	589
B3(040)	Spray	4.319	55		682.3	589
B3(041)	Spray	4.319	55		682.3	589
B3(042)	Spray	4.319	55		682.3	589
B3(043)	Spray	4.319	55		682.3	589
B3(044)	Spray	4.319	55		682.3	589
B3(045)	Spray	4.319	55		682.3	589
B3(046)	Spray	4.319	55		682.3	589
B3(047)	Spray	4.319	55		682.3	589
B3(048)	Spray	4.319	55		682.3	589
B3(049)	Spray	4.319	55		682.3	589
B3(050)	Spray	4.319	55		682.3	589
B3(051)	Spray	4.319	55		682.3	589
Cold Leg A(001)	Boundary pressure	143.4	29		426.1	393
Cold Leg A(002)	Boundary pressure	1679	29		426.1	393
Cold Leg B(001)	Boundary pressure	142.8	29		426.1	393
Cold Leg B(002)	Boundary pressure	1576	29		426.1	393
Cold Leg C(001)	Boundary pressure	141.8	29		426.1	393
Cold Leg C(002)	Boundary pressure	1956	29		426.1	393
Cold Leg D(001)	Boundary pressure	141.7	29		426.1	393
Cold Leg D(002)	Boundary pressure	1825	29		426.1	393
Hot Leg A(001)	Boundary pressure	—	29	Isolated	—	382.7
Hot Leg A(002)	Boundary pressure	—	29	Isolated	—	393
Hot Leg B(001)	Boundary pressure	—	29	Isolated	—	382.7
Hot Leg B(002)	Boundary pressure	0	29		426.1	393
Hot Leg C(001)	Boundary pressure	—	29	Isolated	—	382.7
Hot Leg C(002)	Boundary pressure	—	29	Isolated	—	393
Hot Leg D(001)	Boundary pressure	—	29	Isolated	—	382.7
Hot Leg D(002)	Boundary pressure	0	29		426.1	393

Pump List	Operation	Flow	Status	TDH	dP	NPSHa	Suction Pressure	Discharge Pressure	Suction Elev	Discharge Elev
Centrifugal Charging Pump A	Curve	367.8		4051	1750	84.32	37.37	1787	368.6	368.7
Centrifugal Charging Pump B	Curve	382		4050	1750	83.75	37.13	1787	368.6	368.7
Containment Spray Pump A	Curve	—	Off	—	—	—	—	—	346.3	347.3
Containment Spray Pump B	Curve	—	Off	—	—	—	—	—	346.3	347.3
Positive Dis. Charging Pump	Fixed Flow	1.00E-05	Off	—	—	—	—	—	368.7	367.9
Residual Heat Removal Pump A	Curve	3257		367.9	158	78.84	33.8	192.3	346	347.1
Residual Heat Removal Pump B	Curve	3241		371	160.3	76.05	33.6	193.8	346	347.1
Safety Injection Pump A	Curve	361.3		3001	1296	86.46	37.87	1334	368.5	368.6
Safety Injection Pump B	Curve	336.2		3003	1297	85.44	38.31	1336	368.5	368.6

Component List	Flow	Status	HL	dP	Inlet Pressure	Outlet Pressure	Inlet Elev	Outlet Elev
Residual HX A	3257		45.63	19.71	162.6	142.8	368.7	368.7
Residual HX B	3241		45.17	19.51	157.8	138.3	368.8	368.8

Control List	Type	Set Value	Status	Flow	dP	HL	Inlet Pressure	Outlet Pressure	Elev	Cv	Fp	Chkd?
[illegible]	FCV	0		0	—	—	156.3	156.3	348.8	—	—	—
[illegible]	FCV	0		0	—	—	151	151	360	—	—	—
[illegible]	FCV	Fully open		142.9	0	0	284.2	284.2	412.9	—	—	—
[illegible]	FCV	Fully open		143.4	0	0	206.7	206.7	413	—	—	—
[illegible]	FCV	Fully open		141.8	0	0	252.3	252.3	382.4	—	—	—
[illegible]	FCV	Fully open		141.7	0	0	197.4	197.4	389.5	—	—	—
[illegible]	FCV	Fully open		198.6	0	0	83.18	83.18	414.5	—	—	—
[illegible]	FCV	Fully open		158.9	0	0	77.43	77.43	361.4	—	—	—
[illegible]	FCV	Fully open		158.8	0	0	83.18	83.18	414.8	—	—	—
[illegible]	FCV	Fully open		159	0	0	81.64	81.64	387	—	—	—
[illegible]	FCV	Fully open		0	—	—	102.6	102.6	360.7	—	—	—
[illegible]	FCV	Fully open	Closed	—	—	—	—	—	378	—	—	—
[illegible]	FCV	Fully open		0	—	—	104	104	378.1	—	—	—
[illegible]	FCV	Fully open	Closed	—	—	—	—	—	361.1	—	—	—
[illegible]	FCV	Fully open		0	—	—	130.7	130.7	407	—	—	—
[illegible]	FCV	Fully open		0	—	—	133.7	133.7	390	—	—	—

Pipe Specification	Material	Schedule	Roughness	Sizing	Vel Limits	Press Limits	Valve Table
Steel Sch.40 (clean)	Steel	40	0.0018	not specified	—	—	standard
Steel Sch.80 (clean)	Steel	80	0.0018	not specified	—	—	standard
Steel Sch.140 (clean)	Steel	140	0.0018	not specified	—	—	standard
Steel Sch.40S (clean)	Stainless Pipe IPS	40S	0.0018	not specified	—	—	standard
Steel Sch.160 (clean)	Steel	160	0.0018	not specified	—	—	standard
Steel Sch.30 (clean)	Steel	30	0.0018	not specified	—	—	standard
Steel Sch.20 (clean)	Steel	20	0.0018	not specified	—	—	standard

Fluid Zone	Fluid	Temperature	Pressure	Density	Viscosity	k	Pv	Pc
Containment Sump Water	Water	160	14.7	62.24	0.8812	—	0.9458	3198
Water After RHR HX	Water	160	14.7	62.24	0.8812	—	0.9458	3198

PIPE-FLO [illegible]
System: [illegible]
Lineup: [illegible]

Company: [illegible]
Project: [illegible]
By: [illegible]
Folder:

UNITS
Flow Rate: US gpm
Pressure: psi a   atm: 14.7 psi a
Temperature: °F
Velocity: ft/s
Density: lb/ft³
Grade: ft
Length: ft
Size: in

CALCULATION
Iteration: 15
Deviation percent: [illegible]

Pipe List	Specification	Fluid Zone	Size	Length	K	Status	Flow	Velocity	dP	HL	Tagged	From	To	Inside Dia	Pipe HL	Minor HL	Re	ff	Valves/Fittings	K	Valves/Fittings	K	Valves/Fittings	K
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(005)	15.25	—	—	—	—	2 x Pipe Bend - r/d 1.5 (90°)	0.173	1 x CS009A-1 (Gate Valve)	0.09888	1 x Converging Tee (Through)	1.00E-05
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(006)	15.25	0	0	0	0	1 x Reducer - Contraction (16 x 14 - 14)	0.02451	1 x Pipe Bend - r/d 1.5 (90°)	0.173	1 x CS002A	0.09888
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Containment Spray Pump A	13.25	0	0	0	0						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(237)	15.25	—	—	—	—	1 x Gate - Double Disc	0.09888	1 x CS009B-2 (Gate Valve)	0.09888	1 x Converging Tee (Through)	1.00E-05
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(238)	15.25	0	0	0	0	3 x Elbow - Standard 90°	0.3708	1 x Reducer - Contraction (16 x 14 - 14)	0.02451	1 x CS002B(Gate Valve)	0.09888
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Containment Spray Pump B	13.25	0	0	0	0						
CS02AA(001)	Steel Sch 40 (clean)	Containment Sump Water	8	2	0.05008		0	0	0.432	0	N	Containment Spray Pump A	-N(007)	7.981	0	0	0	0	1 x Reducer - Enlargement (10 x 8 - 7)	0.05008				
CS02AA(002)	Steel Sch 40 (clean)	Containment Sump Water	10	25.5	2.148		0	0	5.054	0	N	-N(007)	-N(008)	10.02	0	0	0	0	4 x Pipe Bend - r/d 1.5 (90°)	0.188	1 x CS003A (Check Valve)	1.289	1 x CV004A (Gate Valve)	0.1074
CS02AA(003)	Steel Sch 40 (clean)	Containment Sump Water	10	101.3	5.652		0	0	15.03	0	N	-N(008)	-N(009)	10.02	0	0	0	0	1 x FE-CS011	4.9	4 x Pipe Bend - r/d 1.5 (90°)	0.188	1 x Diverging Tee (Through)	1.00E-05
CS02AA(004)	Steel Sch 40 (clean)	Containment Sump Water	10	34.8	0.6713		0	0	5.27	0	N	-N(009)	CS007A-1	10.02	0	0	0	0	3 x Pipe Bend - r/d 1.5 (90°)	0.188	1 x CS007A-1 (Gate Valve)	0.1074	1 x Diverging Tee (Through)	1.00E-05
CS02AA(005)	Steel Sch 40 (clean)	Containment Sump Water	10	63.7	2.55		0	0	8.872	0	N	CS007A-1	-N(001)	10.02	0	0	0	0	6 x Pipe Bend - r/d 1.5 (90°)	0.188	1 x Pipe Bend - r/d 1.5 (45°)	0.1331	1 x CS008A (Check Valve)	1.289
CS02AA(006)	Steel Sch 40 (clean)	Containment Sump Water	10	155.7	1.261		0	0	63.2	0	N	-N(001)	-N(001A)	10.02	0	0	0	0	6 x Pipe Bend - r/d 1.5 (90°)	0.188	1 x Pipe Bend - r/d 1.5 (45°)	0.1331		
CS02AB(001)	Steel Sch 40 (clean)	Containment Sump Water	8	2	0.472		0	0	-0.432	0	N	Containment Spray Pump B	-N(239)	7.981	0	0	0	0	1 x Elbow - Standard 90°	0.4219	1 x Reducer - Enlargement (10 x 8 - 7)	0.05008		
CS02AB(002)	Steel Sch 40 (clean)	Containment Sump Water	10	9.9	2.202		0	0	0.216	0	N	-N(239)	-N(240)	10.02	0	0	0	0	2 x Elbow - Standard 90°	0.4028	1 x CV004B (Gate Valve)	0.1074	1 x CV003B (Check Valve)	1.289
CS02AB(003)	Steel Sch 40 (clean)	Containment Sump Water	10	59.1	6.511		0	0	14.9	0	N	-N(240)	-N(241)	10.02	0	0	0	0	4 x Elbow - Standard 90°	0.4028	1 x FE-CS012	4.9	1 x Diverging Tee (Through)	1.00E-05
CS02AB(004)	Steel Sch 40 (clean)	Containment Sump Water	10	33.8	1.316		0	0	7.646	0	N	-N(241)	CS007B-2	10.02	0	0	0	0	3 x Elbow - Standard 90°	0.4028	1 x CV007B-2 (Gate Valve)	0.1074	1 x Diverging Tee (Through)	1.00E-05
CS02AB(005)	Steel Sch 40 (clean)	Containment Sump Water	10	75.4	3.92		0	0	12.53	0	N	CS007B-2	-N(242)	10.02	0	0	0	0	1 x Elbow - Standard 45°	0.2148	6 x Elbow - Standard 90°	0.4028	1 x CS008B (Check Valve)	1.289
CS02AB(006)	Steel Sch 40 (clean)	Containment Sump Water	10	144.2	1		0	0	59.18	0	N	-N(242)	-N(243)	10.02	0	0	0	0	1 x CS008B (Check Valve)	1	1 x Diverging Tee (Through)	1.00E-05		
CS02AB(007)	Steel Sch 40 (clean)	Containment Sump Water	10	30.8	2.00E-05	<-->	801.7	2.45	-7.536	0.056	N	-N(244)	-N(243)	10.02	0.056	0	278182	0.01628	1 x Diverging Tee (Branch)	1.00E-05	1 x Diverging Tee (Through)	1.00E-05		
CS02B	Steel Sch 40 (clean)	Containment Sump Water	8	25.8	0.04216	<-->	444.6	2.854	-6.535	0.087	N	-N(010)	-N(001A)	7.981	0.082	0.005	256078	0.01578	1 x Reducer - Contraction (10 x 8 - 7)	0.04215	1 x Diverging Tee (Through)	1.00E-05		
CS02C	Steel Sch 40 (clean)	Containment Sump Water	8	21.5	0.0533	<-->	203	2.256	-2.863	0.066	N	-N(011)	-N(010)	6.065	0.062	0.004	156042	0.01632	1 x Reducer - Contraction (8 x 6 - 6)	0.05329	1 x Diverging Tee (Through)	1.00E-05		
CS02D(001)	Steel Sch 40 (clean)	Containment Sump Water	4	1.1	0.08157	<-->	101.5	2.56	0.006	0.015	N	-N(012)	-N(011)	4.026	0.007	0.008	116784	0.01976	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156	1 x Diverging' Tee (Branch)	1.00E-05		
CS02D(002)	Steel Sch 40 (clean)	Containment Sump Water	4	1.1	0.08157	<-->	101.6	2.56	0.006	0.015	N	-N(014)	-N(011)	4.026	0.007	0.008	116800	0.01976	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156	1 x Diverging' Tee (Branch)	1.00E-05		
CS02D(003)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	96.27	2.428	0.008	0.019	N	-N(013)	-N(012)	4.026	0.012	0.007	110788	0.01991	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
CS02D(004)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	96.25	2.428	0.008	0.019	N	-N(033)	-N(014)	4.026	0.012	0.007	110749	0.01991	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
CS02D(005)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	91.06	2.297	0.007	0.017	N	-N(015)	-N(013)	4.026	0.01	0.007	104777	0.02005	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
CS02D(006)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	91.04	2.296	0.007	0.017	N	-N(034)	-N(033)	4.026	0.01	0.007	104756	0.02005	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
CS02D(007)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	85.81	2.164	0.007	0.015	N	-N(016)	-N(015)	4.026	0.009	0.006	98736	0.02021	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
CS02D(008)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	85.84	2.165	0.007	0.015	N	-N(035)	-N(034)	4.026	0.009	0.006	98771	0.02021	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
CS02D(009)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	80.61	2.033	0.006	0.013	N	-N(017)	-N(016)	4.026	0.008	0.006	92753	0.02038	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
CS02D(010)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	80.59	2.033	0.006	0.013	N	-N(038)	-N(035)	4.026	0.008	0.006	92734	0.02038	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
CS02D(011)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	75.41	1.902	0.005	0.012	N	-N(018)	-N(017)	4.026	0.007	0.005	86775	0.02057	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
CS02D(012)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	75.4	1.902	0.005	0.012	N	-N(037)	-N(038)	4.026	0.007	0.005	86756	0.02057	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
CS02D(013)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	70.17	1.77	0.004	0.01	N	-N(019)	-N(018)	4.026	0.006	0.004	80745	0.02079	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
CS02D(014)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	70.2	1.771	0.004	0.01	N	-N(036)	-N(037)	4.026	0.006	0.004	80780	0.02078	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
CS02D(015)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	64.98	1.639	0.004	0.009	N	-N(020)	-N(019)	4.026	0.006	0.003	74772	0.02102	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
CS02D(016)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	64.97	1.639	0.004	0.009	N	-N(044)	-N(036)	4.026	0.006	0.003	74753	0.02102	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
CS02D(017)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	59.78	1.508	0.003	0.008	N	-N(021)	-N(020)	4.026	0.005	0.003	68802	0.02129	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
CS02D(018)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	59.78	1.508	0.003	0.008	N	-N(043)	-N(044)	4.026	0.005	0.003	68743	0.02129	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
CS02D(019)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	54.56	1.376	0.003	0.006	N	-N(024)	-N(021)	4.026	0.004	0.002	62779	0.0216	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
CS02D(020)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	54.59	1.377	0.003	0.006	N	-N(042)	-N(043)	4.026	0.004	0.002	62815	0.0216	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
CS02D(021)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	49.37	1.245	0.002	0.005	N	-N(023)	-N(024)	4.026	0.003	0.002	56813	0.02195	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
CS02D(022)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	49.36	1.245	0.002	0.005	N	-N(039)	-N(042)	4.026	0.003	0.002	56794	0.02196	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
CS02D(023)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	44.19	1.115	0.002	0.004	N	-N(022)	-N(023)	4.026	0.002	0.002	50844	0.02237	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
CS02D(024)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	44.17	1.114	0.002	0.004	N	-N(040)	-N(039)	4.026	0.002	0.002	50829	0.02237	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
CS02D(025)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	38.96	0.983	0.001	0.003	N	-N(030)	-N(022)	4.026	0.002	0.001	44829	0.02287	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
CS02D(026)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	38.99	0.983	0.001	0.003	N	-N(041)	-N(040)	4.026	0.002	0.001	44865	0.02286	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
CS02D(027)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	33.79	0.852	0.001	0.003	N	-N(029)	-N(030)	4.026	0.003	0	38867	0.02347	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
CS02D(028)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	33.78	0.852	0.001	0.003	N	-N(045)	-N(041)	4.026	0.003	0	38848	0.02347	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
CS02D(029)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	28.6	0.721	0	0.002	N	-N(028)	-N(029)	4.026	0.002	0	32905	0.02423	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
CS02D(030)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	28.58	0.721	0	0.002	N	-N(046)	-N(045)	4.026	0.002	0	32886	0.02423	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
CS02D(031)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	23.37	0.589	0	0.001	N	-N(025)	-N(028)	4.026	0.001	0	26888	0.02523	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
CS02D(032)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	23.4	0.59	0	0.001	N	-N(047)	-N(046)	4.026	0.001	0	26924	0.02523	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
CS02D(033)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	18.19	0.459	0	0	N	-N(026)	-N(025)	4.026	0	0	20927	0.02662	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
CS02D(034)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	18.17	0.458	0	0	N	-N(050)	-N(047)	4.026	0	0	20906	0.02662	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
CS02D(035)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	13.01	0.328	0	0	N	-N(027)	-N(026)	4.026	0	0	14966	0.02873	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
CS02D(036)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	12.99	0.328	0	0	N	-N(049)	-N(050)	4.026	0	0	14947	0.02874	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
CS02D(037)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	7.779	0.196	0	0	N	-N(031)	-N(027)	4.026	0	0	8951	0.03266	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
CS02D(038)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	7.81	0.197	0	0	N	-N(048)	-N(049)	4.026	0	0	8986	0.03263	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
CS02D(039)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	2.598	0.066	0	0	N	-N(032)	-N(031)	4.026	0	0	2990	0.04496	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
CS02D(040)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	2.542	0.065	0	0	N	-N(032)	-N(048)	4.026	0	0	2971	0.04506	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
CS02E	Steel Sch 40 (clean)	Containment Sump Water	6	23.3	0.1378	<-->	220.6	2.451	-3.978	0.091	N	-N(243)	-N(244)	6.065	0.078	0.013	168460	0.01813	1 x Reducer - Contraction (10 x 6 - 7)	0.1378	1 x Diverging Tee (Through)	1.00E-05		
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(245)	6.065	0.002	0.1	84239	0.02	1 x Diverging' Tee (Branch)	4.3				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(245)	6.065	0.001	0.1	84221	0.02	1 x Diverging' Tee (Branch)	4.3				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(246)	6.065	0.002	0	80835	0.02013						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(247)	6.065	0.002	0	80918	0.02013						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(248)	6.065	0.002	0	77473	0.02028						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(249)	6.065	0.002	0	77615	0.02027						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(250)	6.065	0.002	0	74170	0.02042						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(251)	6.065	0.002	0	74312	0.02042						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(252)	6.065	0.002	0	70868	0.02058						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(253)	6.065	0.002	0	71010	0.02058						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(254)	6.065	0.002	0	67567	0.02075						
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[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(256)	6.065	0.002	0	64265	0.02093						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(257)	6.065	0.002	0	64407	0.02092						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(258)	6.065	0.001	0	60964	0.02113						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(259)	6.065	0.001	0	61106	0.02112						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(260)	6.065	0.001	0	57664	0.02134						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(261)	6.065	0.001	0	57805	0.02133						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(262)	6.065	0.001	0	54363	0.02157						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(263)	6.065	0.001	0	54506	0.02156						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(264)	6.065	0.001	0	51063	0.02182						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(265)	6.065	0.001	0	51206	0.02181						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(266)	6.065	0	0	47764	0.02209						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(267)	6.065	0	0	47906	0.02208						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(268)	6.065	0	0	44464	0.0224						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(269)	6.065	0	0	44606	0.02238						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(270)	6.065	0	0	41165	0.02274						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(271)	6.065	0	0	41306	0.02272						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(272)	6.065	0	0	37865	0.02312						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(273)	6.065	0	0	38007	0.0231						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(274)	6.065	0	0	34566	0.02355						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(275)	6.065	0	0	34708	0.02353						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(276)	6.065	0	0	31267	0.02404						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(277)	6.065	0	0	31409	0.02402						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(278)	6.065	0	0	27968	0.02462						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(279)	6.065	0	0	28110	0.02458						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(280)	6.065	0	0	24669	0.0253						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(281)	6.065	0	0	24811	0.02527						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(282)	6.065	0	0	21371	0.02613						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(283)	6.065	0	0	21512	0.02609						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(284)	6.065	0	0	18072	0.02717						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(285)	6.065	0	0	18213	0.02712						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(286)	6.065	0	0	14773	0.02851						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(287)	6.065	0	0	14915	0.02845						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(288)	6.065	0	0	11474	0.03036						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(289)	6.065	0	0	11616	0.03028						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(290)	6.065	0	0	8176	0.03322						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(291)	6.065	0	0	8317	0.03307						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(292)	6.065	0	0	4877	0.03849						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(293)	6.065	0	0	5019	0.03817						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(294)	6.065	0	0	1579	0.04054						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(295)	6.065	0	0	1720	0.03721						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(010)	7.981	0.002	0.209	140257	0.01815	1 x FX-CS035 (Flow Element)	5.6	1 x Diverging Tee (Branch)	1.00E-05		
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(244)	7.981	0.005	0.399	221236	0.01709	1 x FX-CS037 (Flow Element)	2.3	1 x Diverging Tee (Branch)	2		
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(051)	6.065	0.002	0.001	91958	0.01973	1 x Reducer - Contraction (8 x 6 - 6)	0.05329	1 x Diverging' Tee (Branch)	1.00E-05		
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(051)	6.065	0.001	0.002	92608	0.01971	1 x Reducer - Contraction (8 x 6 - 6)	0.05329	1 x Diverging' Tee (Branch)	1.00E-05		
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(073)	6.065	0.004	0	88757	0.01984						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(070)	6.065	0.004	0	89512	0.01981						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(072)	6.065	0.003	0	85890	0.01995						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(067)	6.065	0.003	0	86545	0.01992						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(071)	6.065	0.003	0	82696	0.02006						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(068)	6.065	0.003	0	83363	0.02004						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(074)	6.065	0.003	0	79615	0.02019						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(069)	6.065	0.003	0	80370	0.02016						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(075)	6.065	0.003	0	76451	0.02032						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(066)	6.065	0.003	0	77306	0.02029						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(076)	6.065	0.003	0	73459	0.02046						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(065)	6.065	0.003	0	74126	0.02043						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(080)	6.065	0.002	0	70279	0.02061						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(064)	6.065	0.002	0	71135	0.02057						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(081)	6.065	0.002	0	67217	0.02077						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(060)	6.065	0.002	0	68072	0.02072						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(082)	6.065	0.002	0	64228	0.02093						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(059)	6.065	0.002	0	64894	0.0209						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(079)	6.065	0.002	0	61049	0.02112						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(058)	6.065	0.002	0	61904	0.02107						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(078)	6.065	0.002	0	57987	0.02132						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(061)	6.065	0.002	0	58843	0.02128						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(077)	6.065	0.002	0	54998	0.02152						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(062)	6.065	0.002	0	55686	0.02147						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(085)	6.065	0.001	0	51822	0.02176						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(063)	6.065	0.001	0	52579	0.02169						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(084)	6.065	0.001	0	48762	0.02201						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(055)	6.065	0.001	0	49616	0.02193						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(083)	6.065	0.001	0	45774	0.02227						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(056)	6.065	0.001	0	46442	0.02221						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(086)	6.065	0	0	42598	0.02258						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(057)	6.065	0	0	43455	0.0225						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(087)	6.065	0	0	39539	0.02292						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(054)	6.065	0	0	40398	0.02282						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(088)	6.065	0	0	36551	0.02328						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(053)	6.065	0	0	37220	0.0232						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(096)	6.065	0	0	33376	0.02372						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(052)	6.065	0	0	34234	0.02359						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(095)	6.065	0	0	30317	0.0242						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(104)	6.065	0	0	31175	0.02406						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-N(097)	6.065	0	0.001	27331	0.02474	1 x Reducer - Contraction (6 x 4 - 5.5)	0.42				

CS02H(048)	Steel Sch 40 (clean)	Containment Sump Water	6	3.8	0	<-->	28.74	0.318	0	0	N	-N(107)	-N(101)	6.065	0	0	21956	0.02567				
CS02H(049)	Steel Sch 40 (clean)	Containment Sump Water	6	3.8	0	<-->	23.71	0.264	0	0	N	-N(083)	-N(082)	6.065	0	0	18111	0.02715				
CS02H(050)	Steel Sch 40 (clean)	Containment Sump Water	6	3.8	0	<-->	24.58	0.273	0	0	N	-N(106)	-N(107)	6.065	0	0	18761	0.02692				
CS02H(051)	Steel Sch 40 (clean)	Containment Sump Water	6	3.8	0	<-->	19.56	0.217	0	0	N	-N(094)	-N(083)	6.065	0	0	14937	0.02844				
CS02H(052)	Steel Sch 40 (clean)	Containment Sump Water	6	3.8	0	<-->	20.68	0.23	0	0	N	-N(105)	-N(106)	6.065	0	0	15785	0.02805				
CS02H(053)	Steel Sch 40 (clean)	Containment Sump Water	6	3.8	0	<-->	15.55	0.173	0	0	N	-N(091)	-N(094)	6.065	0	0	11879	0.03011				
CS02H(054)	Steel Sch 40 (clean)	Containment Sump Water	6	3.8	0	<-->	16.68	0.185	0	0	N	-N(108)	-N(105)	6.065	0	0	12737	0.02958				
CS02H(055)	Steel Sch 40 (clean)	Containment Sump Water	6	3.8	0	<-->	11.64	0.129	0	0	N	-N(090)	-N(091)	6.065	0	0	8893	0.03248				
CS02H(056)	Steel Sch 40 (clean)	Containment Sump Water	6	3.8	0	<-->	12.52	0.139	0	0	N	-N(109)	-N(108)	6.065	0	0	9562	0.03185				
CS02H(057)	Steel Sch 40 (clean)	Containment Sump Water	6	3.8	0	<-->	7.487	0.083	0	0	N	-N(089)	-N(090)	6.065	0	0	5718	0.03674				
CS02H(058)	Steel Sch 40 (clean)	Containment Sump Water	6	3.8	0	<-->	8.61	0.096	0	0	N	-N(110)	-N(109)	6.065	0	0	6576	0.03529				
CS02H(059)	Steel Sch 40 (clean)	Containment Sump Water	6	3.8	0	<-->	3.483	0.039	0	0	N	-N(100)	-N(089)	6.065	0	0	2660	0.04658				
CS02H(060)	Steel Sch 40 (clean)	Containment Sump Water	6	3.8	0	<-->	4.606	0.051	0	0	N	-N(111)	-N(110)	6.065	0	0	3518	0.04255				
CS02H(061)	Steel Sch 40 (clean)	Containment Sump Water	6	3.8	0	<-->	0.427	0.005	0	0	N	-N(100)	-N(111)	6.065	0	0	325.8	0.1964				
CS02J(001)	Steel Sch 40 (clean)	Containment Sump Water	6	1.6	0.0533	<-->	190.6	2.118	0.003	0.008	N	-N(296)	-N(297)	6.065	0.004	0.004	145563	0.01847	1 x Reducer - Contraction (8 x 6 - 6)	0.06329	1 x Diverging" Tee (Branch)	1.00E-05
CS02J(002)	Steel Sch 40 (clean)	Containment Sump Water	6	1.6	0.0533	<-->	190.6	2.118	0.003	0.008	N	-N(300)	-N(297)	6.065	0.004	0.004	145563	0.01847	1 x Reducer - Contraction (8 x 6 - 6)	0.06329	1 x Diverging" Tee (Branch)	1.00E-05
CS02J(003)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	186.3	2.071	0.003	0.008	N	-N(301)	-N(298)	6.065	0.008	0	142308	0.01852				
CS02J(004)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	186.3	2.071	0.003	0.008	N	-N(302)	-N(300)	6.065	0.008	0	142308	0.01852				
CS02J(005)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	182.1	2.023	0.003	0.007	N	-N(303)	-N(301)	6.065	0.007	0	139054	0.01858				
CS02J(006)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	182.1	2.023	0.003	0.007	N	-N(304)	-N(302)	6.065	0.007	0	139054	0.01858				
CS02J(007)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	177.8	1.976	0.003	0.007	N	-N(305)	-N(303)	6.065	0.007	0	135803	0.01864				
CS02J(008)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	177.8	1.976	0.003	0.007	N	-N(306)	-N(304)	6.065	0.007	0	135803	0.01864				
CS02J(009)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	173.5	1.929	0.003	0.007	N	-N(307)	-N(305)	6.065	0.007	0	132553	0.0187				
CS02J(010)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	173.5	1.929	0.003	0.007	N	-N(308)	-N(306)	6.065	0.007	0	132553	0.0187				
CS02J(011)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	169.3	1.881	0.003	0.007	N	-N(310)	-N(307)	6.065	0.007	0	129304	0.01877				
CS02J(012)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	169.3	1.881	0.003	0.007	N	-N(309)	-N(308)	6.065	0.007	0	129304	0.01877				
CS02J(013)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	165	1.834	0.003	0.006	N	-N(311)	-N(310)	6.065	0.006	0	126057	0.01883				
CS02J(014)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	165	1.834	0.003	0.006	N	-N(312)	-N(309)	6.065	0.006	0	126057	0.01883				
CS02J(015)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	160.8	1.787	0.003	0.006	N	-N(314)	-N(311)	6.065	0.006	0	122811	0.0189				
CS02J(016)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	160.8	1.787	0.003	0.006	N	-N(313)	-N(312)	6.065	0.006	0	122811	0.0189				
CS02J(017)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	156.5	1.74	0.002	0.006	N	-N(318)	-N(314)	6.065	0.006	0	119567	0.01897				
CS02J(018)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	156.5	1.74	0.002	0.006	N	-N(317)	-N(313)	6.065	0.006	0	119567	0.01897				
CS02J(019)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	152.3	1.693	0.002	0.005	N	-N(315)	-N(318)	6.065	0.005	0	116324	0.01905				
CS02J(020)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	152.3	1.693	0.002	0.005	N	-N(316)	-N(317)	6.065	0.005	0	116324	0.01905				
CS02J(021)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	148	1.645	0.002	0.005	N	-N(320)	-N(315)	6.065	0.005	0	113082	0.01912				
CS02J(022)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	148	1.645	0.002	0.005	N	-N(319)	-N(316)	6.065	0.005	0	113082	0.01912				
CS02J(023)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	143.8	1.598	0.002	0.005	N	-N(321)	-N(320)	6.065	0.005	0	109841	0.01921				
CS02J(024)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	143.8	1.598	0.002	0.005	N	-N(322)	-N(319)	6.065	0.005	0	109841	0.01921				
CS02J(025)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	139.6	1.551	0.002	0.005	N	-N(323)	-N(321)	6.065	0.005	0	106602	0.01929				
CS02J(026)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	139.6	1.551	0.002	0.005	N	-N(324)	-N(322)	6.065	0.005	0	106602	0.01929				
CS02J(027)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	135.3	1.504	0.002	0.004	N	-N(325)	-N(323)	6.065	0.004	0	103363	0.01938				
CS02J(028)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	135.3	1.504	0.002	0.004	N	-N(326)	-N(324)	6.065	0.004	0	103363	0.01938				
CS02J(029)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	131.1	1.457	0.002	0.004	N	-N(327)	-N(325)	6.065	0.004	0	100125	0.01947				
CS02J(030)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	131.1	1.457	0.002	0.004	N	-N(328)	-N(326)	6.065	0.004	0	100125	0.01947				
CS02J(031)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	126.8	1.41	0.002	0.004	N	-N(329)	-N(327)	6.065	0.004	0	96889	0.01957				
CS02J(032)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	126.8	1.41	0.002	0.004	N	-N(330)	-N(328)	6.065	0.004	0	96889	0.01957				
CS02J(033)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	122.6	1.363	0.002	0.004	N	-N(331)	-N(329)	6.065	0.004	0	93653	0.01967				
CS02J(034)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	122.6	1.363	0.002	0.004	N	-N(332)	-N(330)	6.065	0.004	0	93653	0.01967				
CS02J(035)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	118.4	1.316	0.001	0.003	N	-N(333)	-N(331)	6.065	0.003	0	90418	0.01978				
CS02J(036)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	118.4	1.316	0.001	0.003	N	-N(334)	-N(332)	6.065	0.003	0	90418	0.01978				
CS02J(037)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	114.1	1.269	0.001	0.003	N	-N(335)	-N(333)	6.065	0.003	0	87183	0.01989				
CS02J(038)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	114.1	1.269	0.001	0.003	N	-N(336)	-N(334)	6.065	0.003	0	87183	0.01989				
CS02J(039)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	109.9	1.222	0.001	0.003	N	-N(337)	-N(335)	6.065	0.003	0	83950	0.02001				
CS02J(040)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	109.9	1.222	0.001	0.003	N	-N(338)	-N(336)	6.065	0.003	0	83950	0.02001				
CS02J(041)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	105.7	1.174	0.001	0.003	N	-N(339)	-N(337)	6.065	0.003	0	80717	0.02014				
CS02J(042)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	105.7	1.174	0.001	0.003	N	-N(340)	-N(338)	6.065	0.003	0	80717	0.02014				
CS02J(043)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	101.4	1.127	0.001	0.003	N	-N(341)	-N(339)	6.065	0.003	0	77484	0.02028				
CS02J(044)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	101.4	1.127	0.001	0.003	N	-N(342)	-N(340)	6.065	0.003	0	77484	0.02028				
CS02J(045)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	97.21	1.08	0.001	0.002	N	-N(343)	-N(341)	6.065	0.002	0	74253	0.02042				
CS02J(046)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	97.21	1.08	0.001	0.002	N	-N(344)	-N(342)	6.065	0.002	0	74253	0.02042				
CS02J(047)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	92.98	1.033	0	0.002	N	-N(345)	-N(343)	6.065	0.002	0	71021	0.02057				
CS02J(048)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	92.98	1.033	0	0.002	N	-N(346)	-N(344)	6.065	0.002	0	71021	0.02057				
CS02J(049)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	88.75	0.986	0	0.002	N	-N(347)	-N(345)	6.065	0.002	0	67790	0.02074				
CS02J(050)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	88.75	0.986	0	0.002	N	-N(348)	-N(346)	6.065	0.002	0	67790	0.02074				
CS02J(051)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	84.52	0.939	0	0.002	N	-N(349)	-N(347)	6.065	0.002	0	64560	0.02091				
CS02J(052)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	84.52	0.939	0	0.002	N	-N(350)	-N(348)	6.065	0.002	0	64560	0.02091				
CS02J(053)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	80.29	0.892	0	0.002	N	-N(351)	-N(349)	6.065	0.002	0	61330	0.0211				
CS02J(054)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	80.29	0.892	0	0.002	N	-N(352)	-N(350)	6.065	0.002	0	61330	0.0211				
CS02J(055)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	76.07	0.845	0	0.001	N	-N(353)	-N(351)	6.065	0.001	0	58101	0.02131				
CS02J(056)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	76.07	0.845	0	0.001	N	-N(354)	-N(352)	6.065	0.001	0	58101	0.02131				
CS02J(057)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	71.84	0.798	0	0.001	N	-N(355)	-N(353)	6.065	0.001	0	54871	0.02153				
CS02J(058)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	71.84	0.798	0	0.001	N	-N(356)	-N(354)	6.065	0.001	0	54871	0.02153				
CS02J(059)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	67.61	0.751	0	0.001	N	-N(357)	-N(355)	6.065	0.001	0	51642	0.02177				
CS02J(060)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	67.61	0.751	0	0.001	N	-N(358)	-N(356)	6.065	0.001	0	51642	0.02177				
CS02J(061)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	63.38	0.704	0	0.001	N	-N(359)	-N(357)	6.065	0.001	0	48414	0.02204				
CS02J(062)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	63.38	0.704	0	0.001	N	-N(360)	-N(358)	6.065	0.001	0	48414	0.02204				
CS02J(063)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	59.16	0.657	0	0	N	-N(361)	-N(359)	6.065	0	0	45185	0.02233				
CS02J(064)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	59.16	0.657	0	0	N	-N(362)	-N(360)	6.065	0	0	45185	0.02233				
CS02J(065)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	54.93	0.611	0	0	N	-N(363)	-N(361)	6.065	0	0	41957	0.02265				
CS02J(066)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	54.93	0.611	0	0	N	-N(364)	-N(362)	6.065	0	0	41957	0.02265				
CS02J(067)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	50.7	0.564	0	0	N	-N(365)	-N(363)	6.065	0	0	38729	0.02301				
CS02J(068)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	50.7	0.564	0	0	N	-N(366)	-N(364)	6.065	0	0	38729	0.02301				
CS02J(069)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	46.48	0.517	0	0	N	-N(367)	-N(365)	6.065	0	0	35501	0.02342				
CS02J(070)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	46.48	0.517	0	0	N	-N(368)	-N(366)	6.065	0	0	35501	0.02342				
CS02J(071)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	42.25	0.47	0	0	N	-N(369)	-N(367)	6.065	0	0	32274	0.02388				
CS02J(072)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	42.25	0.47	0	0	N	-N(370)	-N(368)	6.065	0	0	32274	0.02388				
CS02J(073)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	38.03	0.423	0	0	N	-N(371)	-N(369)	6.065	0	0	29046	0.02442				
CS02J(074)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	38.03	0.423	0	0	N	-N(372)	-N(370)	6.065	0	0	29046	0.02442				
CS02J(075)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	33.8	0.376	0	0	N	-N(373)	-N(371)	6.065	0	0	25818	0.02505				
CS02J(076)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	33.8	0.376	0	0	N	-N(374)	-N(372)	6.065	0	0	25818	0.02505				
CS02J(077)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	29.58	0.329	0	0	N	-N(375)	-N(373)	6.065	0	0	22591	0.0258				
CS02J(078)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	29.58	0.329	0	0	N	-N(376)	-N(374)	6.065	0	0	22591	0.0258				
CS02J(079)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	25.35	0.282	0	0	N	-N(377)	-N(375)	6.065	0	0	19364	0.02673				
CS02J(080)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	25.35	0.282	0	0	N	-N(378)	-N(376)	6.065	0	0	19364	0.02673				
CS02J(081)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	21.13	0.235	0	0	N	-N(379)	-N(377)	6.065	0	0	16136	0.02791				
CS02J(082)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	21.13	0.235	0	0	N	-N(380)	-N(378)	6.065	0	0	16136	0.02791				
CS02J(083)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	16.9	0.188	0	0	N	-N(381)	-N(379)	6.065	0	0	12909	0.02948				
CS02J(084)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	16.9	0.188	0	0	N	-N(382)	-N(380)	6.065	0	0	12909	0.02948				
CS02J(085)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	12.68	0.141	0	0	N	-N(383)	-N(381)	6.065	0	0	9682	0.03175				
CS02J(086)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	12.68	0.141	0	0	N	-N(384)	-N(382)	6.065	0	0	9682	0.03175				
CS02J(087)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	8.45	0.094	0	0	N	-N(385)	-N(383)	6.065	0	0	6454	0.03548				
CS02J(088)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	8.45	0.094	0	0	N	-N(387)	-N(384)	6.065	0	0	6454	0.03548				
CS02J(089)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	4.225	0.047	0	0	N	-N(386)	-N(385)	6.065	0	0	3227	0.04374				
CS02J(090)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	4.225	0.047	0	0	N	-N(389)	-N(387)	6.065	0	0	3227	0.04374				
CS02J(091)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0		0	0	0	0	N	-N(389)	-N(388)	6.065	0	0	0.001151	0				
CS02KA	Steel Sch 40 (clean)	Containment Sump Water	10	2	15.8		444.6	1.81	0.996	0.805	N	-N(001A)	-N(112)	10.02	0.002	0.803	206561	0.01662	1 x FX-CS036 (Flow Element)	15.8	1 x Diverging Tee (Branch)	1.00E-05
CS02KB	Steel Sch 40 (clean)	Containment Sump Water	10	2.7	26.1		601.7	2.45	1.816	2.435	N	-N(243)	-N(390)	10.02	0.004	2.431	279182	0.01628	1 x FX-CS038 (Flow Element)	26.1	1 x Diverging Tee (Branch)	1.00E-05
CS02L.001	Steel Sch 40 (clean)	Containment Sump Water	8	1.5	0.04216		222.4	1.428	0.001	0.003	N	-N(112)	-N(113)	7.981	0.002	0.001	129096	0.01838	1 x Reducer - Contraction (10 x 8 - 7)	0.04215	1 x Diverging Tee (Branch)	1.00E-05
CS02L.002	Steel Sch 40 (clean)	Containment Sump Water	8	1.5	0.04216		222.2	1.428	0.001	0.003	N	-N(112)	-N(114)	7.981	0.002	0.001	128982	0.01838	1 x Reducer - Contraction (10 x 8 - 7)	0.04215	1 x Diverging Tee (Branch)	1.00E-05
CS02L.003	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		218.5	1.403	0.001	0.003	N	-N(113)	-N(115)	7.981	0.003	0	126854	0.01842				
CS02L.004	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		218.7	1.403	0.001	0.003	N	-N(114)	-N(203)	7.981	0.003	0	126915	0.01842				
CS02L.005	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		214.8	1.379	0.001	0.002	N	-N(115)	-N(116)	7.981	0.002	0	124689	0.01847				
CS02L.006	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		214.9	1.379	0.001	0.002	N	-N(203)	-N(204)	7.981	0.002	0	124749	0.01847				
CS02L.007	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		211.3	1.356	0.001	0.002	N	-N(116)	-N(117)	7.981	0.002	0	122623	0.01852				
CS02L.008	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		211.1	1.355	0.001	0.002	N	-N(204)	-N(206)	7.981	0.002	0	122506	0.01852				
CS02L.009	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		207.4	1.331	0	0.002	N	-N(117)	-N(118)	7.981	0.002	0	120382	0.01857				
CS02L.010	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		207.5	1.332	0	0.002	N	-N(206)	-N(205)	7.981	0.002	0	120442	0.01857				
CS02L.011	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		203.7	1.307	0	0.002	N	-N(118)	-N(119)	7.981	0.002	0	118218	0.01862				
CS02L.012	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		203.8	1.308	0	0.002	N	-N(205)	-N(210)	7.981	0.002	0	118278	0.01862				
CS02L.013	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		200.1	1.284	0	0.002	N	-N(119)	-N(120)	7.981	0.002	0	116153	0.01867				
CS02L.014	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		199.9	1.283	0	0.002	N	-N(210)	-N(209)	7.981	0.002	0	116039	0.01868				
CS02L.015	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		196.3	1.26	0	0.002	N	-N(120)	-N(122)	7.981	0.002	0	113914	0.01873				
CS02L.016	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		196.4	1.26	0	0.002	N	-N(209)	-N(207)	7.981	0.002	0	113974	0.01873				
CS02L.017	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		192.5	1.236	0	0.002	N	-N(122)	-N(121)	7.981	0.002	0	111751	0.01878				
CS02L.018	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		192.6	1.236	0	0.002	N	-N(207)	-N(208)	7.981	0.002	0	111811	0.01878				
CS02L.019	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		189	1.213	0	0.002	N	-N(121)	-N(123)	7.981	0.002	0	109688	0.01884				
CS02L.020	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		188.8	1.212	0	0.002	N	-N(208)	-N(218)	7.981	0.002	0	109573	0.01884				
CS02L.021	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		185.1	1.188	0	0.002	N	-N(123)	-N(124)	7.981	0.002	0	107449	0.0189				
CS02L.022	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		185.2	1.189	0	0.002	N	-N(218)	-N(217)	7.981	0.002	0	107510	0.0189				
CS02L.023	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		181.4	1.164	0	0.002	N	-N(124)	-N(126)	7.981	0.002	0	105288	0.01896				
CS02L.024	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		181.5	1.165	0	0.002	N	-N(217)	-N(215)	7.981	0.002	0	105348	0.01896				
CS02L.025	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		177.8	1.141	0	0.002	N	-N(126)	-N(125)	7.981	0.002	0	103225	0.01902				

CS02L071	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	[illegible]	[illegible]	0	0	N	[illegible]	[illegible]	7.981	0	0	[illegible]	[illegible]
CS02L072	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	[illegible]	[illegible]	0	0	N	[illegible]	[illegible]	7.981	0	0	[illegible]	[illegible]
CS02L073	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	[illegible]	[illegible]	0	0	N	[illegible]	[illegible]	7.981	0	0	[illegible]	[illegible]
CS02L074	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	[illegible]	[illegible]	0	0	N	[illegible]	[illegible]	7.981	0	0	[illegible]	[illegible]
CS02L075	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	[illegible]	[illegible]	0	0	N	[illegible]	[illegible]	7.981	0	0	[illegible]	[illegible]
CS02L076	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	[illegible]	[illegible]	0	0	N	[illegible]	[illegible]	7.981	0	0	[illegible]	[illegible]
CS02L077	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	[illegible]	[illegible]	0	0	N	[illegible]	[illegible]	7.981	0	0	[illegible]	[illegible]
CS02L078	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	[illegible]	[illegible]	0	0	N	[illegible]	[illegible]	7.981	0	0	[illegible]	[illegible]
CS02L079	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	[illegible]	[illegible]	0	0	N	[illegible]	[illegible]	7.981	0	0	[illegible]	[illegible]
CS02L080	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	[illegible]	[illegible]	0	0	N	[illegible]	[illegible]	7.981	0	0	[illegible]	[illegible]
CS02L081	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	[illegible]	[illegible]	0	0	N	[illegible]	[illegible]	7.981	0	0	[illegible]	[illegible]
CS02L082	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	[illegible]	[illegible]	0	0	N	[illegible]	[illegible]	7.981	0	0	[illegible]	[illegible]
CS02L083	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	[illegible]	[illegible]	0	0	N	[illegible]	[illegible]	7.981	0	0	[illegible]	[illegible]
CS02L084	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	[illegible]	[illegible]	0	0	N	[illegible]	[illegible]	7.981	0	0	[illegible]	[illegible]
CS02L085	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	[illegible]	[illegible]	0	0	N	[illegible]	[illegible]	7.981	0	0	[illegible]	[illegible]
CS02L086	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	[illegible]	[illegible]	0	0	N	[illegible]	[illegible]	7.981	0	0	[illegible]	[illegible]
CS02L087	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	[illegible]	[illegible]	0	0	N	[illegible]	[illegible]	7.981	0	0	[illegible]	[illegible]
CS02L088	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	[illegible]	[illegible]	0	0	N	[illegible]	[illegible]	7.981	0	0	[illegible]	[illegible]
CS02L089	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	[illegible]	[illegible]	0	0	N	[illegible]	[illegible]	7.981	0	0	[illegible]	[illegible]
CS02L090	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	[illegible]	[illegible]	0	0	N	[illegible]	[illegible]	7.981	0	0	[illegible]	[illegible]
CS02L091	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	[illegible]	[illegible]	0	0	N	[illegible]	[illegible]	7.981	0	0	[illegible]	[illegible]
CS02L092	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	[illegible]	[illegible]	0	0	N	[illegible]	[illegible]	7.981	0	0	[illegible]	[illegible]
CS02L093	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	[illegible]	[illegible]	0	0	N	[illegible]	[illegible]	7.981	0	0	[illegible]	[illegible]
CS02L094	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	[illegible]	[illegible]	0	0	N	[illegible]	[illegible]	7.981	0	0	[illegible]	[illegible]
CS02L095	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	[illegible]	[illegible]	0	0	N	[illegible]	[illegible]	7.981	0	0	[illegible]	[illegible]
CS02L096	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	[illegible]	[illegible]	0	0	N	[illegible]	[illegible]	7.981	0	0	[illegible]	[illegible]
CS02L097	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	[illegible]	[illegible]	0	0	N	[illegible]	[illegible]	7.981	0	0	[illegible]	[illegible]
CS02L098	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	[illegible]	[illegible]	0	0	N	[illegible]	[illegible]	7.981	0	0	[illegible]	[illegible]
CS02L099	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	[illegible]	[illegible]	0	0	N	[illegible]	[illegible]	7.981	0	0	[illegible]	[illegible]
CS02L100	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	[illegible]	[illegible]	0	0	N	[illegible]	[illegible]	7.981	0	0	[illegible]	[illegible]
CS02L101	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	[illegible]	[illegible]	0	0	N	[illegible]	[illegible]	7.981	0	0	[illegible]	[illegible]
CS02L102	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	[illegible]	[illegible]	0	0	N	[illegible]	[illegible]	7.981	0	0	[illegible]	[illegible]
CS02L103	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	[illegible]	[illegible]	0	0	N	[illegible]	[illegible]	7.981	0	0	[illegible]	[illegible]
CS02L104	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	[illegible]	[illegible]	0	0	N	[illegible]	[illegible]	7.981	0	0	[illegible]	[illegible]
CS02L105	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	[illegible]	[illegible]	0	0	N	[illegible]	[illegible]	7.981	0	0	[illegible]	[illegible]
CS02L106	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	[illegible]	[illegible]	0	0	N	[illegible]	[illegible]	7.981	0	0	[illegible]	[illegible]
CS02L107	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	[illegible]	[illegible]	0	0	N	[illegible]	[illegible]	7.981	0	0	[illegible]	[illegible]
CS02L108	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	[illegible]	[illegible]	0	0	N	[illegible]	[illegible]	7.981	0	0	[illegible]	[illegible]
CS02L109	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	[illegible]	[illegible]	0	0	N	[illegible]	[illegible]	7.981	0	0	[illegible]	[illegible]
CS02L110	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	[illegible]	[illegible]	0	0	N	[illegible]	[illegible]	7.981	0	0	[illegible]	[illegible]
CS02L111	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	18.46	0.119	0	0	N	-N(164)	-N(165)	7.981	0	0	10713	0.03079
CS02L112	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	18.56	0.119	0	0	N	-N(199)	-N(198)	7.981	0	0	10773	0.03075
CS02L113	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	14.74	0.095	0	0	N	-N(165)	-N(167)	7.981	0	0	8557	0.0327
CS02L114	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	14.85	0.096	0	0	N	-N(198)	-N(196)	7.981	0	0	8618	0.03264
CS02L115	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	11.2	0.072	0	0	N	-N(167)	-N(166)	7.981	0	0	8501	0.03531
CS02L116	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	11	0.071	0	0	N	-N(196)	-N(197)	7.981	0	0	6386	0.03548
CS02L117	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	7.355	0.047	0	0	N	-N(166)	-N(172)	7.981	0	0	4269	0.03998
CS02L118	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	7.459	0.048	0	0	N	-N(197)	-N(202)	7.981	0	0	4330	0.03982
CS02L119	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	3.642	0.023	0	0	N	-N(172)	-N(173)	7.981	0	0	2114	0.05029
CS02L120	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	3.746	0.024	0	0	N	-N(202)	-N(174)	7.981	0	0	2174	0.0498
CS02L121	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	0.099	0	0	0	N	-N(173)	-N(174)	7.981	0	0	57.62	1.111
CS02M(001)	Steel Sch 40 (clean)	Containment Sump Water	10	1.8	4.405	300.8	1.225	0.045	0.103	N	-N(390)	-N(391)	10.02	0	0.103	139077	0.0179
CS02M(002)	Steel Sch 40 (clean)	Containment Sump Water	10	1.8	4.405	300.9	1.225	0.045	0.103	N	-N(390)	-N(392)	10.02	0	0.103	139105	0.0179
CS02M(003)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	295.4	1.898	0.002	0.005	N	-N(391)	-N(393)	7.981	0.005	0	171481	0.01765
CS02M(004)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	295.5	1.897	0.002	0.005	N	-N(392)	-N(394)	7.981	0.005	0	171515	0.01765
CS02M(005)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	290	1.862	0.002	0.005	N	-N(393)	-N(395)	7.981	0.005	0	168353	0.01769
CS02M(006)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	290.1	1.862	0.002	0.005	N	-N(394)	-N(396)	7.981	0.005	0	168387	0.01769
CS02M(007)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	284.7	1.827	0.002	0.005	N	-N(395)	-N(397)	7.981	0.005	0	165225	0.01774
CS02M(008)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	284.7	1.827	0.002	0.005	N	-N(396)	-N(398)	7.981	0.005	0	165259	0.01774
CS02M(009)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	279.3	1.792	0.002	0.005	N	-N(397)	-N(399)	7.981	0.005	0	162099	0.01779
CS02M(010)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	279.3	1.793	0.002	0.005	N	-N(398)	-N(400)	7.981	0.005	0	162133	0.01779
CS02M(011)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	273.9	1.758	0.002	0.005	N	-N(399)	-N(401)	7.981	0.005	0	158973	0.01783
CS02M(012)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	273.9	1.758	0.002	0.005	N	-N(400)	-N(402)	7.981	0.005	0	159007	0.01783
CS02M(013)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	268.5	1.723	0.002	0.004	N	-N(401)	-N(403)	7.981	0.004	0	155847	0.01788
CS02M(014)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	268.6	1.724	0.002	0.004	N	-N(402)	-N(404)	7.981	0.004	0	155882	0.01788
CS02M(015)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	263.1	1.689	0.002	0.004	N	-N(403)	-N(405)	7.981	0.004	0	152723	0.01793
CS02M(016)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	263.2	1.689	0.002	0.004	N	-N(404)	-N(406)	7.981	0.004	0	152757	0.01793
CS02M(017)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	257.7	1.654	0.002	0.004	N	-N(405)	-N(407)	7.981	0.004	0	149598	0.01799
CS02M(018)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	257.8	1.655	0.002	0.004	N	-N(406)	-N(408)	7.981	0.004	0	149633	0.01799
CS02M(019)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	252.3	1.62	0.002	0.004	N	-N(407)	-N(409)	7.981	0.004	0	146475	0.01804
CS02M(020)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	252.4	1.62	0.002	0.004	N	-N(408)	-N(410)	7.981	0.004	0	146509	0.01804
CS02M(021)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	247	1.585	0.002	0.004	N	-N(409)	-N(411)	7.981	0.004	0	143352	0.0181
CS02M(022)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	247	1.586	0.002	0.004	N	-N(410)	-N(412)	7.981	0.004	0	143386	0.0181
CS02M(023)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	241.6	1.551	0.002	0.004	N	-N(411)	-N(413)	7.981	0.004	0	140229	0.01815
CS02M(024)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	241.6	1.551	0.002	0.004	N	-N(412)	-N(414)	7.981	0.004	0	140263	0.01815
CS02M(025)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	236.2	1.516	0.002	0.004	N	-N(413)	-N(415)	7.981	0.004	0	137107	0.01821
CS02M(026)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	236.3	1.516	0.002	0.004	N	-N(414)	-N(416)	7.981	0.004	0	137141	0.01821
CS02M(027)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	230.8	1.482	0.001	0.003	N	-N(415)	-N(417)	7.981	0.003	0	133985	0.01827
CS02M(028)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	230.9	1.482	0.001	0.003	N	-N(416)	-N(418)	7.981	0.003	0	134019	0.01827
CS02M(029)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	225.5	1.447	0.001	0.003	N	-N(417)	-N(419)	7.981	0.003	0	130864	0.01834
CS02M(030)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	225.5	1.447	0.001	0.003	N	-N(418)	-N(420)	7.981	0.003	0	130898	0.01834
CS02M(031)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	220.1	1.413	0.001	0.003	N	-N(419)	-N(421)	7.981	0.003	0	127743	0.0184
CS02M(032)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	220.1	1.413	0.001	0.003	N	-N(420)	-N(422)	7.981	0.003	0	127778	0.0184
CS02M(033)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	214.7	1.379	0.001	0.003	N	-N(421)	-N(423)	7.981	0.003	0	124623	0.01847
CS02M(034)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	214.8	1.379	0.001	0.003	N	-N(422)	-N(424)	7.981	0.003	0	124657	0.01847
CS02M(035)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	209.3	1.344	0.001	0.003	N	-N(423)	-N(425)	7.981	0.003	0	121503	0.01854
CS02M(036)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	209.4	1.344	0.001	0.003	N	-N(424)	-N(426)	7.981	0.003	0	121537	0.01854
CS02M(037)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	204	1.309	0.001	0.003	N	-N(425)	-N(427)	7.981	0.003	0	118384	0.01862
CS02M(038)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	204	1.309	0.001	0.003	N	-N(426)	-N(428)	7.981	0.003	0	118418	0.01862
CS02M(039)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	198.6	1.275	0.001	0.003	N	-N(427)	-N(429)	7.981	0.003	0	115264	0.01869
CS02M(040)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	198.8	1.275	0.001	0.003	N	-N(428)	-N(430)	7.981	0.003	0	115299	0.01869
CS02M(041)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	193.2	1.24	0.001	0.002	N	-N(429)	-N(431)	7.981	0.002	0	112146	0.01877
CS02M(042)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	193.3	1.24	0.001	0.002	N	-N(430)	-N(432)	7.981	0.002	0	112180	0.01877
CS02M(043)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	187.8	1.206	0	0.002	N	-N(431)	-N(433)	7.981	0.002	0	109027	0.01886
CS02M(044)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	187.9	1.206	0	0.002	N	-N(432)	-N(434)	7.981	0.002	0	109061	0.01886
CS02M(045)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	182.5	1.171	0	0.002	N	-N(433)	-N(435)	7.981	0.002	0	105909	0.01894
CS02M(046)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	182.5	1.171	0	0.002	N	-N(434)	-N(436)	7.981	0.002	0	105943	0.01894
CS02M(047)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	177.1	1.137	0	0.002	N	-N(435)	-N(437)	7.981	0.002	0	102791	0.01904
CS02M(048)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	177.1	1.137	0	0.002	N	-N(436)	-N(438)	7.981	0.002	0	102825	0.01903
CS02M(049)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	171.7	1.102	0	0.002	N	-N(437)	-N(439)	7.981	0.002	0	99673	0.01913
CS02M(050)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	171.8	1.103	0	0.002	N	-N(438)	-N(440)	7.981	0.002	0	99707	0.01913
CS02M(051)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	166.3	1.068	0	0.002	N	-N(439)	-N(441)	7.981	0.002	0	96556	0.01923
CS02M(052)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	166.4	1.068	0	0.002	N	-N(440)	-N(442)	7.981	0.002	0	96590	0.01923
CS02M(053)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	161	1.033	0	0.002	N	-N(441)	-N(443)	7.981	0.002	0	93439	0.01933
CS02M(054)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	161	1.034	0	0.002	N	-N(442)	-N(444)	7.981	0.002	0	93473	0.01933
CS02M(055)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	155.6	0.999	0	0.002	N	-N(443)	-N(445)	7.981	0.002	0	90322	0.01944
CS02M(056)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	155.7	0.9991	0	0.002	N	-N(444)	-N(446)	7.981	0.002	0	90356	0.01944
CS02M(057)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	150.2	0.964	0	0.002	N	-N(445)	-N(447)	7.981	0.002	0	87205	0.01956
CS02M(058)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	150.3	0.965	0	0.002	N	-N(446)	-N(448)	7.981	0.002	0	87239	0.01956
CS02M(059)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	144.9	0.93	0	0.001	N	-N(447)	-N(449)	7.981	0.001	0	84089	0.01968
CS02M(060)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	144.9	0.93	0	0.001	N	-N(448)	-N(450)	7.981	0.001	0	84123	0.01968
CS02M(061)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	139.5	0.895	0	0.001	N	-N(449)	-N(451)	7.981	0.001	0	80972	0.01981
CS02M(062)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	139.6	0.896	0	0.001	N	-N(450)	-N(452)	7.981	0.001	0	81006	0.0198
CS02M(063)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	134.1	0.861	0	0.001	N	-N(451)	-N(453)	7.981	0.001	0	77856	0.01994
CS02M(064)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	134.2	0.861	0	0.001	N	-N(452)	-N(454)	7.981	0.001	0	77890	0.01994
CS02M(065)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	128.8	0.826	0	0.001	N	-N(453)	-N(455)	7.981	0.001	0	74740	0.02008
CS02M(066)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	128.8	0.827	0	0.001	N	-N(454)	-N(456)	7.981	0.001	0	74774	0.02008
CS02M(067)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	123.4	0.792	0	0.001	N	-N(455)	-N(457)	7.981	0.001	0	71625	0.02024
CS02M(068)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	123.5	0.792	0	0.001	N	-N(456)	-N(458)	7.981	0.001	0	71659	0.02023
CS02M(069)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	118	0.758	0	0	N	-N(457)	-N(459)	7.981	0	0	68509	0.0204
CS02M(070)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	118.1	0.758	0	0	N	-N(458)	-N(460)	7.981	0	0	68543	0.0204
CS02M(071)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	112.7	0.723	0	0	N	-N(459)	-N(461)	7.981	0	0	65393	0.02057
CS02M(072)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	112.7	0.723	0	0	N	-N(460)	-N(462)	7.981	0	0	65427	0.02057
CS02M(073)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	107.3	0.689	0	0	N	-N(461)	-N(463)	7.981	0	0	62278	0.02076
CS02M(074)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	107.4	0.689	0	0	N	-N(462)	-N(464)	7.981	0	0	62312	0.02075
CS02M(075)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	101.9	0.654	0	0	N	-N(463)	-N(465)	7.981	0	0	59163	0.02096
CS02M(076)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	102	0.655	0	0	N	-N(464)	-N(466)	7.981	0	0	59197	0.02095
CS02M(077)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	96.56	0.62	0	0	N	-N(465)	-N(467)	7.981	0	0	56048	0.02117
CS02M(078)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	96.62	0.62	0	0	N	-N(466)	-N(468)	7.981	0	0	56082	0.02117
CS02M(079)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	91.19	0.585	0	0	N	-N(467)	-N(469)	7.981	0	0	52932	0.0214
CS02M(080)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	91.25	0.586	0	0	N	-N(468)	-N(470)	7.981	0	0	52966	0.0214
CS02M(081)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	85.83	0.551	0	0	N	-N(469)	-N(471)	7.981	0	0	49817	0.02166
CS02M(082)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	85.89	0.551	0	0	N	-N(470)	-N(472)	7.981	0	0	49851	0.02165
CS02M(083)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	80.46	0.516	0	0	N	-N(471)	-N(473)	7.981	0	0	46703	0.02193
CS02M(084)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	80.52	0.517	0	0	N	-N(472)	-N(474)	7.981	0	0	46737	0.02193
CS02M(085)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	75.09	0.482	0	0	N	-N(473)	-N(475)	7.981	0	0	43588	0.02224
CS02M(086)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	75.15	0.482	0	0	N	-N(474)	-N(476)	7.981	0	0	43622	0.02223
CS02M(087)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	69.73	0.448	0	0	N	-N(475)	-N(477)	7.981	0	0	40473	0.02257
CS02M(088)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	69.79	0.448	0	0	N	-N(476)	-N(478)	7.981	0	0	40507	0.02257
CS02M(089)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	64.36	0.413	0	0	N	-N(477)	-N(479)	7.981	0	0	37358	0.02295
CS02M(090)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	64.42	0.413	0	0	N	-N(478)	-N(480)	7.981	0	0	37392	0.02295
CS02M(091)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	59	0.379	0	0	N	-N(479)	-N(481)	7.981	0	0	34243	0.02337
CS02M(092)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	59.05	0.379	0	0	N	-N(480)	-N(482)	7.981	0	0	34277	0.02337
CS02M(093)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	53.63	0.344	0	0	N	-N(481)	-N(483)	7.981	0	0	31129	0.02386
CS02M(094)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	53.69	0.345	0	0	N	-N(482)	-N(484)	7.981	0	0	31163	0.02385
CS02M(095)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	48.26	0.31	0	0	N	-N(483)	-N(485)	7.981	0	0	28014	0.02441
CS02M(096)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	48.32	0.31	0	0	N	-N(484)	-N(486)	7.981	0	0	28048	0.0244
CS02M(097)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	42.9	0.275	0	0	N	-N(485)	-N(487)	7.981	0	0	24899	0.02506
CS02M(098)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	42.96	0.276	0	0	N	-N(486)	-N(488)	7.981	0	0	24933	0.02505
CS02M(099)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	37.53	0.241	0	0	N	-N(487)	-N(489)	7.981	0	0	21785	0.02584
CS02M(100)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	37.59	0.241	0	0	N	-N(488)	-N(490)	7.981	0	0	21819	0.02583
CS02M(101)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	32.17	0.206	0	0	N	-N(489)	-N(491)	7.981	0	0	18670	0.02679
CS02M(102)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	32.22	0.207	0	0	N	-N(490)	-N(492)	7.981	0	0	18704	0.02678
CS02M(103)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	26.8	0.172	0	0	N	-N(491)	-N(493)	7.981	0	0	15556	0.028
CS02M(104)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	26.86	0.172	0	0	N	-N(492)	-N(494)	7.981	0	0	15590	0.02799
CS02M(105)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	21.43	0.138	0	0	N	-N(493)	-N(495)	7.981	0	0	12441	0.02962
CS02M(106)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	21.49	0.138	0	0	N	-N(494)	-N(496)	7.981	0	0	12475	0.0296
CS02M(107)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	16.07	0.103	0	0	N	-N(495)	-N(497)	7.981	0	0	9327	0.03195
CS02M(108)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	16.13	0.104	0	0	N	-N(496)	-N(498)	7.981	0	0	9361	0.03192
CS02M(109)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	10.7	0.069	0	0	N	-N(497)	-N(499)	7.981	0	0	6212	0.03577
CS02M(110)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	10.76	0.069	0	0	N	-N(498)	-N(500)	7.981	0	0	6246	0.03571
CS02M(111)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	5.336	0.034	0	0	N	-N(499)	-N(501)	7.981	0	0	3098	0.04424
CS02M(112)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	5.395	0.035	0	0	N	-N(500)	-N(502)	7.981	0	0	3132	0.04409
CS02M(113)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	0.029	0	0	0	N	-N(502)	-N(501)	7.981	0	0	17.03	3.768
CS05AA	Steel Sch 40 (clean)	Containment Sump Water	3	1	9.8	0	0	0	0	N	-N(008)	-N(563)	3.068	0	0	0	0
CS05AB	Steel Sch 40 (clean)	Containment Sump Water	3	1	11.1	0	0	0	0	N	-N(240)	-N(562)	3.068	0	0	0	0
CS06AA	Steel Sch 40 (clean)	Containment Sump Water	6	1	1	0	0	-1.382	0	N	-N(563)	-N(556)	6.065	0	0	0	0
CS06AB	Steel Sch 40 (clean)	Containment Sump Water	6	1	1	0	0	1.09	0	N	-N(562)	-N(557)	6.065	0	0	0	0
CS23AA	Steel Sch 30 (clean)	Containment Sump Water	14	15.7	1.00E-05	0	0	-6.4	0	N	-N(556)	-N(005)	13.25	0	0	0	0
CS23AB	Steel Sch 30 (clean)	Containment Sump Water	14	4.9	1.00E-05	0	0	-2.117	0	N	-N(557)	-N(237)	13.25	0	0	0	0
CV05B(001)	Steel Sch 40 (clean)	Water After RHR HX	8	17.5	0.8	779.8	5.004	0.204	0.473	N	-N(622)	-N(627)	7.981	0.182	0.311	452506	0.01587
CV05B(002)	Steel Sch 40 (clean)	Water After RHR HX	8	21.7	22.89	130	0.834	0.11	0.254	N	-N(631)	-N(622)	7.981	0.007	0.247	75458	0.02005
CV05B(003)	Steel Sch 40 (clean)	Water After RHR HX	8	18.6	0	130	0.834	0.002	0.005	N	-N(633)	-N(631)	7.981	0.005	0	75458	0.02005
CV05B(004)	Steel Sch 40 (clean)	Water After RHR HX	8	16.5	0.5907	0	0	0	0	N	-N(625)	-N(633)	7.981	0	0	0	0
CV05B(005)	Steel Sch 40 (clean)	Water After RHR HX	8	13.7	1.2	0	0	0.864	0	N	-N(624)	-N(625)	7.981	0	0	0	0
CV05B(006)	Steel Sch 40 (clean)	Water After RHR HX	8	1	1.00E-05	0	0	0	0	N	-N(623)	-N(624)	7.981	0	0	0	0
CV05CA	Steel Sch 40 (clean)	Water After RHR HX	6	24.5	2.612	397.7	4.42	-1.209	1.102	N	-N(627)	Centrifugal Charging Pump A	6.065	0.25	0.852	303756	0.01701
CV05CB	Steel Sch 40 (clean)	Water After RHR HX	6	119.8	1.921	391.9	4.243	-0.864	1.888	N	-N(627)	Centrifugal Charging Pump B	6.065	1.131	0.537	291702	0.01709
CV06A	Steel Sch 40 (clean)	Water After RHR HX	4	39.4	427.8	0	0	-2.506	0	N	-N(631)	Positive Dis. Charging Pump	4.026	0	0	0.01151	0
CV07A(001)	Steel Sch.160 (clean)	Water After RHR HX	3	2.7	8.631	0	0	0	0	N	Positive Dis. Charging Pump	-N(641)	2.624	0	0	0.01765	0
CV07A(002)	Steel Sch.160 (clean)	Water After RHR HX	3	30.5	10.05	0	0	1.555	0	N	-N(641)	-N(640)	2.624	0	0	0.01765	0

CS02M(001)	1 x Reducer - Contraction (10 x 8 - 7)	0.1047	1 x Diverging* Tee (Branch)	4.3						
CS02M(002)	1 x Reducer - Contraction (10 x 8 - 7)	0.1047	1 x Diverging* Tee (Branch)	4.3						
CS05AA	1 x Diverging Tee (Branch)	9.8								
CS05AB	1 x Diverging Tee (Branch)	11.1								
CS06AA	1 x Converging Tee (Branch)	1								
CS06AB	1 x Converging Tee (Branch)	1								
CS23AA	1 x Converging Tee (Branch)	1.00E-05								
CS23AB	1 x Converging Tee (Branch)	1.00E-05								
CV05B(001)	1 x Diverging* Tee (Branch)	0.8								
CV05B(002)	3 x Pipe Bend - r/d 1.5 (90°)	0.1969	1 x Converging Tee (Through)	21.5	1 x Diverging* Tee (Branch)	0.8				
CV05B(004)	3 x Pipe Bend - r/d 1.5 (90°)	0.1969	1 x Converging Tee (Through)	1.00E-05						
CV05B(005)	1 x Converging* Tee (Branch)	1.2								
CV05B(006)	1 x Converging Tee (Through)	1.00E-05								
CV05CA	2 x Pipe Bend - r/d 1.5 (90°)	0.2065	1 x CV8471A (Gate Valve)	0.195	1 x Diverging Tee (Branch)	2.2				
CV05CB	8 x Pipe Bend - r/d 1.5 (90°)	0.2065	1 x Reducer - Contraction (8 x 6 - 5.5)	0.898	1 x CV8471B (Gate Valve)	0.195	1 x Diverging Tee (Through)	1.00E-05		
CV06A	5 x Pipe Bend - r/d 1.5 (90°)	0.2279	1 x Reducer - Contraction (8 x 4 - 6)	0.1867	1 x CV13M(Suct. Stabilizer)	423.9	1 x CV8394(Diaphragm Valve)	2.435	1 x Diverging* Tee (Branch)	1.00E-05
CV07A(001)	1 x Pipe Bend - r/d 1.5 (90°)	0.2511	1 x CV12M(Puls. Dampener)	8.379						
CV07A(002)	1 x CV8497(Check Valve)	3.2	3 x Pipe Bend - r/d 1.5 (90°)	0.2511	1 x CV8388(Globe Valve)	6.1	1 x Diverging Tee (Through)	1.00E-05		

CV08AA(001)	Steel Sch.160 (clean)	Water After RHR HX	4	2.8	0.4721	
CV08AA(002)	Steel Sch.160 (clean)	Water After RHR HX	4	4.8	2.875	
CV08AA(003)	Steel Sch.40 (clean)	Water After RHR HX	4	12.8	0.9047	
CV08BA(001)	Steel Sch.160 (clean)	Water After RHR HX	4	1.7	0.2361	
CV08BA(002)	Steel Sch.160 (clean)	Water After RHR HX	4	3.7	3.211	
CV08BA(003)	Steel Sch.40 (clean)	Water After RHR HX	4	103.1	3.333	
CV09A(001)	Steel Sch.160 (clean)	Water After RHR HX	4	13.3	5	
CV09A(002)	Steel Sch.160 (clean)	Water After RHR HX	4	23.3	9.156	
CV09D(001)	Steel Sch.160 (clean)	Water After RHR HX	3	2.8	0.2638	
CV09D(002)	Steel Sch.160 (clean)	Water After RHR HX	3	8.6	12.63	
CV09D(003)	Steel Sch.160 (clean)	Water After RHR HX	3	23	11.4	
CV09D(004)	Steel Sch.160 (clean)	Water After RHR HX	3	12.5	1.00E-06	
CV12AA	Steel Sch.160 (clean)	Water After RHR HX	3	15.8	1.74	XXX
CV12AB	Steel Sch.160 (clean)	Water After RHR HX	3	116.7	3.247	XXX
CV12B	Steel Sch.160 (clean)	Water After RHR HX	3	0.8	0	
CV13B	Steel Sch.160 (clean)	Water After RHR HX	3	13.8	2.251	
CV43A(001)	Steel Sch.160 (clean)	Water After RHR HX	2	97	49.04	
CV43A(002)	Steel Sch.160 (clean)	Water After RHR HX	2	60.5	1.116	
CV43A(003)	Steel Sch.160 (clean)	Water After RHR HX	2	117.8	2.151	
CV43BA/RC16AA	Steel Sch.160 (clean)	Water After RHR HX	2	134.4	15.41	XXX
CV43BB/RC16AB	Steel Sch.160 (clean)	Water After RHR HX	2	19	13.29	XXX

Pipe(224)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.324	1.607	4.46	7.523	N	B3(004)
Pipe(225)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.324	1.606	4.459	7.521	N	B3(005)
Pipe(226)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.324	1.606	4.459	7.521	N	B3(006)
Pipe(227)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.323	1.606	4.458	7.519	N	B3(007)
Pipe(228)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.323	1.606	4.458	7.519	N	B3(008)
Pipe(229)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.323	1.606	4.457	7.517	N	B3(009)
Pipe(230)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.323	1.606	4.457	7.517	N	B3(010)
Pipe(231)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.322	1.606	4.456	7.515	N	B3(011)
Pipe(232)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.322	1.606	4.456	7.515	N	B3(012)
Pipe(233)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.322	1.606	4.455	7.513	N	B3(013)
Pipe(234)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.322	1.606	4.455	7.513	N	B3(014)
Pipe(235)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.321	1.605	4.455	7.512	N	B3(015)
Pipe(236)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.321	1.605	4.455	7.512	N	B3(016)
Pipe(237)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.321	1.605	4.454	7.51	N	B3(017)
Pipe(238)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.321	1.605	4.454	7.511	N	B3(018)
Pipe(239)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.321	1.605	4.454	7.509	N	B3(019)
Pipe(240)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.321	1.605	4.454	7.509	N	B3(020)
Pipe(241)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.32	1.605	4.453	7.508	N	B3(021)
Pipe(242)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.32	1.605	4.453	7.508	N	B3(022)
Pipe(243)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.32	1.605	4.453	7.507	N	B3(023)
Pipe(244)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.32	1.605	4.453	7.507	N	B3(024)
Pipe(245)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.32	1.605	4.452	7.506	N	B3(025)
Pipe(246)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.32	1.605	4.452	7.506	N	B3(026)
Pipe(247)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.319	1.605	4.452	7.506	N	B3(027)
Pipe(248)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.319	1.605	4.452	7.506	N	B3(028)
Pipe(249)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.319	1.605	4.452	7.506	N	B3(029)
Pipe(250)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.319	1.605	4.452	7.505	N	B3(030)
Pipe(251)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.319	1.605	4.452	7.505	N	B3(031)
Pipe(252)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.319	1.605	4.452	7.505	N	B3(032)
Pipe(253)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.319	1.605	4.451	7.504	N	B3(033)
Pipe(254)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.319	1.605	4.451	7.504	N	B3(034)
Pipe(255)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.319	1.605	4.451	7.504	N	B3(035)
Pipe(256)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.319	1.605	4.451	7.504	N	B3(036)
Pipe(257)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.319	1.605	4.451	7.503	N	B3(037)
Pipe(258)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.319	1.605	4.451	7.503	N	B3(038)
Pipe(259)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.319	1.605	4.451	7.503	N	B3(039)
Pipe(260)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.319	1.605	4.451	7.503	N	B3(040)
Pipe(261)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.319	1.605	4.451	7.503	N	B3(041)
Pipe(262)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.319	1.605	4.451	7.503	N	B3(042)
Pipe(263)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.319	1.604	4.451	7.503	N	B3(043)
Pipe(264)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.319	1.604	4.451	7.503	N	B3(044)
Pipe(265)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.319	1.604	4.451	7.503	N	B3(045)
Pipe(266)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.319	1.604	4.451	7.503	N	B3(046)
Pipe(267)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.319	1.604	4.451	7.503	N	B3(047)
Pipe(268)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.319	1.604	4.451	7.503	N	B3(048)
Pipe(269)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.319	1.604	4.451	7.503	N	B3(049)
Pipe(270)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.319	1.604	4.451	7.503	N	B3(050)
Pipe(271)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.319	1.604	4.451	7.503	N	B3(051)
Pipe(272)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.262	1.583	1.212	7.306	N	B2(001)
Pipe(273)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.262	1.583	1.212	7.306	N	B2(002)
Pipe(274)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.259	1.582	1.209	7.298	N	B2(003)
Pipe(275)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.259	1.582	1.209	7.298	N	B2(004)
Pipe(276)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.257	1.582	1.206	7.291	N	B2(005)
Pipe(277)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.257	1.582	1.206	7.291	N	B2(006)
Pipe(278)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.255	1.581	1.202	7.283	N	B2(007)
Pipe(279)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.255	1.581	1.202	7.283	N	B2(008)
Pipe(280)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.253	1.58	1.199	7.277	N	B2(009)
Pipe(281)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.253	1.58	1.199	7.277	N	B2(010)
Pipe(282)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.251	1.579	1.197	7.27	N	B2(011)
Pipe(283)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.251	1.579	1.197	7.27	N	B2(012)
Pipe(284)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.249	1.579	1.194	7.264	N	B2(013)
Pipe(285)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.249	1.579	1.194	7.264	N	B2(014)
Pipe(286)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.248	1.578	1.191	7.258	N	B2(015)
Pipe(287)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.248	1.578	1.191	7.258	N	B2(016)
Pipe(288)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.246	1.577	1.189	7.252	N	B2(017)
Pipe(289)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.246	1.577	1.189	7.252	N	B2(018)
Pipe(290)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.244	1.577	1.187	7.247	N	B2(019)
Pipe(291)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.244	1.577	1.187	7.247	N	B2(020)
Pipe(292)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.243	1.576	1.184	7.242	N	B2(021)
Pipe(293)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.243	1.576	1.184	7.242	N	B2(022)
Pipe(294)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.241	1.576	1.182	7.237	N	B2(023)
Pipe(295)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.241	1.576	1.182	7.237	N	B2(024)
Pipe(296)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.24	1.575	1.18	7.232	N	B2(025)
Pipe(297)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.24	1.575	1.18	7.232	N	B2(026)
Pipe(298)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.238	1.575	1.179	7.228	N	B2(027)
Pipe(299)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.238	1.575	1.179	7.228	N	B2(028)
Pipe(300)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.238	1.574	1.177	7.224	N	B2(029)
Pipe(301)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.238	1.574	1.177	7.224	N	B2(030)
Pipe(302)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.237	1.574	1.175	7.22	N	B2(031)
Pipe(303)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.237	1.574	1.175	7.22	N	B2(032)
Pipe(304)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.235	1.574	1.174	7.217	N	B2(033)
Pipe(305)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.235	1.574	1.174	7.217	N	B2(034)
Pipe(306)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.234	1.573	1.172	7.213	N	B2(035)
Pipe(307)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.234	1.573	1.172	7.213	N	B2(036)
Pipe(308)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.234	1.573	1.171	7.21	N	B2(037)
Pipe(309)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.234	1.573	1.171	7.21	N	B2(038)
Pipe(310)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.233	1.573	1.17	7.207	N	B2(039)
Pipe(311)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.233	1.573	1.17	7.207	N	B2(040)
Pipe(312)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.232	1.572	1.168	7.204	N	B2(041)
Pipe(313)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.232	1.572	1.168	7.204	N	B2(042)
Pipe(314)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.231	1.572	1.167	7.202	N	B2(043)
Pipe(315)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.231	1.572	1.167	7.202	N	B2(044)
Pipe(316)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.23	1.572	1.166	7.2	N	B2(045)
Pipe(317)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.23	1.572	1.166	7.2	N	B2(046)
Pipe(318)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.23	1.571	1.165	7.197	N	B2(047)
Pipe(319)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.23	1.571	1.165	7.197	N	B2(048)
Pipe(320)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.229	1.571	1.164	7.195	N	B2(049)
Pipe(321)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.229	1.571	1.164	7.195	N	B2(050)
Pipe(322)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.229	1.571	1.164	7.194	N	B2(051)
Pipe(323)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.229	1.571	1.164	7.194	N	B2(052)
Pipe(324)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.228	1.571	1.163	7.192	N	B2(053)
Pipe(325)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.228	1.571	1.163	7.192	N	B2(054)
Pipe(326)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.228	1.571	1.162	7.19	N	B2(055)
Pipe(327)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.228	1.571	1.162	7.19	N	B2(056)
Pipe(328)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.227	1.571	1.162	7.189	N	B2(057)
Pipe(329)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.227	1.571	1.162	7.189	N	B2(058)
Pipe(330)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.227	1.57	1.161	7.188	N	B2(059)
Pipe(331)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.227	1.57	1.161	7.188	N	B2(060)
Pipe(332)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.227	1.57	1.161	7.187	N	B2(061)
Pipe(333)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.227	1.57	1.161	7.187	N	B2(062)
Pipe(334)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.226	1.57	1.16	7.186	N	B2(063)
Pipe(335)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	↔	4.226	1.57	1.16	7.186	N	B2(064)

Pipe(336)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.226	1.57	1.16	7.185	N	B2(065)	~N(363)	1.049	0.006	7.179	18663	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(337)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.226	1.57	1.16	7.185	N	B2(066)	~N(364)	1.049	0.006	7.179	18663	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(338)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.226	1.57	1.16	7.184	N	B2(067)	~N(365)	1.049	0.006	7.178	18663	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(339)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.226	1.57	1.16	7.184	N	B2(068)	~N(366)	1.049	0.006	7.178	18663	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(340)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.226	1.57	1.159	7.184	N	B2(069)	~N(367)	1.049	0.007	7.177	18662	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(341)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.226	1.57	1.159	7.184	N	B2(070)	~N(368)	1.049	0.007	7.177	18662	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(342)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.226	1.57	1.159	7.183	N	B2(071)	~N(369)	1.049	0.006	7.177	18661	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(343)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.226	1.57	1.159	7.183	N	B2(072)	~N(370)	1.049	0.006	7.177	18661	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(344)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.226	1.57	1.159	7.183	N	B2(073)	~N(371)	1.049	0.007	7.176	18660	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(345)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.226	1.57	1.159	7.183	N	B2(074)	~N(372)	1.049	0.007	7.176	18660	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(346)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.225	1.57	1.159	7.182	N	B2(075)	~N(373)	1.049	0.006	7.176	18660	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(347)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.225	1.57	1.159	7.182	N	B2(076)	~N(374)	1.049	0.006	7.176	18660	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(348)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.225	1.57	1.159	7.182	N	B2(077)	~N(375)	1.049	0.006	7.176	18660	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(349)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.225	1.57	1.159	7.182	N	B2(078)	~N(376)	1.049	0.006	7.176	18660	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(350)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.225	1.57	1.159	7.182	N	B2(079)	~N(377)	1.049	0.007	7.175	18659	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(351)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.225	1.57	1.159	7.182	N	B2(080)	~N(378)	1.049	0.007	7.175	18659	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(352)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.225	1.57	1.159	7.182	N	B2(081)	~N(379)	1.049	0.007	7.175	18659	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(353)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.225	1.57	1.159	7.182	N	B2(082)	~N(380)	1.049	0.007	7.175	18659	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(354)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.225	1.57	1.159	7.182	N	B2(083)	~N(381)	1.049	0.007	7.175	18659	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(355)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.225	1.57	1.159	7.182	N	B2(084)	~N(382)	1.049	0.007	7.175	18659	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(356)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.225	1.57	1.158	7.182	N	B2(085)	~N(383)	1.049	0.007	7.175	18659	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(357)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.225	1.57	1.158	7.182	N	B2(086)	~N(384)	1.049	0.007	7.175	18659	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(358)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.225	1.57	1.158	7.182	N	B2(087)	~N(385)	1.049	0.007	7.175	18659	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(359)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.225	1.57	1.158	7.182	N	B2(088)	~N(387)	1.049	0.007	7.175	18659	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(360)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.225	1.57	1.158	7.182	N	B2(089)	~N(388)	1.049	0.007	7.175	18659	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(361)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.225	1.57	1.158	7.182	N	B2(090)	~N(389)	1.049	0.007	7.175	18659	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(362)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.39	2.003	5.049	11.68	N	~N(391)	B1(001)	1.049	0.01	11.68	23804	0.02873	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(363)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.39	2.003	5.049	11.69	N	~N(392)	B1(002)	1.049	0.01	11.68	23804	0.02873	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1

RH03AB(004)	Steel Sch.40 (clean)	Water After RHR HX	8	28.9	2.472		3245	20.83	12.32	20.92	N
RH03AB(005)	Steel Sch.40 (clean)	Water After RHR HX	8	36.3	14000		27.78	0.178	2.982	6.903	N
RH03AB(006)	Steel Sch.40S (clean)	Water After RHR HX	12	1.5	1.00E-05		27.78	0.079	0	0	N
RH09AA(001)	Steel Sch.40 (clean)	Containment Sump Water	8	1	1.00E-05	XXX	—	—	—	—	N
RH09AA(002)	Steel Sch.40 (clean)	Containment Sump Water	8	1	1.00E-05	XXX	—	—	—	—	N
RH09AB(001)	Steel Sch.40 (clean)	Containment Sump Water	8	1	1.00E-05	XXX	—	—	—	—	N
RH09AB(002)	Steel Sch.40 (clean)	Containment Sump Water	8	1	1.00E-05	XXX	—	—	—	—	N
RH10AA(001)	Steel Sch.40 (clean)	Water After RHR HX	3	1	1.00E-05	XXX	—	—	—	—	N
RH10AA(002)	Steel Sch.40 (clean)	Water After RHR HX	3	1	1.00E-05		0	0	0	0	N
RH10AB(001)	Steel Sch.40 (clean)	Water After RHR HX	3	1	1.00E-05	XXX	—	—	—	—	N
RH10AB(002)	Steel Sch.40 (clean)	Water After RHR HX	3	1	1.00E-05		0	0	-9.979	0	N
RH12A/CV99A	Steel Sch.40 (clean)	Water After RHR HX	8	28.6	6.573	XXX	—	—	—	—	N
RH14A	Steel Sch.40 (clean)	Water After RHR HX	8	4.4	1.979	XXX	—	—	—	—	N
SI01A	Steel Sch.40 (clean)	Water After RHR HX	8	28.4	0.9644		0	0	3.456	0	N
SI01B(001)	Steel Sch.20 (clean)	Water After RHR HX	24	113.2	0.3195		13100	9.907	-4.589	1.577	N
SI01B(002)	Steel Sch.20 (clean)	Water After RHR HX	24	58	0.3195		13403	9.38	0.924	0.839	N
SI01B(003)	Steel Sch.20 (clean)	Water After RHR HX	24	4.8	0.3		6420	4.855	0.052	0.121	N
SI01B(004)	Steel Sch.20 (clean)	Water After RHR HX	24	60.3	0.4524		6420	4.855	0.135	0.312	N
SI01B(005)	Steel Sch.20 (clean)	Water After RHR HX	24	7	2.00E-05		6420	4.855	0.007	0.017	N
SI01B(006)	Steel Sch.20 (clean)	Water After RHR HX	24	2	31.6		649.6	0.491	0.051	0.118	N
SI01B(007)	Steel Sch.20 (clean)	Water After RHR HX	24	1	29.43		649.6	0.491	0.048	0.11	N
SI02A/SIF9A	Steel Sch.40 (clean)	Water After RHR HX	8	28.3	8.268		887.2	4.475	-1.175	2.78	N
SI02BA(001)	Steel Sch.40 (clean)	Water After RHR HX	8	1.7	0.1566		361.2	2.318	0.007	0.017	N
SI02BA(002)	Steel Sch.40 (clean)	Water After RHR HX	6	174.8	2.749		361.2	4.014	-3.339	2.172	N
SI02BA(003)	Steel Sch.40 (clean)	Water After RHR HX	6	3.4	0.8286		361.2	4.014	0.124	0.186	N
SI02BA(004)	Steel Sch.40 (clean)	Water After RHR HX	4	1	0		361.2	9.111	0.029	0.068	N
SI02BB(001)	Steel Sch.40 (clean)	Water After RHR HX	6	4.7	2.804		336	3.734	0.277	0.641	N
SI02BB(002)	Steel Sch.40 (clean)	Water After RHR HX	6	14.7	2.837		336	3.734	-3.965	0.722	N
SI02BB(003)	Steel Sch.40 (clean)	Water After RHR HX	4	1	0		336	6.474	0.069	0.059	N
[illegible]											

B82AB/3B	Steel Sch 40 (clean)	Water After RHR HX	12	57.1	4.915
BIA4A	Steel Sch 160 (clean)	Water After RHR HX	8	15.1	1.847
BIA4B	Steel Sch 160 (clean)	Water After RHR HX	8	85.1	2.11

[illegible]

Node List	Status	Pressure	Grade	Elev
~N(001)		121.6	675.5	428
~N(001A)		58.42	675.5	674.3
~N(002)		30.07	390.7	355.1
~N(003)		93.01	390.7	348.3
~N(004)		34.71	396.2	349.9
~N(005)		157.8	675.5	344.3
~N(006)		157.8	675.5	344.3
~N(007)		156.1	675.5	348.3
~N(008)		151	675.5	360
~N(009)		136	675.5	394.8
~N(010)		52.85	675.5	587.2
~N(011)		50.19	675.6	593.5
~N(012)		50.2	675.7	593.5
~N(013)		50.2	675.7	593.5
~N(014)		50.2	675.7	593.5
~N(015)		50.21	675.7	593.5
~N(016)		50.22	675.7	593.5
~N(017)		50.22	675.7	593.5
~N(018)		50.23	675.7	593.5
~N(019)		50.23	675.7	593.5
~N(020)		50.24	675.8	593.5
~N(021)		50.24	675.8	593.5
~N(022)		50.25	675.8	593.5
~N(023)		50.24	675.8	593.5
~N(024)		50.24	675.8	593.5
~N(025)		50.25	675.8	593.5
~N(026)		50.25	675.8	593.5
~N(027)		50.25	675.8	593.5
~N(028)		50.25	675.8	593.5
~N(029)		50.25	675.8	593.5
~N(030)		50.25	675.8	593.5
~N(031)		50.25	675.8	593.5
~N(032)		50.25	675.8	593.5
~N(033)		50.2	675.7	593.5
~N(034)		50.21	675.7	593.5
~N(035)		50.22	675.7	593.5
~N(036)		50.23	675.7	593.5
~N(037)		50.23	675.7	593.5
~N(038)		50.22	675.7	593.5
~N(039)		50.24	675.8	593.5
~N(040)		50.25	675.8	593.5
~N(041)		50.25	675.8	593.5
~N(042)		50.24	675.8	593.5
~N(043)		50.24	675.8	593.5
~N(044)		50.24	675.8	593.5
~N(045)		50.25	675.8	593.5
~N(046)		50.25	675.8	593.5
~N(047)		50.25	675.8	593.5
~N(048)		50.25	675.8	593.5
~N(049)		50.25	675.8	593.5
~N(050)		50.25	675.8	593.5
~N(051)		52.18	675.7	589
~N(052)		52.21	675.8	589
~N(053)		52.21	675.8	589
~N(054)		52.21	675.8	589
~N(055)		52.21	675.8	589
~N(056)		52.21	675.8	589
~N(057)		52.21	675.8	589
~N(058)		52.21	675.8	589
~N(059)		52.21	675.8	589
~N(060)		52.21	675.8	589
~N(061)		52.21	675.8	589
~N(062)		52.21	675.8	589
~N(063)		52.21	675.8	589
~N(064)		52.21	675.8	589
~N(065)		52.2	675.8	589
~N(066)		52.2	675.8	589
~N(067)		52.2	675.8	589
~N(068)		52.2	675.8	589
~N(069)		52.2	675.8	589
~N(070)		52.2	675.8	589
~N(071)		52.2	675.8	589
~N(072)		52.2	675.8	589
~N(073)		52.18	675.7	589
~N(074)		52.2	675.8	589
~N(075)		52.2	675.8	589
~N(076)		52.2	675.8	589
~N(077)		52.21	675.8	589
~N(078)		52.21	675.8	589
~N(079)		52.21	675.8	589
~N(080)		52.2	675.8	589
~N(081)		52.21	675.8	589
~N(082)		52.21	675.8	589
~N(083)		52.21	675.8	589
[illegible]		[illegible]	[illegible]	[illegible]

~N(174)	57.4	674.6	575.8
~N(175)	57.4	674.6	575.8
~N(176)	57.4	674.6	575.8
~N(177)	57.4	674.6	575.8
~N(178)	57.4	674.6	575.8
~N(179)	57.4	674.6	575.8
~N(180)	57.4	674.6	575.8
~N(181)	57.4	674.6	575.8
~N(182)	57.4	674.6	575.8
~N(183)	57.4	674.6	575.8
~N(184)	57.4	674.6	575.8
~N(185)	57.4	674.6	575.8
~N(186)	57.4	674.6	575.8
~N(187)	57.4	674.6	575.8
~N(188)	57.4	674.6	575.8
~N(189)	57.4	674.6	575.8
~N(190)	57.4	674.6	575.8
~N(191)	57.4	674.6	575.8
~N(192)	57.4	674.6	575.8
~N(193)	57.4	674.6	575.8
~N(194)	57.4	674.6	575.8
~N(195)	57.4	674.6	575.8
~N(196)	57.4	674.6	575.8
~N(197)	57.4	674.6	575.8
~N(198)	57.4	674.6	575.8
~N(199)	57.4	674.6	575.8
~N(200)	57.4	674.6	575.8
~N(201)	57.4	674.6	575.8
~N(202)	57.4	674.6	575.8
~N(203)	57.42	674.7	575.8
~N(204)	57.42	674.7	575.8
~N(205)	57.42	674.7	575.8
~N(206)	57.42	674.7	575.8
~N(207)	57.41	674.7	575.8
~N(208)	57.41	674.7	575.8
~N(209)	57.41	674.7	575.8
~N(210)	57.41	674.7	575.8
~N(211)	57.41	674.7	575.8
~N(212)	57.41	674.7	575.8
~N(213)	57.41	674.7	575.8
~N(214)	57.41	674.7	575.8
~N(215)	57.41	674.7	575.8
~N(216)	57.41	674.7	575.8
~N(217)	57.41	674.7	575.8
~N(218)	57.41	674.7	575.8
~N(219)	57.4	674.6	575.8
~N(220)	57.4	674.6	575.8
~N(221)	57.4	674.6	575.8
~N(222)	57.4	674.6	575.8
~N(223)	57.4	674.6	575.8
~N(224)	57.4	674.6	575.8
~N(225)	57.4	674.6	575.8
~N(226)	57.4	674.6	575.8
~N(227)	57.4	674.7	575.8
~N(228)	57.4	674.7	575.8
~N(229)	57.4	674.6	575.8
~N(230)	57.4	674.6	575.8
~N(231)	57.41	674.7	575.8
~N(232)	57.41	674.7	575.8
~N(234)	30.16	390.7	354.9
~N(235)	33.16	392.6	349.9
~N(236)	34.7	390.7	344.4
~N(237)	157.3	674.5	344.4
~N(238)	157.3	674.5	344.4
~N(239)	158.5	674.5	346.3
~N(240)	156.3	674.5	348.8
~N(241)	141.4	674.5	361.3
~N(242)	121.2	674.5	428
~N(243)	62.01	674.5	586
~N(244)	54.47	674.6	582.5
~N(245)	60.5	674.7	591.8
~N(246)	60.54	674.8	591.8
~N(247)	60.54	674.8	591.8
~N(248)	60.22	674	591.8
~N(249)	60.54	674.8	591.8
~N(250)	60.54	674.8	591.8
~N(251)	60.54	674.8	591.8
~N(252)	60.54	674.8	591.8
~N(253)	60.54	674.8	591.8
~N(254)	60.54	674.8	591.8
~N(255)	60.54	674.8	591.8
~N(256)	60.54	674.8	591.8
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~N(258)	60.54	674.8	591.8
~N(259)	60.54	674.8	591.8
~N(260)	60.55	674.8	591.8
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~N(263)	60.55	674.8	591.8
~N(264)	60.55	674.8	591.8
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~N(269)	60.55	674.8	591.8
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~N(271)	60.55	674.8	591.8
~N(272)	60.55	674.8	591.8
~N(273)	60.55	674.8	591.8
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~N(275)	60.55	674.8	591.8
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~N(279)	60.55	674.8	591.8
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~N(294)	60.55	674.8	591.8
~N(295)	60.55	674.8	591.8
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~N(300)	53.78	675	584.5
~N(301)	53.79	675	584.5
~N(302)	53.79	675	584.5
~N(303)	53.79	675	584.5
~N(304)	53.79	675	584.5
~N(305)	53.79	675	584.5
~N(306)	53.79	675	584.5
~N(307)	53.8	675	584.5
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~N(309)	53.8	675	584.5
~N(310)	53.8	675	584.5
~N(311)	53.8	675	584.5
~N(312)	53.8	675	584.5
~N(313)	53.8	675	584.5
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~N(320)	53.81	675	584.5
~N(321)	53.81	675	584.5
~N(322)	53.81	675	584.5
~N(323)	53.82	675	584.5
~N(324)	53.82	675	584.5
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~N(326)	53.82	675	584.5
~N(327)	53.82	675.1	584.5
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~N(329)	53.82	675.1	584.5
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~N(332)	53.82	675.1	584.5
~N(333)	53.82	675.1	584.5
~N(334)	53.82	675.1	584.5
~N(335)	53.82	675.1	584.5
~N(336)	53.83	675.1	584.5
~N(337)	53.83	675.1	584.5
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~N(339)	53.83	675.1	584.5
~N(340)	53.83	675.1	584.5
~N(341)	53.83	675.1	584.5
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~N(373)	53.84	675.1	584.5
~N(374)	53.84	675.1	584.5
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~N(378)	53.84	675.1	584.5
~N(379)	53.84	675.1	584.5
~N(380)	53.84	675.1	584.5
~N(381)	53.84	675.1	584.5
~N(382)	53.84	675.1	584.5
~N(383)	53.84	675.1	584.5
~N(384)	53.84	675.1	584.5
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~N(387)	53.84	675.1	584.5
~N(388)	53.84	675.1	584.5
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~N(391)	60.05	672	567
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~N(394)	60.05	672	567
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~N(402)	60.04	671.9	567
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~N(414)	60.03	671.9	567
~N(415)	60.03	671.9	567
~N(416)	60.03	671.9	567
~N(417)	60.02	671.9	567
~N(418)	60.02	671.9	567
~N(419)	60.02	671.9	567
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~N(469)	60	671.9	567
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~N(484)	60	671.9	567
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~N(487)	60	671.9	567
~N(488)	60	671.9	567
~N(489)	60	671.9	567
~N(490)	60	671.9	567
~N(491)	60	671.9	567
~N(492)	60	671.9	567
~N(493)	60	671.9	567
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~N(499)	60	671.9	567
~N(500)	60	671.9	567
~N(501)	60	671.9	567
~N(502)	60	671.9	567
~N(503)	31.56	420.8	381.8
~N(504)	30.63	419.9	383
~N(505)	30.58	419.8	383
~N(506)	30.45	419.5	383
~N(507)	30.44	419.4	383
~N(508)	30.34	419.2	383
~N(509)	30.39	419.3	383
~N(512)	34.65	390.5	344.3
~N(513)	163.9	712.8	367.3
~N(514)	152.9	702.6	359.7
~N(515)	142.3	655	359.7
~N(516)	135.8	645.7	365.3
~N(517)	123.2	618.4	367.3
~N(518)	107.5	589.8	375
~N(519)	102.7	578.6	375
~N(520)	105	584	375
~N(521)	105	584	375
~N(522)	105	584	375
~N(524)	34.59	390.3	344.3
~N(525)	159	701.6	367.5
~N(526)	158.2	691.9	359.8
~N(527)	137.7	644.6	359.8
~N(528)	130.5	635.4	367.4
~N(529)	120.3	611.9	367.4
~N(530)	108	590.9	375
~N(531)	105	584	375
~N(535)	34.57	390.3	344.3
~N(536)	34.57	390.3	344.3
~N(537)	103.3	584	379
~N(538)	33.84	419.3	375
~N(539)	103.3	584	379
~N(540)	103.3	584	379
~N(541)	100.9	584	384.5
~N(542)	99.82	584	387
~N(544)	100.7	584	385
~N(545)	100.9	584	384.4

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
~N(622)		34.45	418.2	372.5
~N(624)		35.43	418.5	370.5
~N(625)		34.56	418.5	372.5
~N(626)	Isolated	—	—	366.4
~N(627)		34.25	417.8	372.5
~N(631)		34.56	418.5	372.5
~N(635)		1782	4460	369.6
~N(636)		1777	4451	371.5
~N(638)		1782	4460	369.6
~N(639)		1780	4458	371.5
~N(640)		1778	4453	371.5
~N(642)		1778	4453	371.5
~N(643)		1742	4387	388.3
~N(644)		1731	4370	397.5
~N(645)		1729	4364	398.5
~N(646)		1728	4363	398.5
~N(647)		1686	4263	396
~N(648)		1629	4155	420.1
~N(649)		1680	4240	385
~N(650)		1634	4131	382.4
~N(651)		1073	2833	382.4
~N(652)		30.33	429.2	393
~N(654)		1611	4119	423.2
~N(655)		1040	2798	423.2
~N(656)		30.37	429.3	393
~N(659)		1641	4150	385.8
~N(660)		1084	2862	385.6
~N(661)		30.33	429.2	393
~N(664)		1557	3962	413
~N(665)		985.3	2680	413
~N(666)		30.36	429.3	393
~N(667)		1775	4448	378.4
~N(669)		1771	4448	382.9
~N(670)		1771	4448	383.6
~N(671)		1769	4448	386.4
~N(672)		103.3	584	379
~N(673)		89.94	561.2	387
~N(674)		85.39	550.6	387
~N(675)		1317	3398	383
~N(676)	Isolated	—	—	378
~N(677)		1307	3375	383
~N(678)		1776	4447	370.8
~N(680)		984.7	2658	412.9
~N(682)		179	777.3	397
~N(683)		179	777.3	397
~N(684)		1024	2749	413
~N(686)		201.3	845	413
~N(687)		201.2	844.7	413
~N(688)		1073	2832	382.4
~N(690)		229.4	879.9	382.9
~N(691)		228.4	879.5	384.9
~N(692)		1084	2860	385.6
~N(694)		166.2	784.5	387.5
~N(695)		166.1	784.2	387.5
~N(696)		1219	3202	414.5
~N(697)		831	2304	414.5
~N(698)		830.3	2302	414.5
~N(700)		62.5	625.2	414.6
~N(701)		1266	3278	381.4
~N(702)		882	2389	381.4
~N(703)		881.3	2387	381.4
~N(705)		76.77	625.1	381.4
~N(706)		76.72	625	381.4
~N(707)		62.5	625.1	414.5
~N(708)		1236	3243	414.9
~N(709)		848.6	2345	414.9
~N(710)		845.8	2339	414.9
~N(712)		62.52	625.6	414.9
~N(713)		62.47	625.5	414.9
~N(714)		1265	3281	387
~N(715)		880.6	2381	387
~N(716)		879.9	2380	387
~N(718)		61.04	640.5	387
~N(719)		60.99	640.4	387
~N(720)		102.5	584	380.7
~N(721)		102.5	584	380.7
~N(722)		102.5	584	380.7
~N(724)		102.5	584	380.7
~N(725)		102.5	584	380.7
~N(726)		103.7	584	378
~N(727)		103.7	584	378
~N(728)		103.7	584	378
~N(730)		34.98	424.9	378
~N(731)		34.98	424.9	378
~N(732)		103.7	584	378.1
~N(733)		103.7	584	378.1
~N(734)		103.7	584	378.1
~N(736)		103.7	584	378.1
~N(737)		103.7	584	378.1
~N(738)		102.4	584	381.1
~N(739)		102.4	584	381.1
~N(740)		102.4	584	381.1
~N(742)		33.64	424.9	381.1
~N(743)		33.64	424.9	381.1

Tank List	Surface Pressure	Level	Status	Flow	Pressure	Grade	Elev
Accumulator Tank A	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Accumulator Tank B	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Accumulator Tank C	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Accumulator Tank D	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Cont. Recirc. Sump A	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Cont. Recirc. Sump B	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Refueling Water Storage Tank	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Demand List	Demand Type	Flow	Pressure	Status	Grade	Elev
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

A1(011)	Spray	3.657	55	669.6	576.3
A1(012)	Spray	3.659	55	668.7	575.4
A1(013)	Spray	3.658	55	668.7	575.4
A1(014)	Spray	3.656	55	669.6	576.3
A1(015)	Spray	3.728	55	669.1	575.8
A1(016)	Spray	3.728	55	669.1	575.8
A1(017)	Spray	3.655	55	669.6	576.3
A1(018)	Spray	3.657	55	668.7	575.4
A1(019)	Spray	3.656	55	668.7	575.4
A1(020)	Spray	3.654	55	669.6	576.3
A1(021)	Spray	3.724	55	669.1	575.8
A1(022)	Spray	3.724	55	669.1	575.8
A1(023)	Spray	3.653	55	669.6	576.3
A1(024)	Spray	3.658	55	668.7	575.4
A1(025)	Spray	3.654	55	668.7	575.4
A1(026)	Spray	3.652	55	669.6	576.3
A1(027)	Spray	3.723	55	669.1	575.8
A1(028)	Spray	3.723	55	669.1	575.8
A1(029)	Spray	3.651	55	669.6	576.3
A1(030)	Spray	3.653	55	668.7	575.4
A1(031)	Spray	3.653	55	668.7	575.4
A1(032)	Spray	3.651	55	669.6	576.3
A1(033)	Spray	3.721	55	669.1	575.8
A1(034)	Spray	3.721	55	669.1	575.8
A1(035)	Spray	3.65	55	669.6	576.3
A1(036)	Spray	3.652	55	668.7	575.4
A1(037)	Spray	3.651	55	668.7	575.4
A1(038)	Spray	3.649	55	669.6	576.3
A1(039)	Spray	3.72	55	669.1	575.8
A1(040)	Spray	3.72	55	669.1	575.8
A1(041)	Spray	3.648	55	669.6	576.3
A1(042)	Spray	3.651	55	668.7	575.4
A1(043)	Spray	3.65	55	668.7	575.4
A1(044)	Spray	3.648	55	669.6	576.3
A1(045)	Spray	3.718	55	669.1	575.8
A1(046)	Spray	3.718	55	669.1	575.8
A1(047)	Spray	3.647	55	669.6	576.3
A1(048)	Spray	3.65	55	668.7	575.4
A1(049)	Spray	3.649	55	668.7	575.4
A1(050)	Spray	3.647	55	669.6	576.3
A1(051)	Spray	3.717	55	669.1	575.8
A1(052)	Spray	3.717	55	669.1	575.8
A1(053)	Spray	3.646	55	669.6	576.3
A1(054)	Spray	3.649	55	668.7	575.4
A1(055)	Spray	3.648	55	668.7	575.4
A1(056)	Spray	3.646	55	669.6	576.3
A1(057)	Spray	3.717	55	669.1	575.8
A1(058)	Spray	3.717	55	669.1	575.8
A1(059)	Spray	3.645	55	669.6	576.3
A1(060)	Spray	3.648	55	668.7	575.4
A1(061)	Spray	3.648	55	668.7	575.4
A1(062)	Spray	3.645	55	669.6	576.3
A1(063)	Spray	3.716	55	669.1	575.8
A1(064)	Spray	3.716	55	669.1	575.8
A1(065)	Spray	3.644	55	669.6	576.3
A1(066)	Spray	3.647	55	668.7	575.4
A1(067)	Spray	3.647	55	668.7	575.4
A1(068)	Spray	3.644	55	669.6	576.3
A1(069)	Spray	3.715	55	669.1	575.8
A1(070)	Spray	3.715	55	669.1	575.8
A1(071)	Spray	3.644	55	669.6	576.3
A1(072)	Spray	3.647	55	668.7	575.4
A1(073)	Spray	3.646	55	668.7	575.4
A1(074)	Spray	3.644	55	669.6	576.3
A1(075)	Spray	3.715	55	669.1	575.8
A1(076)	Spray	3.715	55	669.1	575.8
A1(077)	Spray	3.643	55	669.6	576.3
A1(078)	Spray	3.646	55	668.7	575.4
A1(079)	Spray	3.646	55	668.7	575.4
A1(080)	Spray	3.643	55	669.6	576.3
A1(081)	Spray	3.714	55	669.1	575.8
A1(082)	Spray	3.714	55	669.1	575.8
A1(083)	Spray	3.643	55	669.6	576.3
A1(084)	Spray	3.646	55	668.7	575.4
A1(085)	Spray	3.646	55	668.7	575.4
A1(086)	Spray	3.643	55	669.6	576.3
A1(087)	Spray	3.714	55	669.1	575.8
A1(088)	Spray	3.714	55	669.1	575.8
A1(089)	Spray	3.643	55	669.6	576.3
A1(090)	Spray	3.646	55	668.7	575.4
A1(091)	Spray	3.645	55	668.7	575.4
A1(092)	Spray	3.643	55	669.6	576.3
A1(093)	Spray	3.714	55	669.1	575.8
A1(094)	Spray	3.714	55	669.1	575.8
A1(095)	Spray	3.642	55	669.6	576.3
A1(096)	Spray	3.645	55	668.7	575.4
A1(097)	Spray	3.645	55	668.7	575.4
A1(098)	Spray	3.642	55	669.6	576.3
A1(099)	Spray	3.714	55	669.1	575.8
A1(100)	Spray	3.714	55	669.1	575.8
A1(101)	Spray	3.642	55	669.6	576.3
A1(102)	Spray	3.645	55	668.7	575.4
A1(103)	Spray	3.645	55	668.7	575.4
A1(104)	Spray	3.642	55	669.6	576.3
A1(105)	Spray	3.714	55	669.1	575.8
A1(106)	Spray	3.714	55	669.1	575.8
A1(107)	Spray	3.642	55	669.6	576.3
A1(108)	Spray	3.645	55	668.7	575.4
A1(109)	Spray	3.645	55	668.7	575.4
A1(110)	Spray	3.642	55	669.6	576.3
A1(111)	Spray	3.714	55	669.1	575.8
A1(112)	Spray	3.714	55	669.1	575.8
A1(113)	Spray	3.642	55	669.6	576.3
A1(114)	Spray	3.645	55	668.7	575.4
A1(115)	Spray	3.645	55	668.7	575.4
A1(116)	Spray	3.642	55	669.6	576.3
A1(117)	Spray	3.714	55	669.1	575.8
A1(118)	Spray	3.714	55	669.1	575.8
A1(119)	Spray	3.642	55	669.6	576.3
A1(120)	Spray	3.645	55	668.7	575.4
A2(001)	Spray	4.19	55	682.8	589.5
A2(002)	Spray	3.922	55	682	588.7
A2(003)	Spray	4.015	55	682.3	589
A2(004)	Spray	4.015	55	682.3	589
A2(005)	Spray	3.92	55	682	588.7
A2(006)	Spray	4.166	55	682.8	589.5
A2(007)	Spray	4.165	55	682.8	589.5
A2(008)	Spray	3.919	55	682	588.7
A2(009)	Spray	4.012	55	682.3	589
A2(010)	Spray	4.012	55	682.3	589
A2(011)	Spray	3.917	55	682	588.7
A2(012)	Spray	4.163	55	682.8	589.5
A2(013)	Spray	4.162	55	682.8	589.5
A2(014)	Spray	3.916	55	682	588.7
A2(015)	Spray	4.01	55	682.3	589
A2(016)	Spray	4.01	55	682.3	589
A2(017)	Spray	3.915	55	682	588.7
A2(018)	Spray	4.161	55	682.8	589.5
A2(019)	Spray	4.161	55	682.8	589.5
A2(020)	Spray	3.914	55	682	588.7
A2(021)	Spray	4.008	55	682.3	589
A2(022)	Spray	4.008	55	682.3	589
A2(023)	Spray	3.913	55	682	588.7
A2(024)	Spray	4.159	55	682.8	589.5
A2(025)	Spray	4.159	55	682.8	589.5
A2(026)	Spray	3.912	55	682	588.7
A2(027)	Spray	4.006	55	682.3	589
A2(028)	Spray	4.006	55	682.3	589
A2(029)	Spray	3.912	55	682	588.7
A2(030)	Spray	4.158	55	682.8	589.5
A2(031)	Spray	4.158	55	682.8	589.5
A2(032)	Spray	3.911	55	682	588.7
A2(033)	Spray	4.005	55	682.3	589
A2(034)	Spray	4.005	55	682.3	589
A2(035)	Spray	3.911	55	682	588.7
A2(036)	Spray	4.157	55	682.8	589.5
A2(037)	Spray	4.157	55	682.8	589.5
A2(038)	Spray	3.91	55	682	588.7
A2(039)	Spray	4.005	55	682.3	589
A2(040)	Spray	4.004	55	682.3	589
A2(041)	Spray	3.91	55	682	588.7
A2(042)	Spray	4.157	55	682.8	589.5
A2(043)	Spray	4.156	55	682.8	589.5
A2(044)	Spray	3.91	55	682	588.7
A2(045)	Spray	4.004	55	682.3	589
A2(046)	Spray	4.004	55	682.3	589
A2(047)	Spray	3.91	55	682	588.7
A2(048)	Spray	4.156	55	682.8	589.5
A2(049)	Spray	4.156	55	682.8	589.5
A2(050)	Spray	3.91	55	682	588.7
A2(051)	Spray	4.004	55	682.3	589
A2(052)	Spray	4.004	55	682.3	589
A2(053)	Spray	3.909	55	682	588.7
A2(054)	Spray	4.156	55	682.8	589.5
A2(055)	Spray	4.156	55	682.8	589.5
A2(056)	Spray	3.909	55	682	588.7
A2(057)	Spray	4.004	55	682.3	589
A2(058)	Spray	4.004	55	682.3	589
A2(059)	Spray	3.909	55	682	588.7
A2(060)	Spray	4.179	55	682.8	589.5
A3(001)	Spray	5.211	55	686.6	593.3
A3(002)	Spray	5.259	55	686.8	593.5
A3(003)	Spray	5.207	55	686.6	593.3
A3(004)	Spray	5.207	55	686.6	593.3
A3(005)	Spray	5.25	55	686.8	593.5
A3(006)	Spray	5.203	55	686.6	593.3
A3(007)	Spray	5.199	55	686.6	593.3
A3(008)	Spray	5.247	55	686.8	593.5
A3(009)	Spray	5.196	55	686.6	593.3
A3(010)	Spray	5.196	55	686.6	593.3
A3(011)	Spray	5.241	55	686.8	593.5

A3(012)	Spray	5.193	55	686.6	583.3
A3(013)	Spray	5.191	55	686.6	583.3
A3(014)	Spray	5.236	55	686.8	583.5
A3(015)	Spray	5.188	55	686.6	583.3
A3(016)	Spray	5.188	55	686.6	583.3
A3(017)	Spray	5.234	55	686.8	583.5
A3(018)	Spray	5.187	55	686.6	583.3
A3(019)	Spray	5.185	55	686.6	583.3
A3(020)	Spray	5.233	55	686.8	583.5
A3(021)	Spray	5.184	55	686.6	583.3
A3(022)	Spray	5.184	55	686.6	583.3
A3(023)	Spray	5.231	55	686.8	583.5
A3(024)	Spray	5.183	55	686.6	583.3
A3(025)	Spray	5.182	55	686.6	583.3
A3(026)	Spray	5.23	55	686.8	583.5
A3(027)	Spray	5.181	55	686.6	583.3
A3(028)	Spray	5.181	55	686.6	583.3
A3(029)	Spray	5.229	55	686.8	583.5
A3(030)	Spray	5.181	55	686.6	583.3
A3(031)	Spray	5.181	55	686.6	583.3
A3(032)	Spray	5.228	55	686.8	583.5
A3(033)	Spray	5.18	55	686.6	583.3
A3(034)	Spray	5.18	55	686.6	583.3
A3(035)	Spray	5.228	55	686.8	583.5
A3(036)	Spray	5.18	55	686.6	583.3
A3(037)	Spray	5.18	55	686.6	583.3
A3(038)	Spray	5.228	55	686.8	583.5
A3(039)	Spray	5.18	55	686.6	583.3
B1(001)	Spray	5.39	55	660.3	567
B1(002)	Spray	5.39	55	660.3	567
B1(003)	Spray	5.389	55	660.3	567
B1(004)	Spray	5.389	55	660.3	567
B1(005)	Spray	5.388	55	660.3	567
B1(006)	Spray	5.388	55	660.3	567
B1(007)	Spray	5.387	55	660.3	567
B1(008)	Spray	5.387	55	660.3	567
B1(009)	Spray	5.385	55	660.3	567
B1(010)	Spray	5.386	55	660.3	567
B1(011)	Spray	5.384	55	660.3	567
B1(012)	Spray	5.384	55	660.3	567
B1(013)	Spray	5.383	55	660.3	567
B1(014)	Spray	5.383	55	660.3	567
B1(015)	Spray	5.382	55	660.3	567
B1(016)	Spray	5.382	55	660.3	567
B1(017)	Spray	5.381	55	660.3	567
B1(018)	Spray	5.381	55	660.3	567
B1(019)	Spray	5.381	55	660.3	567
B1(020)	Spray	5.381	55	660.3	567
B1(021)	Spray	5.38	55	660.3	567
B1(022)	Spray	5.38	55	660.3	567
B1(023)	Spray	5.379	55	660.3	567
B1(024)	Spray	5.379	55	660.3	567
B1(025)	Spray	5.378	55	660.3	567
B1(026)	Spray	5.378	55	660.3	567
B1(027)	Spray	5.377	55	660.3	567
B1(028)	Spray	5.377	55	660.3	567
B1(029)	Spray	5.376	55	660.3	567
B1(030)	Spray	5.376	55	660.3	567
B1(031)	Spray	5.376	55	660.3	567
B1(032)	Spray	5.376	55	660.3	567
B1(033)	Spray	5.375	55	660.3	567
B1(034)	Spray	5.375	55	660.3	567
B1(035)	Spray	5.374	55	660.3	567
B1(036)	Spray	5.374	55	660.3	567
B1(037)	Spray	5.374	55	660.3	567
B1(038)	Spray	5.374	55	660.3	567
B1(039)	Spray	5.373	55	660.3	567
B1(040)	Spray	5.373	55	660.3	567
B1(041)	Spray	5.373	55	660.3	567
B1(042)	Spray	5.373	55	660.3	567
B1(043)	Spray	5.372	55	660.3	567
B1(044)	Spray	5.372	55	660.3	567
B1(045)	Spray	5.372	55	660.3	567
B1(046)	Spray	5.372	55	660.3	567
B1(047)	Spray	5.371	55	660.3	567
B1(048)	Spray	5.371	55	660.3	567
B1(049)	Spray	5.371	55	660.3	567
B1(050)	Spray	5.371	55	660.3	567
B1(051)	Spray	5.37	55	660.3	567
B1(052)	Spray	5.37	55	660.3	567
B1(053)	Spray	5.37	55	660.3	567
B1(054)	Spray	5.37	55	660.3	567
B1(055)	Spray	5.369	55	660.3	567
B1(056)	Spray	5.369	55	660.3	567
B1(057)	Spray	5.369	55	660.3	567
B1(058)	Spray	5.369	55	660.3	567
B1(059)	Spray	5.369	55	660.3	567
B1(060)	Spray	5.369	55	660.3	567
B1(061)	Spray	5.368	55	660.3	567
B1(062)	Spray	5.368	55	660.3	567
B1(063)	Spray	5.368	55	660.3	567
B1(064)	Spray	5.368	55	660.3	567
B1(065)	Spray	5.368	55	660.3	567
B1(066)	Spray	5.368	55	660.3	567
B1(067)	Spray	5.368	55	660.3	567
B1(068)	Spray	5.368	55	660.3	567
B1(069)	Spray	5.367	55	660.3	567
B1(070)	Spray	5.367	55	660.3	567
B1(071)	Spray	5.367	55	660.3	567
B1(072)	Spray	5.367	55	660.3	567
B1(073)	Spray	5.367	55	660.3	567
B1(074)	Spray	5.367	55	660.3	567
B1(075)	Spray	5.367	55	660.3	567
B1(076)	Spray	5.367	55	660.3	567
B1(077)	Spray	5.367	55	660.3	567
B1(078)	Spray	5.367	55	660.3	567
B1(079)	Spray	5.367	55	660.3	567
B1(080)	Spray	5.367	55	660.3	567
B1(081)	Spray	5.366	55	660.3	567
B1(082)	Spray	5.366	55	660.3	567
B1(083)	Spray	5.366	55	660.3	567
B1(084)	Spray	5.366	55	660.3	567
B1(085)	Spray	5.366	55	660.3	567
B1(086)	Spray	5.366	55	660.3	567
B1(087)	Spray	5.366	55	660.3	567
B1(088)	Spray	5.366	55	660.3	567
B1(089)	Spray	5.366	55	660.3	567
B1(090)	Spray	5.366	55	660.3	567
B1(091)	Spray	5.366	55	660.3	567
B1(092)	Spray	5.366	55	660.3	567
B1(093)	Spray	5.366	55	660.3	567
B1(094)	Spray	5.366	55	660.3	567
B1(095)	Spray	5.366	55	660.3	567
B1(096)	Spray	5.366	55	660.3	567
B1(097)	Spray	5.366	55	660.3	567
B1(098)	Spray	5.366	55	660.3	567
B1(099)	Spray	5.366	55	660.3	567
B1(100)	Spray	5.366	55	660.3	567
B1(101)	Spray	5.366	55	660.3	567
B1(102)	Spray	5.366	55	660.3	567
B1(103)	Spray	5.366	55	660.3	567
B1(104)	Spray	5.366	55	660.3	567
B1(105)	Spray	5.366	55	660.3	567
B1(106)	Spray	5.366	55	660.3	567
B1(107)	Spray	5.366	55	660.3	567
B1(108)	Spray	5.366	55	660.3	567
B1(109)	Spray	5.366	55	660.3	567
B1(110)	Spray	5.366	55	660.3	567
B1(111)	Spray	5.366	55	660.3	567
B1(112)	Spray	5.366	55	660.3	567
B2(001)	Spray	4.262	55	662.3	549
B2(002)	Spray	4.252	55	662.3	549
B2(003)	Spray	4.258	55	662.3	549
B2(004)	Spray	4.258	55	662.3	549
B2(005)	Spray	4.257	55	662.3	549
B2(006)	Spray	4.257	55	662.3	549
B2(007)	Spray	4.256	55	662.3	549
B2(008)	Spray	4.255	55	662.3	549
B2(009)	Spray	4.253	55	662.3	549
B2(010)	Spray	4.253	55	662.3	549
B2(011)	Spray	4.251	55	662.3	549
B2(012)	Spray	4.251	55	662.3	549
B2(013)	Spray	4.249	55	662.3	549
B2(014)	Spray	4.248	55	662.3	549
B2(015)	Spray	4.248	55	662.3	549
B2(016)	Spray	4.246	55	662.3	549
B2(017)	Spray	4.246	55	662.3	549
B2(018)	Spray	4.246	55	662.3	549
B2(019)	Spray	4.244	55	662.3	549
B2(020)	Spray	4.244	55	662.3	549
B2(021)	Spray	4.243	55	662.3	549
B2(022)	Spray	4.243	55	662.3	549
B2(023)	Spray	4.241	55	662.3	549
B2(024)	Spray	4.241	55	662.3	549
B2(025)	Spray	4.24	55	662.3	549
B2(026)	Spray	4.24	55	662.3	549
B2(027)	Spray	4.239	55	662.3	549
B2(028)	Spray	4.238	55	662.3	549
B2(029)	Spray	4.238	55	662.3	549
B2(030)	Spray	4.238	55	662.3	549
B2(031)	Spray	4.237	55	662.3	549
B2(032)	Spray	4.237	55	662.3	549
B2(033)	Spray	4.236	55	662.3	549
B2(034)	Spray	4.235	55	662.3	549
B2(035)	Spray	4.234	55	662.3	549
B2(036)	Spray	4.234	55	662.3	549
B2(037)	Spray	4.234	55	662.3	549
B2(038)	Spray	4.234	55	662.3	549
B2(039)	Spray	4.233	55	662.3	549
B2(040)	Spray	4.233	55	662.3	549
B2(041)	Spray	4.232	55	662.3	549

B2(042)	Spray	4.232	55		682.3	589
B2(043)	Spray	4.231	55		682.3	589
B2(044)	Spray	4.231	55		682.3	589
B2(045)	Spray	4.23	55		682.3	589
B2(046)	Spray	4.23	55		682.3	589
B2(047)	Spray	4.23	55		682.3	589
B2(048)	Spray	4.23	55		682.3	589
B2(049)	Spray	4.229	55		682.3	589
B2(050)	Spray	4.229	55		682.3	589
B2(051)	Spray	4.229	55		682.3	589
B2(052)	Spray	4.229	55		682.3	589
B2(053)	Spray	4.228	55		682.3	589
B2(054)	Spray	4.228	55		682.3	589
B2(055)	Spray	4.228	55		682.3	589
B2(056)	Spray	4.228	55		682.3	589
B2(057)	Spray	4.227	55		682.3	589
B2(058)	Spray	4.227	55		682.3	589
B2(059)	Spray	4.227	55		682.3	589
B2(060)	Spray	4.227	55		682.3	589
B2(061)	Spray	4.227	55		682.3	589
B2(062)	Spray	4.227	55		682.3	589
B2(063)	Spray	4.226	55		682.3	589
B2(064)	Spray	4.226	55		682.3	589
B2(065)	Spray	4.226	55		682.3	589
B2(066)	Spray	4.226	55		682.3	589
B2(067)	Spray	4.226	55		682.3	589
B2(068)	Spray	4.226	55		682.3	589
B2(069)	Spray	4.226	55		682.3	589
B2(070)	Spray	4.226	55		682.3	589
B2(071)	Spray	4.226	55		682.3	589
B2(072)	Spray	4.226	55		682.3	589
B2(073)	Spray	4.226	55		682.3	589
B2(074)	Spray	4.226	55		682.3	589
B2(075)	Spray	4.225	55		682.3	589
B2(076)	Spray	4.225	55		682.3	589
B2(077)	Spray	4.225	55		682.3	589
B2(078)	Spray	4.225	55		682.3	589
B2(079)	Spray	4.225	55		682.3	589
B2(080)	Spray	4.225	55		682.3	589
B2(081)	Spray	4.225	55		682.3	589
B2(082)	Spray	4.225	55		682.3	589
B2(083)	Spray	4.225	55		682.3	589
B2(084)	Spray	4.225	55		682.3	589
B2(085)	Spray	4.225	55		682.3	589
B2(086)	Spray	4.225	55		682.3	589
B2(087)	Spray	4.225	55		682.3	589
B2(088)	Spray	4.225	55		682.3	589
B2(089)	Spray	4.225	55		682.3	589
B2(090)	Spray	4.225	55		682.3	589
B3(001)	Spray	4.325	55		682.3	589
B3(002)	Spray	4.325	55		682.3	589
B3(003)	Spray	[illegible]	55		682.3	589
B3(004)	Spray	4.324	55		682.3	589
B3(005)	Spray	4.324	55		682.3	589
B3(006)	Spray	4.324	55		682.3	589
B3(007)	Spray	4.323	55		682.3	589
B3(008)	Spray	4.323	55		682.3	589
B3(009)	Spray	4.323	55		682.3	589
B3(010)	Spray	4.323	55		682.3	589
B3(011)	Spray	4.322	55		682.3	589
B3(012)	Spray	4.322	55		682.3	589
B3(013)	Spray	4.322	55		682.3	589
B3(014)	Spray	4.322	55		682.3	589
B3(015)	Spray	4.321	55		682.3	589
B3(016)	Spray	4.321	55		682.3	589
B3(017)	Spray	4.321	55		682.3	589
B3(018)	Spray	4.321	55		682.3	589
B3(019)	Spray	4.321	55		682.3	589
B3(020)	Spray	4.321	55		682.3	589
B3(021)	Spray	4.32	55		682.3	589
B3(022)	Spray	4.32	55		682.3	589
B3(023)	Spray	4.32	55		682.3	589
B3(024)	Spray	4.32	55		682.3	589
B3(025)	Spray	4.32	55		682.3	589
B3(026)	Spray	4.32	55		682.3	589
B3(027)	Spray	4.319	55		682.3	589
B3(028)	Spray	4.319	55		682.3	589
B3(029)	Spray	4.319	55		682.3	589
B3(030)	Spray	4.319	55		682.3	589
B3(031)	Spray	4.319	55		682.3	589
B3(032)	Spray	4.319	55		682.3	589
B3(033)	Spray	4.319	55		682.3	589
B3(034)	Spray	4.319	55		682.3	589
B3(035)	Spray	4.319	55		682.3	589
B3(036)	Spray	4.319	55		682.3	589
B3(037)	Spray	4.319	55		682.3	589
B3(038)	Spray	4.319	55		682.3	589
B3(039)	Spray	4.319	55		682.3	589
B3(040)	Spray	4.319	55		682.3	589
B3(041)	Spray	4.319	55		682.3	589
B3(042)	Spray	4.319	55		682.3	589
B3(043)	Spray	4.319	55		682.3	589
B3(044)	Spray	4.319	55		682.3	589
B3(045)	Spray	4.319	55		682.3	589
B3(046)	Spray	4.319	55		682.3	589
B3(047)	Spray	4.319	55		682.3	589
B3(048)	Spray	4.319	55		682.3	589
B3(049)	Spray	4.319	55		682.3	589
B3(050)	Spray	4.319	55		682.3	589
B3(051)	Spray	4.319	55		682.3	589
Cold Leg A(001)	Boundary pressure	143.3	28.5		424.9	393
Cold Leg A(002)	Boundary pressure	1881	28.5		424.9	393
Cold Leg B(001)	Boundary pressure	142.8	28.5		424.9	393
Cold Leg B(002)	Boundary pressure	1878	28.5		424.9	393
Cold Leg C(001)	Boundary pressure	141.7	28.5		424.9	393
Cold Leg C(002)	Boundary pressure	1868	28.5		424.9	393
Cold Leg D(001)	Boundary pressure	141.6	28.5		424.9	393
Cold Leg D(002)	Boundary pressure	1927	28.5		424.9	393
Hot Leg A(001)	Boundary pressure	—	28.5	Isolated	—	382.7
Hot Leg A(002)	Boundary pressure	—	28.5	Isolated	—	393
Hot Leg B(001)	Boundary pressure	—	28.5	Isolated	—	382.7
Hot Leg B(002)	Boundary pressure	0	28.5		424.9	393
Hot Leg C(001)	Boundary pressure	—	28.5	Isolated	—	382.7
Hot Leg C(002)	Boundary pressure	—	28.5	Isolated	—	393
Hot Leg D(001)	Boundary pressure	—	28.5	Isolated	—	382.7
Hot Leg D(002)	Boundary pressure	0	28.5		424.9	393

Pump List	Operation	Flow	Status	TDH	dP	NPSHa	Suction Pressure	Discharge Pressure	Suction Elev	Discharge Elev
Centrifugal Charging Pump A	Curve	387.7		-4052	-1756	79.89	35.48	1786	368.6	368.7
Centrifugal Charging Pump B	Curve	361.8		-4061	-1750	79.31	35.21	1785	368.6	368.7
Containment Spray Pump A	Curve	—	Off	—	—	—	—	—	346.3	347.3
Containment Spray Pump B	Curve	—	Off	—	—	—	—	—	346.3	347.3
Positive Dis. Charging Pump	Fixed Flow	1.00E-05	Off	—	—	—	—	—	365.7	367.9
Residual Heat Removal Pump A	Curve	3262		-367.8	-158.9	75.87	33.73	192.1	346	347.1
Residual Heat Removal Pump B	Curve	3245		-370.8	-160.2	75.88	33.73	193.5	346	347.1
Safety Injection Pump A	Curve	361.2		-3001	-1297	80.93	35.81	1332	366.5	366.6
Safety Injection Pump B	Curve	336		-3004	-1298	81.95	36.35	1334	366.5	366.6

Component List	Flow	Status	HL	dP	Inlet Pressure	Outlet Pressure	Inlet Elev	Outlet Elev
Residual HX A	3262		45.75	19.76	162.3	142.6	359.7	359.7
Residual HX B	3245		45.29	19.56	157.6	138	359.8	359.8

Control List	Type	Set Value	Status	Flow	dP	HL	Inlet Pressure	Outlet Pressure	Elev	Cv	Fp	CMax
~N(562)	FCV	0		0	—	—	156.3	156.3	348.8	—	—	—
~N(563)	FCV	0		0	—	—	151	151	360	—	—	—
~N(681)	FCV	Fully open		142.9	0	0	283.5	283.5	412.9	—	—	—
~N(685)	FCV	Fully open		143.3	0	0	206.1	206.1	413	—	—	—
~N(689)	FCV	Fully open		141.7	0	0	251.7	251.7	382.4	—	—	—
~N(693)	FCV	Fully open		141.6	0	0	198.8	198.8	385.8	—	—	—
~N(699)	FCV	Fully open		159.7	0	0	82.71	82.71	414.6	—	—	—
~N(704)	FCV	Fully open		158.9	0	0	76.98	76.98	381.4	—	—	—
~N(711)	FCV	Fully open		159.7	0	0	82.73	82.73	414.9	—	—	—
~N(717)	FCV	Fully open		158.9	0	0	81.19	81.19	387	—	—	—
~N(723)	FCV	Fully open		0	—	—	102.6	102.5	380.7	—	—	—
~N(729)	FCV	Fully open	Closed	—	—	—	—	—	378	—	—	—
~N(735)	FCV	Fully open		0	—	—	103.7	103.7	378.1	—	—	—
~N(741)	FCV	Fully open	Closed	—	—	—	—	—	381.1	—	—	—
CS007A-1	FCV	Fully open		0	—	—	130.7	130.7	407	—	—	—
CS007B-2	FCV	Fully open		0	—	—	133.7	133.7	399	—	—	—

Pipe Specification	Material	Schedule	Roughness	Sizing	Vel Limits	Press Limits	Valve Table
Steel Sch.40 (clean)	Steel	40	0.0018	not specified	—	—	standard
Steel Sch.80 (clean)	Steel	80	0.0018	not specified	—	—	standard
Steel Sch.140 (clean)	Steel	140	0.0018	not specified	—	—	standard
Steel Sch 40S (clean)	Stainless Pipe IPS	40S	0.0018	not specified	—	—	standard
Steel Sch.160 (clean)	Steel	160	0.0018	not specified	—	—	standard
Steel Sch.30 (clean)	Steel	30	0.0018	not specified	—	—	standard
Steel Sch.20 (clean)	Steel	20	0.0018	not specified	—	—	standard

Fluid Zone	Fluid	Temperature	Pressure	Density	Viscosity	k	Pv	Pc
Containment Sump Water	Water	100	14.7	62.24	0.6812	—	0.9496	3198
Water After RHR HX	Water	100	14.7	62.24	0.6812	—	0.9496	3198

PIPE-FLO	ver 8.0	12/1/2008 13:56
System:	5.2 LOCA A1R13 After 6	
Lineup	Cold Leg Injection from Sump	
Company:	Exelon	
Project:	11329-147 Rev. 0	
by:	Sargent & Lundy L.L.C	
Footer:		

UNITS				
Flow Rate:	US gpm			
Pressure:	psi a	Atm.	14.7	psi a
Temperature:	°F			
Viscosity:	cP			
Density:	lb/ft³			
Grade:	ft			
Length:	ft			
Size:	in			

CALCULATION:
Iteration: 15
Deviation percent: 0.004165

Pipe List	Specification	Fluid Zone	Size	Length	K	Status	Flow	Velocity	dP	HL	Tagged	From	To	Inside Dia	Pipe HL	Minor HL	Re	fp	Valves/Fittings					
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	XXX	—	—	—	—	N	~N(003)	~N(005)	15.25	—	—	—	—	2 x Pipe Bend - r/d 1.5 (90°)	0.173	1 x CS009A-1 (Gate Valve)	0.09888	1 x Converging Tee (Through)	1.00E-05
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		0	0	0	0	N	~N(005)	~N(006)	15.25	0	0	0	0	1 x Reducer - Contraction (16 x 14 - 14)	0.02451	1 x Pipe Bend - r/d 1.5 (90°)	0.173	1 x CS002A	0.09888
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		0	0	0.864	0	N	~N(006)	Containment Spray Pump A	13.25	0	0	0	0						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	XXX	—	—	—	—	N	~N(236)	~N(237)	15.25	—	—	—	—	1 x Gate - Double Disc	0.09888	1 x CS009B-2 (Gate Valve)	0.09888	1 x Converging Tee (Through)	1.00E-05
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		0	0	0	0	N	~N(237)	~N(238)	15.25	0	0	0	0	3 x Elbow - Standard 90°	0.3708	1 x Reducer - Contraction (16 x 14 - 14)	0.02451	1 x CS002B(Gate Valve)	0.09888
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		0	0	0.621	0	N	~N(238)	Containment Spray Pump B	13.25	0	0	0	0						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		0	0	0.432	0	N	Containment Spray Pump A	~N(007)	7.981	0	0	0	0	1 x Reducer - Enlargement (10 x 8 - 7)	0.05008				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		0	0	5.054	0	N	~N(007)	~N(008)	10.02	0	0	0	0	4 x Pipe Bend - r/d 1.5 (90°)	0.188	1 x CS003A (Check Valve)	1.289	1 x CV004A (Gate Valve)	0.1074
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		0	0	15.03	0	N	~N(008)	~N(009)	10.02	0	0	0	0	1 x FE-CS011	4.9	4 x Pipe Bend - r/d 1.5 (90°)	0.188	1 x Diverging Tee (Through)	1.00E-05
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		0	0	5.27	0	N	~N(009)	CS007A-1	10.02	0	0	0	0	3 x Pipe Bend - r/d 1.5 (90°)	0.188	1 x CS007A-1 (Gate Valve)	0.1074	1 x Diverging Tee (Through)	1.00E-05
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		0	0	9.072	0	N	CS007A-1	~N(001)	10.02	0	0	0	0	6 x Pipe Bend - r/d 1.5 (90°)	0.188	1 x Pipe Bend - r/d 1.5 (45°)	0.1331	1 x CS008A (Check Valve)	1.289
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		0	0	63.2	0	N	~N(001)	~N(001A)	10.02	0	0	0	0	6 x Pipe Bend - r/d 1.5 (90°)	0.188	1 x Pipe Bend - r/d 1.5 (45°)	0.1331		
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		0	0	-0.432	0	N	Containment Spray Pump B	~N(239)	7.981	0	0	0	0	1 x Elbow - Standard 90°	0.4219	1 x Reducer - Enlargement (10 x 8 - 7)	0.05008		
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		0	0	0.216	0	N	~N(239)	~N(240)	10.02	0	0	0	0	2 x Elbow - Standard 90°	0.4028	1 x CV004B (Gate Valve)	0.1074	1 x CV003B (Check Valve)	1.289
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		0	0	14.9	0	N	~N(240)	~N(241)	10.02	0	0	0	0	4 x Elbow - Standard 90°	0.4028	1 x FE-CS012	4.9	1 x Diverging Tee (Through)	1.00E-05
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		0	0	7.646	0	N	~N(241)	CS007B-2	10.02	0	0	0	0	3 x Elbow - Standard 90°	0.4028	1 x CV007B-2 (Gate Valve)	0.1074	1 x Diverging Tee (Through)	1.00E-05
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		0	0	12.53	0	N	CS007B-2	~N(242)	10.02	0	0	0	0	1 x Elbow - Standard 45°	0.2148	6 x Elbow - Standard 90°	0.4028	1 x CS008B (Check Valve)	1.289
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		0	0	59.18	0	N	~N(242)	~N(243)	10.02	0	0	0	0	1 x CS008B (Check Valve)	1	1 x Diverging Tee (Through)	1.00E-05		
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	<-->	601.7	2.45	-7.536	0.056	N	~N(244)	~N(243)	10.02	0.056	0	278182	0.01828	1 x Diverging Tee (Branch)	1.00E-05	1 x Diverging Tee (Through)	1.00E-05		
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	<-->	444.6	2.854	-6.535	0.067	N	~N(010)	~N(001A)	7.981	0.062	0.005	258078	0.01878	1 x Reducer - Contraction (10 x 8 - 7)	0.04216	1 x Diverging Tee (Through)	1.00E-05		
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	<-->	203	2.256	-2.893	0.066	N	~N(011)	~N(010)	6.065	0.062	0.004	155042	0.01832	1 x Reducer - Contraction (8 x 6 - 6)	0.06329	1 x Diverging Tee (Through)	1.00E-05		
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	<-->	101.5	2.56	0.006	0.015	N	~N(012)	~N(011)	4.026	0.007	0.008	116764	0.01978	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156	1 x Diverging' Tee (Branch)	1.00E-05		
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	<-->	101.5	2.56	0.006	0.015	N	~N(014)	~N(011)	4.026	0.007	0.008	116800	0.01978	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156	1 x Diverging' Tee (Branch)	1.00E-05		
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	<-->	96.27	2.428	0.008	0.019	N	~N(013)	~N(012)	4.026	0.012	0.007	110768	0.01991	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	<-->	96.25	2.428	0.008	0.019	N	~N(033)	~N(014)	4.026	0.012	0.007	110749	0.01991	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	<-->	91.06	2.297	0.007	0.017	N	~N(015)	~N(013)	4.026	0.01	0.007	104777	0.02005	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	<-->	91.04	2.296	0.007	0.017	N	~N(034)	~N(033)	4.026	0.01	0.007	104758	0.02005	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	<-->	85.81	2.164	0.007	0.015	N	~N(016)	~N(015)	4.026	0.009	0.006	98736	0.02021	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	<-->	85.84	2.165	0.007	0.015	N	~N(035)	~N(034)	4.026	0.009	0.006	98771	0.02021	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	<-->	80.61	2.033	0.006	0.013	N	~N(017)	~N(016)	4.026	0.008	0.005	92753	0.02038	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	<-->	80.59	2.033	0.006	0.013	N	~N(036)	~N(035)	4.026	0.008	0.005	92734	0.02038	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	<-->	75.41	1.902	0.005	0.012	N	~N(018)	~N(017)	4.026	0.007	0.005	86775	0.02057	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	<-->	75.4	1.902	0.005	0.012	N	~N(037)	~N(036)	4.026	0.007	0.005	86756	0.02057	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	<-->	70.17	1.77	0.004	0.01	N	~N(019)	~N(018)	4.026	0.006	0.004	80745	0.02079	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	<-->	70.2	1.771	0.004	0.01	N	~N(038)	~N(037)	4.026	0.006	0.004	80780	0.02078	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

C802H(044)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	36.66	0.407	0	0	N	-N(102)	-N(103)	6.065	0	0	28000	0.02461				
C802H(045)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	31.63	0.351	0	0	N	-N(099)	-N(098)	6.065	0	0	24156	0.02542				
C802H(046)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	32.75	0.364	0	0	N	-N(101)	-N(102)	6.065	0	0	25014	0.02523				
C802H(047)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	27.62	0.307	0	0	N	-N(097)	-N(099)	6.065	0	0	21098	0.02621				
C802H(048)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	28.74	0.319	0	0	N	-N(103)	-N(101)	6.065	0	0	21955	0.02597				
C802H(049)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	23.71	0.264	0	0	N	-N(093)	-N(092)	6.065	0	0	18111	0.02715				
C802H(050)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	24.59	0.273	0	0	N	-N(106)	-N(107)	6.065	0	0	18781	0.02682				
C802H(051)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	19.56	0.217	0	0	N	-N(094)	-N(093)	6.065	0	0	14937	0.02844				
C802H(052)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	20.68	0.23	0	0	N	-N(105)	-N(106)	6.065	0	0	15795	0.02805				
C802H(053)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	15.55	0.173	0	0	N	-N(091)	-N(094)	6.065	0	0	11879	0.03011				
C802H(054)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	16.68	0.185	0	0	N	-N(108)	-N(105)	6.065	0	0	12737	0.02958				
C802H(055)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	11.64	0.129	0	0	N	-N(090)	-N(091)	6.065	0	0	8893	0.03248				
C802H(056)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	12.52	0.139	0	0	N	-N(107)	-N(108)	6.065	0	0	9562	0.03185				
C802H(057)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	7.487	0.083	0	0	N	-N(089)	-N(090)	6.065	0	0	5718	0.03674				
C802H(058)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	8.61	0.096	0	0	N	-N(110)	-N(109)	6.065	0	0	6576	0.03529				
C802H(059)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	3.483	0.039	0	0	N	-N(100)	-N(089)	6.065	0	0	2660	0.04658				
C802H(060)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	4.605	0.051	0	0	N	-N(111)	-N(110)	6.065	0	0	3518	0.04255				
C802H(061)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	0.427	0.005	0	0	N	-N(100)	-N(111)	6.065	0	0	325.8	0.1964				
C802J(001)	Steel Sch 40 (clean)	Containment Sump Water	6	1.6	0.0533	<-->	190.6	2.118	0.003	0.008	N	-N(298)	-N(297)	6.065	0.004	0.004	145563	0.01847	1 x Reducer - Contraction (8 x 6 - 6)	0.0533	1 x Diverging Tee (Branch)	1.00E-05
C802J(002)	Steel Sch 40 (clean)	Containment Sump Water	6	1.6	0.0533	<-->	190.6	2.118	0.003	0.008	N	-N(300)	-N(297)	6.065	0.004	0.004	145563	0.01847	1 x Reducer - Contraction (8 x 6 - 6)	0.0533	1 x Diverging Tee (Branch)	1.00E-05
C802J(003)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	186.3	2.071	0.003	0.008	N	-N(301)	-N(298)	6.065	0.008	0	142308	0.01852				
C802J(004)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	186.3	2.071	0.003	0.008	N	-N(302)	-N(300)	6.065	0.008	0	142308	0.01852				
C802J(005)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	182.1	2.023	0.003	0.007	N	-N(303)	-N(301)	6.065	0.007	0	139054	0.01858				
C802J(006)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	182.1	2.023	0.003	0.007	N	-N(304)	-N(302)	6.065	0.007	0	139054	0.01858				
C802J(007)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	177.8	1.976	0.003	0.007	N	-N(305)	-N(303)	6.065	0.007	0	135803	0.01864				
C802J(008)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	177.8	1.976	0.003	0.007	N	-N(306)	-N(304)	6.065	0.007	0	135803	0.01864				
C802J(009)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	173.5	1.929	0.003	0.007	N	-N(307)	-N(305)	6.065	0.007	0	132553	0.0187				
C802J(010)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	173.5	1.929	0.003	0.007	N	-N(308)	-N(306)	6.065	0.007	0	132553	0.0187				
C802J(011)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	169.3	1.881	0.003	0.007	N	-N(310)	-N(307)	6.065	0.007	0	129304	0.01877				
C802J(012)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	169.3	1.881	0.003	0.007	N	-N(309)	-N(308)	6.065	0.007	0	129304	0.01877				
C802J(013)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	165	1.834	0.003	0.006	N	-N(311)	-N(310)	6.065	0.006	0	126057	0.01883				
C802J(014)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	165	1.834	0.003	0.006	N	-N(312)	-N(309)	6.065	0.006	0	126057	0.01883				
C802J(015)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	160.8	1.787	0.003	0.006	N	-N(314)	-N(311)	6.065	0.006	0	122811	0.0189				
C802J(016)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	160.8	1.787	0.003	0.006	N	-N(313)	-N(312)	6.065	0.006	0	122811	0.0189				
C802J(017)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	156.5	1.74	0.002	0.006	N	-N(318)	-N(314)	6.065	0.006	0	119567	0.01897				
C802J(018)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	156.5	1.74	0.002	0.006	N	-N(317)	-N(313)	6.065	0.006	0	119567	0.01897				
C802J(019)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	152.3	1.693	0.002	0.006	N	-N(315)	-N(318)	6.065	0.006	0	116324	0.01905				
C802J(020)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	152.3	1.693	0.002	0.005	N	-N(316)	-N(317)	6.065	0.005	0	116324	0.01905				
C802J(021)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	148	1.645	0.002	0.005	N	-N(320)	-N(315)	6.065	0.005	0	113082	0.01912				
C802J(022)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	148	1.645	0.002	0.005	N	-N(319)	-N(316)	6.065	0.005	0	113082	0.01912				
C802J(023)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	143.8	1.598	0.002	0.005	N	-N(321)	-N(320)	6.065	0.005	0	109841	0.01921				
C802J(024)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	143.8	1.598	0.002	0.005	N	-N(322)	-N(319)	6.065	0.005	0	109841	0.01921				
C802J(025)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	139.6	1.551	0.002	0.005	N	-N(323)	-N(321)	6.065	0.005	0	106802	0.01929				
C802J(026)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	139.6	1.551	0.002	0.005	N	-N(324)	-N(322)	6.065	0.005	0	106802	0.01929				
C802J(027)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	135.3	1.504	0.002	0.004	N	-N(325)	-N(323)	6.065	0.004	0	103363	0.01938				
C802J(028)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	135.3	1.504	0.002	0.004	N	-N(326)	-N(324)	6.065	0.004	0	103363	0.01938				
C802J(029)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	131.1	1.457	0.002	0.004	N	-N(327)	-N(325)	6.065	0.004	0	100125	0.01947				
C802J(030)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	131.1	1.457	0.002	0.004	N	-N(328)	-N(326)	6.065	0.004	0	100125	0.01947				
C802J(031)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	126.8	1.41	0.002	0.004	N	-N(329)	-N(327)	6.065	0.004	0	96889	0.01957				
C802J(032)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	126.8	1.41	0.002	0.004	N	-N(330)	-N(328)	6.065	0.004	0	96889	0.01957				
C802J(033)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	122.6	1.363	0.002	0.004	N	-N(331)	-N(329)	6.065	0.004	0	93653	0.01967				
C802J(034)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	122.6	1.363	0.002	0.004	N	-N(332)	-N(330)	6.065	0.004	0	93653	0.01967				
C802J(035)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	118.4	1.316	0.001	0.003	N	-N(333)	-N(331)	6.065	0.003	0	90418	0.01978				
C802J(036)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	118.4	1.316	0.001	0.003	N	-N(334)	-N(332)	6.065	0.003	0	90418	0.01978				
C802J(037)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	114.1	1.269	0.001	0.003	N	-N(335)	-N(333)	6.065	0.003	0	87183	0.01989				
C802J(038)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	114.1	1.269	0.001	0.003	N	-N(336)	-N(334)	6.065	0.003	0	87183	0.01989				
C802J(039)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	109.9	1.222	0.001	0.003	N	-N(337)	-N(335)	6.065	0.003	0	83950	0.02001				
C802J(040)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	109.9	1.222	0.001	0.003	N	-N(338)	-N(336)	6.065	0.003	0	83950	0.02001				
C802J(041)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	105.7	1.174	0.001	0.003	N	-N(339)	-N(337)	6.065	0.003	0	80717	0.02014				
C802J(042)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	105.7	1.174	0.001	0.003	N	-N(340)	-N(338)	6.065	0.003	0	80717	0.02014				
C802J(043)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	101.4	1.127	0.001	0.003	N	-N(341)	-N(339)	6.065	0.003	0	77484	0.02028				
C802J(044)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	101.4	1.127	0.001	0.003	N	-N(342)	-N(340)	6.065	0.003	0	77484	0.02028				
C802J(045)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	97.21	1.08	0.001	0.002	N	-N(343)	-N(341)	6.065	0.002	0	74253	0.02042				
C802J(046)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	97.21	1.08	0.001	0.002	N	-N(344)	-N(342)	6.065	0.002	0	74253	0.02042				
C802J(047)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	92.98	1.033	0	0.002	N	-N(345)	-N(343)	6.065	0.002	0	71021	0.02057				
C802J(048)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	92.98	1.033	0	0.002	N	-N(346)	-N(344)	6.065	0.002	0	71021	0.02057				
C802J(049)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	88.75	0.986	0	0.002	N	-N(347)	-N(345)	6.065	0.002	0	67790	0.02074				
C802J(050)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	88.75	0.986	0	0.002	N	-N(348)	-N(346)	6.065	0.002	0	67790	0.02074				
C802J(051)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	84.52	0.939	0	0.002	N	-N(349)	-N(347)	6.065	0.002	0	64560	0.02091				
C802J(052)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	84.52	0.939	0	0.002	N	-N(350)	-N(348)	6.065	0.002	0	64560	0.02091				
C802J(053)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	80.29	0.892	0	0.002	N	-N(351)	-N(349)	6.065	0.002	0	61330	0.0211				
C802J(054)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	80.29	0.892	0	0.002	N	-N(352)	-N(350)	6.065	0.002	0	61330	0.0211				
C802J(055)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	76.07	0.845	0	0.001	N	-N(353)	-N(351)	6.065	0.001	0	58101	0.02131				
C802J(056)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	76.07	0.845	0	0.001	N	-N(354)	-N(352)	6.065	0.001	0	58101	0.02131				
C802J(057)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	71.84	0.798	0	0.001	N	-N(355)	-N(353)	6.065	0.001	0	54871	0.02153				
C802J(058)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	71.84	0.798	0	0.001	N	-N(356)	-N(354)	6.065	0.001	0	54871	0.02153				
C802J(059)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	67.61	0.751	0	0.001	N	-N(357)	-N(355)	6.065	0.001	0	51642	0.02177				
C802J(060)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	67.61	0.751	0	0.001	N	-N(358)	-N(356)	6.065	0.001	0	51642	0.02177				
C802J(061)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	63.38	0.704	0	0.001	N	-N(359)	-N(357)	6.065	0.001	0	48414	0.02204				
C802J(062)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	63.38	0.704	0	0.001	N	-N(360)	-N(358)	6.065	0.001	0	48414	0.02204				
C802J(063)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	59.16	0.657	0	0	N	-N(361)	-N(359)	6.065	0	0	45185	0.02233				
C802J(064)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	59.16	0.657	0	0	N	-N(362)	-N(360)	6.065	0	0	45185	0.02233				
C802J(065)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	54.93	0.611	0	0	N	-N(363)	-N(361)	6.065	0	0	41957	0.02265				
C802J(066)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	54.93	0.611	0	0	N	-N(364)	-N(362)	6.065	0	0	41957	0.02265				
C802J(067)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	50.7	0.564	0	0	N	-N(365)	-N(363)	6.065	0	0	38729	0.02301				
C802J(068)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	50.7	0.564	0	0	N	-N(366)	-N(364)	6.065	0	0	38729	0.02301				
C802J(069)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	46.48	0.517	0	0	N	-N(367)	-N(365)	6.065	0	0	35501	0.02342				
C802J(070)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	46.48	0.517	0	0	N	-N(368)	-N(366)	6.065	0	0	35501	0.02342				
C802J(071)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	42.25	0.47	0	0	N	-N(369)	-N(367)	6.065	0	0	32274	0.02388				
C802J(072)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	42.25	0.47	0	0	N	-N(370)	-N(368)	6.065	0	0	32274	0.02388				
C802J(073)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	38.03	0.423	0	0	N	-N(371)	-N(369)	6.065	0	0	29046	0.02442				
C802J(074)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	38.03	0.423	0	0	N	-N(372)	-N(370)	6.065	0	0	29046	0.02442				
C802J(075)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	33.8	0.376	0	0	N	-N(373)	-N(371)	6.065	0	0	25818	0.02505				
C802J(076)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	33.8	0.376	0	0	N	-N(374)	-N(372)	6.065	0	0	25818	0.02505				
C802J(077)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	29.58	0.329	0	0	N	-N(375)	-N(373)	6.065	0	0	22591	0.0258				
C802J(078)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	29.58	0.329	0	0	N	-N(376)	-N(374)	6.065	0	0	22591	0.0258				
C802J(079)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	25.35	0.282	0	0	N	-N(377)	-N(375)	6.065	0	0	19364	0.02673				
C802J(080)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	25.35	0.282	0	0	N	-N(378)	-N(376)	6.065	0	0	19364	0.02673				
C802J(081)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	21.13	0.235	0	0	N	-N(379)	-N(377)	6.065	0	0	16136	0.02791				
C802J(082)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	21.13	0.235	0	0	N	-N(380)	-N(378)	6.065	0	0	16136	0.02791				
C802J(083)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	16.9	0.188	0	0	N	-N(381)	-N(379)	6.065	0	0	12909	0.02948				
C802J(084)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	16.9	0.188	0	0	N	-N(382)	-N(380)	6.065	0	0	12909	0.02948				
C802J(085)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	12.68	0.141	0	0	N	-N(383)	-N(381)	6.065	0	0	9682	0.03175				
C802J(086)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	12.68	0.141	0	0	N	-N(384)	-N(382)	6.065	0	0	9682	0.03175				
C802J(087)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	8.45	0.094	0	0	N	-N(385)	-N(383)	6.065	0	0	6454	0.03548				
C802J(088)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	8.45	0.094	0	0	N	-N(387)	-N(384)	6.065	0	0	6454	0.03548				
C802J(089)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	4.225	0.047	0	0	N	-N(388)	-N(385)	6.065	0	0	3227	0.04374				
C802J(090)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	4.225	0.047	0	0	N	-N(389)	-N(387)	6.065	0	0	3227	0.04374				
C802J(091)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0		0	0	0	0	N	-N(390)	-N(388)	6.065	0	0	0	0.001151				
C80XA	Steel Sch 40 (clean)	Containment Sump Water	10	2	15.8		444.6	1.81	0.996	0.805	N	-N(001A)	-N(112)	10.02	0.002	0.803	205561	0.01882	1 x FX-C8036 (Flow Element)	15.8	1 x Diverging Tee (Branch)	1.00E-05
C80XB	Steel Sch 40 (clean)	Containment Sump Water	10	27	28.1		601.7	2.45	1.916	2.435	N	-N(243)	-N(390)	10.02	0.004	2.431	278182	0.01828	1 x FX-C8036 (Flow Element)	28.1	1 x Diverging Tee (Branch)	1.00E-05
C803.001	Steel Sch 40 (clean)	Containment Sump Water	8	1.5	0.04216		222.4	1.428	0.001	0.003	N	-N(112)	-N(113)	7.981	0.002	0.001	129096	0.01838	1 x Reducer - Contraction (10 x 8 - 7)	0.04216	1 x Diverging Tee (Branch)	1.00E-05
C803.002	Steel Sch 40 (clean)	Containment Sump Water	8	1.5	0.04216		222.2	1.426	0.001	0.003	N	-N(112)	-N(114)	7.981	0.002	0.001	128982	0.01838	1 x Reducer - Contraction (10 x 8 - 7)	0.04216	1 x Diverging Tee (Branch)	1.00E-05
C803.003	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		218.5	1.403	0.001	0.003	N	-N(113)	-N(115)	7.981	0.003	0	126854	0.01842				
C803.004	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		218.7	1.403	0.001	0.003	N	-N(114)	-N(203)	7.981	0.003	0	126915	0.01842				
C803.005	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		214.8	1.379	0.001	0.002	N	-N(115)	-N(116)	7.981	0.002	0	124689	0.01847				
C803.006	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		214.9	1.379	0.001	0.002	N	-N(203)	-N(204)	7.981	0.002	0	124749	0.01847				
C803.007	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		211.3	1.356	0.001	0.002	N	-N(116)	-N(117)	7.981	0.002	0	122623	0.01852				
C803.008	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		211.1	1.355	0.001	0.002	N	-N(204)	-N(205)	7.981	0.002	0	122508	0.01852				
C803.009	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		207.4	1.331	0	0.002	N	-N(117)	-N(118)	7.981	0.002	0	120382	0.01857				
C803.010	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		207.5	1.332	0	0.002	N	-N(205)	-N(206)	7.981	0.002	0	120442	0.01857				
C803.011	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		203.7	1.307	0	0.002	N	-N(118)	-N(119)	7.981	0.002	0	118218	0.01862				
C803.012	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		203.8	1.308	0	0.002	N	-N(205)	-N(210)	7.981	0.002	0	118278	0.01862				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]				
C803.070	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]				

CS02M(023)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	241.6	1.551	0.002	0.004	N	~N(411)	~N(413)	7.981	0.004	0	140229	0.01815	
CS02M(024)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	241.6	1.551	0.002	0.004	N	~N(412)	~N(414)	7.981	0.004	0	140263	0.01815	
CS02M(025)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	236.2	1.516	0.002	0.004	N	~N(413)	~N(415)	7.981	0.004	0	137107	0.01821	
CS02M(026)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	236.3	1.516	0.002	0.004	N	~N(414)	~N(416)	7.981	0.004	0	137141	0.01821	
CS02M(027)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	230.9	1.482	0.001	0.003	N	~N(415)	~N(417)	7.981	0.003	0	133985	0.01827	
CS02M(028)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	230.9	1.482	0.001	0.003	N	~N(416)	~N(418)	7.981	0.003	0	134019	0.01827	
CS02M(029)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	225.5	1.447	0.001	0.003	N	~N(417)	~N(419)	7.981	0.003	0	130864	0.01834	
CS02M(030)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	225.5	1.447	0.001	0.003	N	~N(418)	~N(420)	7.981	0.003	0	130898	0.01834	
CS02M(031)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	220.1	1.413	0.001	0.003	N	~N(419)	~N(421)	7.981	0.003	0	127743	0.0184	
CS02M(032)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	220.1	1.413	0.001	0.003	N	~N(420)	~N(422)	7.981	0.003	0	127778	0.0184	
CS02M(033)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	214.7	1.378	0.001	0.003	N	~N(421)	~N(423)	7.981	0.003	0	124623	0.01847	
CS02M(034)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	214.8	1.378	0.001	0.003	N	~N(422)	~N(424)	7.981	0.003	0	124657	0.01847	
CS02M(035)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	209.3	1.344	0.001	0.003	N	~N(423)	~N(425)	7.981	0.003	0	121503	0.01854	
CS02M(036)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	209.4	1.344	0.001	0.003	N	~N(424)	~N(426)	7.981	0.003	0	121537	0.01854	
CS02M(037)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	204	1.309	0.001	0.003	N	~N(425)	~N(427)	7.981	0.003	0	118384	0.01862	
CS02M(038)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	204	1.309	0.001	0.003	N	~N(426)	~N(428)	7.981	0.003	0	118418	0.01862	
CS02M(039)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	198.6	1.275	0.001	0.003	N	~N(427)	~N(429)	7.981	0.003	0	115264	0.01869	
CS02M(040)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	198.6	1.275	0.001	0.003	N	~N(428)	~N(430)	7.981	0.003	0	115299	0.01869	
CS02M(041)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	193.2	1.24	0.001	0.002	N	~N(429)	~N(431)	7.981	0.002	0	112146	0.01877	
CS02M(042)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	193.3	1.24	0.001	0.002	N	~N(430)	~N(432)	7.981	0.002	0	112180	0.01877	
CS02M(043)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	187.8	1.206	0	0.002	N	~N(431)	~N(433)	7.981	0.002	0	109027	0.01886	
CS02M(044)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	187.9	1.206	0	0.002	N	~N(432)	~N(434)	7.981	0.002	0	109061	0.01886	
CS02M(045)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	182.5	1.171	0	0.002	N	~N(433)	~N(435)	7.981	0.002	0	105909	0.01894	
CS02M(046)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	182.5	1.171	0	0.002	N	~N(434)	~N(436)	7.981	0.002	0	105943	0.01894	
CS02M(047)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	177.1	1.137	0	0.002	N	~N(435)	~N(437)	7.981	0.002	0	102791	0.01904	
CS02M(048)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	177.1	1.137	0	0.002	N	~N(436)	~N(438)	7.981	0.002	0	102825	0.01903	
CS02M(049)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	171.7	1.102	0	0.002	N	~N(437)	~N(439)	7.981	0.002	0	99673	0.01913	
CS02M(050)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	171.8	1.103	0	0.002	N	~N(438)	~N(440)	7.981	0.002	0	99707	0.01913	
CS02M(051)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	166.3	1.068	0	0.002	N	~N(439)	~N(441)	7.981	0.002	0	96556	0.01923	
CS02M(052)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	166.4	1.068	0	0.002	N	~N(440)	~N(442)	7.981	0.002	0	96590	0.01923	
CS02M(053)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	161	1.033	0	0.002	N	~N(441)	~N(443)	7.981	0.002	0	93439	0.01933	
CS02M(054)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	161	1.034	0	0.002	N	~N(442)	~N(444)	7.981	0.002	0	93473	0.01933	
CS02M(055)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	155.6	0.999	0	0.002	N	~N(443)	~N(445)	7.981	0.002	0	90322	0.01944	
CS02M(056)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	155.7	0.9991	0	0.002	N	~N(444)	~N(446)	7.981	0.002	0	90356	0.01944	
CS02M(057)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	150.2	0.964	0	0.002	N	~N(445)	~N(447)	7.981	0.002	0	87205	0.01956	
CS02M(058)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	150.3	0.965	0	0.002	N	~N(446)	~N(448)	7.981	0.002	0	87239	0.01956	
CS02M(059)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	144.9	0.93	0	0.001	N	~N(447)	~N(449)	7.981	0.001	0	84089	0.01968	
CS02M(060)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	144.9	0.93	0	0.001	N	~N(448)	~N(450)	7.981	0.001	0	84123	0.01968	
CS02M(061)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	139.5	0.895	0	0.001	N	~N(449)	~N(451)	7.981	0.001	0	80972	0.01981	
CS02M(062)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	139.6	0.896	0	0.001	N	~N(450)	~N(452)	7.981	0.001	0	81006	0.0198	
CS02M(063)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	134.1	0.861	0	0.001	N	~N(451)	~N(453)	7.981	0.001	0	77856	0.01994	
CS02M(064)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	134.2	0.861	0	0.001	N	~N(452)	~N(454)	7.981	0.001	0	77890	0.01994	
CS02M(065)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	128.8	0.826	0	0.001	N	~N(453)	~N(455)	7.981	0.001	0	74740	0.02008	
CS02M(066)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	128.8	0.827	0	0.001	N	~N(454)	~N(456)	7.981	0.001	0	74774	0.02008	
CS02M(067)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	123.4	0.792	0	0.001	N	~N(455)	~N(457)	7.981	0.001	0	71625	0.02024	
CS02M(068)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	123.5	0.792	0	0.001	N	~N(456)	~N(458)	7.981	0.001	0	71659	0.02023	
CS02M(069)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	118	0.758	0	0	N	~N(457)	~N(459)	7.981	0	0	68509	0.0204	
CS02M(070)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	118.1	0.758	0	0	N	~N(458)	~N(460)	7.981	0	0	68543	0.0204	
CS02M(071)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	112.7	0.723	0	0	N	~N(459)	~N(461)	7.981	0	0	65393	0.02057	
CS02M(072)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	112.7	0.723	0	0	N	~N(460)	~N(462)	7.981	0	0	65427	0.02057	
CS02M(073)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	107.3	0.689	0	0	N	~N(461)	~N(463)	7.981	0	0	62278	0.02076	
CS02M(074)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	107.4	0.689	0	0	N	~N(462)	~N(464)	7.981	0	0	62312	0.02075	
CS02M(075)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	101.9	0.654	0	0	N	~N(463)	~N(465)	7.981	0	0	59163	0.02096	
CS02M(076)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	102	0.655	0	0	N	~N(464)	~N(466)	7.981	0	0	59197	0.02095	
CS02M(077)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	96.56	0.62	0	0	N	~N(465)	~N(467)	7.981	0	0	56048	0.02117	
CS02M(078)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	96.62	0.62	0	0	N	~N(466)	~N(468)	7.981	0	0	56082	0.02117	
CS02M(079)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	91.19	0.585	0	0	N	~N(467)	~N(469)	7.981	0	0	52932	0.0214	
CS02M(080)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	91.25	0.586	0	0	N	~N(468)	~N(470)	7.981	0	0	52966	0.0214	
CS02M(081)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	85.83	0.551	0	0	N	~N(469)	~N(471)	7.981	0	0	49817	0.02166	
CS02M(082)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	85.89	0.551	0	0	N	~N(470)	~N(472)	7.981	0	0	49851	0.02165	
CS02M(083)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	80.46	0.516	0	0	N	~N(471)	~N(473)	7.981	0	0	46703	0.02193	
CS02M(084)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	80.52	0.517	0	0	N	~N(472)	~N(474)	7.981	0	0	46737	0.02193	
CS02M(085)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	75.09	0.482	0	0	N	~N(473)	~N(475)	7.981	0	0	43588	0.02224	
CS02M(086)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	75.15	0.482	0	0	N	~N(474)	~N(476)	7.981	0	0	43622	0.02223	
CS02M(087)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	69.73	0.448	0	0	N	~N(475)	~N(477)	7.981	0	0	40473	0.02257	
CS02M(088)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	69.79	0.448	0	0	N	~N(476)	~N(478)	7.981	0	0	40507	0.02257	
CS02M(089)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	64.36	0.413	0	0	N	~N(477)	~N(479)	7.981	0	0	37358	0.02295	
CS02M(090)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	64.42	0.413	0	0	N	~N(478)	~N(480)	7.981	0	0	37392	0.02295	
CS02M(091)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	59	0.379	0	0	N	~N(479)	~N(481)	7.981	0	0	34243	0.02337	
CS02M(092)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	59.05	0.379	0	0	N	~N(480)	~N(482)	7.981	0	0	34277	0.02337	
CS02M(093)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	53.63	0.344	0	0	N	~N(481)	~N(483)	7.981	0	0	31129	0.02386	
CS02M(094)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	53.69	0.345	0	0	N	~N(482)	~N(484)	7.981	0	0	31163	0.02385	
CS02M(095)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	48.26	0.31	0	0	N	~N(483)	~N(485)	7.981	0	0	28014	0.02441	
CS02M(096)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	48.32	0.31	0	0	N	~N(484)	~N(486)	7.981	0	0	28048	0.0244	
CS02M(097)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	42.9	0.275	0	0	N	~N(485)	~N(487)	7.981	0	0	24899	0.02506	
CS02M(098)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	42.96	0.276	0	0	N	~N(486)	~N(488)	7.981	0	0	24933	0.02505	
CS02M(099)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	37.53	0.241	0	0	N	~N(487)	~N(489)	7.981	0	0	21785	0.02584	
CS02M(100)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	37.59	0.241	0	0	N	~N(488)	~N(490)	7.981	0	0	21819	0.02583	
CS02M(101)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	32.17	0.206	0	0	N	~N(489)	~N(491)	7.981	0	0	18670	0.02679	
CS02M(102)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	32.22	0.207	0	0	N	~N(490)	~N(492)	7.981	0	0	18704	0.02678	
CS02M(103)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	26.8	0.172	0	0	N	~N(491)	~N(493)	7.981	0	0	15556	0.028	
CS02M(104)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	26.86	0.172	0	0	N	~N(492)	~N(494)	7.981	0	0	15590	0.02799	
CS02M(105)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	21.43	0.138	0	0	N	~N(493)	~N(495)	7.981	0	0	12441	0.02962	
CS02M(106)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	21.49	0.138	0	0	N	~N(494)	~N(496)	7.981	0	0	12475	0.0296	
CS02M(107)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	16.07	0.103	0	0	N	~N(495)	~N(497)	7.981	0	0	9327	0.03195	
CS02M(108)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	16.13	0.104	0	0	N	~N(496)	~N(498)	7.981	0	0	9361	0.03192	
CS02M(109)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	10.7	0.069	0	0	N	~N(497)	~N(499)	7.981	0	0	6212	0.03577	
CS02M(110)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	10.76	0.069	0	0	N	~N(498)	~N(500)	7.981	0	0	6246	0.03571	
CS02M(111)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	5.336	0.034	0	0	N	~N(499)	~N(501)	7.981	0	0	3098	0.04424	
CS02M(112)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	5.395	0.035	0	0	N	~N(500)	~N(502)	7.981	0	0	3132	0.04409	
CS02M(113)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	0.029	0	0	0	N	~N(502)	~N(501)	7.981	0	0	17.03	3.758	
CS05AA	Steel Sch 40 (clean)	Containment Sump Water	3	1	9.8	0	0	0	0	N	~N(006)	~N(563)	3.068	0	0	0	0	1 x Diverging Tee (Branch)
CS05AB	Steel Sch 40 (clean)	Containment Sump Water	3	1	11.1	0	0	0	0	N	~N(240)	~N(562)	3.068	0	0	0	0	1 x Diverging Tee (Branch)
CS06AA	Steel Sch 40 (clean)	Containment Sump Water	6	1	1	0	0	-1.382	0	N	~N(563)	~N(556)	6.065	0	0	0	0	1 x Converging Tee (Branch)
CS06AB	Steel Sch 40 (clean)	Containment Sump Water	6	1	1	0	0	1.08	0	N	~N(562)	~N(557)	6.065	0	0	0	0	1 x Converging Tee (Branch)
CS23AA	Steel Sch 30 (clean)	Containment Sump Water	14	15.7	1.00E-05	0	0	-6.4	0	N	~N(556)	~N(005)	13.25	0	0	0	0	1 x Converging Tee (Branch)
CS23AB	Steel Sch 30 (clean)	Containment Sump Water	14	4.9	1.00E-05	0	0	-2.117	0	N	~N(557)	~N(237)	13.25	0	0	0	0	1 x Converging Tee (Branch)
CV05B(001)	Steel Sch 40 (clean)	Water After RHR HX	8	17.5	0.8	779.4	5.003	0.204	0.473	N	~N(622)	~N(627)	7.981	0.182	0.311	452419	0.01587	1 x Diverging Tee (Branch)

CV08AA(001)	Steel Sch.160 (clean)	Water After RHR HX	4	2.8	0.4721		397.6	13.75	1.208	1.897	N	Centrifugal Charging Pump A	-N(637)	3.438	0.512	1.385	635758	0.01786	2 x Pipe Bend - r/d 1.5 (90°)	0.2361												
CV08AA(002)	Steel Sch.160 (clean)	Water After RHR HX	4	4.8	2.975		332.6	11.5	2.906	6.729	N	-N(637)	-N(638)	3.438	0.62	6.108	448174	0.01802	1 x CV8481A(Check Valve)	2.975	1 x Diverging Tee (Through)	1.00E-05										
CV08AA(003)	Steel Sch 40 (clean)	Water After RHR HX	4	12.8	0.8047		332.6	8.389	1.566	1.725	N	-N(638)	-N(639)	4.026	0.737	0.988	382718	0.01771	3 x Pipe Bend - r/d 1.5 (90°)	0.2279	1 x CV8485A	0.221	1 x Diverging Tee (Through)	1.00E-05	1 x Converging Tee (Branch)	1.00E-05						
CV08BA(001)	Steel Sch.160 (clean)	Water After RHR HX	4	1.7	0.2361		381.8	13.21	0.749	0.826	N	Centrifugal Charging Pump B	-N(634)	3.438	0.287	0.639	514491	0.01789	1 x Pipe Bend - r/d 1.5 (90°)	0.2361												
CV08BA(002)	Steel Sch.160 (clean)	Water After RHR HX	4	3.7	3.211		316.6	10.96	2.772	6.417	N	-N(634)	-N(635)	3.438	0.435	5.982	426907	0.01806	1 x Pipe Bend - r/d 1.5 (90°)	0.2361	1 x CV8481B(Check Valve)	2.975	1 x Diverging Tee (Through)	1.00E-05								
CV08BA(003)	Steel Sch 40 (clean)	Water After RHR HX	4	103.1	3.333		316.8	7.981	4.583	9.709	N	-N(635)	-N(636)	4.026	5.408	3.301	364557	0.01776	4 x Pipe Bend - r/d 1.5 (90°)	0.2279	1 x CV8485B (Gate Valve)	0.221	1 x Diverging Tee (Through)	1.00E-05	1 x Converging* Tee (Branch)	2.2						
CV09A(001)	Steel Sch.160 (clean)	Water After RHR HX	4	13.3	5		252.6	8.737	2.983	6.829	N	-N(639)	-N(636)	3.438	1.007	5.921	340378	0.0183	1 x Converging* Tee (Branch)	3.2	1 x Diverging* Tee (Branch)	1.8										
CV09A(002)	Steel Sch.160 (clean)	Water After RHR HX	4	23.3	9.156		569.4	19.7	34.78	63.71	N	-N(636)	-N(643)	3.438	8.61	55.1	767285	0.0176	4 x Pipe Bend - r/d 1.5 (90°)	0.2361	1 x FE917	7.2	1 x Tee - Flow Thru Branch	1.012								
CV09C(001)	Steel Sch.160 (clean)	Water After RHR HX	3	2.6	0.2634		80	4.75	0.077	0.177	N	-N(642)	-N(640)	2.624	0.085	0.092	141236	0.02044	1 x Reducer - Contraction (4 x 3 - 4)	0.03381	1 x CV8483A(Gate Valve)	0.23	1 x Diverging Tee (Through)	1.00E-05								
CV09C(002)	Steel Sch.160 (clean)	Water After RHR HX	3	8.6	12.83		80	4.75	2.062	4.772	N	-N(639)	-N(642)	2.624	0.291	4.491	141236	0.02044	1 x CV8483B(Gate Valve)	0.23	1 x Converging Tee (Through)	1.00E-05	1 x Diverging* Tee (Branch)	12.6								
CV09C(003)	Steel Sch.160 (clean)	Water After RHR HX	3	23	11.4		80	4.75	5.03	4.743	N	-N(640)	-N(667)	2.624	0.753	3.99	141236	0.02044	1 x FE121	8.4	1 x Diverging Tee (Branch)	2	1 x Converging Tee (Through)	1.00E-05								
CV09C(004)	Steel Sch 160 (clean)	Water After RHR HX	3	12.5	1.00E-05		0	0	0	0	N	-N(667)	-N(668)	2.624	0	0	0	0	1 x Diverging Tee (Through)	1.00E-05												
CV12AA	Steel Sch.160 (clean)	Water After RHR HX	3	15.8	1.74	XXX	—	—	—	—	N	-N(638)	-N(678)	2.624	—	—	—	—	3 x Pipe Bend - r/d 1.5 (90°)	0.2511	1 x CV8387A(Globe Valve)	0.9866	1 x Diverging Tee (Branch)	1.00E-05	1 x Converging* Tee (Branch)	1.00E-05						
CV12AB	Steel Sch.160 (clean)	Water After RHR HX	3	118.7	3.247	XXX	—	—	—	—	N	-N(635)	-N(678)	2.824	—	—	—	—	9 x Pipe Bend - r/d 1.5 (90°)	0.2511	1 x CV8387B(Globe Valve)	0.9866	1 x Diverging Tee (Branch)	1.00E-05	1 x Converging* Tee (Branch)	1.00E-05						
CV12B	Steel Sch 160 (clean)	Water After RHR HX	3	0.8	0		0	0	0	0	N	-N(678)	-N(679)	2.824	0	0	0	0														
CV13B	Steel Sch.160 (clean)	Water After RHR HX	3	13.8	2.251		80	4.75	-2.748	1.239	N	-N(667)	-N(679)	2.824	0.451	0.788	141236	0.02044	1 x Pipe Bend - r/d 1.5 (90°)	0.2511	1 x Converging Tee (Branch)	1.00E-05	1 x Diverging* Tee (Branch)	1.00E-05	1 x Diverging Tee (Branch)	2						
CV43A(001)	Steel Sch 160 (clean)	Water After RHR HX	2	92	49.04		0	0	1.944	0	N	-N(668)	-N(669)	1.687	0	0	0	0	13 x Pipe Bend - r/d 1.5 (90°)	0.2791	5 x Pipe Bend - r/d 1.5 (45°)	0.1976	1 x FE139	6.8	1 x CV8345(Globe Valve)	5.891	1 x CV8346(Globe Valve)	5.891	1 x CV8348(Check Valve)	2.006	1 x CV184 (Globe Valve)	23.84	1 x Diverging Tee (Branch) 1.00E-05
CV43A(002)	Steel Sch 160 (clean)	Water After RHR HX	2	80.5	1.116		0	0	0.302	0	N	-N(669)	-N(670)	1.687	0	0	0	0	4 x Pipe Bend - r/d 1.5 (90°)	0.2791	1 x Diverging* Tee (Branch)	1.00E-05										
CV43A(003)	Steel Sch 160 (clean)	Water After RHR HX	2	117.9	2.151		0	0	1.21	0	N	-N(670)	-N(671)	1.687	0	0	0	0	7 x Pipe Bend - r/d 1.5 (90°)	0.2791	1 x Pipe Bend - r/d 1.5 (45°)	0.1976	1 x Diverging Tee (Through)	1.00E-05								
CV43BA/RC16AA	Steel Sch 160 (clean)	Water After RHR HX	2	134.4	15.41	XXX	—	—	—	—	N	-N(671)	Hot Leg A(001)	1.687	—	—	—	—	13 x Pipe Bend - r/d 1.5 (90°)	0.2791	1 x RC8036A (Y Globe Valve)	5.891	1 x RC8036A (Globe Valve)	5.891	1 x Diverging Tee (Through)	1.00E-05						
CV43BB/RC16AB	Steel Sch.160 (clean)	Water After RHR HX	2	19	13.29	XXX	—	—	—	—	N	-N(671)	Hot Leg B(001)	1.887	—	—	—	—	4 x Pipe Bend - r/d 1.5 (90°)	0.2791	2 x Pipe Bend - r/d 1.5 (45°)	0.1976	1 x RC8036B (Y Globe Valve)	5.891	1 x RC8036B (Globe Valve)	5.891	1 x Diverging Tee (Branch)	1.00E-05				
CV43BC/RC16AC	Steel Sch 160 (clean)	Water After RHR HX	2	59.1	13.46	XXX	—	—	—	—	N	-N(670)	Hot Leg C(001)	1.687	—	—	—	—	6 x Pipe Bend - r/d 1.5 (90°)	0.2791	1 x RC8036C (Y Globe Valve)	5.891	1 x RC8036C (Globe Valve)	5.891	1 x Diverging Tee (Branch)	1.00E-05						
CV43BD/RC16AD	Steel Sch.160 (clean)	Water After RHR HX	2	51.7	12.9	XXX	—	—	—	—	N	-N(669)	Hot Leg D(001)	1.687	—	—	—	—	4 x Pipe Bend - r/d 1.5 (90°)	0.2791	1 x RC8036D (Y Globe Valve)	5.891	1 x RC8036D (Globe Valve)	5.891	1 x Diverging* Tee (Branch)	1.00E-05						
CV98A	Steel Sch 40 (clean)	Water After RHR HX	6	5.5	0		649.4	4.168	-2.36	0.036	N	-N(508)	-N(618)	7.981	0.036	0	376961	0.01613														
CV98BA	Steel Sch 40 (clean)	Water After RHR HX	6	8.8	0.3769		324.7	2.084	-2.142	0.041	N	-N(618)	-N(621)	7.981	0.016	0.025	188481	0.01743	1 x Pipe Bend - r/d 1.5 (90°)	0.1969	1 x CV112D(Gate Valve)	0.18	1 x Converging Tee (Branch)	1.00E-05	1 x Diverging Tee (Branch)	1.00E-05						
CV98BB	Steel Sch.40 (clean)	Water After RHR HX	6	8.8	0.3769		324.7	2.084	-2.142	0.041	N	-N(618)	-N(621)	7.981	0.016	0.025	188481	0.01743	1 x Pipe Bend - r/d 1.5 (90°)	0.1969	1 x CV112E(Gate Valve)	0.18	1 x Converging Tee (Through)	1.00E-05	1 x Diverging Tee (Through)	1.00E-05						
CV98C	Steel Sch 40 (clean)	Water After RHR HX	6	6.5	3.2		649.4	4.168	0.391	0.905	N	-N(621)	-N(622)	7.981	0.042	0.863	376961	0.01613	1 x CV8546(Check Valve)	1.9	1 x Converging Tee (Branch)	1.3										
CVA1A/SI13C	Steel Sch 40 (clean)	Water After RHR HX	6	22.5	1.521	XXX	—	—	—	—	N	-N(626)	-N(624)	8.065	—	—	—	—	1 x SI8924 (Gate Valve)	0.195	5 x Pipe Bend - r/d 1.5 (90°)	0.2065	1 x Converging Tee (Branch)	0.7								
CVJ4A	Steel Sch 160 (clean)	Water After RHR HX	4	19.8	1.72		569.4	19.7	11.81	17.67	N	-N(643)	-N(644)	3.438	7.32	10.35	767285	0.0176	3 x Pipe Bend - r/d 1.5 (90°)	0.2361	1 x Tee - Flow Thru Branch	1.012										

Pipe(155)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	3.542	1.316	2.397	5.048	N	~N(180)
Pipe(156)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	3.845	1.429	2.397	5.948	N	~N(184)
Pipe(157)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	3.714	1.38	2.397	5.548	N	~N(185)
Pipe(158)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	3.542	1.316	2.397	5.048	N	~N(167)
Pipe(159)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	3.845	1.429	2.397	5.948	N	~N(168)
Pipe(160)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	3.714	1.38	2.397	5.548	N	~N(172)
Pipe(161)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	3.542	1.316	2.397	5.048	N	~N(173)
Pipe(162)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	3.845	1.429	2.397	5.948	N	~N(174)
Pipe(163)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	3.714	1.38	2.397	5.548	N	~N(202)
Pipe(164)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	3.542	1.316	2.397	5.048	N	~N(197)
Pipe(165)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	3.845	1.429	2.397	5.948	N	~N(196)
Pipe(166)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	3.714	1.38	2.397	5.548	N	~N(198)
Pipe(167)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	3.542	1.316	2.397	5.048	N	~N(199)
Pipe(168)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	3.845	1.429	2.397	5.948	N	~N(194)
Pipe(169)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	3.714	1.38	2.397	5.548	N	~N(195)
Pipe(170)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	3.542	1.316	2.397	5.048	N	~N(193)
Pipe(171)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	3.845	1.429	2.397	5.948	N	~N(182)
Pipe(172)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	3.714	1.38	2.397	5.548	N	~N(200)
Pipe(173)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	3.542	1.316	2.397	5.048	N	~N(201)
Pipe(174)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	3.845	1.429	2.397	5.949	N	~N(186)
Pipe(175)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	3.714	1.38	2.397	5.549	N	~N(187)
Pipe(176)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	3.543	1.316	2.397	5.049	N	~N(185)
[illegible]											

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]
RH08AA(002)	Steel Sch.40 (clean)	Containment Sump Water	8	1	1.00E-05	XXX	—
RH08AB(001)	Steel Sch.40 (clean)	Containment Sump Water	8	1	1.00E-05	XXX	—
RH08AB(002)	Steel Sch.40 (clean)	Containment Sump Water	8	1	1.00E-05	XXX	—
RH10AA(001)	Steel Sch 40 (clean)	Water After RHR HX	3	1	1.00E-05	XXX	—
RH10AA(002)	Steel Sch.40 (clean)	Water After RHR HX	3	1	1.00E-05		0
RH10AB(001)	Steel Sch.40 (clean)	Water After RHR HX	3	1	1.00E-05	XXX	—
RH10AB(002)	Steel Sch 40 (clean)	Water After RHR HX	3	1	1.00E-05		0
RH12A/CV99A	Steel Sch 40 (clean)	Water After RHR HX	8	28.6	5.573	XXX	—
RH14A	Steel Sch 40 (clean)	Water After RHR HX	8	4.4	1.878	XXX	—
SI01A	Steel Sch 40 (clean)	Water After RHR HX	8	28.4	0.9844		0
SI01B(001)	Steel Sch 20 (clean)	Water After RHR HX	24	113.2	0.3195		12223
SI01B(002)	Steel Sch 20 (clean)	Water After RHR HX	24	58	0.3195		11526
SI01B(003)	Steel Sch 20 (clean)	Water After RHR HX	24	4.8	0.3		5985
SI01B(004)	Steel Sch 20 (clean)	Water After RHR HX	24	60.3	0.4524		5985
SI01B(005)	Steel Sch.20 (clean)	Water After RHR HX	24	7	2.00E-05		5985
SI01B(006)	Steel Sch 20 (clean)	Water After RHR HX	24	2	27		849.4
SI01B(007)	Steel Sch 20 (clean)	Water After RHR HX	24	1	29.43		849.4
SI02A/SIF9A	Steel Sch 40 (clean)	Water After RHR HX	6	28.3	7.668		895.9
SI02BA(001)	Steel Sch 40 (clean)	Water After RHR HX	6	1.7	0.1598		361.1
SI02BA(002)	Steel Sch.40 (clean)	Water After RHR HX	6	174.8	2.748		361.1
SI02BA(003)	Steel Sch.40 (clean)	Water After RHR HX	6	3.4	0.6286		361.1
SI02BA(004)	Steel Sch.40 (clean)	Water After RHR HX	4	1	0		361.1
SI02BB(001)	Steel Sch.40 (clean)	Water After RHR HX	6	4.7	2.804		335.8
SI02BB(002)	Steel Sch.40 (clean)	Water After RHR HX	6	14.7	2.837		335.8
SI02BB(003)	Steel Sch.40 (clean)	Water After RHR HX	4	1	0		335.8
SI03AA(001)	Steel Sch.80 (clean)	Water After RHR HX	3	1	0.06412		361.1
SI03AA(002)	Steel Sch.80 (clean)	Water After RHR HX	4	79.6	8.34		331.1
SI03AA(003)	Steel Sch.80 (clean)	Water After RHR HX	4	51.8	0.8219		0
SI03AB(001)	Steel Sch 80 (clean)	Water After RHR HX	3	1	0.06412		335.8
SI03AB(002)	Steel Sch.80 (clean)	Water After RHR HX	4	34.3	8.744		305.8
SI03AB(003)	Steel Sch.80 (clean)	Water After RHR HX	4	25.4	0.481	XXX	—
SI03BA(001)	Steel Sch.160 (clean)	Water After RHR HX	4	34.1	3.841	XXX	—
SI03BA(002)	Steel Sch 160 (clean)	Water After RHR HX	2	0.5	0		0
SI03BB(001)	Steel Sch 160 (clean)	Water After RHR HX	4	43.8	3.877	XXX	—
SI03BB(002)	Steel Sch 160 (clean)	Water After RHR HX	2	1.4	0		0
SI03CA(001)	Steel Sch.160 (clean)	Water After RHR HX	2	13.5	0.2791		0
SI03CA(002)	Steel Sch 160 (clean)	Water After RHR HX	2	0.4	4.3		0
SI03CA(003)	Steel Sch.160 (clean)	Water After RHR HX	2	1.6	0		0
SI03CA(004)	Steel Sch 160 (clean)	Water After RHR HX	2	1	23.1	XXX	—
SI03CA(005)	Steel Sch.160 (clean)	Water After RHR HX	2	0.5	0		0
SI03CA(006)	Steel Sch.160 (clean)	Water After RHR HX	2	0.4	1.00E-05		0
SI03CB(001)	Steel Sch.160 (clean)	Water After RHR HX	2	2	1.00E-05		0
SI03CB(002)	Steel Sch.160 (clean)	Water After RHR HX	2	0.4	4.3		0
SI03CB(003)	Steel Sch.160 (clean)	Water After RHR HX	2	2.3	0		0
SI03CB(004)	Steel Sch.160 (clean)	Water After RHR HX	2	1	45.24		0
SI03CB(005)	Steel Sch.160 (clean)	Water After RHR HX	2	0.2	0		0
SI03CB(006)	Steel Sch.160 (clean)	Water After RHR HX	2	0.4	1.00E-05		0
SI03DA	Steel Sch 160 (clean)	Water After RHR HX	2	94.2	5.378		0
SI03DB	Steel Sch.160 (clean)	Water After RHR HX	2	4.5	2.284		0
SI03EA(001)	Steel Sch 160 (clean)	Water After RHR HX	2	7.5	1.00E-05		0
SI03EA(002)	Steel Sch.160 (clean)	Water After RHR HX	2	0.1	16		0
SI03EA(003)	Steel Sch.160 (clean)	Water After RHR HX	2	2.1	0		0
SI03EA(004)	Steel Sch.160 (clean)	Water After RHR HX	2	1	39.08		0
SI03EA(005)	Steel Sch 160 (clean)	Water After RHR HX	2	0.4	0		0
SI03EA(006)	Steel Sch 160 (clean)	Water After RHR HX	2	0.1	1.00E-05		0
SI03EB(001)	Steel Sch 160 (clean)	Water After RHR HX	2	6.1	1.00E-05		0
SI03EB(002)	Steel Sch 160 (clean)	Water After RHR HX	2	0.5	16		0
SI03EB(003)	Steel Sch 160 (clean)	Water After RHR HX	2	6.7	0		0
SI03EB(004)	Steel Sch 160 (clean)	Water After RHR HX	2	1	31.68	XXX	—
SI03EB(005)	Steel Sch 160 (clean)	Water After RHR HX	2	0.4	0		0
SI03EB(006)	Steel Sch 160 (clean)	Water After RHR HX	2	0.1	1.00E-05		0
SI03FA	Steel Sch.160 (clean)	Water After RHR HX	2	12.3	2.705		0
SI03FB	Steel Sch.160 (clean)	Water After RHR HX	2	79.6	8.494		0
SI04A	Steel Sch.40S (clean)	Water After RHR HX	12	30	0.5687		0
SI04B	Steel Sch.140 (clean)	Water After RHR HX	12	84	1.1		0
SI04C	Steel Sch.140 (clean)	Water After RHR HX	12	1.5	8.4803		0
SI04C/D	Steel Sch.160 (clean)	Water After RHR HX	8	18	0.84		0
SI04J	Steel Sch.160 (clean)	Water After RHR HX	8	83.2	1.559		0
SI05AA	Steel Sch.40 (clean)	Water After RHR HX	8	72.6	8.9269		3295
SI05AB(001)	Steel Sch 40 (clean)	Water After RHR HX	8	63.4	1.009		3222
SI05AB(002)	Steel Sch.40 (clean)	Water After RHR HX	8	31.9	2.984		3222
SI05BA	Steel Sch.160 (clean)	Water After RHR HX	8	18.5	0.3856		3295
SI05BB	Steel Sch.160 (clean)	Water After RHR HX	8	18.8	0.182		3222
SI05CA	Steel Sch.160 (clean)	Water After RHR HX	8	238.2	4.006		1524
SI05CB	Steel Sch 160 (clean)	Water After RHR HX	8	268.2	8.084		1421
SI05CC	Steel Sch.160 (clean)	Water After RHR HX	6	3.5	3.638		1802
SI05CD	Steel Sch 160 (clean)	Water After RHR HX	8	10.8	4.838		1771
SI05DA(001)	Steel Sch.160 (clean)	Water After RHR HX	6	8	3.256		1524
SI05DA(002)	Steel Sch 160 (clean)	Water After RHR HX	6	102.9	2.477		1684
SI05DB(001)	Steel Sch 160 (clean)	Water After RHR HX	6	6	3.041		1421
SI05DB(002)	Steel Sch 160 (clean)	Water After RHR HX	6	98.7	2.325		1580
SI05DC(001)	Steel Sch.160 (clean)	Water After RHR HX	6	6.4	3.03		1802
SI05DC(002)	Steel Sch 160 (clean)	Water After RHR HX	6	73.7	1.831		1961
SI05DD(001)	Steel Sch.160 (clean)	Water After RHR HX	6	2.6	2.725		1771
SI05DD(002)	Steel Sch.160 (clean)	Water After RHR HX	6	84.1	2.262		1930
SI06AA/BA	Steel Sch.40 (clean)	Containment Sump Water	24	97.7	15.06	←→	2089
SI06AB/BB	Steel Sch.40 (clean)	Containment Sump Water	24	98.3	12.57	←→	2291
SI06BA	Steel Sch.40 (clean)	Containment Sump Water	24	11.5	0.585		0
SI06BB	Steel Sch 40 (clean)	Containment Sump Water	24	15.5	0.7785		0
SI08B	Steel Sch.160 (clean)	Water After RHR HX	4	4.8	0.6393		569.4
SI08CA	Steel Sch.160 (clean)	Water After RHR HX	4	6.1	0.4571		284.7
SI08CB	Steel Sch.160 (clean)	Water After RHR HX	4	6.1	0.4571		284.7
SI08E	Steel Sch.160 (clean)	Water After RHR HX	3	23.1	3.688		569.4
SI08FA	Steel Sch.160 (clean)	Water After RHR HX	3	193.3	7.465		286.1
SI08FB	Steel Sch.160 (clean)	Water After RHR HX	3	10	4.3		283.3
SI08GA	Steel Sch.160 (clean)	Water After RHR HX	1.5	3.4	1.498		143.3
SI08GA/HA	Steel Sch.160 (clean)	Water After RHR HX	2	7.4	200.1		143.3
SI08GB	Steel Sch 160 (clean)	Water After RHR HX	1.5	49.4	0.8026		142.8
SI08GB/HB	Steel Sch 160 (clean)	Water After RHR HX	2	15.7	200.1		142.8
SI08GC	Steel Sch.160 (clean)	Water After RHR HX	1.5	10.3	4.703		141.7
SI08GC/HC	Steel Sch 160 (clean)	Water After RHR HX	2	12	200.1		141.7
SI08GD	Steel Sch 160 (clean)	Water After RHR HX	1.5	3.6	4.826		141.6
SI08GD/HD	Steel Sch 160 (clean)	Water After RHR HX	2	4.2	200.1		141.6
SI08JA/RC30AA	Steel Sch 160 (clean)	Water After RHR HX	1.5	103.8	4.762		143.3
SI08JA(001)	Steel Sch.160 (clean)	Water After RHR HX	1.5	11.5	0.8121		143.3
SI08JA(002)	Steel Sch.160 (clean)	Water After RHR HX	1.5	1	113.7		143.3
SI08JA(003)	Steel Sch.160 (clean)	Water After RHR HX	1.5	3.4	0		143.3
SI08JA(004)	Steel Sch.160 (clean)	Water After RHR HX	1.5	0.1	1.00E-05		143.3
SI08JB/RC30AB	Steel Sch.160 (clean)	Water After RHR HX	1.5	93.4	2.866		142.8
SI08JB(001)	Steel Sch.160 (clean)	Water After RHR HX	1.5	0.4	0.02078		142.8
SI08JB(002)	Steel Sch.160 (clean)	Water After RHR HX	1.5	1	98.07		142.8
SI08JB(003)	Steel Sch.160 (clean)	Water After RHR HX	1.5	67.3	2.468		142.8
SI08JB(004)	Steel Sch.160 (clean)	Water After RHR HX	1.5	0.01	1.00E-05		142.8
SI08JC/RC30AC	Steel Sch.160 (clean)	Water After RHR HX	1.5	99.5	8.31		141.7
SI08JC(001)	Steel Sch.160 (clean)	Water After RHR HX	1.5	0.2	0.02078		141.7
SI08JC(002)	Steel Sch.160 (clean)	Water After RHR HX	1.5	1	116.8		141.7
SI08JC(003)	Steel Sch.160 (clean)	Water After RHR HX	1.5	14.6	0.2957		141.7
SI08JC(004)	Steel Sch 160 (clean)	Water After RHR HX	1.5	0.1	1.00E-05		141.7
SI08JD/RC30AD	Steel Sch 160 (clean)	Water After RHR HX	1.5	90.8	4.17		141.6
SI08JD(001)	Steel Sch.160 (clean)	Water After RHR HX	1.5	0.5	0.02078		141.6
SI08JD(002)	Steel Sch.160 (clean)	Water After RHR HX	1.5	1	126.3		141.6
SI08JD(003)	Steel Sch 160 (clean)	Water After RHR HX	1.5	4.1	0.5913		141.6
SI08JD(004)	Steel Sch.160 (clean)	Water After RHR HX	1.5	0.1	1.00E-05		141.6
SI09AA(001)	Steel Sch 40 (clean)	Water After RHR HX	10	24.6	1.584		0
SI09AA(002)	Steel Sch.140 (clean)	Water After RHR HX	10	70.8	2.509	XXX	—
SI09AB(001)	Steel Sch 40 (clean)	Water After RHR HX	10	25.8	1.584		0
SI09AB(002)	Steel Sch.140 (clean)	Water After RHR HX	10	64.2	2.453	XXX	—
SI09AC(001)	Steel Sch 40 (clean)	Water After RHR HX	10	31.4	1.564		0
SI09AC(002)	Steel Sch.140 (clean)	Water After RHR HX	10	67.7	1.793	XXX	—
SI09AD(001)	Steel Sch.40 (clean)	Water After RHR HX	10	25.1	1.864		0
SI09AD(002)	Steel Sch.140 (clean)	Water After RHR HX	10	65.2	2.759	XXX	—
SI09BA/RC29AA	Steel Sch.140 (clean)	Water After RHR HX	10	11.5	1.307		1684
SI09BB/RC29AB	Steel Sch.140 (clean)	Water After RHR HX	10	12.7	1.307		1580
SI09BC/RC29AC	Steel Sch.140 (clean)	Water After RHR HX	10	12.8	1.17		1961
SI09BD/RC29AD	Steel Sch.140 (clean)	Water After RHR HX	10	9.4	1.307		1930
SI13A	Steel Sch 40 (clean)	Water After RHR HX	6	1.3	3.4		0
SI13BA	Steel Sch 40 (clean)	Water After RHR HX	6	9.3	0.812	XXX	—
SI13BB	Steel Sch 40 (clean)	Water After RHR HX	6	5.6	0.812	XXX	—
SI16AA	Steel Sch.80 (clean)	Water After RHR HX	4	2	2.621		331.1
SI16AB	Steel Sch.80 (clean)	Water After RHR HX	4	117	5.095		305.8
SI18B	Steel Sch.80 (clean)	Water After RHR HX	4	94.2	1.085		636.9
SI18C	Steel Sch.160 (clean)	Water After RHR HX	4	15.7	0.221		636.9
SI18DA	Steel Sch 160 (clean)	Water After RHR HX	4	28.4	5.944		317.7
SI18DB	Steel Sch.160 (clean)	Water After RHR HX	4	231.3	3.57		319.2
SI18EA(001)	Steel Sch 160 (clean)	Water After RHR HX	2	48.5	3.892		159.6
SI18EA(002)	Steel Sch 160 (clean)	Water After RHR HX	2	0.01	110		159.6
SI18EA(003)	Steel Sch 160 (clean)	Water After RHR HX	2	5.4	0		159.6
SI18EA(004)	Steel Sch.160 (clean)	Water After RHR HX	2	1	222		159.6
SI18EA(005)	Steel Sch.160 (clean)	Water After RHR HX	2	0.4	0		159.6
SI18EA(006)	Steel Sch.160 (clean)	Water After RHR HX	2	0.1	1.00E-05		159.6
SI18EB(001)	Steel Sch.160 (clean)	Water After RHR HX	2	80.3	3.968		159.6
SI18EB(002)	Steel Sch.160 (clean)	Water After RHR HX	2	0.01	110		159.6
SI18EB(003)	Steel Sch.160 (clean)	Water After RHR HX	2	1.4	0		159.6
SI18EB(004)	Steel Sch.160 (clean)	Water After RHR HX	2	1	217.4		159.6
SI18EB(005)	Steel Sch.160 (clean)	Water After RHR HX	2	0.4	0		159.6
SI18EB(006)	Steel Sch.160 (clean)	Water After RHR HX	2	0.01	1.00E-05		159.6
SI18EC(001)	Steel Sch.160 (clean)	Water After RHR HX	2	15.4	6.822		158.8
SI18EC(002)	Steel Sch.160 (clean)	Water After RHR HX	2	0.01	110		158.8
SI18EC(003)	Steel Sch 160 (clean)	Water After RHR HX	2	1.5	0		158.8
SI18EC(004)	Steel Sch.160 (clean)	Water After RHR HX	2	1	230.3		158.8
SI18EC(005)	Steel Sch.160 (clean)	Water After RHR HX	2	0.4	0		158.8
SI18EC(006)	Steel Sch.160 (clean)	Water After RHR HX	2	0.1	1.00E-05		158.8
SI18ED(001)	Steel Sch 160 (clean)	Water After RHR HX	2	12.7	8.822		158.9
SI18ED(002)	Steel Sch 160 (clean)	Water After RHR HX	2	0.1	110		158.9
SI18ED(003)	Steel Sch 160 (clean)	Water After RHR HX	2	1.2	0		158.9
SI18ED(004)	Steel Sch 160 (clean)	Water After RHR HX	2	1	228.5		158.9
SI18ED(005)	Steel Sch 160 (clean)	Water After RHR HX	2	0.3	0		158.9
SI18ED(006)	Steel Sch 160 (clean)	Water After RHR HX	2	0.1	1.00E-05		158.9
SI18FA	Steel Sch 160 (clean)	Water After RHR HX	2	6.8	3.301		159.6
SI18FB	Steel Sch.160 (clean)	Water After RHR HX	2	5.7	4.887		159.6
SI18FC	Steel Sch 160 (clean)	Water After RHR HX	2	5.9	3.5		158.8
SI18FD	Steel Sch.160 (clean)	Water After RHR HX	2	5.3	4.397		158.9
SI34A(001)	Steel Sch 40 (clean)	Water After RHR HX	8	63.7	1.79	XXX	—
SI34A(002)	Steel Sch 40 (clean)	Water After RHR HX	8	1	1.00E-05		0
SI53AA/CS23AA	Steel Sch.30 (clean)	Water After RHR HX	14	42.4	0.9908	XXX	—
SI53AB/CS23AB	Steel Sch.30 (clean)	Water After RHR HX	14	41.3	0.7081	XXX	—
SI82AA/BA	Steel Sch 40 (clean)	Water After RHR HX	12	52.8	4.715		5336

BB2A/BB0	Steel Sch 40 (steam)	Water Alter Kraft	12	97.1	4.919	5841	15.49	4.854	22.33	N	~N(504)	~N(502)	11.804	3.67	19.26	2.15E+05	0.01363	3 x Pipe Bend - r/d 1.5 (90°)	[illegible]
BAA4	Steel Sch 160 (steam)	Water Alter Kraft	6	13.1	2.667	0	0	2.342	0	N	~N(537)	~N(544)	8.813	0	0	0	0	2 x Pipe Bend - r/d 1.5 (90°)	[illegible]
BAA5	Steel Sch 160 (steam)	Water Alter Kraft	8	85.1	2.11	0	0	0.259	0	N	~N(544)	~N(545)	8.813	0	0	0	0	9 x Pipe Bend - r/d 1.5 (90°)	[illegible]

Node List	Status	Pressure	Grade	Elev
~N(001)		121.6	675.5	429
~N(001A)		58.42	675.5	574.3
~N(002)		30.1	360.6	330.1
~N(003)		33.84	360.6	346.3
~N(004)		34.38	365.5	349.5
~N(005)		117.8	675.5	344.3
~N(006)		137.8	675.5	344.3
~N(007)		150.1	675.5	340.3
~N(008)		151	675.5	300
~N(009)		138	675.5	364.9
~N(010)		52.85	675.5	647.2
~N(011)		50.19	675.6	593.5
~N(012)		50.2	675.7	593.5
~N(013)		50.2	675.7	593.5
~N(014)		50.2	675.7	593.5
~N(015)		50.21	675.7	593.5
~N(016)		50.22	675.7	593.5
~N(017)		50.22	675.7	593.5
~N(018)		50.23	675.7	593.5
~N(019)		50.23	675.7	593.5
~N(020)		50.24	675.8	593.5
~N(021)		50.24	675.8	593.5
~N(022)		50.25	675.8	593.5
~N(023)		50.24	675.8	593.5
~N(024)		50.24	675.8	593.5
~N(025)		50.25	675.8	593.5
~N(026)		50.25	675.8	593.5
~N(027)		50.25	675.8	593.5
~N(028)		50.25	675.8	593.5
~N(029)		50.25	675.8	593.5
~N(030)		50.25	675.8	593.5
~N(031)		50.25	675.8	593.5
~N(032)		50.25	675.8	593.5
~N(033)		50.2	675.7	593.5
~N(034)		50.21	675.7	593.5
~N(035)		50.22	675.7	593.5
~N(036)		50.23	675.7	593.5
~N(037)		50.23	675.7	593.5
~N(038)		50.22	675.7	593.5
~N(039)		50.24	675.8	593.5
~N(040)		50.25	675.8	593.5
~N(041)		50.25	675.8	593.5
~N(042)		50.24	675.8	593.5
~N(043)		50.24	675.8	593.5
~N(044)		50.24	675.8	593.5
~N(045)		50.25	675.8	593.5
~N(046)		50.25	675.8	593.5
~N(047)		50.25	675.8	593.5
~N(048)		50.25	675.8	593.5
~N(049)		50.25	675.8	593.5
~N(050)		50.25	675.8	593.5
~N(051)		52.18	675.7	589
~N(052)		52.21	675.8	589
~N(053)		52.21	675.8	589
~N(054)		52.21	675.8	589
~N(055)		52.21	675.8	589
~N(056)		52.21	675.8	589
~N(057)		52.21	675.8	589
~N(058)		52.21	675.8	589
~N(059)		52.21	675.8	589
~N(060)		52.21	675.8	589
~N(061)		52.21	675.8	589
~N(062)		52.21	675.8	589
~N(063)		52.21	675.8	589
~N(064)		52.21	675.8	589
~N(065)		52.2	675.8	589
~N(066)		52.2	675.8	589
~N(067)		52.2	675.8	589
~N(068)		52.2	675.8	589
~N(069)		52.2	675.8	589
~N(070)		52.2	675.8	589
~N(071)		52.2	675.8	589
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-N(509)	28.62	415.2	383
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-N(517)	122.9	617.4	367.3
-N(518)	107.2	588.1	375
-N(519)	102.4	577.9	375
-N(520)	104.7	583.3	375
-N(521)	104.7	583.3	375
-N(522)	104.7	583.3	375
-N(524)	34.57	390.3	344.3
-N(525)	158.9	701.2	367.6
-N(526)	158	691.6	359.8
-N(527)	137.5	644.1	359.8
-N(528)	130.2	634.8	367.4
-N(529)	120	611.2	367.4
-N(530)	107.7	590.2	375
-N(531)	104.7	583.3	375
-N(535)	34.59	390.3	344.3
-N(536)	34.56	390.2	344.3
-N(537)	103	583.3	379
-N(538)	32.07	415.2	375
-N(539)	103	583.3	379
-N(540)	103	583.3	379
-N(541)	100.8	583.3	384.5
-N(542)	99.52	583.3	387
-N(544)	100.4	583.3	385
-N(545)	100.6	583.3	384.4

~N(546)		99.74	583.3	386.5
~N(548)		21.85	395.8	379
~N(549)		34.42	395.6	349.9
~N(551)		20.83	393.4	379.2
~N(552)		33.44	393.4	349.9
~N(553)		33.27	387.9	349.9
~N(556)	Isolated	—	—	367.3
~N(558)		34.67	390.5	344.3
~N(560)	Isolated	—	—	367.4
~N(561)		24.59	390.3	367.4
~N(564)		83.45	548.6	389.5
~N(565)		66.93	519.3	421.5
~N(566)		45.76	499.4	417.5
~N(569)		75.09	529.3	389.5
~N(570)		81.41	497.6	389.5
~N(571)		29.63	426.3	391.7
~N(572)		100.8	574.3	375
~N(573)		81.87	542	387
~N(574)		61.52	502.2	417
~N(575)		41.45	478.9	417
~N(576)		30.74	425.5	388.4
~N(577)		78.11	528.7	384.5
~N(578)		31.21	426.2	388
~N(579)		59.71	488.7	384.5
~N(580)		1007	2709	413.1
~N(581)		30.22	425.7	389.8
~N(583)		1007	2709	413.3
~N(588)		1007	2709	413.3
~N(589)		1007	2709	413.3
~N(590)		30.96	413.9	376.3
~N(591)		30.95	413.9	376.3
~N(592)		34.29	411.7	366.4
~N(593)		34.17	411.6	366.5
~N(595)		30.88	413.3	376.3
~N(596)		34.65	412.6	366.4
~N(598)		30.88	413.3	376.3
~N(600)		1316	3394	377.5
~N(601)		103.4	583.3	378
~N(602)		103.4	583.3	378
~N(603)		28.7	423.8	396
~N(605)		1322	3404	377.5
~N(606)		103.4	583.3	378
~N(607)		103.4	583.3	378
~N(610)		28.7	423.8	396
~N(613)		1316	3391	377.5
~N(614)		1302	3362	383
~N(615)		1297	3348	380
~N(616)		1271	3329	420.2
~N(618)		30.93	415.1	377.5
~N(619)		34.29	411.7	366.4
~N(621)		33.07	415	372.5
~N(622)		32.69	414.1	372.5
~N(624)		33.86	414.4	370.5
~N(625)		32.79	414.4	372.5
~N(626)	Isolated	—	—	366.4
~N(627)		32.48	413.7	372.5
~N(631)		32.79	414.4	372.5
~N(635)		1780	4457	369.6
~N(636)		1776	4448	371.5
~N(638)		1780	4456	369.6
~N(639)		1779	4455	371.5
~N(640)		1777	4450	371.5
~N(642)		1777	4450	371.5
~N(643)		1741	4384	388.3
~N(644)		1729	4366	397.5
~N(645)		1727	4361	396.5
~N(646)		1727	4360	396.5
~N(647)		1684	4260	395
~N(648)		1627	4152	420.1
~N(649)		1679	4237	385
~N(650)		1633	4129	382.4
~N(651)		1072	2831	382.4
~N(652)		29.83	428	393
~N(654)		1610	4116	423.2
~N(655)		1039	2794	423.2
~N(656)		29.87	428.1	393
~N(659)		1646	4147	385.6
~N(660)		1063	2858	385.6
~N(661)		29.83	428	393
~N(664)		1555	3979	413
~N(665)		984.3	2657	413
~N(666)		29.86	428.1	393
~N(667)		1772	4445	378.4
~N(669)		1770	4445	382.9
~N(670)		1769	4445	383.6
~N(671)		1768	4445	386.4
~N(672)		103	583.3	379
~N(673)		89.81	580.4	387
~N(674)		85.04	549.8	387
~N(675)		1316	3394	383
~N(676)	Isolated	—	—	379
~N(677)		1306	3371	383
~N(678)		1774	4444	370.8
~N(680)		983.7	2656	412.9
~N(682)		178.4	776	397
~N(683)		178.4	776	397
~N(684)		1023	2746	413
~N(686)		200.7	843.6	413
~N(687)		200.6	843.3	413
~N(688)		1072	2830	382.4
~N(690)		228.8	878.5	382.9
~N(691)		227.8	878.2	384.9
~N(692)		1063	2857	385.6
~N(694)		185.6	783.1	387.5
~N(695)		185.5	782.8	387.5
~N(696)		1217	3199	414.5
~N(697)		829.8	2301	414.5
~N(698)		829.1	2300	414.5
~N(700)		62.06	524.1	414.5
~N(701)		1284	3274	381.4
~N(702)		880.9	2386	381.4
~N(703)		880.1	2385	381.4
~N(705)		76.33	524.1	381.4
~N(706)		76.28	523.9	381.4
~N(707)		62.04	524.1	414.5
~N(708)		1235	3239	414.9
~N(709)		847.4	2343	414.9
~N(710)		844.6	2336	414.9
~N(712)		62.09	524.6	414.9
~N(713)		62.04	524.5	414.9
~N(714)		1263	3277	387
~N(715)		879.4	2389	387
~N(716)		878.8	2387	387
~N(718)		80.61	539.6	387
~N(719)		80.56	539.4	387
~N(720)		102.2	583.3	380.7
~N(721)		102.2	583.3	380.7
~N(722)		102.2	583.3	380.7
~N(724)		102.2	583.3	380.7
~N(725)		102.2	583.3	380.7
~N(726)		103.4	583.3	378
~N(727)		103.4	583.3	378
~N(728)		103.4	583.3	378
~N(730)		34.48	423.8	378
~N(731)		34.48	423.8	378
~N(732)		103.4	583.3	378.1
~N(733)		103.4	583.3	378.1
~N(734)		103.4	583.3	378.1
~N(736)		103.4	583.3	378.1
~N(737)		103.4	583.3	378.1
~N(738)		102.1	583.3	381.1
~N(739)		102.1	583.3	381.1
~N(740)		102.1	583.3	381.1
~N(742)		33.14	423.8	381.1
~N(743)		33.14	423.8	381.1

Tank List	Surface Pressure	Level	Status	Flow	Pressure	Grade	Elev
Accumulator Tank A	1000	0		0	1000	2709	428.7
Accumulator Tank B	1000	0		0	1000	2709	428.6
Accumulator Tank C	1000	0		0	1000	2709	428.6
Accumulator Tank D	1000	0		0	1000	2709	428.5
Cont. Recirc. Sump A	19.1	11.7		2069	24.15	390.1	368.2
Cont. Recirc. Sump B	19.1	11.7		2291	24.15	390.1	368.2
Refueling Water Storage Tank	14.7	23.9		12223	25.02	417.9	394

Demand List	Demand Type	Flow	Pressure	Status	Grade	Elev
~N(556)	Flow in	0	152.4		875.5	356.8
~N(557)	Flow in	0	155.2		874.6	349.3
~N(599)	Flow out	30	1331		3413	366.6
~N(604)	Flow out	30	1332		3416	366.8
~N(623)	Flow in	0	33.66		414.4	370.5
~N(633)	Flow in	130	32.79		414.4	372.5
~N(634)	Flow out	65	1783		4463	369.6
~N(637)	Flow out	65	1783		4463	369.6
~N(641)	Flow out	0	1778		4450	367.9
~N(668)	Flow out	0	1772		4445	378.4
~N(679)	Flow out	80	1774		4444	370.8
A1(001)	Spray	3.863	55		888.7	575.4
A1(002)	Spray	3.561	55		889.6	578.3
A1(003)	Spray	3.731	55		889.1	575.8
A1(004)	Spray	3.731	55		869.1	575.8
A1(005)	Spray	3.559	55		869.6	578.3
A1(006)	Spray	3.861	55		868.7	575.4
A1(007)	Spray	3.86	55		868.7	575.4
A1(008)	Spray	3.559	55		869.6	578.3
A1(009)	Spray	3.728	55		869.1	575.8
A1(010)	Spray	3.728	55		869.1	575.8

A1(011)	Spray	3.557	55	669.6	576.3
A1(012)	Spray	3.859	55	668.7	575.4
A1(013)	Spray	3.858	55	668.7	575.4
A1(014)	Spray	3.556	55	669.6	576.3
A1(015)	Spray	3.726	55	669.1	575.8
A1(016)	Spray	3.726	55	669.1	575.8
A1(017)	Spray	3.555	55	669.6	576.3
A1(018)	Spray	3.857	55	668.7	575.4
A1(019)	Spray	3.856	55	668.7	575.4
A1(020)	Spray	3.554	55	669.6	576.3
A1(021)	Spray	3.724	55	669.1	575.8
A1(022)	Spray	3.724	55	669.1	575.8
A1(023)	Spray	3.553	55	669.6	576.3
A1(024)	Spray	3.855	55	668.7	575.4
A1(025)	Spray	3.854	55	668.7	575.4
A1(026)	Spray	3.552	55	669.6	576.3
A1(027)	Spray	3.723	55	669.1	575.8
A1(028)	Spray	3.723	55	669.1	575.8
A1(029)	Spray	3.551	55	669.6	576.3
A1(030)	Spray	3.853	55	668.7	575.4
A1(031)	Spray	3.853	55	668.7	575.4
A1(032)	Spray	3.551	55	669.6	576.3
A1(033)	Spray	3.721	55	669.1	575.8
A1(034)	Spray	3.721	55	669.1	575.8
A1(035)	Spray	3.55	55	669.6	576.3
A1(036)	Spray	3.852	55	668.7	575.4
A1(037)	Spray	3.851	55	668.7	575.4
A1(038)	Spray	3.549	55	669.6	576.3
A1(039)	Spray	3.72	55	669.1	575.8
A1(040)	Spray	3.72	55	669.1	575.8
A1(041)	Spray	3.548	55	669.6	576.3
A1(042)	Spray	3.851	55	668.7	575.4
A1(043)	Spray	3.85	55	668.7	575.4
A1(044)	Spray	3.548	55	669.6	576.3
A1(045)	Spray	3.718	55	669.1	575.8
A1(046)	Spray	3.718	55	669.1	575.8
A1(047)	Spray	3.547	55	669.6	576.3
A1(048)	Spray	3.85	55	668.7	575.4
A1(049)	Spray	3.849	55	668.7	575.4
A1(050)	Spray	3.547	55	669.6	576.3
A1(051)	Spray	3.717	55	669.1	575.8
A1(052)	Spray	3.717	55	669.1	575.8
A1(053)	Spray	3.546	55	669.6	576.3
A1(054)	Spray	3.849	55	668.7	575.4
A1(055)	Spray	3.848	55	668.7	575.4
A1(056)	Spray	3.546	55	669.6	576.3
A1(057)	Spray	3.717	55	669.1	575.8
A1(058)	Spray	3.717	55	669.1	575.8
A1(059)	Spray	3.545	55	669.6	576.3
A1(060)	Spray	3.848	55	668.7	575.4
A1(061)	Spray	3.848	55	668.7	575.4
A1(062)	Spray	3.545	55	669.6	576.3
A1(063)	Spray	3.716	55	669.1	575.8
A1(064)	Spray	3.716	55	669.1	575.8
A1(065)	Spray	3.544	55	669.6	576.3
A1(066)	Spray	3.847	55	668.7	575.4
A1(067)	Spray	3.847	55	668.7	575.4
A1(068)	Spray	3.544	55	669.6	576.3
A1(069)	Spray	3.715	55	669.1	575.8
A1(070)	Spray	3.715	55	669.1	575.8
A1(071)	Spray	3.544	55	669.6	576.3
A1(072)	Spray	3.847	55	668.7	575.4
A1(073)	Spray	3.846	55	668.7	575.4
A1(074)	Spray	3.544	55	669.6	576.3
A1(075)	Spray	3.715	55	669.1	575.8
A1(076)	Spray	3.715	55	669.1	575.8
A1(077)	Spray	3.543	55	669.6	576.3
A1(078)	Spray	3.846	55	668.7	575.4
A1(079)	Spray	3.846	55	668.7	575.4
A1(080)	Spray	3.543	55	669.6	576.3
A1(081)	Spray	3.714	55	669.1	575.8
A1(082)	Spray	3.714	55	669.1	575.8
A1(083)	Spray	3.543	55	669.6	576.3
A1(084)	Spray	3.846	55	668.7	575.4
A1(085)	Spray	3.846	55	668.7	575.4
A1(086)	Spray	3.543	55	669.6	576.3
A1(087)	Spray	3.714	55	669.1	575.8
A1(088)	Spray	3.714	55	669.1	575.8
A1(089)	Spray	3.543	55	669.6	576.3
A1(090)	Spray	3.846	55	668.7	575.4
A1(091)	Spray	3.845	55	668.7	575.4
A1(092)	Spray	3.543	55	669.6	576.3
A1(093)	Spray	3.714	55	669.1	575.8
A1(094)	Spray	3.714	55	669.1	575.8
A1(095)	Spray	3.542	55	669.6	576.3
A1(096)	Spray	3.845	55	668.7	575.4
A1(097)	Spray	3.845	55	668.7	575.4
A1(098)	Spray	3.542	55	669.6	576.3
A1(099)	Spray	3.714	55	669.1	575.8
A1(100)	Spray	3.714	55	669.1	575.8
A1(101)	Spray	3.542	55	669.6	576.3
A1(102)	Spray	3.845	55	668.7	575.4
A1(103)	Spray	3.845	55	668.7	575.4
A1(104)	Spray	3.542	55	669.6	576.3
A1(105)	Spray	3.714	55	669.1	575.8
A1(106)	Spray	3.714	55	669.1	575.8
A1(107)	Spray	3.542	55	669.6	576.3
A1(108)	Spray	3.845	55	668.7	575.4
A1(109)	Spray	3.845	55	668.7	575.4
A1(110)	Spray	3.542	55	669.6	576.3
A1(111)	Spray	3.714	55	669.1	575.8
A1(112)	Spray	3.714	55	669.1	575.8
A1(113)	Spray	3.542	55	669.6	576.3
A1(114)	Spray	3.845	55	668.7	575.4
A1(115)	Spray	3.845	55	668.7	575.4
A1(116)	Spray	3.542	55	669.6	576.3
A1(117)	Spray	3.714	55	669.1	575.8
A1(118)	Spray	3.714	55	669.1	575.8
A1(119)	Spray	3.542	55	669.6	576.3
A1(120)	Spray	3.845	55	668.7	575.4
A2(001)	Spray	4.19	55	682.8	589.5
A2(002)	Spray	3.922	55	682	588.7
A2(003)	Spray	4.015	55	682.3	589
A2(004)	Spray	4.015	55	682.3	589
A2(005)	Spray	3.92	55	682	588.7
A2(006)	Spray	4.166	55	682.8	589.5
A2(007)	Spray	4.165	55	682.8	589.5
A2(008)	Spray	3.919	55	682	588.7
A2(009)	Spray	4.012	55	682.3	589
A2(010)	Spray	4.012	55	682.3	589
A2(011)	Spray	3.917	55	682	588.7
A2(012)	Spray	4.163	55	682.8	589.5
A2(013)	Spray	4.162	55	682.8	589.5
A2(014)	Spray	3.916	55	682	588.7
A2(015)	Spray	4.01	55	682.3	589
A2(016)	Spray	4.01	55	682.3	589
A2(017)	Spray	3.915	55	682	588.7
A2(018)	Spray	4.161	55	682.8	589.5
A2(019)	Spray	4.161	55	682.8	589.5
A2(020)	Spray	3.914	55	682	588.7
A2(021)	Spray	4.008	55	682.3	589
A2(022)	Spray	4.008	55	682.3	589
A2(023)	Spray	3.913	55	682	588.7
A2(024)	Spray	4.159	55	682.8	589.5
A2(025)	Spray	4.159	55	682.8	589.5
A2(026)	Spray	3.912	55	682	588.7
A2(027)	Spray	4.006	55	682.3	589
A2(028)	Spray	4.006	55	682.3	589
A2(029)	Spray	3.912	55	682	588.7
A2(030)	Spray	4.158	55	682.8	589.5
A2(031)	Spray	4.158	55	682.8	589.5
A2(032)	Spray	3.911	55	682	588.7
A2(033)	Spray	4.005	55	682.3	589
A2(034)	Spray	4.005	55	682.3	589
A2(035)	Spray	3.911	55	682	588.7
A2(036)	Spray	4.157	55	682.8	589.5
A2(037)	Spray	4.157	55	682.8	589.5
A2(038)	Spray	3.91	55	682	588.7
A2(039)	Spray	4.005	55	682.3	589
A2(040)	Spray	4.004	55	682.3	589
A2(041)	Spray	3.91	55	682	588.7
A2(042)	Spray	4.157	55	682.8	589.5
A2(043)	Spray	4.156	55	682.8	589.5
A2(044)	Spray	3.91	55	682	588.7
A2(045)	Spray	4.004	55	682.3	589
A2(046)	Spray	4.004	55	682.3	589
A2(047)	Spray	3.91	55	682	588.7
A2(048)	Spray	4.156	55	682.8	589.5
A2(049)	Spray	4.156	55	682.8	589.5
A2(050)	Spray	3.91	55	682	588.7
A2(051)	Spray	4.004	55	682.3	589
A2(052)	Spray	4.004	55	682.3	589
A2(053)	Spray	3.908	55	682	588.7
A2(054)	Spray	4.156	55	682.8	589.5
A2(055)	Spray	4.156	55	682.8	589.5
A2(056)	Spray	3.909	55	682	588.7
A2(057)	Spray	4.004	55	682.3	589
A2(058)	Spray	4.004	55	682.3	589
A2(059)	Spray	3.909	55	682	588.7
A2(060)	Spray	4.179	55	682.8	589.5
A3(001)	Spray	5.211	55	686.6	593.3
A3(002)	Spray	5.258	55	686.8	593.5
A3(003)	Spray	5.207	55	686.6	593.3
A3(004)	Spray	5.207	55	686.6	593.3
A3(005)	Spray	5.25	55	686.8	593.5
A3(006)	Spray	5.203	55	686.6	593.3
A3(007)	Spray	5.199	55	686.6	593.3
A3(008)	Spray	5.247	55	686.8	593.5
A3(009)	Spray	5.196	55	686.6	593.3
A3(010)	Spray	5.196	55	686.6	593.3
A3(011)	Spray	5.241	55	686.8	593.5

A3(012)	Spray	5.183	55	686.6	583.3
A3(013)	Spray	5.181	55	686.6	583.3
A3(014)	Spray	5.236	55	686.9	583.5
A3(015)	Spray	5.188	55	686.6	583.3
A3(016)	Spray	5.188	55	686.6	583.3
A3(017)	Spray	5.234	55	686.9	583.5
A3(018)	Spray	5.187	55	686.6	583.3
A3(019)	Spray	5.185	55	686.6	583.3
A3(020)	Spray	5.233	55	686.9	583.5
A3(021)	Spray	5.184	55	686.6	583.3
A3(022)	Spray	5.184	55	686.6	583.3
A3(023)	Spray	5.231	55	686.9	583.5
A3(024)	Spray	5.183	55	686.6	583.3
A3(025)	Spray	5.182	55	686.6	583.3
A3(026)	Spray	5.23	55	686.9	583.5
A3(027)	Spray	5.181	55	686.6	583.3
A3(028)	Spray	5.181	55	686.6	583.3
A3(029)	Spray	5.229	55	686.9	583.5
A3(030)	Spray	5.181	55	686.6	583.3
A3(031)	Spray	5.181	55	686.6	583.3
A3(032)	Spray	5.228	55	686.9	583.5
A3(033)	Spray	5.18	55	686.6	583.3
A3(034)	Spray	5.18	55	686.6	583.3
A3(035)	Spray	5.228	55	686.9	583.5
A3(036)	Spray	5.18	55	686.6	583.3
A3(037)	Spray	5.18	55	686.6	583.3
A3(038)	Spray	5.228	55	686.9	583.5
A3(039)	Spray	5.18	55	686.6	583.3
B1(001)	Spray	5.39	55	660.3	567
B1(002)	Spray	5.39	55	660.3	567
B1(003)	Spray	5.389	55	660.3	567
B1(004)	Spray	5.389	55	660.3	567
B1(005)	Spray	5.388	55	660.3	567
B1(006)	Spray	5.388	55	660.3	567
B1(007)	Spray	5.387	55	660.3	567
B1(008)	Spray	5.387	55	660.3	567
B1(009)	Spray	5.386	55	660.3	567
B1(010)	Spray	5.386	55	660.3	567
B1(011)	Spray	5.385	55	660.3	567
B1(012)	Spray	5.385	55	660.3	567
B1(013)	Spray	5.384	55	660.3	567
B1(014)	Spray	5.384	55	660.3	567
B1(015)	Spray	5.383	55	660.3	567
B1(016)	Spray	5.383	55	660.3	567
B1(017)	Spray	5.382	55	660.3	567
B1(018)	Spray	5.382	55	660.3	567
B1(019)	Spray	5.381	55	660.3	567
B1(020)	Spray	5.381	55	660.3	567
B1(021)	Spray	5.38	55	660.3	567
B1(022)	Spray	5.38	55	660.3	567
B1(023)	Spray	5.379	55	660.3	567
B1(024)	Spray	5.379	55	660.3	567
B1(025)	Spray	5.378	55	660.3	567
B1(026)	Spray	5.378	55	660.3	567
B1(027)	Spray	5.377	55	660.3	567
B1(028)	Spray	5.377	55	660.3	567
B1(029)	Spray	5.376	55	660.3	567
B1(030)	Spray	5.376	55	660.3	567
B1(031)	Spray	5.376	55	660.3	567
B1(032)	Spray	5.375	55	660.3	567
B1(033)	Spray	5.375	55	660.3	567
B1(034)	Spray	5.375	55	660.3	567
B1(035)	Spray	5.374	55	660.3	567
B1(036)	Spray	5.374	55	660.3	567
B1(037)	Spray	5.374	55	660.3	567
B1(038)	Spray	5.374	55	660.3	567
B1(039)	Spray	5.373	55	660.3	567
B1(040)	Spray	5.373	55	660.3	567
B1(041)	Spray	5.373	55	660.3	567
B1(042)	Spray	5.372	55	660.3	567
B1(043)	Spray	5.372	55	660.3	567
B1(044)	Spray	5.372	55	660.3	567
B1(045)	Spray	5.372	55	660.3	567
B1(046)	Spray	5.371	55	660.3	567
B1(047)	Spray	5.371	55	660.3	567
B1(048)	Spray	5.371	55	660.3	567
B1(049)	Spray	5.371	55	660.3	567
B1(050)	Spray	5.371	55	660.3	567
B1(051)	Spray	5.37	55	660.3	567
B1(052)	Spray	5.37	55	660.3	567
B1(053)	Spray	5.37	55	660.3	567
B1(054)	Spray	5.37	55	660.3	567
B1(055)	Spray	5.369	55	660.3	567
B1(056)	Spray	5.369	55	660.3	567
B1(057)	Spray	5.369	55	660.3	567
B1(058)	Spray	5.369	55	660.3	567
B1(059)	Spray	5.369	55	660.3	567
B1(060)	Spray	5.369	55	660.3	567
B1(061)	Spray	5.368	55	660.3	567
B1(062)	Spray	5.368	55	660.3	567
B1(063)	Spray	5.368	55	660.3	567
B1(064)	Spray	5.368	55	660.3	567
B1(065)	Spray	5.368	55	660.3	567
B1(066)	Spray	5.368	55	660.3	567
B1(067)	Spray	5.368	55	660.3	567
B1(068)	Spray	5.368	55	660.3	567
B1(069)	Spray	5.367	55	660.3	567
B1(070)	Spray	5.367	55	660.3	567
B1(071)	Spray	5.367	55	660.3	567
B1(072)	Spray	5.367	55	660.3	567
B1(073)	Spray	5.367	55	660.3	567
B1(074)	Spray	5.367	55	660.3	567
B1(075)	Spray	5.367	55	660.3	567
B1(076)	Spray	5.367	55	660.3	567
B1(077)	Spray	5.367	55	660.3	567
B1(078)	Spray	5.367	55	660.3	567
B1(079)	Spray	5.367	55	660.3	567
B1(080)	Spray	5.367	55	660.3	567
B1(081)	Spray	5.366	55	660.3	567
B1(082)	Spray	5.366	55	660.3	567
B1(083)	Spray	5.366	55	660.3	567
B1(084)	Spray	5.366	55	660.3	567
B1(085)	Spray	5.366	55	660.3	567
B1(086)	Spray	5.366	55	660.3	567
B1(087)	Spray	5.366	55	660.3	567
B1(088)	Spray	5.366	55	660.3	567
B1(089)	Spray	5.366	55	660.3	567
B1(090)	Spray	5.366	55	660.3	567
B1(091)	Spray	5.366	55	660.3	567
B1(092)	Spray	5.366	55	660.3	567
B1(093)	Spray	5.366	55	660.3	567
B1(094)	Spray	5.366	55	660.3	567
B1(095)	Spray	5.366	55	660.3	567
B1(096)	Spray	5.366	55	660.3	567
B1(097)	Spray	5.366	55	660.3	567
B1(098)	Spray	5.366	55	660.3	567
B1(099)	Spray	5.366	55	660.3	567
B1(100)	Spray	5.366	55	660.3	567
B1(101)	Spray	5.366	55	660.3	567
B1(102)	Spray	5.366	55	660.3	567
B1(103)	Spray	5.366	55	660.3	567
B1(104)	Spray	5.366	55	660.3	567
B1(105)	Spray	5.366	55	660.3	567
B1(106)	Spray	5.366	55	660.3	567
B1(107)	Spray	5.366	55	660.3	567
B1(108)	Spray	5.366	55	660.3	567
B1(109)	Spray	5.366	55	660.3	567
B1(110)	Spray	5.366	55	660.3	567
B1(111)	Spray	5.366	55	660.3	567
B1(112)	Spray	5.366	55	660.3	567
B2(001)	Spray	4.262	55	682.3	589
B2(002)	Spray	4.262	55	682.3	589
B2(003)	Spray	4.259	55	682.3	589
B2(004)	Spray	4.259	55	682.3	589
B2(005)	Spray	4.257	55	682.3	589
B2(006)	Spray	4.257	55	682.3	589
B2(007)	Spray	4.255	55	682.3	589
B2(008)	Spray	4.255	55	682.3	589
B2(009)	Spray	4.253	55	682.3	589
B2(010)	Spray	4.253	55	682.3	589
B2(011)	Spray	4.251	55	682.3	589
B2(012)	Spray	4.251	55	682.3	589
B2(013)	Spray	4.249	55	682.3	589
B2(014)	Spray	4.249	55	682.3	589
B2(015)	Spray	4.248	55	682.3	589
B2(016)	Spray	4.248	55	682.3	589
B2(017)	Spray	4.246	55	682.3	589
B2(018)	Spray	4.246	55	682.3	589
B2(019)	Spray	4.244	55	682.3	589
B2(020)	Spray	4.244	55	682.3	589
B2(021)	Spray	4.243	55	682.3	589
B2(022)	Spray	4.243	55	682.3	589
B2(023)	Spray	4.241	55	682.3	589
B2(024)	Spray	4.241	55	682.3	589
B2(025)	Spray	4.24	55	682.3	589
B2(026)	Spray	4.24	55	682.3	589
B2(027)	Spray	4.239	55	682.3	589
B2(028)	Spray	4.239	55	682.3	589
B2(029)	Spray	4.238	55	682.3	589
B2(030)	Spray	4.238	55	682.3	589
B2(031)	Spray	4.237	55	682.3	589
B2(032)	Spray	4.237	55	682.3	589
B2(033)	Spray	4.235	55	682.3	589
B2(034)	Spray	4.235	55	682.3	589
B2(035)	Spray	4.234	55	682.3	589
B2(036)	Spray	4.234	55	682.3	589
B2(037)	Spray	4.234	55	682.3	589
B2(038)	Spray	4.234	55	682.3	589
B2(039)	Spray	4.233	55	682.3	589
B2(040)	Spray	4.233	55	682.3	589
B2(041)	Spray	4.232	55	682.3	589

B2(042)	Spray	4.232	55		682.3	589
B2(043)	Spray	4.231	55		682.3	589
B2(044)	Spray	4.231	55		682.3	589
B2(045)	Spray	4.23	55		682.3	589
B2(046)	Spray	4.23	55		682.3	589
B2(047)	Spray	4.23	55		682.3	589
B2(048)	Spray	4.23	55		682.3	589
B2(049)	Spray	4.229	55		682.3	589
B2(050)	Spray	4.229	55		682.3	589
B2(051)	Spray	4.229	55		682.3	589
B2(052)	Spray	4.229	55		682.3	589
B2(053)	Spray	4.228	55		682.3	589
B2(054)	Spray	4.228	55		682.3	589
B2(055)	Spray	4.228	55		682.3	589
B2(056)	Spray	4.228	55		682.3	589
B2(057)	Spray	4.227	55		682.3	589
B2(058)	Spray	4.227	55		682.3	589
B2(059)	Spray	4.227	55		682.3	589
B2(060)	Spray	4.227	55		682.3	589
B2(061)	Spray	4.227	55		682.3	589
B2(062)	Spray	4.227	55		682.3	589
B2(063)	Spray	4.226	55		682.3	589
B2(064)	Spray	4.226	55		682.3	589
B2(065)	Spray	4.226	55		682.3	589
B2(066)	Spray	4.226	55		682.3	589
B2(067)	Spray	4.226	55		682.3	589
B2(068)	Spray	4.226	55		682.3	589
B2(069)	Spray	4.226	55		682.3	589
B2(070)	Spray	4.226	55		682.3	589
B2(071)	Spray	4.226	55		682.3	589
B2(072)	Spray	4.226	55		682.3	589
B2(073)	Spray	4.226	55		682.3	589
B2(074)	Spray	4.226	55		682.3	589
B2(075)	Spray	4.225	55		682.3	589
B2(076)	Spray	4.225	55		682.3	589
B2(077)	Spray	4.225	55		682.3	589
B2(078)	Spray	4.225	55		682.3	589
B2(079)	Spray	4.225	55		682.3	589
B2(080)	Spray	4.225	55		682.3	589
B2(081)	Spray	4.225	55		682.3	589
B2(082)	Spray	4.225	55		682.3	589
B2(083)	Spray	4.225	55		682.3	589
B2(084)	Spray	4.225	55		682.3	589
B2(085)	Spray	4.225	55		682.3	589
B2(086)	Spray	4.225	55		682.3	589
B2(087)	Spray	4.225	55		682.3	589
B2(088)	Spray	4.225	55		682.3	589
B2(089)	Spray	4.225	55		682.3	589
B2(090)	Spray	4.225	55		682.3	589
B3(001)	Spray	4.325	55		682.3	589
B3(002)	Spray	4.325	55		682.3	589
B3(003)	Spray	4.325	55		682.3	589
B3(004)	Spray	4.324	55		682.3	589
B3(005)	Spray	4.324	55		682.3	589
B3(006)	Spray	4.324	55		682.3	589
B3(007)	Spray	4.323	55		682.3	589
B3(008)	Spray	4.323	55		682.3	589
B3(009)	Spray	4.323	55		682.3	589
B3(010)	Spray	4.323	55		682.3	589
B3(011)	Spray	4.322	55		682.3	589
B3(012)	Spray	4.322	55		682.3	589
B3(013)	Spray	4.322	55		682.3	589
B3(014)	Spray	4.322	55		682.3	589
B3(015)	Spray	4.321	55		682.3	589
B3(016)	Spray	4.321	55		682.3	589
B3(017)	Spray	4.321	55		682.3	589
B3(018)	Spray	4.321	55		682.3	589
B3(019)	Spray	4.321	55		682.3	589
B3(020)	Spray	4.321	55		682.3	589
B3(021)	Spray	4.32	55		682.3	589
B3(022)	Spray	4.32	55		682.3	589
B3(023)	Spray	4.32	55		682.3	589
B3(024)	Spray	4.32	55		682.3	589
B3(025)	Spray	4.32	55		682.3	589
B3(026)	Spray	4.32	55		682.3	589
B3(027)	Spray	4.319	55		682.3	589
B3(028)	Spray	4.319	55		682.3	589
B3(029)	Spray	4.319	55		682.3	589
B3(030)	Spray	4.319	55		682.3	589
B3(031)	Spray	4.319	55		682.3	589
B3(032)	Spray	4.319	55		682.3	589
B3(033)	Spray	4.319	55		682.3	589
B3(034)	Spray	4.319	55		682.3	589
B3(035)	Spray	4.319	55		682.3	589
B3(036)	Spray	4.319	55		682.3	589
B3(037)	Spray	4.319	55		682.3	589
B3(038)	Spray	4.319	55		682.3	589
B3(039)	Spray	4.319	55		682.3	589
B3(040)	Spray	4.319	55		682.3	589
B3(041)	Spray	4.319	55		682.3	589
B3(042)	Spray	4.319	55		682.3	589
B3(043)	Spray	4.319	55		682.3	589
B3(044)	Spray	4.319	55		682.3	589
B3(045)	Spray	4.319	55		682.3	589
B3(046)	Spray	4.319	55		682.3	589
B3(047)	Spray	4.319	55		682.3	589
B3(048)	Spray	4.319	55		682.3	589
B3(049)	Spray	4.319	55		682.3	589
B3(050)	Spray	4.319	55		682.3	589
B3(051)	Spray	4.319	55		682.3	589
Cold Leg A(001)	Boundary pressure	143.3	28		423.8	393
Cold Leg A(002)	Boundary pressure	1684	28		423.8	393
Cold Leg B(001)	Boundary pressure	142.8	28		423.8	393
Cold Leg B(002)	Boundary pressure	1580	28		423.8	393
Cold Leg C(001)	Boundary pressure	141.7	28		423.8	393
Cold Leg C(002)	Boundary pressure	1961	28		423.8	393
Cold Leg D(001)	Boundary pressure	141.6	28		423.8	393
Cold Leg D(002)	Boundary pressure	1930	28		423.8	393
Hot Leg A(001)	Boundary pressure	—	28	Isolated	—	382.7
Hot Leg A(002)	Boundary pressure	—	28	Isolated	—	393
Hot Leg B(001)	Boundary pressure	—	28	Isolated	—	382.7
Hot Leg B(002)	Boundary pressure	0	28		423.8	393
Hot Leg C(001)	Boundary pressure	—	28	Isolated	—	382.7
Hot Leg C(002)	Boundary pressure	—	28	Isolated	—	393
Hot Leg D(001)	Boundary pressure	—	28	Isolated	—	382.7
Hot Leg D(002)	Boundary pressure	0	28		423.8	393

Pump List	Operation	Flow	Status	TDH	dP	NPSHa	Suction Pressure	Discharge Pressure	Suction Elev	Discharge Elev
Centrifugal Charging Pump A	Curve	397.6		-4053	-1751	75.78	33.59	1784	368.6	368.7
Centrifugal Charging Pump B	Curve	381.8		-4052	-1750	75.21	33.44	1784	368.6	368.7
Containment Spray Pump A	Curve	—	Off	—	—	—	—	—	346.3	347.3
Containment Spray Pump B	Curve	—	Off	—	—	—	—	—	346.3	347.3
Positive Dis. Charging Pump	Fixed Flow	1.00E-05	Off	—	—	—	—	—	366.7	367.9
Residual Heat Removal Pump A	Curve	3267		-367.7	-158.8	75.91	33.74	192.1	346	347.1
Residual Heat Removal Pump B	Curve	3250		-370.7	-160.1	75.84	33.71	193.4	346	347.1
Safety Injection Pump A	Curve	361.1		-3002	-1297	78.82	34.14	1331	366.5	366.6
Safety Injection Pump B	Curve	335.8		-3004	-1298	77.84	34.58	1332	366.5	366.6

Component List	Flow	Status	HL	dP	Inlet Pressure	Outlet Pressure	Inlet Elev	Outlet Elev
Residual HX A	3267		45.9	19.83	162.2	142.4	359.7	359.7
Residual HX B	3250		45.42	19.62	157.4	137.8	359.8	359.8

Control List	Type	Set Value	Status	Flow	dP	HL	Inlet Pressure	Outlet Pressure	Elev	Cv	Fp	CMax
~N(562)	FCV	0		0	—	—	156.3	156.3	346.8	—	—	—
~N(563)	FCV	0		0	—	—	151	151	360	—	—	—
~N(581)	FCV	Fully open		142.8	0	0	282.9	282.9	412.9	—	—	—
~N(595)	FCV	Fully open		143.3	0	0	205.5	205.5	413	—	—	—
~N(599)	FCV	Fully open		141.7	0	0	251.1	251.1	382.4	—	—	—
~N(663)	FCV	Fully open		141.6	0	0	196.3	196.3	389.8	—	—	—
~N(669)	FCV	Fully open		158.6	0	0	82.25	82.25	414.5	—	—	—
~N(704)	FCV	Fully open		158.6	0	0	76.54	76.54	391.4	—	—	—
~N(711)	FCV	Fully open		158.6	0	0	62.5	62.5	414.8	—	—	—
~N(717)	FCV	Fully open		158.9	0	0	99.76	99.76	387	—	—	—
~N(723)	FCV	Fully open		0	—	—	102.2	102.2	380.7	—	—	—
~N(728)	FCV	Fully open	Closed	—	—	—	—	—	378	—	—	—
~N(735)	FCV	Fully open		0	—	—	103.4	103.4	378.1	—	—	—
~N(741)	FCV	Fully open	Closed	—	—	—	—	—	381.1	—	—	—
CS007A-1	FCV	Fully open		0	—	—	130.7	130.7	407	—	—	—
CS007B-2	FCV	Fully open		0	—	—	133.7	133.7	388	—	—	—

Pipe Specification	Material	Schedule	Roughness	Sizing	Vel Limits	Press Limits	Valve Table
Steel Sch.40 (clean)	Steel	40	0.0018	not specified	—	—	standard
Steel Sch.80 (clean)	Steel	80	0.0018	not specified	—	—	standard
Steel Sch.140 (clean)	Steel	140	0.0018	not specified	—	—	standard
Steel Sch.40S (clean)	Stainless Pipe IPS	40S	0.0018	not specified	—	—	standard
Steel Sch.160 (clean)	Steel	160	0.0018	not specified	—	—	standard
Steel Sch.30 (clean)	Steel	30	0.0018	not specified	—	—	standard
Steel Sch.20 (clean)	Steel	20	0.0018	not specified	—	—	standard

Fluid Zone	Fluid	Temperature	Pressure	Density	Viscosity	k	Pv	Pc
Containment Sump Water	Water	100	14.7	62.24	0.6812	—	0.9496	3198
Water After RHR HX	Water	100	14.7	62.24	0.6812	—	0.9496	3198

PIPE-FLO	ver 8.0	12/1/2008 14:59
System:	2 LOCA A1R13 LaLo	
Lineup:	Cold Leg Injection from Sump	
Company:	Exelon	
Project:	11329-147 Rev. 0	
by:	Sargent & Lundy L.L.C.	
Footer:		

UNITS:						CALCULATION
Flow Rate:	US gpm					Iteration: 15
Pressure:	psi a	Atm:	14.7	psi a		Deviation percent: 0.004512
Temperature:	°F					
Viscosity:	cP					
Density:	lb/ft³					
Grade:	ft					
Length:	ft					
Size:	in					

Pipe List	Specification	Fluid Zone	Size	Length	K	Status	Flow	Velocity	dP	HL	Tagged	From	To	Inside Dia	Pipe HL	Minor HL	Re	f	Valves/Fittings					
CS01AA(001)	Steel Sch 30 (clean)	Containment Sump Water	16	12.3	0.445	XXX	—	—	—	—	N	~N(003)	~N(005)	15.25	—	—	—	—	2 x Pipe Bend - r/d 1.5 (90°)	0.173	1 x CS008A-1 (Gate Valve)	0.09888	1 x Converging Tee (Through)	1.00E-05
CS01AA(002)	Steel Sch 30 (clean)	Containment Sump Water	16	10.8	0.2964		0	0	0	0	N	~N(005)	~N(006)	15.25	0	0	0	0	1 x Reducer - Contraction (16 x 14 - 14)	0.02451	1 x Pipe Bend - r/d 1.5 (90°)	0.173	1 x CS002A	0.09888
CS01AA(003)	Steel Sch 30 (clean)	Containment Sump Water	14	2	0		0	0	0.864	0	N	~N(006)	Containment Spray Pump A	13.25	0	0	0	0						
CS01AB(001)	Steel Sch 30 (clean)	Containment Sump Water	16	4.3	0.1978	XXX	—	—	—	—	N	~N(236)	~N(237)	15.25	—	—	—	—	1 x Gate - Double Disc	0.09888	1 x CS009B-2 (Gate Valve)	0.09888	1 x Converging Tee (Through)	1.00E-05
CS01AB(002)	Steel Sch 30 (clean)	Containment Sump Water	16	19.3	1.238		0	0	0	0	N	~N(237)	~N(238)	15.25	0	0	0	0	3 x Elbow - Standard 90°	0.3708	1 x Reducer - Contraction (16 x 14 - 14)	0.02451	1 x CS002B(Gate Valve)	0.09888
CS01AB(003)	Steel Sch 30 (clean)	Containment Sump Water	14	2	0		0	0	0.821	0	N	~N(238)	Containment Spray Pump B	13.25	0	0	0	0						
CS02AA(001)	Steel Sch 40 (clean)	Containment Sump Water	8	2	0.05008		0	0	0.432	0	N	Containment Spray Pump A	~N(007)	7.981	0	0	0	0	1 x Reducer - Enlargement (10 x 8 - 7)	0.05008				
CS02AA(002)	Steel Sch 40 (clean)	Containment Sump Water	10	25.5	2.148		0	0	5.054	0	N	~N(007)	~N(008)	10.02	0	0	0	0	4 x Pipe Bend - r/d 1.5 (90°)	0.188	1 x CS003A (Check Valve)	1.289	1 x CV004A (Gate Valve)	0.1074
CS02AA(003)	Steel Sch 40 (clean)	Containment Sump Water	10	101.3	5.652		0	0	15.03	0	N	~N(008)	~N(009)	10.02	0	0	0	0	1 x FE-CS011	4.9	4 x Pipe Bend - r/d 1.5 (90°)	0.188	1 x Diverging Tee (Through)	1.00E-05
CS02AA(004)	Steel Sch 40 (clean)	Containment Sump Water	10	34.8	0.6713		0	0	5.27	0	N	~N(009)	CS007A-1	10.02	0	0	0	0	3 x Pipe Bend - r/d 1.5 (90°)	0.188	1 x CS007A-1 (Gate Valve)	0.1074	1 x Diverging Tee (Through)	1.00E-05
CS02AA(005)	Steel Sch 40 (clean)	Containment Sump Water	10	63.7	2.55		0	0	8.072	0	N	CS007A-1	~N(001)	10.02	0	0	0	0	8 x Pipe Bend - r/d 1.5 (90°)	0.188	1 x Pipe Bend - r/d 1.5 (45°)	0.1331	1 x CS008A (Check Valve)	1.289
CS02AA(006)	Steel Sch 40 (clean)	Containment Sump Water	10	155.7	1.261		0	0	63.2	0	N	~N(001)	~N(001A)	10.02	0	0	0	0	6 x Pipe Bend - r/d 1.5 (90°)	0.188	1 x Pipe Bend - r/d 1.5 (45°)	0.1331		
CS02AB(001)	Steel Sch 40 (clean)	Containment Sump Water	8	2	0.472		0	0	-0.432	0	N	Containment Spray Pump B	~N(239)	7.981	0	0	0	0	1 x Elbow - Standard 90°	0.4219	1 x Reducer - Enlargement (10 x 8 - 7)	0.05008		
CS02AB(002)	Steel Sch 40 (clean)	Containment Sump Water	10	9.9	2.202		0	0	0.218	0	N	~N(239)	~N(240)	10.02	0	0	0	0	2 x Elbow - Standard 90°	0.4028	1 x CV004B (Gate Valve)	0.1074	1 x CV003B (Check Valve)	1.289
CS02AB(003)	Steel Sch 40 (clean)	Containment Sump Water	10	59.1	6.511		0	0	14.9	0	N	~N(240)	~N(241)	10.02	0	0	0	0	4 x Elbow - Standard 90°	0.4028	1 x FE-CS012	4.9	1 x Diverging Tee (Through)	1.00E-05
CS02AB(004)	Steel Sch 40 (clean)	Containment Sump Water	10	33.8	1.318		0	0	7.845	0.	N	~N(241)	CS007B-2	10.02	0	0	0	0	3 x Elbow - Standard 90°	0.4028	1 x CV007B-2 (Gate Valve)	0.1074	1 x Diverging Tee (Through)	1.00E-05
CS02AB(005)	Steel Sch 40 (clean)	Containment Sump Water	10	75.4	3.92		0	0	12.53	0	N	CS007B-2	~N(242)	10.02	0	0	0	0	1 x Elbow - Standard 45°	0.2148	8 x Elbow - Standard 90°	0.4028	1 x CS008B (Check Valve)	1.289
CS02AB(006)	Steel Sch 40 (clean)	Containment Sump Water	10	144.2	1		0	0	59.18	0	N	~N(242)	~N(243)	10.02	0	0	0	0	1 x CS008B (Check Valve)	1	1 x Diverging Tee (Through)	1.00E-05		
CS02AB(007)	Steel Sch 40 (clean)	Containment Sump Water	10	30.8	2.00E-05	<-->	601.7	2.45	-7.536	0.056	N	~N(244)	~N(243)	10.02	0.056	0	278182	0.01628	1 x Diverging Tee (Branch)	1.00E-05	1 x Diverging Tee (Through)	1.00E-05		
CS02B	Steel Sch 40 (clean)	Containment Sump Water	8	25.6	0.04216	<-->	444.6	2.854	-6.535	0.067	N	~N(010)	~N(001A)	7.981	0.062	0.005	258078	0.01678	1 x Reducer - Contraction (10 x 8 - 7)	0.04216	1 x Diverging Tee (Through)	1.00E-05		
CS02C	Steel Sch 40 (clean)	Containment Sump Water	6	21.5	0.0533	<-->	203	2.256	-2.893	0.068	N	~N(011)	~N(010)	6.065	0.062	0.004	156042	0.01832	1 x Reducer - Contraction (8 x 6 - 6)	0.05329	1 x Diverging Tee (Through)	1.00E-05		
CS02D(001)	Steel Sch 40 (clean)	Containment Sump Water	4	1.1	0.08157	<-->	101.5	2.56	0.006	0.015	N	~N(012)	~N(011)	4.026	0.007	0.008	116764	0.01978	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156	1 x Diverging* Tee (Branch)	1.00E-05		
CS02D(002)	Steel Sch 40 (clean)	Containment Sump Water	4	1.1	0.08157	<-->	101.5	2.56	0.006	0.015	N	~N(014)	~N(011)	4.026	0.007	0.008	116800	0.01978	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156	1 x Diverging* Tee (Branch)	1.00E-05		
CS02D(003)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	96.27	2.428	0.008	0.019	N	~N(013)	~N(012)	4.026	0.012	0.007	110768	0.01991	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
CS02D(004)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	96.25	2.428	0.008	0.019	N	~N(033)	~N(014)	4.026	0.012	0.007	110749	0.01991	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
CS02D(005)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	91.06	2.297	0.007	0.017	N	~N(015)	~N(013)	4.026	0.01	0.007	104777	0.02005	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
CS02D(006)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	91.04	2.296	0.007	0.017	N	~N(034)	~N(033)	4.026	0.01	0.007	104758	0.02005	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
CS02D(007)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	85.81	2.164	0.007	0.015	N	~N(016)	~N(015)	4.026	0.009	0.006	98736	0.02021	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
CS02D(008)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	85.84	2.165	0.007	0.015	N	~N(035)	~N(034)	4.026	0.009	0.006	98771	0.02021	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
CS02D(009)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	80.61	2.033	0.006	0.013	N	~N(017)	~N(016)	4.026	0.008	0.005	92753	0.02038	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
CS02D(010)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	80.59	2.033	0.006	0.013	N	~N(038)	~N(035)	4.026	0.008	0.005	92734	0.02038	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
CS02D(011)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	75.41	1.902	0.005	0.012	N	~N(018)	~N(017)	4.026	0.007	0.005	86775	0.02057	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
CS02D(012)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	75.4	1.902	0.005	0.012	N	~N(037)	~N(038)	4.026	0.007	0.005	86756	0.02057	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
CS02D(013)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	70.17	1.77	0.004	0.01	N	~N(019)	~N(018)	4.026	0.006	0.004	80745	0.02079	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.01	N	~N(036)	~N(037)	4.026	0.006	0.004	80780	0.02078	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.009	N	~N(020)	~N(019)	4.026	0.005	0.003	74772	0.02102	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.009	N	~N(044)	~N(036)	4.026	0.006	0.003	74753	0.02102	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.008	N	~N(021)	~N(020)	4.026	0.005	0.003	68802	0.02129	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.008	N	~N(043)	~N(044)	4.026	0.005	0.003	68783	0.02129	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.006	N	~N(024)	~N(021)	4.026	0.004	0.002	62779	0.0216	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.006	N	~N(042)	~N(043)	4.026	0.004	0.002	62815	0.0216	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.005	N	~N(023)	~N(024)	4.026	0.003	0.002	56813	0.02195	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.005	N	~N(039)	~N(042)	4.026	0.003	0.002	56794	0.02196	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.004	N	~N(022)	~N(023)	4.026	0.002	0.002	50848	0.02237	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.004	N	~N(040)	~N(039)	4.026	0.002	0.002	50829	0.02237	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.003	N	~N(030)	~N(022)	4.026	0.002	0.001	44829	0.02287	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.003	N	~N(041)	~N(040)	4.026	0.002	0.001	44865	0.02286	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.003	N	~N(029)	~N(030)	4.026	0.003	0	38867	0.02347	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.003	N	~N(045)	~N(041)	4.026	0.003	0	38848	0.02347	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.002	N	~N(028)	~N(029)	4.026	0.002	0	32905	0.02423	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.002	N	~N(046)	~N(045)	4.026	0.002	0	32886	0.02423	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.001	N	~N(025)	~N(028)	4.026	0.001	0	26888	0.02523	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.001	N	~N(047)	~N(046)	4.026	0.001	0	26924	0.02523	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0	N	~N(026)	~N(025)	4.026	0	0	20927	0.02662	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0	N	~N(050)	~N(047)	4.026	0	0	20906	0.02662	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0	N	~N(027)	~N(026)	4.026	0	0	14966	0.02873	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0	N	~N(049)	~N(050)	4.026	0	0	14947	0.02874	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0	N	~N(031)	~N(027)	4.026	0	0	8951	0.03266	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0	N	~N(048)	~N(049)	4.026	0	0	8986	0.03263	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0	N	~N(032)	~N(031)	4.026	0	0	2990	0.04496	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0	N	~N(032)	~N(048)	4.026	0	0	2971	0.04508	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.091	N	~N(245)	~N(244)	6.065	0.078	0.013	168460	0.01813	1 x Reducer - Contraction (10 x 6 - 7)	0.1378	1 x Diverging Tee (Through)	1.00E-05		
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.102	N	~N(246)	~N(245)	6.065	0.002	0.1	84239	0.02	1 x Diverging* Tee (Branch)	4.3				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.101	N	~N(247)	~N(245)	6.065	0.001	0.1	84221	0.02	1 x Diverging* Tee (Branch)	4.3				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.002	N	~N(248)	~N(246)	6.065	0.002	0	80935	0.02013						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.002	N	~N(249)	~N(247)	6.065	0.002	0	80918	0.02013						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.002	N	~N(250)	~N(248)	6.065	0.002	0	77473	0.02028						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.002	N	~N(251)	~N(249)	6.065	0.002	0	77615	0.02027						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.002	N	~N(252)	~N(250)	6.065	0.002	0	74170	0.02042						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.002	N	~N(253)	~N(251)	6.065	0.002	0	74312	0.02042						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.002	N	~N(254)	~N(252)	6.065	0.002	0	70868	0.02058						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.002	N	~N(255)	~N(253)	6.065	0.002	0	71010	0.02059						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.002	N	~N(256)	~N(254)	6.065	0.002	0	67567	0.02075						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.002	N	~N(257)	~N(255)	6.065	0.002	0	67708	0.02074						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.002	N	~N(258)	~N(256)	6.065	0.002	0	64265	0.02093						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.002	N	~N(259)	~N(257)	6.065	0.002	0	64407	0.02092						
CS02F(015)	Steel Sch 40 (clean)	Containment Sump Water	6	2.9	0	<-->	79.82	0.887	0	0.001	N	~N(260)	~N(258)	6.065	0.001	0	60984	0.02113						
CS02F(016)	Steel Sch 40 (clean)	Containment Sump Water	6	2.9	0	<-->	80	0.889	0	0.001	N	~N(261)	~N(259)	6.065	0.001	0	61106	0.02112						
CS02F(017)	Steel Sch 40 (clean)	Containment Sump Water	6	2.9	0	<-->	75.49	0.839	0	0.001	N	~N(262)	~N(260)	6.065	0.001	0	57664	0.02134						
CS02F(018)	Steel Sch 40 (clean)	Containment Sump Water	6	2.9	0	<-->	75.68	0.841	0	0.001	N	~N(263)	~N(261)	6.065	0.001	0	57805	0.02133						
CS02F(019)	Steel Sch 40 (clean)	Containment Sump Water	6	2.9	0	<-->	71.17	0.791	0	0.001	N	~N(264)	~N(262)	6.065	0.001	0	54363	0.02157						
CS02F(020)	Steel Sch 40 (clean)	Containment Sump Water	6	2.9	0	<-->	71.36	0.793	0	0.001	N	~N(265)	~N(263)	6.065	0.001	0	54505	0.02156						
CS02F(021)	Steel Sch 40 (clean)	Containment Sump Water	6	2.9	0	<-->	66.85	0.743	0	0.001	N	~N(266)	~N(264)	6.065	0.001	0	51063	0.02182						
CS02F(022)	Steel Sch 40 (clean)	Containment Sump Water	6	2.9	0	<-->	67.04	0.745	0	0.001	N	~N(267)	~N(265)	6.065	0.001	0	51205	0.02181						
CS02F(023)	Steel Sch 40 (clean)	Containment Sump Water	6	2.9	0	<-->	62.53	0.695	0	0	N	~N(268)	~N(266)	6.065	0	0	47764	0.02209						
CS02F(024)	Steel Sch 40 (clean)	Containment Sump Water	6	2.9	0	<-->	62.72	0.697	0	0	N	~N(269)	~N(267)	6.065	0	0	47905	0.02208						
CS02F(025)	Steel Sch 40 (clean)	Containment Sump Water	6	2.9	0	<-->	58.21	0.647	0	0	N	~N(270)	~N(268)	6.065	0	0	44464	0.0224						
CS02F(026)	Steel Sch 40 (clean)	Containment Sump Water	6	2.9	0	<-->	58.4	0.649	0	0	N	~N(271)	~N(269)	6.065	0	0	44605	0.02238						
CS02F(027)	Steel Sch 40 (clean)	Containment Sump Water	6	2.9	0	<-->	53.89	0.599	0	0	N	~N(272)	~N(270)	6.065	0	0	41165	0.02274						
CS02F(028)	Steel Sch 40 (clean)	Containment Sump Water	6	2.9	0	<-->	54.08	0.601	0	0	N	~N(273)	~N(271)	6.065	0	0	41306	0.02272						
CS02F(029)	Steel Sch 40 (clean)	Containment Sump Water	6	2.9	0	<-->	49.57	0.551	0	0	N	~N(274)	~N(272)	6.065	0	0	37865	0.02312						
CS02F(030)	Steel Sch 40 (clean)	Containment Sump Water	6	2.9	0	<-->	49.76	0.553	0	0	N	~N(275)	~N(273)	6.065	0	0	38007	0.0231						
CS02F(031)	Steel Sch 40 (clean)	Containment Sump Water	6	2.9	0	<-->	45.25	0.503	0	0	N	~N(276)	~N(274)	6.065	0	0	34566	0.02355						
CS02F(032)	Steel Sch 40 (clean)	Containment Sump Water	6	2.9	0	<-->	45.44	0.505	0	0	N	~N(277)	~N(275)	6.065	0	0	34708	0.02353						
CS02F(033)	Steel Sch 40 (clean)	Containment Sump Water	6	2.9	0	<-->	40.94	0.455	0	0	N	~N(278)	~N(276)	6.065	0	0	31267	0.02404						
CS02F(034)	Steel Sch 40 (clean)	Containment Sump Water	6	2.9	0	<-->	41.12	0.457	0	0	N	~N(279)	~N(277)	6.065	0	0	31409	0.02402						
CS02F(035)	Steel Sch 40 (clean)	Containment Sump Water	6	2.9	0	<-->	36.62	0.407	0	0	N	~N(280)	~N(278)	6.065	0	0	27968	0.02462						
CS02F(036)	Steel Sch 40 (clean)	Containment Sump Water	6	2.9	0	<-->	36.8	0.409	0	0	N	~N(281)	~N(279)	6.065	0	0	28110	0.02459						
CS02F(037)	Steel Sch 40 (clean)	Containment Sump Water	6	2.9	0	<-->	32.3	0.359	0	0	N	~N(282)	~N(280)	6.065	0	0	24669	0.0253						
CS02F(038)	Steel Sch 40 (clean)	Containment Sump Water	6	2.9	0	<-->	32.48	0.361	0	0	N	~N(283)	~N(281)	6.065	0	0	24811	0.02527						
CS02F(039)	Steel Sch 40 (clean)	Containment Sump Water	6	2.9	0	<-->	27.98	0.311	0	0	N	~N(284)	~N(282)	6.065	0	0	21371	0.02613						
CS02F(040)	Steel Sch 40 (clean)	Containment Sump Water	6	2.9	0	<-->	28.16	0.313	0	0	N	~N(285)	~N(283)	6.065	0	0	21512	0.02609						
CS02F(041)	Steel Sch 40 (clean)	Containment Sump Water	6	2.9	0	<-->	23.66	0.263	0	0	N	~N(286)	~N(284)	6.065	0	0	18072	0.02717						
CS02F(042)	Steel Sch 40 (clean)	Containment Sump Water	6	2.9	0	<-->	23.85	0.265	0	0	N	~N(287)	~N(285)	6.065	0	0	18213	0.02712						
CS02F(043)	Steel Sch 40 (clean)	Containment Sump Water	6	2.9	0	<-->	19.34	0.215	0	0	N	~N(288)	~N(286)	6.065	0	0	14773	0.02851						
CS02F(044)	Steel Sch 40 (clean)	Containment Sump Water	6	2.9	0	<-->	19.53	0.217	0	0	N	~N(289)	~N(287)	6.065	0	0	14915	0.02845						
CS02F(045)	Steel Sch 40 (clean)	Containment Sump Water	6	2.9	0	<-->	15.02	0.167	0	0	N	~N(290)	~N(288)	6.065	0	0	11474	0.03038						
CS02F(046)	Steel Sch 40 (clean)	Containment Sump Water	6	2.9	0	<-->	15.21	0.169	0	0	N	~N(291)	~N(289)	6.065	0	0	11616	0.03028						
CS02F(047)	Steel Sch 40 (clean)	Containment Sump Water	6	2.9	0	<-->	10.7	0.119	0	0	N	~N(292)	~N(290)	6.065	0	0	8176	0.03322						
CS02F(048)	Steel Sch 40 (clean)	Containment Sump Water	6	2.9	0	<-->	10.89	0.121	0	0	N	~N(293)	~N(291)	6.065	0	0	8317	0.03307						
CS02F(049)	Steel Sch 40 (clean)	Containment Sump Water	6	2.9	0	<-->	6.385	0.071	0	0	N	~N(294)	~N(292)	6.065	0	0	4877	0.03849						
CS02F(050)	Steel Sch 40 (clean)	Containment Sump Water	6	2.9	0	<-->	6.571	0.073	0	0	N	~N(295)	~N(293)	6.065	0	0	5019	0.03817						
CS02F(051)	Steel Sch 40 (clean)	Containment Sump Water	6	2.9	0	<-->	2.067	0.023	0	0	N	~N(296)	~N(294)	6.065	0	0	1579	0.04054						
CS02F(052)	Steel Sch 40 (clean)	Containment Sump Water	6	2.9	0	<-->	2.252	0.025	0	0	N	~N(298)	~N(295)	6.065	0	0	1720	0.03721						
CS02GA	Steel Sch 40 (clean)	Containment Sump Water	8	2	5.6	<-->	241.8	1.551	-0.686	0.211	N	~N(051)	~N(010)	7.981	0.002	0.209	140257	0.01816	1 x FX-CS036 (Flow Element)	5.6	1 x Diverging Tee (Branch)	1.00E-05		
CS02GB	Steel Sch 40 (clean)	Containment Sump Water	8	2.1	4.3	<-->	381.1	2.446	-0.689	0.404	N	~N(297)	~N(244)	7.981	0.005	0.399	221235	0.01709	1 x FX-CS037 (Flow Element)	2.5	1 x Diverging Tee (Branch)	2		
CS02H(001)	Steel Sch 40 (clean)	Containment Sump Water	6	1.8	0.0533	<-->	120.4	1.338	0.001	0.003	N	~N(073)	~N(051)	6.065	0.002	0.001	91958	0.01973	1 x Reducer - Contraction (8 x 6 - 6)	0.05329	1 x Diverging* Tee (Branch)	1.00E-05		
CS02H(002)	Steel Sch 40 (clean)	Containment Sump Water	6	1.8	0.0533	<-->	121.2	1.348	0.002	0.003	N	~N(070)	~N(051)	6.065	0.001	0.002	92606	0.01971	1 x Reducer - Contraction (8 x 6 - 6)	0.05329	1 x Diverging* Tee (Branch)	1.00E-05		
CS02H(003)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	116.2	1.291	0.002	0.004	N	~N(072)	~N(073)	6.065	0.004	0	88757	0.01984						
CS02H(004)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	117.3	1.304	0.002	0.004	N	~N(067)	~N(070)	6.065	0.004	0	89612	0.01981						
CS02H(005)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	112.2	1.247	0.001	0.003	N	~N(071)	~N(072)	6.065	0.003	0	85690	0.01995						
CS02H(006)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	113.3	1.259	0.002	0.003	N	~N(068)	~N(067)	6.065	0.003	0	86545	0.01992						
CS02H(007)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	108.3	1.203	0.001	0.003	N	~N(074)	~N(071)	6.065	0.003	0	82696	0.02006						
CS02H(008)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	109.1	1.213	0.001	0.003	N	~N(069)	~N(068)	6.065	0.003	0	83363	0.02004						
CS02H(009)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	104.1	1.157	0.001	0.003	N	~N(075)	~N(074)	6.065	0.003	0	79515	0.02019						
CS02H(010)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	105.2	1.169	0.001	0.003	N	~N(066)	~N(069)	6.065	0.003	0	80370	0.02016						
CS02H(011)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	100.1	1.112	0.001	0.003	N	~N(078)	~N(075)	6.065	0.003	0	76451	0.02032						
CS02H(012)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	101.2	1.125	0.001	0.003	N	~N(065)	~N(066)	6.065	0.003	0	77306	0.02029						
CS02H(013)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	96.17	1.069	0.001	0.003	N	~N(080)	~N(076)	6.065	0.003	0	73459	0.02046						
CS02H(014)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	97.05	1.079	0.001	0.003	N	~N(064)	~N(065)	6.065	0.003	0	74126	0.02043						
CS02H(015)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	92.01	1.023	0.001	0.002	N	~N(081)	~N(080)	6.065	0.002	0	70279	0.02061						
CS02H(016)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	93.13	1.035	0.001	0.002	N	~N(060)	~N(064)	6.065	0.002	0	71135	0.02057						
CS02H(017)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	88	0.978	0	0.002	N	~N(082)	~N(081)	6.065	0.002	0	67217	0.02077						
CS02H(018)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	89.12	0.991	0	0.002	N	~N(059)	~N(060)	6.065	0.002	0	68072	0.02072						
CS02H(019)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	84.09	0.935	0	0.002	N	~N(079)	~N(082)	6.065	0.002	0	64226	0.02093						
CS02H(020)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	84.96	0.944	0	0.002	N	~N(058)	~N(059)	6.065	0.002	0	64894	0.0209						
CS02H(021)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	79.93	0.888	0	0.002	N	~N(078)	~N(079)	6.065	0.002	0	61049	0.02112						
CS02H(022)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	81.05	0.901	0	0.002	N	~N(061)	~N(058)	6.065	0.002	0	61904	0.02107						
CS02H(023)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	75.82	0.844	0	0.002	N	~N(077)	~N(078)	6.065	0.002	0	57987	0.02132						
CS02H(024)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	77.04	0.856	0	0.002	N	~N(062)	~N(061)	6.065	0.002	0	58843	0.02126						
CS02H(025)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	72.01	0.8	0	0.002	N	~N(085)	~N(077)	6.065	0.002	0	54998	0.02152						
CS02H(026)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	72.88	0.81	0	0.002	N	~N(063)	~N(062)	6.065	0.002	0	55666	0.02147						
CS02H(027)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	67.85	0.754	0	0.001	N	~N(084)	~N(085)	6.065	0.001	0	51822	0.02176						
CS02H(028)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	68.97	0.767	0	0.001	N	~N(055)	~N(063)	6.065	0.001	0	52678	0.02169						
CS02H(029)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	63.84	0.71	0	0.001	N	~N(083)	~N(084)	6.065	0.001	0	48762	0.02201						
CS02H(030)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	64.96	0.722	0	0.001	N	~N(056)	~N(055)	6.065	0.001	0	49618	0.02193						
CS02H(031)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	59.93	0.666	0	0.001	N	~N(086)	~N(083)	6.065	0.001	0	45774	0.02227						
CS02H(032)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	60.8	0.676	0	0.001	N	~N(057)	~N(056)	6.065	0.001	0	46442	0.02221						
CS02H(033)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	55.77	0.62	0	0	N	~N(087)	~N(086)	6.065	0	0	42598	0.02258						
CS02H(034)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	56.89	0.632	0	0	N	~N(054)	~N(057)	6.065	0	0	43455	0.0225						
CS02H(035)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	51.76	0.575	0	0	N	~N(088)	~N(087)	6.065	0	0	39539	0.02292						
CS02H(036)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	52.89	0.588	0	0	N	~N(053)	~N(054)	6.065	0	0	40396	0.02282						
CS02H(037)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	47.85	0.532	0	0	N	~N(096)	~N(088)	6.065	0	0	36551	0.02328						
CS02H(038)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	48.73	0.542	0	0	N	~N(052)	~N(053)	6.065	0	0	37220	0.0232						
CS02H(039)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	43.7	0.486	0	0	N	~N(095)	~N(096)	6.065	0	0	33376	0.02372						
CS02H(040)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	44.82	0.498	0	0	N	~N(104)	~N(052)	6.065	0	0	34234	0.02359						
CS02H(041)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	39.69	0.441	0	0	N	~N(097)	~N(095)	6.065	0	0	30317	0.0242						
CS02H(042)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	40.81	0.454	0	0	N	~N(103)	~N(104)	6.065	0	0	31175	0.02408						
CS02H(043)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0.42	<-->	35.79	0.398	0	0.001	N	~N(098)	~N(097)	6.065	0	0.001	27331	0.02474	1 x Reducer - Contraction (6 x 4 - 5.5)	0.42				

CS02H(044)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	36.66	0.407	0	0	N	~N(102)	~N(103)	6.065	0	0	28000	0.02481					
CS02H(045)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	31.63	0.351	0	0	N	~N(099)	~N(098)	6.065	0	0	24156	0.02542					
CS02H(046)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	32.75	0.364	0	0	N	~N(101)	~N(102)	6.065	0	0	25014	0.02523					
CS02H(047)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	27.62	0.307	0	0	N	~N(092)	~N(089)	6.065	0	0	21098	0.02621					
CS02H(048)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	28.74	0.319	0	0	N	~N(107)	~N(101)	6.065	0	0	21956	0.02597					
CS02H(049)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	23.71	0.264	0	0	N	~N(093)	~N(092)	6.065	0	0	18111	0.02715					
CS02H(050)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	24.59	0.273	0	0	N	~N(106)	~N(107)	6.065	0	0	18781	0.02692					
CS02H(051)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	19.56	0.217	0	0	N	~N(094)	~N(093)	6.065	0	0	14937	0.02844					
CS02H(052)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	20.68	0.23	0	0	N	~N(105)	~N(106)	6.065	0	0	15795	0.02805					
CS02H(053)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	15.55	0.173	0	0	N	~N(091)	~N(094)	6.065	0	0	11879	0.03011					
CS02H(054)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	16.68	0.185	0	0	N	~N(108)	~N(105)	6.065	0	0	12737	0.02958					
CS02H(055)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	11.64	0.129	0	0	N	~N(090)	~N(091)	6.065	0	0	8893	0.03248					
CS02H(056)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	12.52	0.139	0	0	N	~N(109)	~N(108)	6.065	0	0	9562	0.03185					
CS02H(057)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	7.487	0.083	0	0	N	~N(089)	~N(090)	6.065	0	0	5718	0.03674					
CS02H(058)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	8.61	0.096	0	0	N	~N(110)	~N(109)	6.065	0	0	6576	0.03529					
CS02H(059)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	3.483	0.039	0	0	N	~N(100)	~N(099)	6.065	0	0	2660	0.04858					
CS02H(060)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	4.606	0.051	0	0	N	~N(111)	~N(110)	6.065	0	0	3518	0.04256					
CS02H(061)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	0.427	0.005	0	0	N	~N(100)	~N(111)	6.065	0	0	325.8	0.1964					
CS02J(001)	Steel Sch 40 (clean)	Containment Sump Water	6	1.6	0.0533	<-->	190.6	2.118	0.003	0.008	N	~N(299)	~N(297)	6.065	0.004	0.004	145563	0.01847	1 x Reducer - Contraction (6 x 6 - 6)	0.05329	1 x Diverging* Tee (Branch)	1.00E-05
CS02J(002)	Steel Sch 40 (clean)	Containment Sump Water	6	1.6	0.0533	<-->	190.6	2.118	0.003	0.008	N	~N(300)	~N(297)	6.065	0.004	0.004	145563	0.01847	1 x Reducer - Contraction (6 x 6 - 6)	0.05329	1 x Diverging* Tee (Branch)	1.00E-05

[illegible]

CS02L.071	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	92.46	0.593	0	0	N	-N(148)	-N(149)	7.981	0	0	53668	0.02135										
CS02L.072	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	92.56	0.594	0	0	N	-N(179)	-N(178)	7.981	0	0	53728	0.02134										
CS02L.073	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	88.92	0.571	0	0	N	-N(149)	-N(150)	7.981	0	0	51611	0.02151										
CS02L.074	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	88.72	0.569	0	0	N	-N(178)	-N(183)	7.981	0	0	51495	0.02152										
CS02L.075	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	85.07	0.546	0	0	N	-N(150)	-N(151)	7.981	0	0	49378	0.02169										
CS02L.076	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	85.17	0.547	0	0	N	-N(183)	-N(182)	7.981	0	0	49439	0.02169										
CS02L.077	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	81.35	0.522	0	0	N	-N(151)	-N(153)	7.981	0	0	47222	0.02188										
CS02L.078	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	81.46	0.523	0	0	N	-N(182)	-N(180)	7.981	0	0	47282	0.02188										
CS02L.079	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	77.81	0.499	0	0	N	-N(153)	-N(152)	7.981	0	0	45165	0.02208										
CS02L.080	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	77.61	0.498	0	0	N	-N(180)	-N(181)	7.981	0	0	45050	0.02209										
CS02L.081	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	73.97	0.475	0	0	N	-N(152)	-N(154)	7.981	0	0	42933	0.0223										
CS02L.082	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	74.07	0.475	0	0	N	-N(181)	-N(191)	7.981	0	0	42993	0.0223										
CS02L.083	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	70.25	0.451	0	0	N	-N(154)	-N(155)	7.981	0	0	40777	0.02254										
CS02L.084	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	70.36	0.452	0	0	N	-N(191)	-N(190)	7.981	0	0	40837	0.02253										
CS02L.085	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	66.71	0.428	0	0	N	-N(155)	-N(157)	7.981	0	0	38720	0.02278										
CS02L.086	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	66.51	0.427	0	0	N	-N(190)	-N(188)	7.981	0	0	38605	0.02279										
CS02L.087	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	62.86	0.403	0	0	N	-N(157)	-N(156)	7.981	0	0	36488	0.02306										
CS02L.088	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	62.97	0.404	0	0	N	-N(188)	-N(189)	7.981	0	0	36549	0.02305										
CS02L.089	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	59.15	0.38	0	0	N	-N(156)	-N(161)	7.981	0	0	34332	0.02336										
CS02L.090	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	59.25	0.38	0	0	N	-N(189)	-N(184)	7.981	0	0	34393	0.02335										
CS02L.091	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	55.61	0.357	0	0	N	-N(161)	-N(160)	7.981	0	0	32278	0.02367										
CS02L.092	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	55.41	0.356	0	0	N	-N(184)	-N(185)	7.981	0	0	32161	0.02369										
CS02L.093	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	51.76	0.332	0	0	N	-N(160)	-N(158)	7.981	0	0	30044	0.02404										
CS02L.094	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	51.86	0.333	0	0	N	-N(185)	-N(187)	7.981	0	0	30104	0.02403										
CS02L.095	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	48.05	0.308	0	0	N	-N(158)	-N(159)	7.981	0	0	27888	0.02444										
CS02L.096	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	48.15	0.309	0	0	N	-N(187)	-N(186)	7.981	0	0	27949	0.02442										
CS02L.097	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	44.5	0.286	0	0	N	-N(159)	-N(162)	7.981	0	0	25832	0.02486										
CS02L.098	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	44.31	0.284	0	0	N	-N(186)	-N(201)	7.981	0	0	25717	0.02488										
CS02L.099	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	40.66	0.261	0	0	N	-N(162)	-N(163)	7.981	0	0	23600	0.02537										
CS02L.100	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	40.76	0.262	0	0	N	-N(201)	-N(200)	7.981	0	0	23660	0.02535										
CS02L.101	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	36.94	0.237	0	0	N	-N(163)	-N(171)	7.981	0	0	21444	0.02593										
CS02L.102	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	37.05	0.238	0	0	N	-N(200)	-N(192)	7.981	0	0	21505	0.02592										
CS02L.103	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	33.4	0.214	0	0	N	-N(171)	-N(170)	7.981	0	0	19388	0.02655										
CS02L.104	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	33.2	0.213	0	0	N	-N(192)	-N(193)	7.981	0	0	19273	0.02659										
CS02L.105	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	29.56	0.19	0	0	N	-N(170)	-N(168)	7.981	0	0	17156	0.02734										
CS02L.106	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	29.66	0.19	0	0	N	-N(193)	-N(195)	7.981	0	0	17217	0.02732										
CS02L.107	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	25.84	0.166	0	0	N	-N(168)	-N(169)	7.981	0	0	15001	0.02826										
CS02L.108	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	25.95	0.167	0	0	N	-N(195)	-N(194)	7.981	0	0	15061	0.02823										
CS02L.109	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	22.3	0.143	0	0	N	-N(169)	-N(164)	7.981	0	0	12945	0.02932										
CS02L.110	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	22.1	0.142	0	0	N	-N(194)	-N(199)	7.981	0	0	12829	0.02938										
CS02L.111	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	18.46	0.118	0	0	N	-N(164)	-N(165)	7.981	0	0	10713	0.03079										
CS02L.112	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	18.56	0.119	0	0	N	-N(199)	-N(196)	7.981	0	0	10773	0.03075										
CS02L.113	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	14.74	0.095	0	0	N	-N(165)	-N(167)	7.981	0	0	8567	0.0327										
CS02L.114	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	8618	0.03264										
CS02L.115	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	8501	0.03531										
CS02L.116	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	8386	0.03549										
CS02L.117	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	4289	0.03999										
CS02L.118	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	4330	0.03982										
CS02L.119	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2114	0.05029										
CS02L.120	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2174	0.0498										
CS02L.121	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	57.82	1.111										
CS02M(001)	Steel Sch 40 (clean)	Containment Sump Water	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	139077	0.0179	1 x Reducer - Contraction (10 x 8 - 7)	0.1047	1 x Diverging' Tee (Branch)	4.3						
CS02M(002)	Steel Sch 40 (clean)	Containment Sump Water	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	139105	0.0179	1 x Reducer - Contraction (10 x 8 - 7)	0.1047	1 x Diverging' Tee (Branch)	4.3						
CS02M(003)	Steel Sch 40 (clean)	Containment Sump Water	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	171481	0.01765										
CS02M(004)	Steel Sch 40 (clean)	Containment Sump Water	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	171515	0.01765										
CS02M(005)	Steel Sch 40 (clean)	Containment Sump Water	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	168353	0.01769										
CS02M(006)	Steel Sch 40 (clean)	Containment Sump Water	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	168387	0.01769										
CS02M(007)	Steel Sch 40 (clean)	Containment Sump Water	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	165225	0.01774										
CS02M(008)	Steel Sch 40 (clean)	Containment Sump Water	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	165259	0.01774										
CS02M(009)	Steel Sch 40 (clean)	Containment Sump Water	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	162099	0.01779										
CS02M(010)	Steel Sch 40 (clean)	Containment Sump Water	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	162133	0.01779										
CS02M(011)	Steel Sch 40 (clean)	Containment Sump Water	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	158973	0.01783										
CS02M(012)	Steel Sch 40 (clean)	Containment Sump Water	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	159007	0.01783										
CS02M(013)	Steel Sch 40 (clean)	Containment Sump Water	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	155847	0.01788										
CS02M(014)	Steel Sch 40 (clean)	Containment Sump Water	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	155882	0.01788										
CS02M(015) – CS02M(028)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]										
CS02M(029)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	225.5	1.447	0.001	0.003	N	-N(417)	-N(419)	7.981	0.003	0	130864	0.01834										
CS02M(030)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	225.5	1.447	0.001	0.003	N	-N(418)	-N(420)	7.981	0.003	0	130898	0.01834										
CS02M(031)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	220.1	1.413	0.001	0.003	N	-N(419)	-N(421)	7.981	0.003	0	127743	0.0184										
CS02M(032)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	220.1	1.413	0.001	0.003	N	-N(420)	-N(422)	7.981	0.003	0	127778	0.0184										
CS02M(033)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	214.7	1.378	0.001	0.003	N	-N(421)	-N(423)	7.981	0.003	0	124623	0.01847										
CS02M(034)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	214.8	1.378	0.001	0.003	N	-N(422)	-N(424)	7.981	0.003	0	124657	0.01847										
CS02M(035)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	209.3	1.344	0.001	0.003	N	-N(423)	-N(425)	7.981	0.003	0	121503	0.01854										
CS02M(036)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	209.4	1.344	0.001	0.003	N	-N(424)	-N(426)	7.981	0.003	0	121537	0.01854										
CS02M(037)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	204	1.309	0.001	0.003	N	-N(425)	-N(427)	7.981	0.003	0	118384	0.01862										
CS02M(038)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	204	1.309	0.001	0.003	N	-N(426)	-N(428)	7.981	0.003	0	118418	0.01862										
CS02M(039)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	198.6	1.275	0.001	0.003	N	-N(427)	-N(429)	7.981	0.003	0	115264	0.01869										
CS02M(040)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	198.6	1.275	0.001	0.003	N	-N(428)	-N(430)	7.981	0.003	0	115298	0.01869										
CS02M(041)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	193.2	1.24	0.001	0.002	N	-N(429)	-N(431)	7.981	0.002	0	112146	0.01877										
CS02M(042)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	193.3	1.24	0.001	0.002	N	-N(430)	-N(432)	7.981	0.002	0	112180	0.01877										
CS02M(043)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	187.8	1.206	0	0.002	N	-N(431)	-N(433)	7.981	0.002	0	109027	0.01886										
CS02M(044)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	187.9	1.206	0	0.002	N	-N(432)	-N(434)	7.981	0.002	0	109061	0.01886										
CS02M(045)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	182.5	1.171	0	0.002	N	-N(433)	-N(435)	7.981	0.002	0	105908	0.01894										
CS02M(046)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	182.5	1.171	0	0.002	N	-N(434)	-N(436)	7.981	0.002	0	105943	0.01894										
CS02M(047)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	177.1	1.137	0	0.002	N	-N(435)	-N(437)	7.981	0.002	0	102791	0.01904										
CS02M(048)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	177.1	1.137	0	0.002	N	-N(436)	-N(438)	7.981	0.002	0	102825	0.01903										
CS02M(049)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	171.7	1.102	0	0.002	N	-N(437)	-N(439)	7.981	0.002	0	99673	0.01913										
CS02M(050)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	171.8	1.103	0	0.002	N	-N(438)	-N(440)	7.981	0.002	0	99707	0.01913										
CS02M(051)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	166.3	1.068	0	0.002	N	-N(439)	-N(441)	7.981	0.002	0	96556	0.01923										
CS02M(052)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	166.4	1.068	0	0.002	N	-N(440)	-N(442)	7.981	0.002	0	96590	0.01923										
CS02M(053)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	161	1.033	0	0.002	N	-N(441)	-N(443)	7.981	0.002	0	93439	0.01933										
CS02M(054)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	161	1.034	0	0.002	N	-N(442)	-N(444)	7.981	0.002	0	93473	0.01933										
CS02M(055)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	155.6	0.999	0	0.002	N	-N(443)	-N(445)	7.981	0.002	0	90322	0.01944										
CS02M(056)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	155.7	0.999	0	0.002	N	-N(444)	-N(446)	7.981	0.002	0	90356	0.01944										
CS02M(057)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	150.2	0.964	0	0.002	N	-N(445)	-N(447)	7.981	0.002	0	87205	0.01956										
CS02M(058)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	150.3	0.965	0	0.002	N	-N(446)	-N(448)	7.981	0.002	0	87239	0.01956										
CS02M(059)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	144.9	0.93	0	0.001	N	-N(447)	-N(449)	7.981	0.001	0	84089	0.01968										
CS02M(060)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	144.9	0.93	0	0.001	N	-N(448)	-N(450)	7.981	0.001	0	84123	0.01968										
CS02M(061)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	139.5	0.896	0	0.001	N	-N(449)	-N(451)	7.981	0.001	0	80972	0.01981										
CS02M(062)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	139.6	0.896	0	0.001	N	-N(450)	-N(452)	7.981	0.001	0	81006	0.0198										
CS02M(063)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	134.1	0.861	0	0.001	N	-N(451)	-N(453)	7.981	0.001	0	77856	0.01994										
CS02M(064)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	134.2	0.861	0	0.001	N	-N(452)	-N(454)	7.981	0.001	0	77890	0.01994										
CS02M(065)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	128.8	0.826	0	0.001	N	-N(453)	-N(455)	7.981	0.001	0	74740	0.02008										
CS02M(066)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	128.8	0.827	0	0.001	N	-N(454)	-N(456)	7.981	0.001	0	74774	0.02008										
CS02M(067)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	123.4	0.792	0	0.001	N	-N(455)	-N(457)	7.981	0.001	0	71625	0.02024										
CS02M(068)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	123.5	0.792	0	0.001	N	-N(456)	-N(458)	7.981	0.001	0	71659	0.02023										
CS02M(069)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	118	0.758	0	0	N	-N(457)	-N(459)	7.981	0	0	68509	0.0204										
CS02M(070)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	118.1	0.758	0	0	N	-N(458)	-N(460)	7.981	0	0	68543	0.0204										
CS02M(071)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	112.7	0.723	0	0	N	-N(459)	-N(461)	7.981	0	0	65393	0.02057										
CS02M(072)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	112.7	0.723	0	0	N	-N(460)	-N(462)	7.981	0	0	65427	0.02057										
CS02M(073)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	107.3	0.689	0	0	N	-N(461)	-N(463)	7.981	0	0	62278	0.02076										
CS02M(074)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	107.4	0.689	0	0	N	-N(462)	-N(464)	7.981	0	0	62312	0.02075										
CS02M(075)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	101.9	0.654	0	0	N	-N(463)	-N(465)	7.981	0	0	59163	0.02096										
CS02M(076)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	102	0.655	0	0	N	-N(464)	-N(466)	7.981	0	0	59197	0.02095										
CS02M(077)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	96.56	0.62	0	0	N	-N(465)	-N(467)	7.981	0	0	56048	0.02117										
CS02M(078)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	96.62	0.62	0	0	N	-N(466)	-N(468)	7.981	0	0	56082	0.02117										
CS02M(079)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	91.19	0.585	0	0	N	-N(467)	-N(469)	7.981	0	0	52932	0.0214										
CS02M(080)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	91.25	0.586	0	0	N	-N(468)	-N(470)	7.981	0	0	52966	0.0214										
CS02M(081)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	85.83	0.551	0	0	N	-N(469)	-N(471)	7.981	0	0	49817	0.02165										
CS02M(082)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	85.89	0.551	0	0	N	-N(470)	-N(472)	7.981	0	0	49851	0.02165										
CS02M(083)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	80.46	0.516	0	0	N	-N(471)	-N(473)	7.981	0	0	46703	0.02193										
CS02M(084)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	80.52	0.517	0	0	N	-N(472)	-N(474)	7.981	0	0	46737	0.02193										
CS02M(085)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	75.09	0.482	0	0	N	-N(473)	-N(475)	7.981	0	0	43588	0.02224										
CS02M(086)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	75.15	0.482	0	0	N	-N(474)	-N(476)	7.981	0	0	43622	0.02223										
CS02M(087)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	69.73	0.448	0	0	N	-N(475)	-N(477)	7.981	0	0	40473	0.02257										
CS02M(088)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	69.79	0.448	0	0	N	-N(476)	-N(478)	7.981	0	0	40507	0.02257										
CS02M(089)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	64.36	0.413	0	0	N	-N(477)	-N(479)	7.981	0	0	37358	0.02295										
CS02M(090)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	64.42	0.413	0	0	N	-N(478)	-N(480)	7.981	0	0	37392	0.02295										
CS02M(091)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	59	0.379	0	0	N	-N(479)	-N(481)	7.981	0	0	34243	0.02337										
CS02M(092)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	59.05	0.379	0	0	N	-N(480)	-N(482)	7.981	0	0	34277	0.02337										
CS02M(093)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	53.63	0.344	0	0	N	-N(481)	-N(483)	7.981	0	0	31129	0.02386										
CS02M(094)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	53.69	0.345	0	0	N	-N(482)	-N(484)	7.981	0	0	31163	0.02385										
CS02M(095)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	48.26	0.31	0	0	N	-N(483)	-N(485)	7.981	0	0	28014	0.02441										
CS02M(096)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	48.32	0.31	0	0	N	-N(484)	-N(486)	7.981	0	0	28048	0.0244										
CS02M(097)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	42.9	0.275	0	0	N	-N(485)	-N(487)	7.981	0	0	24899	0.02506										
CS02M(098)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	42.95	0.276	0	0	N	-N(486)	-N(488)	7.981	0	0	24933	0.02505										
CS02M(099)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	37.53	0.241	0	0	N	-N(487)	-N(489)	7.981	0	0	21785	0.02584										
CS02M(100)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	37.59	0.241	0	0	N	-N(488)	-N(490)	7.981	0	0	21819	0.02583										
CS02M(101)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	32.17	0.206	0	0	N	-N(489)	-N(491)	7.981	0	0	18670	0.02679										
CS02M(102)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	32.22	0.207	0	0	N	-N(490)	-N(492)	7.981	0	0	18704	0.02678										
CS02M(103)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	26.8	0.172	0	0	N	-N(491)	-N(493)	7.981	0	0	15556	0.028										
CS02M(104)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	26.86	0.172	0	0	N	-N(492)	-N(494)	7.981	0	0	15590	0.02799										
CS02M(105)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	21.43	0.138	0	0	N	-N(493)	-N(495)	7.981	0	0	12441	0.02962										
CS02M(106)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	21.49	0.138	0	0	N	-N(494)	-N(496)	7.981	0	0	12475	0.0296										
CS02M(107)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	16.07	0.103	0	0	N	-N(495)	-N(497)	7.981	0	0	9327	0.03195										
CS02M(108)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	16.13	0.104	0	0	N	-N(496)	-N(498)	7.981	0	0	9361	0.03192										
CS02M(109)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	10.7	0.069	0	0	N	-N(497)	-N(499)	7.981	0	0	6212	0.03577										
CS02M(110)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	10.76	0.069	0	0	N	-N(498)	-N(500)	7.981	0	0	6246	0.03571										
CS02M(111)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	5.336	0.034	0	0	N	-N(499)	-N(501)	7.981	0	0	3098	0.04424										
CS02M(112)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	5.395	0.035	0	0	N	-N(500)	-N(502)	7.981	0	0	3132	0.04409										
CS02M(113)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	0.029	0	0	0	N	-N(502)	-N(501)	7.981	0	0	17.03	3.758										
CS05AA	Steel Sch 40 (clean)	Containment Sump Water	3	1	9.8	0	0	0	0	N	+N(008)	-N(563)	3.068	0	0	0	0	1 x Diverging Tee (Branch)	9.8								
CS05AB	Steel Sch 40 (clean)	Containment Sump Water	3	1	11.1	0	0	0	0	N	-N(240)	-N(562)	3.068	0	0	0	0	1 x Diverging Tee (Branch)	11.1								
CS06AA	Steel Sch 40 (clean)	Containment Sump Water	6	1	1	0	0	-1.382	0	N	+N(563)	-N(556)	6.065	0	0	0	0	1 x Converging Tee (Branch)	1								
CS06AB	Steel Sch 40 (clean)	Containment Sump Water	6	1	1	0	0	1.08	0	N	-N(562)	-N(557)	6.065	0	0	0	0	1 x Converging Tee (Branch)	1								
CS23AA	Steel Sch 30 (clean)	Containment Sump Water	14	15.7	1.00E-05	0	0	-6.4	0	N	+N(556)	-N(005)	13.25	0	0	0	0	1 x Converging Tee (Branch)	1.00E-05								
CS23AB	Steel Sch 30 (clean)	Containment Sump Water	14	4.9	1.00E-05	0	0	-2.117	0	N	+N(557)	-N(237)	13.25	0	0	0	0	1 x Converging Tee (Branch)	1.00E-05								
CV05B(001)	Steel Sch 40 (clean)	Water After RHR HX	8	17.6	0.8	789.5	4.939	0.199	0.461	N	-N(622)	-N(627)	7.981	0.158	0.303	446680	0.01589	1 x Diverging' Tee (Branch)	0.8								
CV05B(002)	Steel Sch 40 (clean)	Water After RHR HX	8	21.7	22.29	130	0.834	0.107	0.248	N	+N(631)	-N(622)	7.981	0.007	0.241	75458	0.02005	3 x Pipe Bend - r/d 1.5 (90°)	0.1969	1 x Converging Tee (Through)	20.9	1 x Diverging' Tee (Branch)	0.8				
CV05B(003)	Steel Sch 40 (clean)	Water After RHR HX	8	16.6	0	130	0.834	0.002	0.005	N	-N(633)	-N(631)	7.981	0.005	0	75458	0.02005										
CV05B(004)	Steel Sch 40 (clean)	Water After RHR HX	8	16.5	0.5907	0	0	0	0	N	-N(625)	-N(633)	7.981	0	0	0	0	3 x Pipe Bend - r/d 1.5 (90°)	0.1969	1 x Converging Tee (Through)	1.00E-05						
CV05B(005)	Steel Sch 40 (clean)	Water After RHR HX	8	13.7	1.2	0	0	0.664	0	N	-N(624)	-N(625)	7.981	0	0	0	0	1 x Converging' Tee (Branch)	1.2								
CV05B(006)	Steel Sch 40 (clean)	Water After RHR HX	8	1	1.00E-05	0	0	0	0	N	+N(623)	-N(624)	7.981	0	0	0	0	1 x Converging Tee (Through)	1.00E-05								
CV05CA	Steel Sch 40 (clean)	Water After RHR HX	6	24.5	2.812	392.7	4.366	-1.22	1.075	N	-N(627)	Centrifugal Charging Pump A	6.065	0.244	0.831	299958	0.01703	2 x Pipe Bend - r/d 1.5 (90°)	0.2085	1 x CV8471A (Gate Valve)	0.195	1 x Diverging Tee (Branch)	2.2				
CV05CB	Steel Sch 40 (clean)	Water After RHR HX	6	119.8	1.921	375.8	4.168	-0.983	1.626	N	-N(627)	Centrifugal Charging Pump B	6.065	1.103	0.523	287833	0.0171	8 x Pipe Bend - r/d 1.5 (90°)	0.2085	1 x Reducer - Contraction (8 x 6 - 5.5)	0.058	1 x CV8471B (Gate Valve)	0.195	1 x Diverging Tee (Through)	1.00E-05		
CV06A	Steel Sch 40 (clean)	Water After RHR HX	4	39.4	427.6	0	0	-2.506	0	N	-N(631)	Positive Dis. Charging Pump	4.026	0	0	0.01151	0	6 x Pipe Bend - r/d 1.5 (90°)	0.2279	1 x Reducer - Contraction (8 x 4 - 8)	0.1867	1 x CV13M(Suct. Stabilizer)	423.9	1 x CV8394(Diaphragm Valve)	2.436	1 x Diverging' Tee (Branch)	1.00E-05
CV07A(001)	Steel Sch.160 (clean)	Water After RHR HX	3	2.7	8.631	0	0	0	0	N	Positive Dis. Charging Pump	-N(641)	2.624	0	0	0.01765	0	1 x Pipe Bend - r/d 1.5 (90°)	0.2511	1 x CV12M(Puls. Dampener)	8.379						
CV07A(002)	Steel Sch.160 (clean)	Water After RHR HX	3	30.5	10.05	0	0	1.655	0	N	-N(641)	-N(640)	2.624	0	0	0.01765	0	1 x CV8497(Check Valve)	3.2	3 x Pipe Bend - r/d 1.5 (90°)	0.2511	1 x CV8388(Globe Valve)	6.1	1 x Diverging Tee (Through)	1.00E-05		

CV08AA(001)	Steel Sch 160 (clean)	Water After RHR HX	4	2.8	0.4721		382.7	13.56	1.169	1.851
CV08AA(002)	Steel Sch 160 (clean)	Water After RHR HX	4	4.8	2.975		327.7	11.33	2.622	6.532
CV08AA(003)	Steel Sch 40 (clean)	Water After RHR HX	4	12.8	0.9047		327.7	8.256	1.545	1.676
CV08BA(001)	Steel Sch 160 (clean)	Water After RHR HX	4	1.7	0.2361		376.6	13.03	0.779	0.902
CV08BA(002)	Steel Sch 160 (clean)	Water After RHR HX	4	3.7	3.211		311.8	10.79	2.686	6.216
CV08BA(003)	Steel Sch 40 (clean)	Water After RHR HX	4	103.1	3.333		311.8	7.865	4.468	6.443
CV09A(001)	Steel Sch 160 (clean)	Water After RHR HX	4	13.3	5		247.7	8.569	2.878	5.663
CV09A(002)	Steel Sch 160 (clean)	Water After RHR HX	4	23.3	9.156		559.5	19.35	33.84	61.52
CV09O(001)	Steel Sch 160 (clean)	Water After RHR HX	3	2.6	0.2638		80	4.75	0.077	0.177
CV09O(002)	Steel Sch 160 (clean)	Water After RHR HX	3	6.8	12.53		80	4.75	2.016	4.667
CV09O(003)	Steel Sch 160 (clean)	Water After RHR HX	3	23	11.4		80	4.75	5.03	4.743
CV09O(004)	Steel Sch 160 (clean)	Water After RHR HX	3	12.5	1.00E-05		0	0	0	0
CV12AA	Steel Sch 160 (clean)	Water After RHR HX	3	15.6	1.74	XXX	—	—	—	—
CV12AB	Steel Sch 160 (clean)	Water After RHR HX	3	116.7	3.247	XXX	—	—	—	—
CV12B	Steel Sch 160 (clean)	Water After RHR HX	3	0.8	0		0	0	0	0
CV13B	Steel Sch 160 (clean)	Water After RHR HX	3	13.8	2.251		80	4.75	-2.748	1.239
CV43A(001)	Steel Sch 160 (clean)	Water After RHR HX	2	92	49.04		0	0	1.944	0
CV43A(002)	Steel Sch 160 (clean)	Water After RHR HX	2	60.5	1.116		0	0	0.302	0
CV43A(003)	Steel Sch 160 (clean)	Water After RHR HX	2	117.8	2.151		0	0	1.21	0
CV43BA/RC16AA	Steel Sch 160 (clean)	Water After RHR HX	2	134.4	15.41	XXX	—	—	—	—
CV43BB/RC16AB	Steel Sch 160 (clean)	Water After RHR HX	2	19	13.29	XXX	—	—	—	—

Pipe(155)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		[illegible]	[illegible]	[illegible]	[illegible]	N	~N(169)	A1(107)	1.049	0.005	5.043	15643	0.03087	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(156)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		[illegible]	[illegible]	[illegible]	[illegible]	N	~N(164)	A1(109)	1.049	0.006	5.942	16981	0.03041	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(157)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		[illegible]	[illegible]	[illegible]	[illegible]	N	~N(165)	A1(111)	1.049	0.005	5.543	16400	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(158)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		[illegible]	[illegible]	[illegible]	[illegible]	N	~N(167)	A1(113)	1.049	0.005	5.043	15643	0.03087	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(159)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		[illegible]	[illegible]	[illegible]	[illegible]	N	~N(166)	A1(115)	1.049	0.006	5.942	16981	0.03041	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(160)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		[illegible]	[illegible]	[illegible]	[illegible]	N	~N(172)	A1(117)	1.049	0.005	5.543	16400	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(161)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		[illegible]	[illegible]	[illegible]	[illegible]	N	~N(173)	A1(119)	1.049	0.005	5.043	15643	0.03087	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(162)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		[illegible]	[illegible]	[illegible]	[illegible]	N	~N(174)	A1(120)	1.049	0.006	5.942	16981	0.03041	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(163)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		[illegible]	[illegible]	[illegible]	[illegible]	N	~N(202)	A1(118)	1.049	0.005	5.543	16400	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(164)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		[illegible]	[illegible]	[illegible]	[illegible]	N	~N(197)	A1(116)	1.049	0.005	5.043	15643	0.03087	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(165)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		[illegible]	[illegible]	[illegible]	[illegible]	N	~N(196)	A1(114)	1.049	0.006	5.942	16981	0.03041	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(166)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		[illegible]	[illegible]	[illegible]	[illegible]	N	~N(198)	A1(112)	1.049	0.005	5.543	16400	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(167)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		[illegible]	[illegible]	[illegible]	[illegible]	N	~N(199)	A1(110)	1.049	0.005	5.043	15643	0.03087	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(168)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		[illegible]	[illegible]	[illegible]	[illegible]	N	~N(194)	A1(108)	1.049	0.006	5.942	16981	0.03041	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(169)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		[illegible]	[illegible]	[illegible]	[illegible]	N	~N(195)	A1(106)	1.049	0.005	5.543	16400	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(170)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		[illegible]	[illegible]	[illegible]	[illegible]	N	~N(193)	A1(104)	1.049	0.005	5.043	15643	0.03087	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(171)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		[illegible]	[illegible]	[illegible]	[illegible]	N	~N(192)	A1(102)	1.049	0.005	5.943	16981	0.03041	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(172)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		[illegible]	[illegible]	[illegible]	[illegible]	N	~N(200)	A1(100)	1.049	0.005	5.543	16400	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(173)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		[illegible]	[illegible]	[illegible]	[illegible]	N	~N(201)	A1(098)	1.049	0.004	5.044	15644	0.03087	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(174)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		[illegible]	[illegible]	[illegible]	[illegible]	N	~N(186)	A1(096)	1.049	0.006	5.943	16982	0.03041	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(175)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.714	1.38	2.397	5.549	N	~N(187)	A1(094)	1.049	0.005	5.544	16401	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(176)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.543	1.316	2.397	5.049	N	~N(185)	A1(092)	1.049	0.005	5.044	15645	0.03087	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(177)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.846	1.429	2.397	5.949	N	~N(184)	A1(090)	1.049	0.005	5.944	16982	0.03041	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(178)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.714	1.38	2.397	5.549	N	~N(189)	A1(088)	1.049	0.005	5.544	16402	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(179)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.543	1.316	2.397	5.05	N	~N(188)	A1(086)	1.049	0.005	5.045	15646	0.03087	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(180)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.846	1.429	2.398	5.95	N	~N(190)	A1(084)	1.049	0.006	5.944	16983	0.03041	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(181)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.714	1.38	2.398	5.55	N	~N(191)	A1(082)	1.049	0.005	5.545	16403	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(182)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.543	1.316	2.398	5.051	N	~N(181)	A1(080)	1.049	0.005	5.046	15647	0.03087	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(183)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.846	1.429	2.398	5.951	N	~N(180)	A1(078)	1.049	0.006	5.945	16985	0.03041	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(184)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.715	1.38	2.398	5.551	N	~N(182)	A1(076)	1.049	0.005	5.546	16405	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(185)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.544	1.317	2.398	5.052	N	~N(183)	A1(074)	1.049	0.005	5.047	15649	0.03087	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(186)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.847	1.429	2.399	5.952	N	~N(178)	A1(072)	1.049	0.005	5.947	16987	0.03041	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(187)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.715	1.38	2.399	5.553	N	~N(179)	A1(070)	1.049	0.005	5.548	16407	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(188)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.544	1.317	2.399	5.053	N	~N(177)	A1(068)	1.049	0.004	5.049	15652	0.03086	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(189)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.847	1.429	2.399	5.954	N	~N(176)	A1(066)	1.049	0.006	5.948	16989	0.03041	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(190)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.718	1.381	2.4	5.555	N	~N(175)	A1(064)	1.049	0.006	5.549	16410	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(191)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.731	1.386	2.419	5.599	N	~N(203)	A1(004)	1.049	0.005	5.594	16476	0.03058	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(192)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.861	1.434	2.418	5.997	N	~N(204)	A1(006)	1.049	0.006	5.991	17050	0.03039	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(193)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.559	1.322	2.417	5.095	N	~N(206)	A1(008)	1.049	0.005	5.09	15715	0.03084	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(194)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.728	1.385	2.416	5.592	N	~N(205)	A1(010)	1.049	0.005	5.587	16465	0.03058	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(195)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.859	1.434	2.415	5.99	N	~N(210)	A1(012)	1.049	0.006	5.984	17041	0.03039	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(196)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.556	1.321	2.414	5.088	N	~N(209)	A1(014)	1.049	0.005	5.083	15705	0.03086	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(197)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.726	1.384	2.413	5.586	N	~N(207)	A1(016)	1.049	0.005	5.581	16456	0.03058	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(198)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.857	1.433	2.412	5.984	N	~N(208)	A1(018)	1.049	0.006	5.978	17032	0.03039	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(199)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.554	1.32	2.411	5.082	N	~N(218)	A1(020)	1.049	0.005	5.077	15696	0.03085	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(200)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.724	1.384	2.411	5.58	N	~N(217)	A1(022)	1.049	0.005	5.575	16447	0.03058	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(201)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.855	1.432	2.41	5.978	N	~N(215)	A1(024)	1.049	0.005	5.973	17024	0.03039	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(202)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.552	1.32	2.409	5.076	N	~N(216)	A1(026)	1.049	0.004	5.072	15687	0.03085	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(203)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.723	1.383	2.408	5.575	N	~N(211)	A1(028)	1.049	0.005	5.57	16439	0.03058	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(204)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.853	1.432	2.408	5.973	N	~N(212)	A1(030)	1.049	0.005	5.968	17017	0.0304	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(205)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.551	1.319	2.407	5.072	N	~N(214)	A1(032)	1.049	0.005	5.067	15680	0.03085	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(206)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.721	1.382	2.406	5.57	N	~N(213)	A1(034)	1.049	0.005	5.565	16433	0.03059	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(207)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.852	1.431	2.406	5.969	N	~N(231)	A1(036)	1.049	0.006	5.963	17010	0.0304	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(208)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.549	1.319	2.405	5.067	N	~N(232)	A1(038)	1.049	0.004	5.063	15673	0.03086	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(209)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.72	1.382	2.405	5.566	N	~N(227)	A1(040)	1.049	0.005	5.561	16427	0.03059	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(210)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.851	1.431	2.404	5.965	N	~N(228)	A1(042)	1.049	0.006	5.959	17005	0.0304	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(211)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.548	1.318	2.404	5.064	N	~N(230)	A1(044)	1.049	0.005	5.059	15668	0.03086	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(212)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.718	1.382	2.403	5.563	N	~N(229)	A1(046)	1.049	0.006	5.557	16421	0.03059	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(213)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.85	1.43	2.403	5.961	N	~N(219)	A1(048)	1.049	0.005	5.956	17000	0.0304	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(214)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.547	1.318	2.402	5.06	N	~N(220)	A1(050)	1.049	0.004	5.056	15663	0.03086	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(215)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.717	1.381	2.402	5.559	N	~N(222)	A1(052)	1.049	0.005	5.554	16417	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(216)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.849	1.43	2.401	5.959	N	~N(221)	A1(054)	1.049	0.006	5.953	16996	0.0304	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(217)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.546	1.317	2.401	5.058	N	~N(226)	A1(056)	1.049	0.005	5.053	15658	0.03086	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(218)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.717	1.381	2.401	5.557	N	~N(225)	A1(058)	1.049	0.005	5.552	16413	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(219)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.848	1.43	2.4	5.956	N	~N(223)	A1(060)	1.049	0.005	5.951	16992	0.0304	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(220)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.545	1.317	2.4	5.055	N	~N(224)	A1(062)	1.049	0.004	5.051	15655	0.03086	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(221)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.325	1.807	4.461	7.526	N	B3(001)	~N(245)	1.049	0.007	7.519	19101	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(222)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.533	1.894	4.78	8.265	N	B3(003)	~N(246)	1.049	0.007	8.254	20018	0.02955	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(223)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.325	1.807	4.461	7.526	N	B3(002)	~N(247)	1.049	0.007	7.519	19101	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(224)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.324	1.807	4.46	7.523	N	B3(004)	~N(249)	1.049	0.007	7.516	19098	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(225)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.324	1.806	4.459	7.521	N	B3(005)	~N(250)	1.049	0.007	7.514	19095	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(226)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.324	1.806	4.459	7.521	N	B3(006)	~N(251)	1.049	0.007	7.514	19095	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(227)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.323	1.806	4.458	7.519	N	B3(007)	~N(252)	1.049	0.007	7.512	19092	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(228)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.323	1.806	4.458	7.519	N	B3(008)	~N(253)	1.049	0.007	7.512	19092	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(229)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.323	1.806	4.457	7.517	N	B3(009)	~N(254)	1.049	0.007	7.51	19089	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(230)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B3(010)	~N(255)	1.049	0.007	7.51	19089	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(231)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B3(011)	~N(256)	1.049	0.007	7.508	19087	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(232)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B3(012)	~N(257)	1.049	0.007	7.508	19087	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(233)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B3(013)	~N(258)	1.049	0.007	7.506	19085	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(234)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B3(014)	~N(259)	1.049	0.006	7.507	19085	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(235)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B3(015)	~N(260)	1.049	0.007	7.505	19083	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(236)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B3(016)	~N(261)	1.049	0.007	7.505	19083	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(237)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B3(017)	~N(262)	1.049	0.006	7.504	19081	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(238)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B3(018)	~N(263)	1.049	0.007	7.504	19081	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(239)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B3(019)	~N(264)	1.049	0.007	7.502	19080	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(240)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B3(020)	~N(265)	1.049	0.007	7.502	19080	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(241)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B3(021)	~N(266)	1.049	0.007	7.501	19079	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(242)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B3(022)	~N(267)	1.049	0.007	7.501	19079	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(243)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B3(023)	~N(268)	1.049	0.007	7.5	19077	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(244)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B3(024)	~N(269)	1.049	0.007	7.5	19077	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(245)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B3(025)	~N(270)	1.049	0.006	7.5	19076	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(246)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B3(026)	~N(271)	1.049	0.006	7.5	19076	0.02978	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(247)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B3(027)	~N(272)	1.049	0.007	7.499	19075	0.02978	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(248)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B3(028)	~N(273)	1.049	0.007	7.499	19075	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(249)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B3(029)	~N(274)	1.049	0.007	7.498	19075	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(250)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B3(030)	~N(275)	1.049	0.007	7.498	19075	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(251)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B3(031)	~N(276)	1.049	0.007	7.498	19074	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(252)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B3(032)	~N(277)	1.049	0.007	7.498	19074	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(253)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B3(033)	~N(278)	1.049	0.007	7.497	19073	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(254)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B3(034)	~N(279)	1.049	0.007	7.497	19073	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(255)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B3(035)	~N(280)	1.049	0.007	7.497	19073	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(256)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B3(036)	~N(281)	1.049	0.007	7.497	19073	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(257)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B3(037)	~N(282)	1.049	0.006	7.497	19073	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(258)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B3(038)	~N(283)	1.049	0.006	7.497	19073	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(259)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B3(039)	~N(284)	1.049	0.007	7.496	19072	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(260)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B3(040)	~N(285)	1.049	0.007	7.496	19072	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(261)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B3(041)	~N(286)	1.049	0.007	7.496	19072	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(262)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B3(042)	~N(287)	1.049	0.007	7.496	19072	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(263)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B3(043)	~N(288)	1.049	0.007	7.496	19072	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(264)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B3(044)	~N(289)	1.049	0.007	7.496	19072	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(265)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B3(045)	~N(290)	1.049	0.007	7.496	19072	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(266)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B3(046)	~N(291)	1.049	0.007	7.496	19072	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(267)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B3(047)	~N(292)	1.049	0.007	7.496	19072	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(268)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B3(048)	~N(293)	1.049	0.007	7.496	19072	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(269)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B3(049)	~N(294)	1.049	0.007	7.496	19072	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(270)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B3(050)	~N(295)	1.049	0.007	7.496	19072	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(271)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B3(051)	~N(296)	1.049	0.007	7.496	19072	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(272)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B2(001)	~N(298)	1.049	0.007	7.299	18820	0.02986	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(273)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B2(002)	~N(300)	1.049	0.007	7.299	18820	0.02986	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(274)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B2(003)	~N(301)	1.049	0.007	7.291	18810	0.02987	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(275)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B2(004)	~N(302)	1.049	0.007	7.291	18810	0.02987	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(276)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B2(005)	~N(303)	1.049	0.007	7.284	18800	0.02987	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(277)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B2(006)	~N(304)	1.049	0.007	7.284	18800	0.02987	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(278)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B2(007)	~N(305)	1.049	0.008	7.277	18791	0.02987	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(279)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B2(008)	~N(306)	1.049	0.006	7.277	18791	0.02987	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(280)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B2(009)	~N(307)	1.049	0.007	7.27	18782	0.02987	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(281)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B2(010)	~N(308)	1.049	0.007	7.27	18782	0.02987	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(282)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B2(011)	~N(310)	1.049	0.007	7.263	18773	0.02988	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(283)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B2(012)	~N(309)	1.049	0.007	7.263	18773	0.02988	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(284)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B2(013)	~N(311)	1.049	0.007	7.257	18765	0.02988	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(285)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B2(014)	~N(312)	1.049	0.007	7.257	18765	0.02988	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(286)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B2(015)	~N(314)	1.049	0.007	7.251	18758	0.02988	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(287)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B2(016)	~N(313)	1.049	0.007	7.251	18758	0.02988	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(288)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B2(017)	~N(316)	1.049	0.006	7.246	18750	0.02988	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(289)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B2(018)	~N(317)	1.049	0.006	7.246	18750	0.02988	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(290)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B2(019)	~N(315)	1.049	0.007	7.24	18744	0.02988	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(291)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B2(020)	~N(318)	1.049	0.007	7.24	18744	0.02988	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(292)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B2(021)	~N(320)	1.049	0.007	7.235	18737	0.02989	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(293)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B2(022)	~N(319)	1.049	0.007	7.235	18737	0.02989	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(294)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B2(023)	~N(321)	1.049	0.007	7.23	18731	0.02989	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(295)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B2(024)	~N(322)	1.049	0.007	7.23	18731	0.02989	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(296)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B2(025)	~N(323)	1.049	0.008	7.226	18725	0.02989	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(297)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B2(026)	~N(324)	1.049	0.006	7.226	18725	0.02989	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(298)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B2(027)	~N(325)	1.049	0.007	7.221	18719	0.02989	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(299)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B2(028)	~N(326)	1.049	0.007	7.221	18719	0.02989	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(300)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B2(029)	~N(327)	1.049	0.007	7.217	18714	0.02989	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(301)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B2(030)	~N(328)	1.049	0.007	7.217	18714	0.02989	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(302)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B2(031)	~N(329)	1.049	0.006	7.214	18709	0.02989	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(303)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B2(032)	~N(330)	1.049	0.006	7.214	18709	0.02989	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(304)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B2(033)	~N(331)	1.049	0.007	7.21	18704	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(305)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B2(034)	~N(332)	1.049	0.007	7.21	18704	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(306)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B2(035)	~N(333)	1.049	0.006	7.207	18700	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(307)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B2(036)	~N(334)	1.049	0.006	7.207	18700	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(308)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B2(037)	~N(335)	1.049	0.006	7.204	18696	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(309)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B2(038)	~N(336)	1.049	0.006	7.204	18696	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(310)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B2(039)	~N(337)	1.049	0.006	7.201	18692	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(311)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B2(040)	~N(338)	1.049	0.006	7.201	18692	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(312)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B2(041)	~N(339)	1.049	0.006	7.198	18689	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(313)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B2(042)	~N(340)	1.049	0.006	7.198	18689	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(314)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B2(043)	~N(341)	1.049	0.007	7.196	18685	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(315)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B2(044)	~N(342)	1.049	0.007	7.195	18685	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(316)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B2(045)	~N(343)	1.049	0.007	7.193	18682	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(317)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B2(046)	~N(344)	1.049	0.007	7.193	18682	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(318)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B2(047)	~N(345)	1.049	0.006	7.191	18679	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(319)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B2(048)	~N(346)	1.049	0.007	7.191	18679	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(320)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B2(049)	~N(347)	1.049	0.006	7.189	18677	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(321)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B2(050)	~N(348)	1.049	0.006	7.189	18677	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(322)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B2(051)	~N(349)	1.049	0.007	7.187	18675	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(323)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B2(052)	~N(350)	1.049	0.007	7.187	18675	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(324)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B2(053)	~N(351)	1.049	0.007	7.185	18672	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(325)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B2(054)	~N(352)	1.049	0.007	7.185	18672	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(326)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B2(055)	~N(353)	1.049	0.006	7.184	18670	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(327)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B2(056)	~N(354)	1.049	0.006	7.184	18670	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(328)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B2(057)	~N(355)	1.049	0.006	7.183	18669	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(329)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B2(058)	~N(356)	1.049	0.006	7.183	18669	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(330)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B2(059)	~N(357)	1.049	0.007	7.181	18667	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(331)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B2(060)	~N(358)	1.049	0.007	7.181	18667	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(332)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B2(061)	~N(359)	1.049	0.007	7.18	18666	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(333)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B2(062)	~N(360)	1.049	0.007	7.18	18666	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(334)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B2(063)	~N(361)	1.049	0.007	7.179	18665	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(335)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	B2(064)	~N(362)	1.049	0.007	7.179	18665	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1

Pipe(336)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<—>	4.226	1.57	1.16	7.185	N	B2(065)
Pipe(337)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<—>	4.226	1.57	1.16	7.185	N	B2(066)
Pipe(338)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<—>	4.226	1.57	1.16	7.184	N	B2(067)
Pipe(339)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<—>	4.226	1.57	1.16	7.184	N	B2(068)
Pipe(340)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<—>	4.226	1.57	1.159	7.184	N	B2(069)
Pipe(341)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<—>	4.225	1.57	1.159	7.184	N	B2(070)
Pipe(342)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<—>	4.226	1.57	1.159	7.183	N	B2(071)
Pipe(343)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<—>	4.226	1.57	1.159	7.183	N	B2(072)
Pipe(344)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<—>	4.225	1.57	1.159	7.183	N	B2(073)
Pipe(345)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<—>	4.226	1.57	1.159	7.183	N	B2(074)
Pipe(346)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<—>	4.225	1.57	1.159	7.182	N	B2(075)
Pipe(347)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<—>	4.225	1.57	1.159	7.182	N	B2(076)
Pipe(348)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<—>	4.225	1.57	1.159	7.182	N	B2(077)
Pipe(349)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<—>	4.225	1.57	1.159	7.182	N	B2(078)
Pipe(350)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<—>	4.225	1.57	1.159	7.182	N	B2(079)
Pipe(351)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<—>	4.225	1.57	1.159	7.182	N	B2(080)
Pipe(352)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<—>	4.225	1.57	1.158	7.182	N	B2(081)
Pipe(353)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<—>	4.225	1.57	1.159	7.182	N	B2(082)
Pipe(354)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<—>	4.225	1.57	1.159	7.182	N	B2(083)
Pipe(355)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<—>	4.225	1.57	1.159	7.182	N	B2(084)
Pipe(356)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<—>	4.225	1.57	1.158	7.182	N	B2(085)
Pipe(357)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<—>	4.225	1.57	1.158	7.182	N	B2(086)
Pipe(358)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<—>	4.225	1.57	1.158	7.182	N	B2(087)
Pipe(359)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<—>	4.225	1.57	1.158	7.182	N	B2(088)
Pipe(360)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<—>	4.225	1.57	1.159	7.182	N	B2(089)
Pipe(361)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<—>	4.225	1.57	1.158	7.182	N	B2(090)
Pipe(362)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.39	2.003	5.049	11.68	N	→N(391)
[illegible]												
Pipe(408)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.371	1.996	5.013	11.61	N	→N(437)
Pipe(409)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.371	1.996	5.013	11.61	N	→N(438)
Pipe(410)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.371	1.995	5.013	11.6	N	→N(439)
Pipe(411)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.371	1.995	5.013	11.6	N	→N(440)
Pipe(412)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.37	1.995	5.012	11.6	N	→N(441)
Pipe(413)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.37	1.995	5.012	11.6	N	→N(442)
Pipe(414)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.37	1.995	5.011	11.6	N	→N(443)
Pipe(415)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.37	1.995	5.011	11.6	N	→N(444)
Pipe(416)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.369	1.995	5.01	11.6	N	→N(445)
Pipe(417)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.369	1.995	5.01	11.6	N	→N(446)
Pipe(418)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.369	1.995	5.01	11.6	N	→N(447)
Pipe(419)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.369	1.995	5.01	11.6	N	→N(448)
Pipe(420)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.369	1.995	5.009	11.59	N	→N(449)
Pipe(421)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.369	1.995	5.009	11.59	N	→N(450)
Pipe(422)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.368	1.995	5.009	11.59	N	→N(451)
Pipe(423)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.368	1.995	5.009	11.59	N	→N(452)
Pipe(424)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.368	1.994	5.008	11.59	N	→N(453)
Pipe(425)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.368	1.994	5.008	11.59	N	→N(454)
Pipe(426)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.368	1.994	5.007	11.59	N	→N(455)
Pipe(427)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.368	1.994	5.007	11.59	N	→N(456)
Pipe(428)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.368	1.994	5.007	11.59	N	→N(457)
Pipe(429)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.368	1.994	5.007	11.59	N	→N(458)
Pipe(430)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.367	1.994	5.007	11.59	N	→N(459)
Pipe(431)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.367	1.994	5.007	11.59	N	→N(460)
Pipe(432)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.367	1.994	5.006	11.59	N	→N(461)
Pipe(433)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.367	1.994	5.006	11.59	N	→N(462)
Pipe(434)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.367	1.994	5.006	11.59	N	→N(463)
Pipe(435)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.367	1.994	5.006	11.59	N	→N(464)
Pipe(436)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.367	1.994	5.006	11.59	N	→N(465)
Pipe(437)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.367	1.994	5.006	11.59	N	→N(466)
Pipe(438)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.367	1.994	5.006	11.59	N	→N(467)
Pipe(439)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.367	1.994	5.005	11.59	N	→N(468)
Pipe(440)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.367	1.994	5.005	11.59	N	→N(469)
Pipe(441)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.367	1.994	5.005	11.59	N	→N(470)
Pipe(442)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.005	11.58	N	→N(471)
Pipe(443)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.005	11.58	N	→N(472)
Pipe(444)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.005	11.58	N	→N(473)
Pipe(445)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.005	11.58	N	→N(474)
Pipe(446)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.004	11.58	N	→N(475)
Pipe(447)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.004	11.58	N	→N(476)
Pipe(448)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.004	11.58	N	→N(477)
Pipe(449)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.004	11.58	N	→N(478)
Pipe(450)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.004	11.58	N	→N(479)
Pipe(451)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.004	11.58	N	→N(480)
Pipe(452)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.004	11.58	N	→N(481)
Pipe(453)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.004	11.58	N	→N(482)
Pipe(454)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.004	11.58	N	→N(483)
Pipe(455)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.004	11.58	N	→N(484)
Pipe(456)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.004	11.58	N	→N(485)
Pipe(457)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.004	11.58	N	→N(486)
Pipe(458)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.004	11.58	N	→N(487)
Pipe(459)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.004	11.58	N	→N(488)
Pipe(460)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.004	11.58	N	→N(489)
Pipe(461)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.004	11.58	N	→N(490)
Pipe(462)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.004	11.58	N	→N(491)
Pipe(463)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.004	11.58	N	→N(492)
Pipe(464)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.004	11.58	N	→N(493)
Pipe(465)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.004	11.58	N	→N(494)
Pipe(466)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.003	11.58	N	→N(495)
Pipe(467)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.003	11.58	N	→N(496)
Pipe(468)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.003	11.58	N	→N(497)
Pipe(469)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.003	11.58	N	→N(498)
Pipe(470)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.003	11.58	N	→N(499)
Pipe(471)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.003	11.58	N	→N(500)
Pipe(472)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.003	11.58	N	→N(501)
Pipe(473)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.003	11.58	N	→N(502)
Pipe(474)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.863	1.435	2.42	6.002	N	→N(113)
RC04AA	Steel Sch 140 (clean)	Water After RHR HX	12	10.3	0.318	XXX	—	—	—	—	N	→N(546)
RC04AA/RH01AA	Steel Sch 140 (clean)	Water After RHR HX	12	149.6	2.723	XXX	—	—	—	—	N	→N(546)
RC04AB	Steel Sch 140 (clean)	Water After RHR HX	12	9.7	1.118	XXX	—	—	—	—	N	→N(542)
RC04AB/RH01AB	Steel Sch 140 (clean)	Water After RHR HX	12	148.4	3.227	XXX	—	—	—	—	N	→N(542)
RC05AA	Steel Sch 160 (clean)	Water After RHR HX	6	7	2.841		0	0	-1.298	0	N	→N(610)
RC05AB	Steel Sch 160 (clean)	Water After RHR HX	6	12.8	3.656		0	0	1.08	0	N	→N(541)
RC35AA	Steel Sch 160 (clean)	Water After RHR HX	6	7.6	4.066		0	0	0.807	0	N	→N(545)
RC35AB	Steel Sch 160 (clean)	Water After RHR HX	6	7	2.841		0	0	-1.298	0	N	→N(603)
RC45AA	Steel Sch 160 (clean)	Water After RHR HX	3	0.6	3.805		140.6	8.36	1.808	4.184	N	→N(656)
RC45AB	Steel Sch 160 (clean)	Water After RHR HX	3	0.6	3.805		140.4	8.334	1.796	4.158	N	→N(660)
RC45AC	Steel Sch 160 (clean)	Water After RHR HX	3	0.6	3.805		139.2	8.268	1.768	4.092	N	→N(652)
RC45AD	Steel Sch 160 (clean)	Water After RHR HX	3	0.6	3.805		139.1	8.261	1.765	4.086	N	→N(661)
RH01BA(001)	Steel Sch 40S (clean)	Containment Sump Water	12	81	1.439		0	0	-12.57	0	N	→N(548)
RH01BA(002)	Steel Sch 40S (clean)	Containment Sump Water	12	1.8	1.00E-05		6202	17.61	0.051	0.117	N	→N(549)
RH01BB(001)	Steel Sch 40S (clean)	Containment Sump Water	12	76.5	1.077		0	0	-12.66	0	N	→N(551)
RH01BB(002)	Steel Sch 40S (clean)	Containment Sump Water	12	4.5	0.0704		6440	18.28	0.294	0.681	N	→N(552)
RH01BB(003)	Steel Sch 40 (clean)	Containment Sump Water	16	1	0.335		6440	11.7	0.317	0.734	N	→N(553)
RH01CA(001)	Steel Sch 40 (clean)	Containment Sump Water	16	6.4	8.123	<—>	3977	7.226	5.113	6.636	N	→N(004)
RH01CA(002)	Steel Sch 40 (clean)	Containment Sump Water	16	16.2	25.07		2225	4.042	0.346	6.402	N	→N(004)
RH01CA(003)	Steel Sch 40 (clean)	Containment Sump Water	16	13.2	0.1736		2225	4.042	0.035	0.082	N	→N(512)
RH01CA(004)	Steel Sch 40 (clean)	Containment Sump Water	14	6.8	0.1907	<—>	2225	5.28	0.787	0.121	N	→N(535)
RH01CB(001)	Steel Sch 40 (clean)	Containment Sump Water	16	6.3	2.723	<—>	4227	7.681	3.263	2.564	N	→N(235)
RH01CB(002)	Steel Sch 40 (clean)	Containment Sump Water	16	19.1	7.647		2213	4.02	-1.867	1.972	N	→N(235)
RH01CB(003)	Steel Sch 40 (clean)	Containment Sump Water	16	9.1	0		2213	4.02	0.011	0.026	N	→N(524)
RH01CB(004)	Steel Sch 40 (clean)	Containment Sump Water	14	5.4	0.1907		2213	5.252	0.783	0.112	N	→N(536)
RH02AA(001)	Steel Sch 40 (clean)	Containment Sump Water	8	67.2	6.15		2225	14.28	17.81	21.03	N	Residual Heat Removal Pump A
RH02AA(002)	Steel Sch 40 (clean)	Containment Sump Water	8	27.2	0.8694		2225	14.28	-1.265	4.671	N	→N(513)
RH02AA(003)	Steel Sch 40 (clean)	Containment Sump Water	14	1	1.466		2225	5.28	0.276	0.639	N	→N(514)
RH02AB(001)	Steel Sch 40 (clean)	Containment Sump Water	8	126.8	6.02		2213	14.2	20.78	27.7	N	Residual Heat Removal Pump B
RH02AB(002)	Steel Sch 40 (clean)	Containment Sump Water	8	25.8	0.8694		2213	14.2	-1.379	4.509	N	→N(525)
RH02AB(003)	Steel Sch 40 (clean)	Containment Sump Water	14	1	1.465		2213	5.252	0.273	0.632	N	→N(526)
RH03AA(001)	Steel Sch 40 (clean)	Water After RHR HX	14	1	0.7153		2225	5.28	0.136	0.315	N	Residual HX A
RH03AA(002)	Steel Sch 40 (clean)	Water After RHR HX	8	22.4	0.8694		2225	14.28	4.291	4.332	N	→N(515)
RH03AA(003)	Steel Sch 40 (clean)	Water After RHR HX	8	8.1	3.846		2225	14.28	6.365	12.73	N	→N(516)
RH03AA(004)	Steel Sch 40 (clean)	Water After RHR HX	8	64.8	2.781		2225	14.28	9.097	13.36	N	→N(517)
RH03AA(005)	Steel Sch 40 (clean)	Water After RHR HX	8	11.3	1.397		2225	14.28	2.253	5.216	N	→N(518)
RH03AA(006)	Steel Sch 40 (clean)	Water After RHR HX	8	9.5	11000		18.67	0.12	1.059	2.452	N	→N(520)
RH03AA(007)	Steel Sch 40 (clean)	Water After RHR HX	8	1	0.1909		18.67	0.12	0	0	N	→N(521)
RH03AA(008)	Steel Sch 40S (clean)	Water After RHR HX	12	1.1	2.00E-06		18.67	0.053	0	0	N	→N(522)
RH03AB(001)	Steel Sch 40 (clean)	Water After RHR HX	14	1	0.7153		2213	5.252	0.135	0.312	N	Residual HX B
RH03AB(002)	Steel Sch 40 (clean)	Water After RHR HX	8	22.9	0.8694		2213	14.2	5.15	4.321	N	→N(527)
RH03AB(003)	Steel Sch 40 (clean)	Water After RHR HX	8	7	3.452		2213	14.2	4.726	10.94	N	→N(528)

RH03AB(004)	Steel Sch 40 (clean)	Water After RHR HX	8	28.9	2.472		2215
RH03AB(005)	Steel Sch 40 (clean)	Water After RHR HX	8	86.3	14000		18.67
RH03AB(006)	Steel Sch 40S (clean)	Water After RHR HX	12	1.5	1.00E-05		18.67
RH09AA(001)	Steel Sch 40 (clean)	Containment Sump Water	8	1	1.00E-05	XXX	—
RH09AA(002)	Steel Sch 40 (clean)	Containment Sump Water	8	1	1.00E-05	XXX	—
RH09AB(001)	Steel Sch 40 (clean)	Containment Sump Water	8	1	1.00E-05	XXX	—
RH09AB(002)	Steel Sch 40 (clean)	Containment Sump Water	8	1	1.00E-05	XXX	—
RH10AA(001)	Steel Sch 40 (clean)	Water After RHR HX	3	1	1.00E-05	XXX	—
RH10AA(002)	Steel Sch 40 (clean)	Water After RHR HX	3	1	1.00E-05		0
RH10AB(001)	Steel Sch 40 (clean)	Water After RHR HX	3	1	1.00E-05	XXX	—
RH10AB(002)	Steel Sch 40 (clean)	Water After RHR HX	3	1	1.00E-05		0
RH12A/CV99A	Steel Sch 40 (clean)	Water After RHR HX	8	28.6	6.573	XXX	—
RH14A	Steel Sch 40 (clean)	Water After RHR HX	8	4.4	1.979	XXX	—
SI01A	Steel Sch 40 (clean)	Water After RHR HX	8	28.4	0.9844		0
SI01B(001)	Steel Sch 20 (clean)	Water After RHR HX	24	113.2	0.3195		13862
SI01B(002)	Steel Sch 20 (clean)	Water After RHR HX	24	68	0.3195		13281
SI01B(003)	Steel Sch 20 (clean)	Water After RHR HX	24	4.6	0.4		6841
SI01B(004)	Steel Sch 20 (clean)	Water After RHR HX	24	60.3	0.4524		6841
SI01B(005)	Steel Sch 20 (clean)	Water After RHR HX	24	7	2.00E-05		6841
SI01B(006)	Steel Sch 20 (clean)	Water After RHR HX	24	2	37.6		639.5
SI01B(007)	Steel Sch 20 (clean)	Water After RHR HX	24	1	29.43		639.5
SI02A/SIF9A	Steel Sch 40 (clean)	Water After RHR HX	8	28.3	9.058		681

[illegible]

BI82AB/BB	Steel Sch 40 (clean)	Water After RHR HX	12	57.1	4.915	6440	18.47	-1.281	30.13	N	~N(504)	~N(552)	11.938	4.11	26.02	2.50E+06	0.01365	3 x Pipe Bend - r/d 1.5 (90°)	0.1815	1 x BI8958B(Check Valve)	1.8	1 x BI8812B(Gate Valve)	0.17	1 x Diverging Tee (Branch)	1.3	1 x Converging Tee (Branch)	1.1
BIA4A	Steel Sch.160 (clean)	Water After RHR HX	8	15.1	1.847	0	0	2.892	0	N	~N(537)	~N(544)	6.813	0	0	0	0	2 x Pipe Bend - r/d 1.5 (90°)	0.2035	1 x BI8841A (Check Valve)	0.64	1 x Diverging Tee (Branch)	1.90E-05	1 x Converging Tee (Through)	0.6		
BIA4B	Steel Sch 160 (clean)	Water After RHR HX	8	85.1	2.11	0	0	-0.258	0	N	~N(544)	~N(545)	6.813	0	0	0	0	9 x Pipe Bend - r/d 1.5 (90°)	0.2035	1 x Pipe Bend - r/d 1.5 (45°)	0.144	1 x Reducer - Contraction (8 x 8 - 6)	0.1344				

Node List	Status	Pressure	Grade	Elev
~N(001)		121.6	675.5	428
~N(001A)		58.42	675.6	574.3
~N(002)		29.97	390.5	356.1
~N(003)		32.91	390.5	348.3
~N(004)		35.09	397.1	349.9
~N(005)		157.8	675.5	344.3
~N(006)		157.8	675.5	344.3
~N(007)		156.1	675.5	348.3
~N(008)		151	675.5	360
~N(009)		136	675.5	394.8
~N(010)		52.85	675.5	587.2
~N(011)		50.19	675.6	593.5
~N(012)		50.2	675.7	593.5
~N(013)		50.2	675.7	593.5
~N(014)		50.2	675.7	593.5
~N(015)		50.21	675.7	593.5
~N(016)		50.22	675.7	593.5
~N(017)		50.22	675.7	593.5
~N(018)		50.23	675.7	593.5
~N(019)		50.23	675.7	593.5
~N(020)		50.24	675.8	593.5
~N(021)		50.24	675.8	593.5
~N(022)		50.25	675.8	593.5
~N(023)		50.24	675.8	593.5
~N(024)		50.24	675.8	593.5
~N(025)		50.25	675.8	593.5
~N(026)		50.25	675.8	593.5
~N(027)		50.25	675.8	593.5
~N(028)		50.25	675.8	593.5
~N(029)		50.25	675.8	593.5
~N(030)		50.25	675.8	593.5
~N(031)		50.25	675.8	593.5
~N(032)		50.25	675.8	593.5
~N(033)		50.2	675.7	593.5
~N(034)		50.21	675.7	593.5
~N(035)		50.22	675.7	593.5
~N(036)		50.23	675.7	593.5
~N(037)		50.23	675.7	593.5
~N(038)		50.22	675.7	593.5
~N(039)		50.24	675.8	593.5
~N(040)		50.25	675.8	593.5
~N(041)		50.25	675.8	593.5
~N(042)		50.24	675.8	593.5
~N(043)		50.24	675.8	593.5
~N(044)		50.24	675.8	593.5
~N(045)		50.25	675.8	593.5
~N(046)		50.25	675.8	593.5
~N(047)		50.25	675.8	593.5
~N(048)		50.25	675.8	593.5
~N(049)		50.25	675.8	593.5
~N(050)		50.25	675.8	593.5
~N(051)		52.18	675.7	589
~N(052)		[illegible]	[illegible]	[illegible]
~N(053)		[illegible]	[illegible]	[illegible]
~N(054)		[illegible]	[illegible]	[illegible]
~N(055)		[illegible]	[illegible]	[illegible]
~N(056)		[illegible]	[illegible]	[illegible]
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~N(059)		[illegible]	[illegible]	[illegible]
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~N(067)		[illegible]	[illegible]	[illegible]
~N(068)		[illegible]	[illegible]	[illegible]
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~N(075)		[illegible]	[illegible]	[illegible]
~N(076)		[illegible]	[illegible]	[illegible]
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~N(078)		[illegible]	[illegible]	[illegible]
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~N(080)		[illegible]	[illegible]	[illegible]
~N(081)		[illegible]	[illegible]	[illegible]
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~N(084)		[illegible]	[illegible]	[illegible]
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~N(086)		[illegible]	[illegible]	[illegible]
~N(087)		[illegible]	[illegible]	[illegible]
~N(088)		[illegible]	[illegible]	[illegible]
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~N(094)		[illegible]	[illegible]	[illegible]
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-N(176)	57.4	674.6	575.8
-N(177)	57.4	674.6	575.8
-N(178)	57.4	674.6	575.8
-N(179)	57.4	674.6	575.8
-N(180)	57.4	674.6	575.8
-N(181)	57.4	674.6	575.8
-N(182)	57.4	674.6	575.8
-N(183)	57.4	674.6	575.8
-N(184)	57.4	674.6	575.8
-N(185)	57.4	674.6	575.8
-N(186)	57.4	674.6	575.8
-N(187)	57.4	674.6	575.8
-N(188)	57.4	674.6	575.8
-N(189)	57.4	674.6	575.8
-N(190)	57.4	674.6	575.8
-N(191)	57.4	674.6	575.8
-N(192)	57.4	674.6	575.8
-N(193)	57.4	674.6	575.8
-N(194)	57.4	674.6	575.8
-N(195)	57.4	674.6	575.8
-N(196)	57.4	674.6	575.8
-N(197)	57.4	674.6	575.8
-N(198)	57.4	674.6	575.8
-N(199)	57.4	674.6	575.8
-N(200)	57.4	674.6	575.8
-N(201)	57.4	674.6	575.8
-N(202)	57.4	674.6	575.8
-N(203)	57.42	674.7	575.8
-N(204)	57.42	674.7	575.8
-N(205)	57.42	674.7	575.8
-N(206)	57.42	674.7	575.8
-N(207)	57.41	674.7	575.8
-N(208)	57.41	674.7	575.8
-N(209)	57.41	674.7	575.8
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-N(211)	57.41	674.7	575.8
-N(212)	57.41	674.7	575.8
-N(213)	57.41	674.7	575.8
-N(214)	57.41	674.7	575.8
-N(215)	57.41	674.7	575.8
-N(216)	57.41	674.7	575.8
-N(217)	57.41	674.7	575.8
-N(218)	57.41	674.7	575.8
-N(219)	57.4	674.6	575.8
-N(220)	57.4	674.6	575.8
-N(221)	57.4	674.6	575.8
-N(222)	57.4	674.6	575.8
-N(223)	57.4	674.6	575.8
-N(224)	57.4	674.6	575.8
-N(225)	57.4	674.6	575.8
-N(226)	57.4	674.6	575.8
-N(227)	57.4	674.7	575.8
-N(228)	57.4	674.7	575.8
-N(229)	57.4	674.6	575.8
-N(230)	57.4	674.6	575.8
-N(231)	57.41	674.7	575.8
-N(232)	57.41	674.7	575.8
-N(234)	30.01	390.3	354.9
-N(235)	33.27	392.9	349.0
-N(236)	34.54	390.3	344.4
-N(237)	157.3	674.5	344.4
-N(238)	157.3	674.5	344.4
-N(239)	156.5	674.5	346.3
-N(240)	156.3	674.5	346.8
-N(241)	141.4	674.5	381.3
-N(242)	121.2	674.5	428
-N(243)	62.01	674.5	565
-N(244)	64.47	674.6	582.5
-N(245)	60.5	674.7	591.8
-N(246)	60.54	674.8	591.8
-N(247)	60.54	674.8	591.8
-N(248)	60.22	674	591.8
-N(249)	60.54	674.8	591.8
-N(250)	60.54	674.8	591.8
-N(251)	60.54	674.8	591.8
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-N(259)	60.54	674.8	591.8
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-N(261)	60.55	674.8	591.8
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-N(263)	60.55	674.8	591.8
-N(264)	60.55	674.8	591.8
-N(265)	60.56	674.8	591.8
-N(266)	60.55	674.8	591.8
-N(267)	60.55	674.8	591.8
-N(268)	60.55	674.8	591.8
-N(269)	60.55	674.8	591.8
-N(270)	60.55	674.8	591.8
-N(271)	60.56	674.8	591.8
-N(272)	60.55	674.8	591.8
-N(273)	60.55	674.8	591.8
-N(274)	60.56	674.8	591.8
-N(275)	60.56	674.8	591.8
-N(276)	60.55	674.8	591.8
-N(277)	60.56	674.8	591.8
-N(278)	60.55	674.8	591.8
-N(279)	60.56	674.8	591.8
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-N(281)	60.55	674.8	591.8
-N(282)	60.55	674.8	591.8
-N(283)	60.55	674.8	591.8
-N(284)	60.55	674.8	591.8
-N(285)	60.55	674.8	591.8
-N(286)	60.56	674.8	591.8
-N(287)	60.55	674.8	591.8
-N(288)	60.55	674.8	591.8
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-N(290)	60.55	674.8	591.8
-N(291)	60.56	674.8	591.8
-N(292)	60.56	674.8	591.8
-N(293)	60.55	674.8	591.8
-N(294)	60.55	674.8	591.8
-N(295)	60.56	674.8	591.8
-N(296)	60.55	674.8	591.8
-N(297)	53.79	675	584.5
-N(298)	53.79	675	584.5
-N(300)	53.79	675	584.5
-N(301)	53.79	675	584.5
-N(302)	53.79	675	584.5
-N(303)	53.79	675	584.5
-N(304)	53.79	675	584.5
-N(305)	53.8	675	584.5
-N(306)	53.8	675	584.5
-N(307)	53.8	675	584.5
-N(308)	53.8	675	584.5
-N(309)	53.8	675	584.5
-N(310)	53.8	675	584.5
-N(311)	53.81	675	584.5
-N(312)	53.81	675	584.5
-N(313)	53.81	675	584.5
-N(314)	53.81	675	584.5
-N(315)	53.81	675	584.5
-N(316)	53.81	675	584.5
-N(317)	53.81	675	584.5
-N(318)	53.81	675	584.5
-N(319)	53.82	675	584.5
-N(320)	53.82	675	584.5
-N(321)	53.82	675	584.5
-N(322)	53.82	675	584.5
-N(323)	53.82	675.1	584.5
-N(324)	53.82	675.1	584.5
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-N(326)	53.82	675.1	584.5
-N(327)	53.82	675.1	584.5
-N(328)	53.82	675.1	584.5
-N(329)	53.82	675.1	584.5
-N(330)	53.82	675.1	584.5
-N(331)	53.83	675.1	584.5
-N(332)	53.83	675.1	584.5
-N(333)	53.83	675.1	584.5
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-N(335)	53.83	675.1	584.5
-N(336)	53.83	675.1	584.5
-N(337)	53.83	675.1	584.5
-N(338)	53.83	675.1	584.5
-N(339)	53.83	675.1	584.5
-N(340)	53.83	675.1	584.5
-N(341)	53.83	675.1	584.5
-N(342)	53.83	675.1	584.5
-N(343)	53.83	675.1	584.5
-N(344)	53.83	675.1	584.5
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-N(350)	53.84	675.1	584.5
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-N(356)	53.84	675.1	584.5

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~N(380)	53.84	675.1	584.5
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~N(504)	32.8	424.4	383
~N(505)	32.52	424.3	383
~N(506)	32.37	423.9	383
~N(507)	32.36	423.9	383
~N(508)	32.26	423.8	383
~N(509)	32.3	423.8	383
~N(512)	34.74	390.7	344.3
~N(513)	185.4	762.4	367.3
~N(514)	186.6	757.7	358.7
~N(515)	177	735.5	359.7
~N(516)	172.7	731.1	365.3
~N(517)	166.4	718.4	367.3
~N(518)	157.3	705.1	375
~N(519)	155	699.8	375
~N(520)	156.1	702.3	375
~N(521)	156.1	702.3	375
~N(522)	156.1	702.3	375
~N(524)	34.84	390.9	344.3
~N(525)	182.9	756.9	367.5
~N(526)	184.3	752.4	369.8
~N(527)	174.8	730.4	359.8
~N(528)	169.7	726.1	367.4
~N(529)	164.9	715.2	367.4
~N(530)	157.4	706.4	375
~N(531)	156.1	702.3	375
~N(535)	34.7	390.6	344.3
~N(536)	34.83	390.9	344.3
~N(537)	154.4	702.3	379
~N(538)	35.78	423.8	375
~N(539)	154.4	702.3	379
~N(540)	154.4	702.3	379
~N(541)	152	702.3	384.5
~N(542)	150.9	702.3	387
~N(544)	151.8	702.3	385
~N(545)	152	702.3	384.4

~N(546)		151.1	702.3	386.5
~N(548)		22.56	387.2	379
~N(549)		35.14	387.2	349.9
~N(551)		21.22	394.3	379.2
~N(552)		33.88	394.3	349.9
~N(553)		33.59	393.6	349.9
~N(558)	Isolated	—	—	367.3
~N(559)		34.74	390.7	344.3
~N(560)	Isolated	—	—	367.4
~N(561)		24.88	390.9	367.4
~N(564)		142.9	686.2	389.5
~N(565)		123.1	672.3	421.5
~N(566)		116.8	658.4	417.5
~N(569)		139	677.2	389.5
~N(570)		132.4	662	389.5
~N(571)		116.1	626.4	361.7
~N(572)		154.2	687.9	375
~N(573)		142.5	682.9	387
~N(574)		121.5	664.3	417
~N(575)		116.7	653.2	417
~N(576)		117.4	626.1	388.4
~N(577)		140.5	675.8	384.5
~N(578)		117.7	626.4	388
~N(579)		132.7	657.8	384.5
~N(580)		1007	2709	413.1
~N(581)		116.8	626.2	388.8
~N(583)		1007	2709	413.3
~N(588)		1007	2709	413.3
~N(589)		1007	2709	413.3
~N(590)		34.71	422.8	376.3
~N(591)		34.7	422.8	376.3
~N(592)		38.07	420.5	366.4
~N(593)		37.85	420.3	366.5
~N(595)		34.45	422	376.3
~N(596)		38.43	421.3	366.4
~N(598)		34.45	422	376.3
~N(600)		1331	3423	377.5
~N(601)		154.8	702.3	378
~N(602)		154.8	702.3	378
~N(603)		113.7	625.2	396
~N(605)		1334	3432	377.5
~N(606)		154.8	702.3	378
~N(607)		154.8	702.3	378
~N(610)		113.7	625.2	396
~N(613)		1329	3420	377.5
~N(614)		1315	3393	383
~N(615)		1310	3379	380
~N(616)		1265	3360	420.2
~N(618)		34.62	423.6	377.5
~N(619)		39.07	420.5	366.4
~N(621)		36.76	423.6	372.5
~N(622)		36.38	422.7	372.5
~N(624)		37.36	422.9	370.5
~N(625)		36.49	422.9	372.5
~N(626)	Isolated	—	—	368.4
~N(627)		36.18	422.2	372.5
~N(631)		36.49	422.9	372.5
~N(635)		1807	4519	369.6
~N(636)		1803	4511	371.5
~N(638)		1807	4519	369.6
~N(639)		1806	4518	371.5
~N(640)		1804	4513	371.5
~N(642)		1804	4513	371.5
~N(643)		1769	4449	388.3
~N(644)		1758	4432	397.5
~N(645)		1756	4427	396.5
~N(646)		1756	4426	396.5
~N(647)		1714	4329	395
~N(648)		1658	4225	420.1
~N(649)		1709	4307	385
~N(650)		1665	4202	382.4
~N(651)		1124	2949	382.4
~N(652)		116.8	629.3	393
~N(654)		1642	4180	423.2
~N(655)		1091	2914	423.2
~N(656)		116.8	629.4	393
~N(659)		1671	4221	385.6
~N(660)		1134	2977	385.6
~N(661)		116.8	629.3	393
~N(664)		1590	4069	413
~N(665)		1038	2782	413
~N(666)		116.8	629.3	393
~N(667)		1799	4506	378.4
~N(669)		1797	4508	382.9
~N(670)		1798	4508	383.6
~N(671)		1796	4508	386.4
~N(672)		154.4	702.3	379
~N(673)		146.3	691.6	387
~N(674)		144.1	686.8	387
~N(675)		1328	3423	383
~N(676)	Isolated	—	—	379
~N(677)		1319	3401	383
~N(678)		1801	4507	370.6
~N(680)		1038	2781	412.9
~N(682)		260.2	965.4	397
~N(683)		260.2	965.3	397
~N(684)		1075	2868	413
~N(686)		281.8	1031	413
~N(687)		281.4	1030	413
~N(688)		1123	2948	382.4
~N(690)		309.1	1064	382.9
~N(691)		308.1	1064	384.9
~N(692)		1133	2975	385.6
~N(694)		267.3	972.3	387.5
~N(695)		267.2	972	387.5
~N(696)		1234	3238	414.5
~N(697)		868.3	2388	414.5
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Tank List	Surface Pressure	Level	Status	Flow	Pressure	Grade	Elev
Accumulator Tank A	1000	0		0	1000	2709	[illegible]
Accumulator Tank B	1000	0		0	1000	2709	[illegible]
Accumulator Tank C	1000	0		0	1000	2709	[illegible]
Accumulator Tank D	1000	0		0	1000	2709	[illegible]
Cont. Recirc. Sump A	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]
Cont. Recirc. Sump B	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]
Refueling Water Storage Tank	14.7	[illegible]		[illegible]	[illegible]	[illegible]	384

Demand List	Demand Type	Flow	Pressure	Status	Grade	Elev
[illegible]	Flow in	[illegible]	[illegible]		[illegible]	[illegible]
[illegible]	Flow out	[illegible]	[illegible]		[illegible]	[illegible]
[illegible]	Spray	[illegible]	[illegible]		[illegible]	[illegible]

A1{011}	Spray	3.557	55	669.6	576.3
A1{012}	Spray	3.859	55	668.7	575.4
A1{013}	Spray	3.858	55	668.7	575.4
A1{014}	Spray	3.556	55	669.6	576.3
A1{015}	Spray	3.726	55	669.1	575.8
A1{016}	Spray	3.726	55	669.1	575.8
A1{017}	Spray	3.555	55	669.6	576.3
A1{018}	Spray	3.857	55	668.7	575.4
A1{019}	Spray	3.856	55	668.7	575.4
A1{020}	Spray	3.554	55	669.6	576.3
A1{021}	Spray	3.724	55	669.1	575.8
A1{022}	Spray	3.724	55	669.1	575.8
A1{023}	Spray	3.553	55	669.6	576.3
A1{024}	Spray	3.855	55	668.7	575.4
A1{025}	Spray	3.854	55	668.7	575.4
A1{026}	Spray	3.552	55	669.6	576.3
A1{027}	Spray	3.723	55	669.1	575.8
A1{028}	Spray	3.723	55	669.1	575.8
A1{029}	Spray	3.551	55	669.6	576.3
A1{030}	Spray	3.853	55	668.7	575.4
A1{031}	Spray	3.853	55	668.7	575.4
A1{032}	Spray	3.551	55	669.6	576.3
A1{033}	Spray	3.721	55	669.1	575.8
A1{034}	Spray	3.721	55	669.1	575.8
A1{035}	Spray	3.55	55	669.6	576.3
A1{036}	Spray	3.852	55	668.7	575.4
A1{037}	Spray	3.851	55	668.7	575.4
A1{038}	Spray	3.549	55	669.6	576.3
A1{039}	Spray	3.72	55	669.1	575.8
A1{040}	Spray	3.72	55	669.1	575.8
A1{041}	Spray	3.548	55	669.6	576.3
A1{042}	Spray	3.851	55	668.7	575.4
A1{043}	Spray	3.85	55	668.7	575.4
A1{044}	Spray	3.548	55	669.6	576.3
A1{045}	Spray	3.718	55	669.1	575.8
A1{046}	Spray	3.718	55	669.1	575.8
A1{047}	Spray	3.547	55	669.6	576.3
A1{048}	Spray	3.85	55	668.7	575.4
A1{049}	Spray	3.849	55	668.7	575.4
A1{050}	Spray	3.547	55	669.6	576.3
A1{051}	Spray	3.717	55	669.1	575.8
A1{052}	Spray	3.717	55	669.1	575.8
A1{053}	Spray	3.546	55	669.6	576.3
A1{054}	Spray	3.849	55	668.7	575.4
A1{055}	Spray	[illegible]	55	[illegible]	[illegible]
A1{056}	Spray	[illegible]	55	[illegible]	[illegible]
A1{057}	Spray	[illegible]	55	[illegible]	[illegible]
A1{058}	Spray	[illegible]	55	[illegible]	[illegible]
A1{059}	Spray	[illegible]	55	[illegible]	[illegible]
A1{060}	Spray	[illegible]	55	[illegible]	[illegible]
A1{061}	Spray	[illegible]	55	[illegible]	[illegible]
A1{062}	Spray	[illegible]	55	[illegible]	[illegible]
A1{063}	Spray	[illegible]	55	[illegible]	[illegible]
A1{064}	Spray	[illegible]	55	[illegible]	[illegible]
A1{065}	Spray	[illegible]	55	[illegible]	[illegible]
A1{066}	Spray	[illegible]	55	[illegible]	[illegible]
A1{067}	Spray	[illegible]	55	[illegible]	[illegible]
A1{068}	Spray	[illegible]	55	[illegible]	[illegible]
A1{069}	Spray	[illegible]	55	[illegible]	[illegible]
A1{070}	Spray	[illegible]	55	[illegible]	[illegible]
A1{071}	Spray	[illegible]	55	[illegible]	[illegible]
A1{072}	Spray	[illegible]	55	[illegible]	[illegible]
A1{073}	Spray	[illegible]	55	[illegible]	[illegible]
A1{074}	Spray	[illegible]	55	[illegible]	[illegible]
A1{075}	Spray	[illegible]	55	[illegible]	[illegible]
A1{076}	Spray	[illegible]	55	[illegible]	[illegible]
A1{077}	Spray	[illegible]	55	[illegible]	[illegible]
A1{078}	Spray	[illegible]	55	[illegible]	[illegible]
A1{079}	Spray	[illegible]	55	[illegible]	[illegible]
A1{080}	Spray	[illegible]	55	[illegible]	[illegible]
A1{081}	Spray	[illegible]	55	[illegible]	[illegible]
A1{082}	Spray	[illegible]	55	[illegible]	[illegible]
A1{083}	Spray	3.543	55	669.6	576.3
A1{084}	Spray	3.846	55	668.7	575.4
A1{085}	Spray	3.845	55	668.7	575.4
A1{086}	Spray	3.543	55	669.6	576.3
A1{087}	Spray	3.714	55	669.1	575.8
A1{088}	Spray	3.714	55	669.1	575.8
A1{089}	Spray	3.543	55	669.6	576.3
A1{090}	Spray	3.846	55	668.7	575.4
A1{091}	Spray	3.845	55	668.7	575.4
A1{092}	Spray	3.543	55	669.6	576.3
A1{093}	Spray	3.714	55	669.1	575.8
A1{094}	Spray	3.714	55	669.1	575.8
A1{095}	Spray	3.542	55	669.6	576.3
A1{096}	Spray	3.845	55	668.7	575.4
A1{097}	Spray	3.845	55	668.7	575.4
A1{098}	Spray	3.542	55	669.6	576.3
A1{099}	Spray	3.714	55	669.1	575.8
A1{100}	Spray	3.714	55	669.1	575.8
A1{101}	Spray	3.542	55	669.6	576.3
A1{102}	Spray	3.845	55	668.7	575.4
A1{103}	Spray	3.845	55	668.7	575.4
A1{104}	Spray	3.542	55	669.6	576.3
A1{105}	Spray	3.714	55	669.1	575.8
A1{106}	Spray	3.714	55	669.1	575.8
A1{107}	Spray	3.542	55	669.6	576.3
A1{108}	Spray	3.845	55	668.7	575.4
A1{109}	Spray	3.845	55	668.7	575.4
A1{110}	Spray	3.542	55	669.6	576.3
A1{111}	Spray	3.714	55	669.1	575.8
A1{112}	Spray	3.714	55	669.1	575.8
A1{113}	Spray	3.542	55	669.6	576.3
A1{114}	Spray	3.845	55	668.7	575.4
A1{115}	Spray	3.845	55	668.7	575.4
A1{116}	Spray	3.542	55	669.6	576.3
A1{117}	Spray	3.714	55	669.1	575.8
A1{118}	Spray	3.714	55	669.1	575.8
A1{119}	Spray	3.542	55	669.6	576.3
A1{120}	Spray	3.845	55	668.7	575.4
A2{001}	Spray	4.19	55	682.8	589.5
A2{002}	Spray	3.922	55	682	588.7
A2{003}	Spray	4.015	55	682.3	589
A2{004}	Spray	4.015	55	682.3	589
A2{005}	Spray	3.92	55	682	588.7
A2{006}	Spray	4.166	55	682.8	589.5
A2{007}	Spray	4.165	55	682.8	589.5
A2{008}	Spray	3.919	55	682	588.7
A2{009}	Spray	4.012	55	682.3	589
A2{010}	Spray	4.012	55	682.3	589
A2{011}	Spray	3.917	55	682	588.7
A2{012}	Spray	4.163	55	682.8	589.5
A2{013}	Spray	4.162	55	682.8	589.5
A2{014}	Spray	3.916	55	682	588.7
A2{015}	Spray	4.01	55	682.3	589
A2{016}	Spray	[illegible]	55	[illegible]	[illegible]
A2{017}	Spray	[illegible]	55	[illegible]	[illegible]
A2{018}	Spray	[illegible]	55	[illegible]	[illegible]
A2{019}	Spray	[illegible]	55	[illegible]	[illegible]
A2{020}	Spray	[illegible]	55	[illegible]	[illegible]
A2{021}	Spray	[illegible]	55	[illegible]	[illegible]
A2{022}	Spray	[illegible]	55	[illegible]	[illegible]
A2{023}	Spray	[illegible]	55	[illegible]	[illegible]
A2{024}	Spray	[illegible]	55	[illegible]	[illegible]
A2{025}	Spray	[illegible]	55	[illegible]	[illegible]
A2{026}	Spray	[illegible]	55	[illegible]	[illegible]
A2{027}	Spray	[illegible]	55	[illegible]	[illegible]
A2{028}	Spray	[illegible]	55	[illegible]	[illegible]
A2{029}	Spray	[illegible]	55	[illegible]	[illegible]
A2{030}	Spray	[illegible]	55	[illegible]	[illegible]
A2{031}	Spray	[illegible]	55	[illegible]	[illegible]
A2{032}	Spray	[illegible]	55	[illegible]	[illegible]
A2{033}	Spray	[illegible]	55	[illegible]	[illegible]
A2{034}	Spray	[illegible]	55	[illegible]	[illegible]
A2{035}	Spray	[illegible]	55	[illegible]	[illegible]
A2{036}	Spray	[illegible]	55	[illegible]	[illegible]
A2{037}	Spray	[illegible]	55	[illegible]	[illegible]
A2{038}	Spray	[illegible]	55	[illegible]	[illegible]
A2{039}	Spray	[illegible]	55	[illegible]	[illegible]
A2{040}	Spray	[illegible]	55	[illegible]	[illegible]
A2{041}	Spray	[illegible]	55	[illegible]	[illegible]
A2{042}	Spray	[illegible]	55	[illegible]	[illegible]
A2{043}	Spray	[illegible]	55	[illegible]	[illegible]
A2{044}	Spray	[illegible]	55	[illegible]	[illegible]
A2{045}	Spray	[illegible]	55	[illegible]	[illegible]
A2{046}	Spray	[illegible]	55	[illegible]	[illegible]
A2{047}	Spray	3.91	55	682	588.7
A2{048}	Spray	4.156	55	682.8	589.5
A2{049}	Spray	4.156	55	682.8	589.5
A2{050}	Spray	3.91	55	682	588.7
A2{051}	Spray	4.004	55	682.3	589
A2{052}	Spray	4.004	55	682.3	589
A2{053}	Spray	3.909	55	682	588.7
A2{054}	Spray	4.156	55	682.8	589.5
A2{055}	Spray	4.156	55	682.8	589.5
A2{056}	Spray	3.909	55	682	588.7
A2{057}	Spray	4.004	55	682.3	589
A2{058}	Spray	4.004	55	682.3	589
A2{059}	Spray	3.908	55	682	588.7
A2{060}	Spray	4.179	55	682.8	589.5
A3{001}	Spray	5.211	55	686.6	593.3
A3{002}	Spray	5.259	55	686.8	593.5
A3{003}	Spray	5.207	55	686.6	593.3
A3{004}	Spray	5.207	55	686.6	593.3
A3{005}	Spray	5.25	55	686.8	593.5
A3{006}	Spray	5.203	55	686.6	593.3
A3{007}	Spray	5.199	55	686.6	593.3
A3{008}	Spray	5.247	55	686.8	593.5
A3{009}	Spray	5.196	55	686.6	593.3
A3{010}	Spray	5.196	55	686.6	593.3
A3{011}	Spray	5.241	55	686.8	593.5

A3(012)	Spray	5.183	55	686.6	593.3
A3(013)	Spray	5.181	55	686.6	593.3
A3(014)	Spray	5.238	55	686.8	593.5
A3(015)	Spray	5.188	55	686.6	593.3
A3(016)	Spray	5.188	55	686.6	593.3
A3(017)	Spray	5.234	55	686.8	593.5
A3(018)	Spray	5.187	55	686.6	593.3
A3(019)	Spray	5.185	55	686.6	593.3
A3(020)	Spray	5.233	55	686.8	593.5
A3(021)	Spray	5.184	55	686.6	593.3
A3(022)	Spray	5.184	55	686.6	593.3
A3(023)	Spray	5.231	55	686.8	593.5
A3(024)	Spray	5.183	55	686.6	593.3
A3(025)	Spray	5.182	55	686.6	593.3
A3(026)	Spray	5.23	55	686.8	593.5
A3(027)	Spray	5.181	55	686.6	593.3
A3(028)	Spray	5.181	55	686.6	593.3
A3(029)	Spray	5.229	55	686.8	593.5
A3(030)	Spray	5.181	55	686.6	593.3
A3(031)	Spray	5.181	55	686.6	593.3
A3(032)	Spray	5.228	55	686.8	593.5
A3(033)	Spray	5.18	55	686.6	593.3
A3(034)	Spray	5.18	55	686.6	593.3
A3(035)	Spray	5.228	55	686.8	593.5
A3(036)	Spray	5.18	55	686.6	593.3
A3(037)	Spray	5.18	55	686.6	593.3
A3(038)	Spray	5.228	55	686.8	593.5
A3(039)	Spray	5.18	55	686.6	593.3
B1(001)	Spray	5.39	55	660.3	567
B1(002)	Spray	5.39	55	660.3	567
B1(003)	Spray	5.389	55	660.3	567
B1(004)	Spray	5.389	55	660.3	567
B1(005)	Spray	5.388	55	660.3	567
B1(006)	Spray	5.388	55	660.3	567
B1(007)	Spray	5.387	55	660.3	567
B1(008)	Spray	5.387	55	660.3	567
B1(009)	Spray	5.385	55	660.3	567
B1(010)	Spray	5.386	55	660.3	567
B1(011)	Spray	5.384	55	660.3	567
B1(012)	Spray	5.384	55	660.3	567
B1(013)	Spray	5.383	55	660.3	567
B1(014)	Spray	5.383	55	660.3	567
B1(015)	Spray	5.382	55	660.3	567
B1(016)	Spray	5.382	55	660.3	567
B1(017)	Spray	5.381	55	660.3	567
B1(018)	Spray	5.381	55	660.3	567
B1(019)	Spray	5.381	55	660.3	567
B1(020)	Spray	5.381	55	660.3	567
B1(021)	Spray	5.38	55	660.3	567
B1(022)	Spray	5.38	55	660.3	567
B1(023)	Spray	5.379	55	660.3	567
B1(024)	Spray	5.379	55	660.3	567
B1(025)	Spray	5.378	55	660.3	567
B1(026)	Spray	5.378	55	660.3	567
B1(027)	Spray	5.377	55	660.3	567
B1(028)	Spray	5.377	55	660.3	567
B1(029)	Spray	5.376	55	660.3	567
B1(030)	Spray	5.376	55	660.3	567
B1(031)	Spray	5.376	55	660.3	567
B1(032)	Spray	5.376	55	660.3	567
B1(033)	Spray	5.375	55	660.3	567
B1(034)	Spray	5.375	55	660.3	567
B1(035)	Spray	5.374	55	660.3	567
B1(036)	Spray	5.374	55	660.3	567
B1(037)	Spray	5.374	55	660.3	567
B1(038)	Spray	5.374	55	660.3	567
B1(039)	Spray	5.373	55	660.3	567
B1(040)	Spray	5.373	55	660.3	567
B1(041)	Spray	5.373	55	660.3	567
B1(042)	Spray	5.373	55	660.3	567
B1(043)	Spray	5.372	55	660.3	567
B1(044)	Spray	5.372	55	660.3	567
B1(045)	Spray	5.372	55	660.3	567
B1(046)	Spray	5.372	55	660.3	567
B1(047)	Spray	5.371	55	660.3	567
B1(048)	Spray	5.371	55	660.3	567
B1(049)	Spray	5.371	55	660.3	567
B1(050)	Spray	5.371	55	660.3	567
B1(051)	Spray	5.37	55	660.3	567
B1(052)	Spray	5.37	55	660.3	567
B1(053)	Spray	5.37	55	660.3	567
B1(054)	Spray	5.37	55	660.3	567
B1(055)	Spray	5.369	55	660.3	567
B1(056)	Spray	5.369	55	660.3	567
B1(057)	Spray	5.369	55	660.3	567
B1(058)	Spray	5.369	55	660.3	567
B1(059)	Spray	5.369	55	660.3	567
B1(060)	Spray	5.369	55	660.3	567
B1(061)	Spray	5.368	55	660.3	567
B1(062)	Spray	5.368	55	660.3	567
B1(063)	Spray	5.368	55	660.3	567
B1(064)	Spray	5.368	55	660.3	567
B1(065)	Spray	5.368	55	660.3	567
B1(066)	Spray	5.368	55	660.3	567
B1(067)	Spray	5.368	55	660.3	567
B1(068)	Spray	5.368	55	660.3	567
B1(069)	Spray	5.367	55	660.3	567
B1(070)	Spray	5.367	55	660.3	567
B1(071)	Spray	5.367	55	660.3	567
B1(072)	Spray	5.367	55	660.3	567
B1(073)	Spray	5.367	55	660.3	567
B1(074)	Spray	5.367	55	660.3	567
B1(075)	Spray	5.367	55	660.3	567
B1(076)	Spray	5.367	55	660.3	567
B1(077)	Spray	5.367	55	660.3	567
B1(078)	Spray	5.367	55	660.3	567
B1(079)	Spray	5.367	55	660.3	567
B1(080)	Spray	5.367	55	660.3	567
B1(081)	Spray	5.366	55	660.3	567
B1(082)	Spray	5.366	55	660.3	567
B1(083)	Spray	5.366	55	660.3	567
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

B2(042)	Spray	4.232	55		682.3	589
B2(043)	Spray	4.231	55		682.3	589
B2(044)	Spray	4.231	55		682.3	589
B2(045)	Spray	4.23	55		682.3	589
B2(046)	Spray	4.23	55		682.3	589
B2(047)	Spray	4.23	55		682.3	589
B2(048)	Spray	4.23	55		682.3	589
B2(049)	Spray	4.229	55		682.3	589
B2(050)	Spray	4.229	55		682.3	589
B2(051)	Spray	4.229	55		682.3	589
B2(052)	Spray	4.229	55		682.3	589
B2(053)	Spray	4.228	55		682.3	589
B2(054)	Spray	4.228	55		682.3	589
B2(055)	Spray	4.228	55		682.3	589
B2(056)	Spray	4.228	55		682.3	589
B2(057)	Spray	4.227	55		682.3	589
B2(058)	Spray	4.227	55		682.3	589
B2(059)	Spray	4.227	55		682.3	589
B2(060)	Spray	4.227	55		682.3	589
B2(061)	Spray	4.227	55		682.3	589
B2(062)	Spray	4.227	55		682.3	589
B2(063)	Spray	4.226	55		682.3	589
B2(064)	Spray	4.226	55		682.3	589
B2(065)	Spray	4.226	55		682.3	589
B2(066)	Spray	4.226	55		682.3	589
B2(067)	Spray	4.226	55		682.3	589
B2(068)	Spray	4.226	55		682.3	589
B2(069)	Spray	4.226	55		682.3	589
B2(070)	Spray	4.226	55		682.3	589
B2(071)	Spray	4.226	55		682.3	589
B2(072)	Spray	4.226	55		682.3	589
B2(073)	Spray	4.226	55		682.3	589
B2(074)	Spray	4.226	55		682.3	589
B2(075)	Spray	4.225	55		682.3	589
B2(076)	Spray	4.225	55		682.3	589
B2(077)	Spray	4.225	55		682.3	589
B2(078)	Spray	4.225	55		682.3	589
B2(079)	Spray	4.225	55		682.3	589
B2(080)	Spray	4.225	55		682.3	589
B2(081)	Spray	4.226	55		682.3	589
B2(082)	Spray	4.225	55		682.3	589
B2(083)	Spray	4.225	55		682.3	589
B2(084)	Spray	4.225	55		682.3	589
B2(085)	Spray	4.225	55		682.3	589
B2(086)	Spray	4.225	55		682.3	589
B2(087)	Spray	4.225	55		682.3	589
B2(088)	Spray	4.225	55		682.3	589
B2(089)	Spray	4.225	55		682.3	589
B2(090)	Spray	4.225	55		682.3	589
B3(001)	Spray	4.325	55		682.3	589
B3(002)	Spray	4.325	55		682.3	589
B3(003)	Spray	4.325	55		682.3	589
B3(004)	Spray	4.324	55		682.3	589
B3(005)	Spray	4.324	55		682.3	589
B3(006)	Spray	4.324	55		682.3	589
B3(007)	Spray	4.323	55		682.3	589
B3(008)	Spray	4.323	55		682.3	589
B3(009)	Spray	4.323	55		682.3	589
B3(010)	Spray	4.323	55		682.3	589
B3(011)	Spray	4.323	55		682.3	589
B3(012)	Spray	4.322	55		682.3	589
B3(013)	Spray	4.322	55		682.3	589
B3(014)	Spray	4.322	55		682.3	589
B3(015)	Spray	4.322	55		682.3	589
B3(016)	Spray	4.321	55		682.3	589
B3(017)	Spray	4.321	55		682.3	589
B3(018)	Spray	4.321	55		682.3	589
B3(019)	Spray	4.321	55		682.3	589
B3(020)	Spray	4.321	55		682.3	589
B3(021)	Spray	4.32	55		682.3	589
B3(022)	Spray	4.32	55		682.3	589
B3(023)	Spray	4.32	55		682.3	589
B3(024)	Spray	4.32	55		682.3	589
B3(025)	Spray	4.32	55		682.3	589
B3(026)	Spray	4.32	55		682.3	589
B3(027)	Spray	4.319	55		682.3	589
B3(028)	Spray	4.319	55		682.3	589
B3(029)	Spray	4.319	55		682.3	589
B3(030)	Spray	4.319	55		682.3	589
B3(031)	Spray	4.319	55		682.3	589
B3(032)	Spray	4.319	55		682.3	589
B3(033)	Spray	4.319	55		682.3	589
B3(034)	Spray	4.319	55		682.3	589
B3(035)	Spray	4.319	55		682.3	589
B3(036)	Spray	4.319	55		682.3	589
B3(037)	Spray	4.319	55		682.3	589
B3(038)	Spray	4.319	55		682.3	589
B3(039)	Spray	4.319	55		682.3	589
B3(040)	Spray	4.319	55		682.3	589
B3(041)	Spray	4.319	55		682.3	589
B3(042)	Spray	4.319	55		682.3	589
B3(043)	Spray	4.319	55		682.3	589
B3(044)	Spray	4.319	55		682.3	589
B3(045)	Spray	4.319	55		682.3	589
B3(046)	Spray	4.319	55		682.3	589
B3(047)	Spray	4.319	55		682.3	589
B3(048)	Spray	4.319	55		682.3	589
B3(049)	Spray	4.319	55		682.3	589
B3(050)	Spray	4.319	55		682.3	589
B3(051)	Spray	4.319	55		682.3	589
Cold Leg A(001)	Boundary pressure	140.6	115		625.2	393
Cold Leg A(002)	Boundary pressure	1195	115		625.2	393
Cold Leg B(001)	Boundary pressure	140.4	115		625.2	393
Cold Leg B(002)	Boundary pressure	1122	115		625.2	393
Cold Leg C(001)	Boundary pressure	138.2	115		625.2	393
Cold Leg C(002)	Boundary pressure	1382	115		625.2	393
Cold Leg D(001)	Boundary pressure	139.1	115		625.2	393
Cold Leg D(002)	Boundary pressure	1359	115		625.2	393
Hot Leg A(001)	Boundary pressure	—	115	Isolated	—	392.7
Hot Leg A(002)	Boundary pressure	—	115	Isolated	—	393
Hot Leg B(001)	Boundary pressure	—	115	Isolated	—	392.7
Hot Leg B(002)	Boundary pressure	0	115		625.2	393
Hot Leg C(001)	Boundary pressure	—	115	Isolated	—	392.7
Hot Leg C(002)	Boundary pressure	—	115	Isolated	—	393
Hot Leg D(001)	Boundary pressure	—	115	Isolated	—	392.7
Hot Leg D(002)	Boundary pressure	0	115		625.2	393

Pump List	Operation	Flow	Status	TDH	dP	NPSHa	Suction Pressure	Discharge Pressure	Suction Elev	Discharge Elev
Centrifugal Charging Pump A	Curve	392.7		-4106	-1774	84.38	37.4	1811	368.6	368.7
Centrifugal Charging Pump B	Curve	378.8		-4106	-1774	83.83	37.17	1811	368.6	368.7
Containment Spray Pump A	Curve	—	Off	—	—	—	—	—	346.3	347.3
Containment Spray Pump B	Curve	—	Off	—	—	—	—	—	346.3	347.3
Positive Dis. Charging Pump	Fixed Flow	1.00E-05	Off	—	—	—	—	—	366.7	367.9
Residual Heat Removal Pump A	Curve	2225		-392.9	-169.7	76.31	33.92	203.2	346	347.1
Residual Heat Removal Pump B	Curve	2213		-393.8	-170.1	76.61	34.04	203.7	346	347.1
Safety Injection Pump A	Curve	355.2		-3021	-1305	85.59	37.92	1343	366.5	366.6
Safety Injection Pump B	Curve	325.8		-3023	-1306	86.61	38.37	1344	366.5	366.6

Component List	Flow	Status	HL	dP	Inlet Pressure	Outlet Pressure	Inlet Elev	Outlet Elev
Residual HX A	2225		21.28	9.193	186.4	177.2	359.7	359.7
Residual HX B	2213		21.05	9.095	184	174.9	359.8	358.8

Control List	Type	Set Value	Status	Flow	dP	HL	Inlet Pressure	Outlet Pressure	Elev	Cv	Fp	QMax
~N(562)	FCV	0		0	—	—	156.3	156.3	346.8	—	—	—
~N(563)	FCV	0		0	—	—	151	151	360	—	—	—
~N(581)	FCV	Fully open		140.4	0	0	360.9	360.9	412.9	—	—	—
~N(585)	FCV	Fully open		140.6	0	0	286.2	286.2	413	—	—	—
~N(589)	FCV	Fully open		139.2	0	0	330.6	330.6	382.4	—	—	—
~N(593)	FCV	Fully open		139.1	0	0	277.6	277.6	385.6	—	—	—
~N(699)	FCV	Fully open		155.5	0	0	137.9	137.9	414.5	—	—	—
~N(704)	FCV	Fully open		154.8	0	0	150.1	150.1	381.4	—	—	—
~N(711)	FCV	Fully open		155.6	0	0	138.2	138.2	414.9	—	—	—
~N(717)	FCV	Fully open		155	0	0	152.6	152.6	387	—	—	—
~N(723)	FCV	Fully open		0	—	—	153.6	153.6	380.7	—	—	—
~N(729)	FCV	Fully open	Closed	—	—	—	—	—	378	—	—	—
~N(735)	FCV	Fully open		0	—	—	154.8	154.8	378.1	—	—	—
~N(741)	FCV	Fully open	Closed	—	—	—	—	—	381.1	—	—	—
CS007A-1	FCV	Fully open		0	—	—	130.7	130.7	407	—	—	—
CS007B-2	FCV	Fully open		0	—	—	133.7	133.7	399	—	—	—

Pipe Specification	Material	Schedule	Roughness	Sizing	Vel Limits	Press Limits	Valve Table
Steel Sch.40 (clean)	Steel	40	0.0018	not specified	—	—	standard
Steel Sch.80 (clean)	Steel	80	0.0018	not specified	—	—	standard
Steel Sch.140 (clean)	Steel	140	0.0018	not specified	—	—	standard
Steel Sch.40S (clean)	Stainless Pipe IPS	40S	0.0018	not specified	—	—	standard
Steel Sch 160 (clean)	Steel	160	0.0018	not specified	—	—	standard
Steel Sch 30 (clean)	Steel	30	0.0018	not specified	—	—	standard
Steel Sch 20 (clean)	Steel	20	0.0018	not specified	—	—	standard

Fluid Zone	Fluid	Temperature	Pressure	Density	Viscosity	k	Pv	Pc
Containment Sump Water	Water	100	14.7	62.24	0.6812	—	0.9498	3198
Water After RHR HX	Water	100	14.7	62.24	0.6812	—	0.9498	3198

PIPE-FLO	ver 8.0	12/1/2009 15:40
System:	2 LOCA A1R13 After 6	
Lineup	Cold Leg Injection from Sump	
Company	Exelon	
Project	11329-147 Rev. 0	
by	Sargent & Lundy L.L.C.	
Footer:		

UNITS					CALCULATION:
Flow Rate	US gpm				Iteration: 15
Pressure	psi a	Atm:	14.7	psi a	Deviation percent: 0.004721
Temperature	°F				
Viscosity	cP				
Density	lb/ft³				
Grade	ft				
Length	ft				
Size	in				

Pipe List	Specification	Fluid Zone	Size	Length	K	Status	Flow	Velocity	dP	HL	Tagged	From	To	Inside Dia	Pipe HL	Minor HL	Re	fp	Valves/Fittings					
CS01AA(001)	Steel Sch.30 (clean)	Containment Sump Water	16	12.3	0.445	XXX	---	---	---	---	N	~N(003)	~N(005)	15.25	---	---	---	---	2 x Pipe Bend - r/d 1.5 (90°)	0.173	1 x CS009A-1 (Gate Valve)	0.09888	1 x Converging Tee (Through)	1.00E-05
CS01AA(002)	Steel Sch.30 (clean)	Containment Sump Water	16	10.6	0.2964		0	0	0	0	N	~N(005)	~N(006)	15.25	0	0	0	0	1 x Reducer - Contraction (16 x 14 - 14)	0.02451	1 x Pipe Bend - r/d 1.5 (90°)	0.173	1 x CS002A	0.09888
CS01AA(003)	Steel Sch 30 (clean)	Containment Sump Water	14	2	0		0	0	0.864	0	N	~N(006)	Containment Spray Pump A	13.25	0	0	0	0						
CS01AB(001)	Steel Sch 30 (clean)	Containment Sump Water	16	4.3	0.1978	XXX	—	—	—	—	N	~N(236)	~N(237)	15.25	—	—	—	—	1 x Gate - Double Disc	0.09888	1 x CS009B-2 (Gate Valve)	0.09888	1 x Converging Tee (Through)	1.00E-05
CS01AB(002)	Steel Sch 30 (clean)	Containment Sump Water	16	19.3	1.236		0	0	0	0	N	~N(237)	~N(238)	15.25	0	0	0	0	3 x Elbow - Standard 90°	0.3708	1 x Reducer - Contraction (16 x 14 - 14)	0.02451	1 x CS002B(Gate Valve)	0.09888
CS01AB(003)	Steel Sch.30 (clean)	Containment Sump Water	14	2	0		0	0	0.621	0	N	~N(238)	Containment Spray Pump B	13.25	0	0	0	0						
CS02AA(001)	Steel Sch 40 (clean)	Containment Sump Water	8	2	0.05008		0	0	0.432	0	N	Containment Spray Pump A	~N(007)	7.981	0	0	0	0	1 x Reducer - Enlargement (10 x 8 - 7)	0.05008				
CS02AA(002)	Steel Sch 40 (clean)	Containment Sump Water	10	25.5	2.148		0	0	8.054	0	N	~N(007)	~N(008)	10.02	0	0	0	0	4 x Pipe Bend - r/d 1.5 (90°)	0.188	1 x CS003A (Check Valve)	1.289	1 x CV004A (Gate Valve)	0.1074
CS02AA(003)	Steel Sch.40 (clean)	Containment Sump Water	10	101.3	5.852		0	0	15.03	0	N	~N(008)	~N(009)	10.02	0	0	0	0	1 x FE-CS011	4.9	4 x Pipe Bend - r/d 1.5 (90°)	0.188	1 x Diverging Tee (Through)	1.00E-05
CS02AA(004)	Steel Sch 40 (clean)	Containment Sump Water	10	34.8	0.6713		0	0	8.27	0	N	~N(009)	CS007A-1	10.02	0	0	0	0	3 x Pipe Bend - r/d 1.5 (90°)	0.188	1 x CS007A-1 (Gate Valve)	0.1074	1 x Diverging Tee (Through)	1.00E-05
CS02AA(005)	Steel Sch 40 (clean)	Containment Sump Water	10	83.7	2.55		0	0	9.072	0	N	CS007A-1	~N(001)	10.02	0	0	0	0	6 x Pipe Bend - r/d 1.5 (90°)	0.188	1 x Pipe Bend - r/d 1.5 (45°)	0.1331	1 x CS008A (Check Valve)	1.289
CS02AA(006)	Steel Sch 40 (clean)	Containment Sump Water	10	155.7	1.261		0	0	63.2	0	N	~N(001)	~N(001A)	10.02	0	0	0	0	6 x Pipe Bend - r/d 1.5 (90°)	0.188	1 x Pipe Bend - r/d 1.5 (45°)	0.1331		
CS02AB(001)	Steel Sch 40 (clean)	Containment Sump Water	8	2	0.472		0	0	-0.432	0	N	Containment Spray Pump B	~N(239)	7.981	0	0	0	0	1 x Elbow - Standard 90°	0.4219	1 x Reducer - Enlargement (10 x 8 - 7)	0.05008		
CS02AB(002)	Steel Sch.40 (clean)	Containment Sump Water	10	9.9	2.202		0	0	0.216	0	N	~N(239)	~N(240)	10.02	0	0	0	0	2 x Elbow - Standard 90°	0.4028	1 x CV004B (Gate Valve)	0.1074	1 x CV003B (Check Valve)	1.289
CS02AB(003)	Steel Sch 40 (clean)	Containment Sump Water	10	59.1	6.511		0	0	14.9	0	N	~N(240)	~N(241)	10.02	0	0	0	0	4 x Elbow - Standard 90°	0.4028	1 x FE-CS012	4.9	1 x Diverging Tee (Through)	1.00E-05
CS02AB(004)	Steel Sch 40 (clean)	Containment Sump Water	10	33.8	1.318		0	0	7.646	0	N	~N(241)	CS007B-2	10.02	0	0	0	0	3 x Elbow - Standard 90°	0.4028	1 x CV007B-2 (Gate Valve)	0.1074	1 x Diverging Tee (Through)	1.00E-05
CS02AB(005)	Steel Sch 40 (clean)	Containment Sump Water	10	75.4	3.92		0	0	12.53	0	N	CS007B-2	~N(242)	10.02	0	0	0	0	1 x Elbow - Standard 45°	0.2148	6 x Elbow - Standard 90°	0.4028	1 x CS008B (Check Valve)	1.289
CS02AB(006)	Steel Sch 40 (clean)	Containment Sump Water	10	144.2	1		0	0	59.18	0	N	~N(242)	~N(243)	10.02	0	0	0	0	1 x CS008B (Check Valve)	1	1 x Diverging Tee (Through)	1.00E-05		
CS02AB(007)	Steel Sch.40 (clean)	Containment Sump Water	10	30.8	2.00E-05	<--->	601.7	2.45	-7.536	0.058	N	~N(244)	~N(243)	10.02	0.058	0	278182	0.01626	1 x Diverging Tee (Branch)	1.00E-05	1 x Diverging Tee (Through)	1.00E-05		
CS02B	Steel Sch 40 (clean)	Containment Sump Water	8	25.6	0.04216	<--->	444.6	2.854	-6.535	0.087	N	~N(010)	~N(001A)	7.981	0.082	0.005	256078	0.01678	1 x Reducer - Contraction (10 x 8 - 7)	0.04215	1 x Diverging Tee (Through)	1.00E-05		
CS02C	Steel Sch.40 (clean)	Containment Sump Water	6	21.5	0.0633	<--->	203	2.256	-2.603	0.066	N	~N(011)	~N(010)	6.065	0.062	0.004	156042	0.01832	1 x Reducer - Contraction (8 x 6 - 6)	0.05329	1 x Diverging Tee (Through)	1.00E-05		
CS02D(001)	Steel Sch.40 (clean)	Containment Sump Water	4	1.1	0.08157	<--->	101.5	2.56	0.006	0.015	N	~N(012)	~N(011)	4.026	0.007	0.008	116784	0.01979	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156	1 x Diverging" Tee (Branch)	1.00E-05		
CS02D(002)	Steel Sch 40 (clean)	Containment Sump Water	4	1.1	0.08157	<--->	101.6	2.56	0.006	0.015	N	~N(014)	~N(011)	4.026	0.007	0.008	116800	0.01978	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156	1 x Diverging" Tee (Branch)	1.00E-05		
CS02D(003)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<--->	96.27	2.428	0.008	0.019	N	~N(013)	~N(012)	4.026	0.012	0.007	110768	0.01991	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
CS02D(004)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<--->	96.25	2.428	0.008	0.019	N	~N(033)	~N(014)	4.026	0.012	0.007	110749	0.01991	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				

CS02H(044)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	35.66	0.407	0	0	N	~N(102)	~N(103)	6.065	0	0	28000	0.02461				
CS02H(045)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	31.63	0.351	0	0	N	~N(099)	~N(098)	6.065	0	0	24156	0.02542				
CS02H(046)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	32.75	0.364	0	0	N	~N(101)	~N(102)	6.065	0	0	25014	0.02523				
CS02H(047)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	27.62	0.307	0	0	N	~N(082)	~N(099)	6.065	0	0	21098	0.02621				
CS02H(048)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	28.74	0.319	0	0	N	~N(107)	~N(101)	6.065	0	0	21955	0.02597				
CS02H(049)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	23.71	0.264	0	0	N	~N(093)	~N(092)	6.065	0	0	18111	0.02715				
CS02H(050)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	24.59	0.273	0	0	N	~N(106)	~N(107)	6.065	0	0	18781	0.02692				
CS02H(051)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	19.56	0.217	0	0	N	~N(094)	~N(093)	6.065	0	0	14937	0.02844				
CS02H(052)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	20.68	0.23	0	0	N	~N(105)	~N(106)	6.065	0	0	15795	0.02805				
CS02H(053)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	15.55	0.173	0	0	N	~N(091)	~N(094)	6.065	0	0	11879	0.03011				
CS02H(054)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	16.68	0.185	0	0	N	~N(108)	~N(105)	6.065	0	0	12737	0.02958				
CS02H(055)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	11.64	0.129	0	0	N	~N(090)	~N(091)	6.065	0	0	8893	0.03248				
CS02H(056)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	12.52	0.139	0	0	N	~N(109)	~N(108)	6.065	0	0	9562	0.03185				
CS02H(057)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	7.487	0.083	0	0	N	~N(089)	~N(090)	6.065	0	0	5718	0.03674				
CS02H(058)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	8.61	0.096	0	0	N	~N(110)	~N(109)	6.065	0	0	6576	0.03529				
CS02H(059)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	3.483	0.039	0	0	N	~N(100)	~N(089)	6.065	0	0	2660	0.04658				
CS02H(060)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	4.606	0.051	0	0	N	~N(111)	~N(110)	6.065	0	0	3518	0.04255				
CS02H(061)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	0.427	0.005	0	0	N	~N(100)	~N(111)	6.065	0	0	325.8	0.1964				
CS02J(001)	Steel Sch 40 (clean)	Containment Sump Water	6	1.8	0.0533	<-->	190.6	2.118	0.003	0.008	N	~N(298)	~N(297)	6.065	0.004	0.004	145563	0.01847	1 x Reducer - Contraction (8 x 6 - 6)	0.06329	1 x Diverging' Tee (Branch)	1.00E-05	
CS02J(002)	Steel Sch 40 (clean)	Containment Sump Water	6	1.8	0.0533	<-->	190.6	2.118	0.003	0.008	N	~N(300)	~N(297)	6.065	0.004	0.004	145563	0.01847	1 x Reducer - Contraction (8 x 6 - 6)	0.06329	1 x Diverging' Tee (Branch)	1.00E-05	
CS02J(003)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	186.3	2.071	0.003	0.008	N	~N(301)	~N(298)	6.065	0.008	0	142308	0.01852				
CS02J(004)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	186.3	2.071	0.003	0.008	N	~N(302)	~N(300)	6.065	0.008	0	142308	0.01852				
CS02J(005)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	182.1	2.023	0.003	0.007	N	~N(303)	~N(301)	6.065	0.007	0	139054	0.01858				
CS02J(006)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	182.1	2.023	0.003	0.007	N	~N(304)	~N(302)	6.065	0.007	0	139054	0.01858				
CS02J(007)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	177.8	1.976	0.003	0.007	N	~N(305)	~N(303)	6.065	0.007	0	135803	0.01864				
CS02J(008)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	177.8	1.976	0.003	0.007	N	~N(306)	~N(304)	6.065	0.007	0	135803	0.01864				
CS02J(009)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	173.5	1.929	0.003	0.007	N	~N(307)	~N(305)	6.065	0.007	0	132553	0.0187				
CS02J(010)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	173.5	1.929	0.003	0.007	N	~N(308)	~N(306)	6.065	0.007	0	132553	0.0187				
CS02J(011)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	169.3	1.881	0.003	0.007	N	~N(310)	~N(307)	6.065	0.007	0	129304	0.01877				
CS02J(012)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	169.3	1.881	0.003	0.007	N	~N(309)	~N(308)	6.065	0.007	0	129304	0.01877				
CS02J(013)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	165	1.834	0.003	0.006	N	~N(311)	~N(310)	6.065	0.006	0	126057	0.01883				
CS02J(014)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	165	1.834	0.003	0.006	N	~N(312)	~N(309)	6.065	0.006	0	126057	0.01883				
CS02J(015)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	160.8	1.787	0.003	0.006	N	~N(314)	~N(311)	6.065	0.006	0	122811	0.0189				
CS02J(016)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	160.8	1.787	0.003	0.006	N	~N(313)	~N(312)	6.065	0.006	0	122811	0.0189				
CS02J(017)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	156.5	1.74	0.002	0.006	N	~N(318)	~N(314)	6.065	0.006	0	119567	0.01897				
CS02J(018)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	156.5	1.74	0.002	0.006	N	~N(317)	~N(313)	6.065	0.006	0	119567	0.01897				
CS02J(019)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	152.3	1.693	0.002	0.005	N	~N(315)	~N(318)	6.065	0.005	0	116324	0.01905				
CS02J(020)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	152.3	1.693	0.002	0.005	N	~N(316)	~N(317)	6.065	0.005	0	116324	0.01905				
CS02J(021)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	148	1.645	0.002	0.005	N	~N(320)	~N(315)	6.065	0.005	0	113082	0.01912				
CS02J(022)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	148	1.645	0.002	0.005	N	~N(319)	~N(316)	6.065	0.005	0	113082	0.01912				
CS02J(023)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	143.8	1.598	0.002	0.005	N	~N(321)	~N(320)	6.065	0.005	0	109841	0.01921				
CS02J(024)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	143.8	1.598	0.002	0.005	N	~N(322)	~N(319)	6.065	0.005	0	109841	0.01921				
CS02J(025)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	139.6	1.551	0.002	0.005	N	~N(323)	~N(321)	6.065	0.005	0	106602	0.01929				
CS02J(026)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	139.6	1.551	0.002	0.005	N	~N(324)	~N(322)	6.065	0.005	0	106602	0.01929				
CS02J(027)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	135.3	1.504	0.002	0.004	N	~N(325)	~N(323)	6.065	0.004	0	103363	0.01938				
CS02J(028)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	135.3	1.504	0.002	0.004	N	~N(326)	~N(324)	6.065	0.004	0	103363	0.01938				
CS02J(029)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	131.1	1.457	0.002	0.004	N	~N(327)	~N(325)	6.065	0.004	0	100125	0.01947				
CS02J(030)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	131.1	1.457	0.002	0.004	N	~N(328)	~N(326)	6.065	0.004	0	100125	0.01947				
CS02J(031)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	126.8	1.41	0.002	0.004	N	~N(329)	~N(327)	6.065	0.004	0	96889	0.01957				
CS02J(032)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	126.8	1.41	0.002	0.004	N	~N(330)	~N(328)	6.065	0.004	0	96889	0.01957				
CS02J(033)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	122.6	1.363	0.002	0.004	N	~N(331)	~N(329)	6.065	0.004	0	93653	0.01967				
CS02J(034)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	122.6	1.363	0.002	0.004	N	~N(332)	~N(330)	6.065	0.004	0	93653	0.01967				
CS02J(035)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	118.4	1.316	0.001	0.003	N	~N(333)	~N(331)	6.065	0.003	0	90418	0.01978				
CS02J(036)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	118.4	1.316	0.001	0.003	N	~N(334)	~N(332)	6.065	0.003	0	90418	0.01978				
CS02J(037)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	114.1	1.269	0.001	0.003	N	~N(335)	~N(333)	6.065	0.003	0	87183	0.01989				
CS02J(038)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	114.1	1.269	0.001	0.003	N	~N(336)	~N(334)	6.065	0.003	0	87183	0.01989				
CS02J(039)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	109.9	1.222	0.001	0.003	N	~N(337)	~N(335)	6.065	0.003	0	83950	0.02001				
CS02J(040)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	109.9	1.222	0.001	0.003	N	~N(338)	~N(336)	6.065	0.003	0	83950	0.02001				
CS02J(041)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	105.7	1.174	0.001	0.003	N	~N(339)	~N(337)	6.065	0.003	0	80717	0.02014				
CS02J(042)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	105.7	1.174	0.001	0.003	N	~N(340)	~N(338)	6.065	0.003	0	80717	0.02014				
CS02J(043)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	101.4	1.127	0.001	0.003	N	~N(341)	~N(339)	6.065	0.003	0	77484	0.02028				
CS02J(044)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	101.4	1.127	0.001	0.003	N	~N(342)	~N(340)	6.065	0.003	0	77484	0.02028				
CS02J(045)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	97.21	1.08	0.001	0.002	N	~N(343)	~N(341)	6.065	0.002	0	74253	0.02042				
CS02J(046)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	97.21	1.08	0.001	0.002	N	~N(344)	~N(342)	6.065	0.002	0	74253	0.02042				
CS02J(047)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	92.98	1.033	0	0.002	N	~N(345)	~N(343)	6.065	0.002	0	71021	0.02057				
CS02J(048)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	92.98	1.033	0	0.002	N	~N(346)	~N(344)	6.065	0.002	0	71021	0.02057				
CS02J(049)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	88.75	0.986	0	0.002	N	~N(347)	~N(345)	6.065	0.002	0	67790	0.02074				
CS02J(050)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	88.75	0.986	0	0.002	N	~N(348)	~N(346)	6.065	0.002	0	67790	0.02074				
CS02J(051)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	84.52	0.939	0	0.002	N	~N(349)	~N(347)	6.065	0.002	0	64560	0.02091				
CS02J(052)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	84.52	0.939	0	0.002	N	~N(350)	~N(348)	6.065	0.002	0	64560	0.02091				
CS02J(053)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	80.29	0.892	0	0.002	N	~N(351)	~N(349)	6.065	0.002	0	61330	0.0211				
CS02J(054)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	80.29	0.892	0	0.002	N	~N(352)	~N(350)	6.065	0.002	0	61330	0.0211				
CS02J(055)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	76.07	0.845	0	0.001	N	~N(353)	~N(351)	6.065	0.001	0	58101	0.02131				
CS02J(056)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	76.07	0.845	0	0.001	N	~N(354)	~N(352)	6.065	0.001	0	58101	0.02131				
CS02J(057)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	71.84	0.798	0	0.001	N	~N(355)	~N(353)	6.065	0.001	0	54871	0.02153				
CS02J(058)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	71.84	0.798	0	0.001	N	~N(356)	~N(354)	6.065	0.001	0	54871	0.02153				
CS02J(059)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	67.61	0.751	0	0.001	N	~N(357)	~N(355)	6.065	0.001	0	51642	0.02177				
CS02J(060)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	67.61	0.751	0	0.001	N	~N(358)	~N(356)	6.065	0.001	0	51642	0.02177				
CS02J(061)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	63.38	0.704	0	0.001	N	~N(359)	~N(357)	6.065	0.001	0	48414	0.02204				
CS02J(062)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	63.38	0.704	0	0.001	N	~N(360)	~N(358)	6.065	0.001	0	48414	0.02204				
CS02J(063)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	59.16	0.657	0	0	N	~N(361)	~N(359)	6.065	0	0	45185	0.02233				
CS02J(064)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	59.16	0.657	0	0	N	~N(362)	~N(360)	6.065	0	0	45185	0.02233				
CS02J(065)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	54.93	0.611	0	0	N	~N(363)	~N(361)	6.065	0	0	41957	0.02265				
CS02J(066)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	54.93	0.611	0	0	N	~N(364)	~N(362)	6.065	0	0	41957	0.02265				
CS02J(067)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	50.7	0.564	0	0	N	~N(365)	~N(363)	6.065	0	0	38729	0.02301				
CS02J(068)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	50.7	0.564	0	0	N	~N(366)	~N(364)	6.065	0	0	38729	0.02301				
CS02J(069)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	46.48	0.517	0	0	N	~N(367)	~N(365)	6.065	0	0	35501	0.02342				
CS02J(070)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	46.48	0.517	0	0	N	~N(368)	~N(366)	6.065	0	0	35501	0.02342				
CS02J(071)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	42.25	0.47	0	0	N	~N(369)	~N(367)	6.065	0	0	32274	0.02388				
CS02J(072)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	42.25	0.47	0	0	N	~N(370)	~N(368)	6.065	0	0	32274	0.02388				
CS02J(073)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	38.03	0.423	0	0	N	~N(371)	~N(369)	6.065	0	0	29046	0.02442				
CS02J(074)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	38.03	0.423	0	0	N	~N(372)	~N(370)	6.065	0	0	29046	0.02442				
CS02J(075)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	33.8	0.376	0	0	N	[illegible]	[illegible]	6.065	0	0	25818	0.02505				
CS02J(076)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	33.8	0.376	0	0	N	[illegible]	[illegible]	6.065	0	0	25818	0.02505				
CS02J(077)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	29.58	0.329	0	0	N	[illegible]	[illegible]	6.065	0	0	22591	0.0258				
CS02J(078)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	29.58	0.329	0	0	N	[illegible]	[illegible]	6.065	0	0	22591	0.0258				
CS02J(079)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	25.35	0.282	0	0	N	[illegible]	[illegible]	6.065	0	0	19364	0.02673				
CS02J(080)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	25.35	0.282	0	0	N	[illegible]	[illegible]	6.065	0	0	19364	0.02673				
CS02J(081)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	21.13	0.235	0	0	N	[illegible]	[illegible]	6.065	0	0	16136	0.02791				
CS02J(082)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	21.13	0.235	0	0	N	[illegible]	[illegible]	6.065	0	0	16136	0.02791				
CS02J(083)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	16.9	0.188	0	0	N	[illegible]	[illegible]	6.065	0	0	12909	0.02948				
CS02J(084)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	16.9	0.188	0	0	N	[illegible]	[illegible]	6.065	0	0	12909	0.02948				
CS02J(085)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	12.68	0.141	0	0	N	[illegible]	[illegible]	6.065	0	0	9682	0.03175				
CS02J(086)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	12.68	0.141	0	0	N	[illegible]	[illegible]	6.065	0	0	9682	0.03175				
CS02J(087)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	8.45	0.094	0	0	N	[illegible]	[illegible]	6.065	0	0	6454	0.03548				
CS02J(088)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	8.45	0.094	0	0	N	[illegible]	[illegible]	6.065	0	0	6454	0.03548				
CS02J(089)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	4.225	0.047	0	0	N	[illegible]	[illegible]	6.065	0	0	3227	0.04374				
CS02J(090)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	4.225	0.047	0	0	N	[illegible]	[illegible]	6.065	0	0	3227	0.04374				
CS02J(091)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	[illegible]	0	0	0	N	[illegible]	[illegible]	6.065	0	0	0.001151	0				
CS02KA	Steel Sch 40 (clean)	Containment Sump Water	10	3	15.8		444.8	1.81	0.996	0.005	N	[illegible]	~N(112)	10.02	0.002	0.003	205561	0.01692	1 x FX-CS036 (Flow Element)	15.8	1 x Diverging Tee (Branch)	1.00E-05	
CS02KB	Steel Sch 40 (clean)	Containment Sump Water	10	2.7	28.1		601.7	2.45	1.976	2.435	N	[illegible]	[illegible]	10.02	0.004	2.431	278182	0.01628	1 x FX-CS036 (Flow Element)	28.1	1 x Diverging Tee (Branch)	1.00E-05	
CS02L.001	Steel Sch 40 (clean)	Containment Sump Water	8	1.8	0.04216		222.4	1.429	0.001	0.003	N	[illegible]	[illegible]	7.981	0.002	0.001	129096	0.01838	1 x Reducer - Contraction (10 x 8 - 7)	0.04215	1 x Diverging' Tee (Branch)	1.00E-05	
CS02L.002	Steel Sch 40 (clean)	Containment Sump Water	8	1.8	0.04216		222.2	1.426	0.001	0.003	N	~N(112)	~N(114)	7.981	0.002	0.001	128982	0.01838	1 x Reducer - Contraction (10 x 8 - 7)	0.04215	1 x Diverging' Tee (Branch)	1.00E-05	
CS02L.003	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		218.5	1.403	0.001	0.003	N	~N(113)	~N(115)	7.981	0.003	0	126854	0.01842				
CS02L.004	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		218.7	1.403	0.001	0.003	N	~N(114)	~N(203)	7.981	0.003	0	125915	0.01842				
CS02L.005	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		214.8	1.379	0.001	0.002	N	~N(115)	~N(116)	7.981	0.002	0	124689	0.01847				
CS02L.006	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		214.9	1.379	0.001	0.002	N	~N(203)	~N(204)	7.981	0.002	0	124749	0.01847				
CS02L.007	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		211.3	1.358	0.001	0.002	N	~N(116)	~N(117)	7.981	0.002	0	122623	0.01852				
CS02L.008	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		211.1	1.355	0.001	0.002	N	~N(204)	~N(206)	7.981	0.002	0	122506	0.01852				
CS02L.009	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		207.4	1.331	0	0.002	N	~N(117)	~N(118)	7.981	0.002	0	120382	0.01857				
CS02L.010	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		207.5	1.332	0	0.002	N	~N(206)	~N(205)	7.981	0.002	0	120442	0.01857				
CS02L.011	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		203.7	1.307	0	0.002	N	~N(118)	~N(119)	7.981	0.002	0	118218	0.01862				
CS02L.012	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		203.8	1.308	0	0.002	N	~N(205)	~N(210)	7.981	0.002	0	118278	0.01862				
CS02L.013	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		200.1	1.284	0	0.002	N	~N(119)	~N(120)	7.981	0.002	0	116153	0.01867				
CS02L.014	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		199.9	1.283	0	0.002	N	~N(210)	~N(209)	7.981	0.002	0	116036	0.01868				
CS02L.015	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		196.3	1.26	0	0.002	N	~N(120)	~N(122)	7.981	0.002	0	113914	0.01873				
CS02L.016	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		196.4	1.26	0	0.002	N	~N(209)	~N(207)	7.981	0.002	0	113974	0.01873				
CS02L.017	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		192.5	1.236	0	0.002	N	~N(122)	~N(121)	7.981	0.002	0	111751	0.01878				
CS02L.018	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		192.6	1.236	0	0.002	N	~N(207)	~N(208)	7.981	0.002	0	111811	0.01878				
CS02L.019	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		189	1.213	0	0.002	N	~N(121)	~N(123)	7.981	0.002	0	109688	0.01884				
CS02L.020	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		188.8	1.212	0	0.002	N	~N(208)	~N(218)	7.981	0.002	0	109573	0.01884				
CS02L.021	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		185.1	1.188	0	0.002	N	~N(123)	~N(124)	7.981	0.002	0	107449	0.0189				
CS02L.022	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		185.2	1.189	0	0.002	N	~N(218)	~N(217)	7.981	0.002	0	107510	0.0189				
CS02L.023	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		181.4	1.164	0	0.002	N	~N(124)	~N(126)	7.981	0.002	0	105288	0.01896				
CS02L.024	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		181.5	1.165	0	0.002	N	~N(217)	~N(215)	7.981	0.002	0	105348	0.01896				
CS02L.025	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		177.8	1.141	0	0.002	N	~N(126)	~N(125)	7.981	0.002	0	103225	0.01902				
CS02L.026	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		177.6	1.14	0	0.002	N	~N(215)	~N(216)	7.981	0.002	0	103111	0.01903				
CS02L.027	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		174	1.117	0	0.002	N	~N(125)	~N(130)	7.981	0.002	0	100988	0.01909				
CS02L.028	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		174.1	1.117	0	0.002	N	~N(216)	~N(211)	7.981	0.002	0	101049	0.01909				
CS02L.029	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		170.3	1.093	0	0.002	N	~N(130)	~N(129)	7.981	0.002	0	98827	0.01916				
CS02L.030	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		170.4	1.093	0	0.002	N	~N(211)	~N(212)	7.981	0.002	0	98888	0.01915				
CS02L.031	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		166.7	1.07	0	0.002	N	~N(129)	~N(127)	7.981	0.002	0	96766	0.01922				
CS02L.032	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		166.5	1.069	0	0.002	N	~N(212)	~N(214)	7.981	0.002	0	96651	0.01923				
CS02L.033	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		162.9	1.045	0	0.001	N	~N(127)	~N(128)	7.981	0.001	0	94530	0.0193				
CS02L.034	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		163	1.046	0	0.001	N	~N(214)	~N(213)	7.981	0.001	0	94590	0.01929				
CS02L.035	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		159.1	1.021	0	0.001	N	~N(128)	~N(132)	7.981	0.001	0	92370	0.01937				
CS02L.036	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		159.2	1.022	0	0.001	N	~N(213)	~N(231)	7.981	0.001	0	92430	0.01937				
CS02L.037	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		155.6	0.999	0	0.001	N	~N(132)	~N(131)	7.981	0.001	0	90310	0.01944				
CS02L.038	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		155.4	0.997	0	0.001	N	~N(231)	~N(232)	7.981	0.001	0	90195	0.01945				
CS02L.039	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		151.7	0.974	0	0.001	N	~N(131)	~N(136)	7.981	0.001	0	88074	0.01952				
CS02L.040	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		151.8	0.975	0	0.001	N	~N(232)	~N(227)	7.981	0.001	0	88135	0.01952				
CS02L.041	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		148	0.95	0	0.001	N	~N(136)	~N(135)	7.981	0.001	0	85915	0.01961				
CS02L.042	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		148.1	0.951	0	0.001	N	~N(227)	~N(226)	7.981	0.001	0	85976	0.0196				
CS02L.043	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		144.5	0.927	0	0.001	N	~N(135)	~N(133)	7.981	0.001	0	83856	0.01969				
CS02L.044	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		144.3	0.926	0	0.001	N	~N(226)	~N(230)	7.981	0.001	0	83741	0.01969				
CS02L.045	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		140.6	0.903	0	0.001	N	~N(133)	~N(134)	7.981	0.001	0	81621	0.01978				
CS02L.046	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		140.7	0.903	0	0.001	N	~N(230)	~N(229)	7.981	0.001	0	81681	0.01978				
CS02L.047	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		136.9	0.879	0	0.001	N	~N(134)	~N(144)	7.981	0.001	0	79462	0.01987				
CS02L.048	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		137	0.879	0	0.001	N	~N(229)	~N(219)	7.981	0.001	0	79523	0.01987				
CS02L.049	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		133.4	0.856	0	0.001	N	~N(144)	~N(143)	7.981	0.001	0	77404	0.01996				
CS02L.050	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		133.2	0.855	0	0.001	N	~N(219)	~N(220)	7.981	0.001	0	77288	0.01997				
CS02L.051	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		129.5	0.831	0	0	N	~N(143)	~N(141)	7.981	0	0	75169	0.02006				
CS02L.052	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		129.6	0.832	0	0	N	~N(220)	~N(222)	7.981	0	0	75230	0.02006				
CS02L.053	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		125.8	0.807	0	0	N	~N(141)	~N(142)	7.981	0	0	73012	0.02017				
CS02L.054	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		125.9	0.808	0	0	N	~N(222)	~N(221)	7.981	0	0	73072	0.02016				
CS02L.055	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		122.2	0.785	0	0	N	~N(142)	~N(137)	7.981	0	0	70953	0.02027				
CS02L.056	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		122	0.783	0	0	N	~N(221)	~N(226)	7.981	0	0	70838	0.02028				
CS02L.057	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		118.4	0.76	0	0	N	~N(137)	~N(138)	7.981	0	0	68720	0.02039				
CS02L.058	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		118.5	0.761	0	0	N	~N(226)	~N(225)	7.981	0	0	68780	0.02038				
CS02L.059	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		114.7	0.736	0	0	N	~N(138)	~N(140)	7.981	0	0	66562	0.02051				
CS02L.060	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		114.8	0.737	0	0	N	~N(225)	~N(223)	7.981	0	0	66623	0.0205				
CS02L.061	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		111.1	0.713	0	0	N	~N(140)	~N(139)	7.981	0	0	64505	0.02062				
CS02L.062	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		110.9	0.712	0	0	N	~N(223)	~N(224)	7.981	0	0	64389	0.02063				
CS02L.063	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		107.3	0.689	0	0	N	~N(139)	~N(145)	7.981	0	0	62271	0.02076				
CS02L.064	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		107.4	0.689	0	0	N	~N(224)	~N(175)	7.981	0	0	62332	0.02075				
CS02L.065	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		103.6	0.665	0	0	N	~N(145)	~N(146)	7.981	0	0	60114	0.02089				
CS02L.066	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		103.7	0.665	0	0	N	~N(175)	~N(176)	7.981	0	0	60175	0.02089				
CS02L.067	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		100	0.642	0	0	N	~N(146)	~N(147)	7.981	0	0	58057	0.02103				
CS02L.068	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		99.82	0.641	0	0	N	~N(176)	~N(177)	7.981	0	0	57942	0.02104				
CS02L.069	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		96.17	0.617	0	0	N	~N(147)	~N(148)	7.981	0	0	55824	0.02119				
CS02L.070	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		96.28	0.618	0	0	N	~N(177)	~N(178)	7.981	0	0	55885	0.02118				

CS02L071	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	92.46	0.593	0	0	N	~N(148)	~N(149)	7.981	0	0	53668	0.02135										
CS02L072	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	92.56	0.594	0	0	N	~N(179)	~N(178)	7.981	0	0	53728	0.02134										
CS02L073	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	88.92	0.571	0	0	N	~N(149)	~N(150)	7.981	0	0	51611	0.02151										
CS02L074	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	88.72	0.569	0	0	N	~N(178)	~N(183)	7.981	0	0	51495	0.02152										
CS02L075	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	85.07	0.546	0	0	N	~N(150)	~N(151)	7.981	0	0	49378	0.02169										
CS02L076	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	85.17	0.547	0	0	N	~N(183)	~N(182)	7.981	0	0	49439	0.02169										
CS02L077	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	81.35	0.522	0	0	N	~N(151)	~N(153)	7.981	0	0	47222	0.02188										
CS02L078	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	81.46	0.523	0	0	N	~N(182)	~N(180)	7.981	0	0	47282	0.02188										
CS02L079	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	77.81	0.499	0	0	N	~N(153)	~N(152)	7.981	0	0	45165	0.02208										
CS02L080	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	77.61	0.498	0	0	N	~N(180)	~N(181)	7.981	0	0	45050	0.02209										
CS02L081	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	73.97	0.475	0	0	N	~N(152)	~N(154)	7.981	0	0	42933	0.0223										
CS02L082	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	74.07	0.475	0	0	N	~N(181)	~N(191)	7.981	0	0	42993	0.0223										
CS02L083	Steel Sch.40 (clean)	Containment Sump Water	8	3	0	70.25	0.451	0	0	N	~N(154)	~N(155)	7.981	0	0	40777	0.02254										
CS02L084	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	70.36	0.452	0	0	N	~N(191)	~N(190)	7.981	0	0	40837	0.02253										
CS02L085	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	66.71	0.428	0	0	N	~N(155)	~N(157)	7.981	0	0	38720	0.02278										
CS02L086	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	66.51	0.427	0	0	N	~N(190)	~N(188)	7.981	0	0	38605	0.02279										
CS02L087	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	62.86	0.403	0	0	N	~N(157)	~N(156)	7.981	0	0	36488	0.02306										
CS02L088	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	62.97	0.404	0	0	N	~N(188)	~N(189)	7.981	0	0	36549	0.02305										
CS02L089	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	59.15	0.38	0	0	N	~N(156)	~N(161)	7.981	0	0	34332	0.02336										
CS02L090	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	59.25	0.38	0	0	N	~N(189)	~N(184)	7.981	0	0	34393	0.02335										
CS02L091	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	55.61	0.357	0	0	N	~N(161)	~N(160)	7.981	0	0	32278	0.02367										
CS02L092	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	55.41	0.356	0	0	N	~N(184)	~N(185)	7.981	0	0	32161	0.02369										
CS02L093	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	51.76	0.332	0	0	N	~N(160)	~N(158)	7.981	0	0	30044	0.02404										
CS02L094	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	51.86	0.333	0	0	N	~N(185)	~N(187)	7.981	0	0	30104	0.02403										
CS02L095	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	48.05	0.308	0	0	N	~N(158)	~N(159)	7.981	0	0	27888	0.02444										
CS02L096	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	48.15	0.309	0	0	N	~N(187)	~N(186)	7.981	0	0	27949	0.02442										
CS02L097	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	44.5	0.286	0	0	N	~N(159)	~N(162)	7.981	0	0	25832	0.02486										
CS02L098	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	44.31	0.284	0	0	N	~N(186)	~N(201)	7.981	0	0	25717	0.02488										
CS02L099	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	40.66	0.261	0	0	N	~N(162)	~N(163)	7.981	0	0	23600	0.02537										
CS02L100	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	40.76	0.262	0	0	N	~N(201)	~N(200)	7.981	0	0	23660	0.02535										
CS02L101	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	36.94	0.237	0	0	N	~N(163)	~N(171)	7.981	0	0	21444	0.02583										
CS02L102	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	37.06	0.238	0	0	N	~N(200)	~N(192)	7.981	0	0	21506	0.02582										
CS02L103	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	33.4	0.214	0	0	N	~N(171)	~N(170)	7.981	0	0	19388	0.02655										
CS02L104	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	33.2	0.213	0	0	N	~N(192)	~N(193)	7.981	0	0	19273	0.02659										
CS02L105	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	29.56	0.19	0	0	N	~N(170)	~N(168)	7.981	0	0	17156	0.02734										
CS02L106	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	29.66	0.19	0	0	N	~N(193)	~N(195)	7.981	0	0	17217	0.02732										
CS02L107	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	25.84	0.166	0	0	N	~N(168)	~N(169)	7.981	0	0	15001	0.02826										
CS02L108	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	25.95	0.167	0	0	N	~N(195)	~N(194)	7.981	0	0	15061	0.02823										
CS02L109	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	22.3	0.143	0	0	N	~N(169)	~N(164)	7.981	0	0	12945	0.02932										
CS02L110	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	22.1	0.142	0	0	N	~N(194)	~N(199)	7.981	0	0	12829	0.02939										
CS02L111	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	18.46	0.118	0	0	N	~N(164)	~N(165)	7.981	0	0	10713	0.03079										
CS02L112	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	18.56	0.119	0	0	N	~N(199)	~N(198)	7.981	0	0	10773	0.03075										
CS02L113	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	14.74	0.095	0	0	N	~N(165)	~N(167)	7.981	0	0	8557	0.0327										
CS02L114	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	14.85	0.095	0	0	N	~N(198)	~N(196)	7.981	0	0	8618	0.03264										
CS02L115	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	11.2	0.072	0	0	N	~N(167)	~N(166)	7.981	0	0	6501	0.03531										
CS02L116	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	11	0.071	0	0	N	~N(196)	~N(197)	7.981	0	0	6385	0.03549										
CS02L117	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	7.355	0.047	0	0	N	~N(166)	~N(172)	7.981	0	0	4269	0.03999										
CS02L118	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	7.459	0.048	0	0	N	~N(197)	~N(202)	7.981	0	0	4330	0.03962										
CS02L119	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	3.642	0.023	0	0	N	~N(172)	~N(173)	7.981	0	0	2114	0.05029										
CS02L120	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	3.748	0.024	0	0	N	~N(202)	~N(174)	7.981	0	0	2174	0.0496										
CS02L121	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	0.099	0	0	0	N	~N(173)	~N(174)	7.981	0	0	57.62	1.111										
CS02M(001)	Steel Sch 40 (clean)	Containment Sump Water	10	1.8	4.405	300.8	1.225	0.045	0.103	N	~N(380)	~N(381)	10.02	0	0.103	139077	0.0179	1 x Reducer - Contraction (10 x 8 - 7)	0.1047	1 x Diverging* Tee (Branch)	4.3						
CS02M(002)	Steel Sch 40 (clean)	Containment Sump Water	10	1.8	4.405	300.9	1.225	0.045	0.103	N	~N(380)	~N(382)	10.02	0	0.103	139105	0.0179	1 x Reducer - Contraction (10 x 8 - 7)	0.1047	1 x Diverging* Tee (Branch)	4.3						
CS02M(003)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	295.4	1.896	0.002	0.005	N	~N(381)	~N(383)	7.981	0.005	0	171481	0.01765										
CS02M(004)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	295.5	1.897	0.002	0.005	N	~N(382)	~N(384)	7.981	0.005	0	171515	0.01765										
CS02M(005)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	290	1.862	0.002	0.005	N	~N(383)	~N(385)	7.981	0.005	0	168353	0.01769										
CS02M(006)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	290.1	1.862	0.002	0.005	N	~N(384)	~N(386)	7.981	0.005	0	168387	0.01769										
CS02M(007)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	284.7	1.827	0.002	0.005	N	~N(385)	~N(387)	7.981	0.005	0	165225	0.01774										
CS02M(008)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	284.7	1.827	0.002	0.005	N	~N(386)	~N(388)	7.981	0.005	0	165259	0.01774										
CS02M(009)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	279.3	1.792	0.002	0.005	N	~N(387)	~N(389)	7.981	0.005	0	162099	0.01779										
CS02M(010)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	279.3	1.793	0.002	0.005	N	~N(388)	~N(400)	7.981	0.005	0	162133	0.01779										
CS02M(011)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	273.9	1.758	0.002	0.005	N	~N(389)	~N(401)	7.981	0.005	0	158973	0.01783										
CS02M(012)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	273.9	1.758	0.002	0.005	N	~N(400)	~N(402)	7.981	0.005	0	159007	0.01783										
CS02M(013)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	268.5	1.723	0.002	0.004	N	~N(401)	~N(403)	7.981	0.004	0	155847	0.01788										
CS02M(014)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	268.6	1.724	0.002	0.004	N	~N(402)	~N(404)	7.981	0.004	0	155882	0.01788										
CS02M(015)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	263.1	1.689	0.002	0.004	N	~N(403)	~N(405)	7.981	0.004	0	152723	0.01793										
CS02M(016)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	263.2	1.689	0.002	0.004	N	~N(404)	~N(406)	7.981	0.004	0	152757	0.01793										
CS02M(017)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	257.7	1.654	0.002	0.004	N	~N(405)	~N(407)	7.981	0.004	0	149598	0.01799										
CS02M(018)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	257.8	1.655	0.002	0.004	N	~N(406)	~N(408)	7.981	0.004	0	149633	0.01799										
CS02M(019)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	252.3	1.62	0.002	0.004	N	~N(407)	~N(409)	7.981	0.004	0	146475	0.01804										
CS02M(020)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	252.4	1.62	0.002	0.004	N	~N(408)	~N(410)	7.981	0.004	0	146509	0.01804										
CS02M(021)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	247	1.585	0.002	0.004	N	~N(409)	~N(411)	7.981	0.004	0	143352	0.0181										
CS02M(022)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	247	1.586	0.002	0.004	N	~N(410)	~N(412)	7.981	0.004	0	143386	0.0181										
CS02M(023)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	241.6	1.551	0.002	0.004	N	~N(411)	~N(413)	7.981	0.004	0	140229	0.01815										
CS02M(024)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	241.6	1.551	0.002	0.004	N	~N(412)	~N(414)	7.981	0.004	0	140263	0.01815										
CS02M(025)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	236.2	1.516	0.002	0.004	N	~N(413)	~N(415)	7.981	0.004	0	137107	0.01821										
CS02M(026)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	236.3	1.516	0.002	0.004	N	~N(414)	~N(416)	7.981	0.004	0	137141	0.01821										
CS02M(027)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	230.8	1.482	0.001	0.003	N	~N(415)	~N(417)	7.981	0.003	0	133985	0.01827										
CS02M(028)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	230.9	1.482	0.001	0.003	N	~N(416)	~N(418)	7.981	0.003	0	134019	0.01827										
CS02M(029)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	225.5	1.447	0.001	0.003	N	~N(417)	~N(419)	7.981	0.003	0	130864	0.01834										
CS02M(030)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	225.5	1.447	0.001	0.003	N	~N(418)	~N(420)	7.981	0.003	0	130898	0.01834										
CS02M(031)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	220.1	1.413	0.001	0.003	N	~N(419)	~N(421)	7.981	0.003	0	127743	0.0184										
CS02M(032)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	220.1	1.413	0.001	0.003	N	~N(420)	~N(422)	7.981	0.003	0	127778	0.0184										
CS02M(033)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	214.7	1.378	0.001	0.003	N	~N(421)	~N(423)	7.981	0.003	0	124623	0.01847										
CS02M(034)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	214.8	1.378	0.001	0.003	N	~N(422)	~N(424)	7.981	0.003	0	124657	0.01847										
CS02M(035)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	209.3	1.344	0.001	0.003	N	~N(423)	~N(425)	7.981	0.003	0	121503	0.01854										
CS02M(036)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	209.4	1.344	0.001	0.003	N	~N(424)	~N(426)	7.981	0.003	0	121537	0.01854										
CS02M(037)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	204	1.309	0.001	0.003	N	~N(425)	~N(427)	7.981	0.003	0	118384	0.01862										
CS02M(038)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	204	1.309	0.001	0.003	N	~N(426)	~N(428)	7.981	0.003	0	118418	0.01862										
CS02M(039)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	198.6	1.275	0.001	0.003	N	~N(427)	~N(429)	7.981	0.003	0	115264	0.01869										
CS02M(040)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	198.6	1.275	0.001	0.003	N	~N(428)	~N(430)	7.981	0.003	0	115299	0.01869										
CS02M(041)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	193.2	1.24	0.001	0.002	N	~N(429)	~N(431)	7.981	0.002	0	112146	0.01877										
CS02M(042)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	193.3	1.24	0.001	0.002	N	~N(430)	~N(432)	7.981	0.002	0	112180	0.01877										
CS02M(043)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	187.8	1.206	0	0.002	N	~N(431)	~N(433)	7.981	0.002	0	109027	0.01886										
CS02M(044)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	187.9	1.206	0	0.002	N	~N(432)	~N(434)	7.981	0.002	0	109061	0.01886										
CS02M(045)	Steel Sch.40 (clean)	Containment Sump Water	8	3.6	0	182.5	1.171	0	0.002	N	~N(433)	~N(435)	7.981	0.002	0	105909	0.01894										
CS02M(046)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	182.5	1.171	0	0.002	N	~N(434)	~N(436)	7.981	0.002	0	105943	0.01894										
CS02M(047)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	177.1	1.137	0	0.002	N	~N(435)	~N(437)	7.981	0.002	0	102791	0.01904										
CS02M(048)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	177.1	1.137	0	0.002	N	~N(436)	~N(438)	7.981	0.002	0	102825	0.01903										
CS02M(049)	Steel Sch.40 (clean)	Containment Sump Water	8	3.6	0	171.7	1.102	0	0.002	N	~N(437)	~N(439)	7.981	0.002	0	99673	0.01913										
CS02M(050)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	171.8	1.103	0	0.002	N	~N(438)	~N(440)	7.981	0.002	0	99707	0.01913										
CS02M(051)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	166.3	1.068	0	0.002	N	~N(439)	~N(441)	7.981	0.002	0	96556	0.01923										
CS02M(052)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	166.4	1.068	0	0.002	N	~N(440)	~N(442)	7.981	0.002	0	96590	0.01923										
CS02M(053)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	161	1.033	0	0.002	N	~N(441)	~N(443)	7.981	0.002	0	93439	0.01933										
CS02M(054)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	161	1.034	0	0.002	N	~N(442)	~N(444)	7.981	0.002	0	93473	0.01933										
CS02M(055)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	155.6	0.999	0	0.002	N	~N(443)	~N(445)	7.981	0.002	0	90322	0.01944										
CS02M(056)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	155.7	0.9991	0	0.002	N	~N(444)	~N(446)	7.981	0.002	0	90356	0.01944										
CS02M(057)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	150.2	0.964	0	0.002	N	~N(445)	~N(447)	7.981	0.002	0	87205	0.01956										
CS02M(058)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	150.3	0.965	0	0.002	N	~N(446)	~N(448)	7.981	0.002	0	87239	0.01956										
CS02M(059)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	144.9	0.93	0	0.001	N	~N(447)	~N(449)	7.981	0.001	0	84089	0.01968										
CS02M(060)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]										
CS02M(061)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]										
CS02M(062)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]										
CS02M(063)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]										
CS02M(064)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]										
CS02M(065)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]										
CS02M(066)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]										
CS02M(067)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]										
CS02M(068)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]										
CS02M(069)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]										
CS02M(070)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]										
CS02M(071)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]										
CS02M(072)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]										
CS02M(073)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]										
CS02M(074)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]										
CS02M(075)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]										
CS02M(076)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]										
CS02M(077)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]										
CS02M(078)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]										
CS02M(079)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]										
CS02M(080)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]										
CS02M(081)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	85.83	0.551	0	0	N	~N(469)	~N(471)	7.981	0	0	49817	0.02166										
CS02M(082)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	85.89	0.551	0	0	N	~N(470)	~N(472)	7.981	0	0	49851	0.02165										
CS02M(083)	Steel Sch.40 (clean)	Containment Sump Water	8	3.6	0	80.46	0.516	0	0	N	~N(471)	~N(473)	7.981	0	0	46703	0.02193										
CS02M(084)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	80.52	0.517	0	0	N	~N(472)	~N(474)	7.981	0	0	46737	0.02193										
CS02M(085)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	75.09	0.482	0	0	N	~N(473)	~N(475)	7.981	0	0	43588	0.02224										
CS02M(086)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	75.15	0.482	0	0	N	~N(474)	~N(476)	7.981	0	0	43622	0.02223										
CS02M(087)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	69.73	0.448	0	0	N	~N(475)	~N(477)	7.981	0	0	40473	0.02257										
CS02M(088)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	69.79	0.448	0	0	N	~N(476)	~N(478)	7.981	0	0	40507	0.02257										
CS02M(089)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	64.36	0.413	0	0	N	~N(477)	~N(479)	7.981	0	0	37358	0.02295										
CS02M(090)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	64.42	0.413	0	0	N	~N(478)	~N(480)	7.981	0	0	37392	0.02295										
CS02M(091)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	59	0.379	0	0	N	~N(479)	~N(481)	7.981	0	0	34243	0.02337										
CS02M(092)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	59.05	0.379	0	0	N	~N(480)	~N(482)	7.981	0	0	34277	0.02337										
CS02M(093)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	53.63	0.344	0	0	N	~N(481)	~N(483)	7.981	0	0	31129	0.02386										
CS02M(094)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	53.69	0.345	0	0	N	~N(482)	~N(484)	7.981	0	0	31163	0.02385										
CS02M(095)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	48.26	0.31	0	0	N	~N(483)	~N(485)	7.981	0	0	28014	0.02441										
CS02M(096)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	48.32	0.31	0	0	N	~N(484)	~N(486)	7.981	0	0	28048	0.0244										
CS02M(097)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	42.9	0.275	0	0	N	~N(485)	~N(487)	7.981	0	0	24899	0.02506										
CS02M(098)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	42.96	0.276	0	0	N	~N(486)	~N(488)	7.981	0	0	24933	0.02505										
CS02M(099)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	37.53	0.241	0	0	N	~N(487)	~N(489)	7.981	0	0	21785	0.02584										
CS02M(100)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	37.59	0.241	0	0	N	~N(488)	~N(490)	7.981	0	0	21819	0.02583										
CS02M(101)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	32.17	0.206	0	0	N	~N(489)	~N(491)	7.981	0	0	18670	0.02679										
CS02M(102)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	32.22	0.207	0	0	N	~N(490)	~N(492)	7.981	0	0	18704	0.02678										
CS02M(103)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	26.8	0.172	0	0	N	~N(491)	~N(493)	7.981	0	0	15556	0.028										
CS02M(104)	Steel Sch.40 (clean)	Containment Sump Water	8	3.6	0	26.86	0.172	0	0	N	~N(492)	~N(494)	7.981	0	0	15590	0.02799										
CS02M(105)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	21.43	0.138	0	0	N	~N(493)	~N(495)	7.981	0	0	12441	0.02962										
CS02M(106)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	21.49	0.138	0	0	N	~N(494)	~N(496)	7.981	0	0	12475	0.0296										
CS02M(107)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	16.07	0.103	0	0	N	~N(495)	~N(497)	7.981	0	0	9327	0.03195										
CS02M(108)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	16.13	0.104	0	0	N	~N(496)	~N(498)	7.981	0	0	9361	0.03192										
CS02M(109)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	10.7	0.069	0	0	N	~N(497)	~N(499)	7.981	0	0	6212	0.03577										
CS02M(110)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	10.76	0.069	0	0	N	~N(498)	~N(500)	7.981	0	0	6246	0.03571										
CS02M(111)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	5.336	0.034	0	0	N	~N(499)	~N(501)	7.981	0	0	3098	0.04424										
CS02M(112)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	5.395	0.035	0	0	N	~N(500)	~N(502)	7.981	0	0	3132	0.04409										
CS02M(113)	Steel Sch 40 (clean)	Containment Sump Water	8	3.6	0	0.029	0	0	0	N	~N(502)	~N(501)	7.981	0	0	17.03	3.758										
CS05AA	Steel Sch 40 (clean)	Containment Sump Water	3	1	9.8	0	0	0	0	N	~N(008)	~N(563)	3.068	0	0	0	0	1 x Diverging Tee (Branch)	9.8								
CS05AB	Steel Sch 40 (clean)	Containment Sump Water	3	1	11.1	0	0	0	0	N	~N(240)	~N(562)	3.068	0	0	0	0	1 x Diverging Tee (Branch)	11.1								
CS06AA	Steel Sch 40 (clean)	Containment Sump Water	6	1	1	0	0	-1.382	0	N	~N(563)	~N(566)	6.065	0	0	0	0	1 x Converging Tee (Branch)	1								
CS06AB	Steel Sch 40 (clean)	Containment Sump Water	6	1	1	0	0	1.08	0	N	~N(562)	~N(567)	6.065	0	0	0	0	1 x Converging Tee (Branch)	1								
CS23AA	Steel Sch.30 (clean)	Containment Sump Water	14	15.7	1.00E-05	0	0	-6.4	0	N	~N(566)	~N(005)	13.25	0	0	0	0	1 x Converging Tee (Branch)	1.00E-05								
CS23AB	Steel Sch.30 (clean)	Containment Sump Water	14	4.9	1.00E-05	0	0	-2.117	0	N	~N(567)	~N(237)	13.25	0	0	0	0	1 x Converging Tee (Branch)	1.00E-05								
CV05B(001)	Steel Sch 40 (clean)	Water After RHR HX	8	17.5	0.8	789.6	4.939	0.199	0.461	N	~N(622)	~N(627)	7.981	0.158	0.303	446701	0.01589	1 x Diverging* Tee (Branch)	0.8								
CV05B(002)	Steel Sch.40 (clean)	Water After RHR HX	8	21.7	22.29	130	0.834	0.107	0.249	N	~N(631)	~N(622)	7.981	0.007	0.241	75458	0.02005	3 x Pipe Bend - r/d 1.5 (90°)	0.1969	1 x Converging Tee (Through)	20.9	1 x Diverging* Tee (Branch)	0.8				
CV05B(003)	Steel Sch 40 (clean)	Water After RHR HX	8	18.6	0	130	0.834	0.002	0.005	N	~N(633)	~N(631)	7.981	0.005	0	75458	0.02005										
CV05B(004)	Steel Sch 40 (clean)	Water After RHR HX	8	18.5	0.5807	0	0	0	0	N	~N(625)	~N(633)	7.981	0	0	0	0	3 x Pipe Bend - r/d 1.5 (90°)	0.1969	1 x Converging Tee (Through)	1.00E-05						
CV05B(005)	Steel Sch 40 (clean)	Water After RHR HX	8	13.7	1.2	0	0	0.884	0	N	~N(624)	~N(625)	7.981	0	0	0	0	1 x Converging* Tee (Branch)	1.2								
CV05B(006)	Steel Sch 40 (clean)	Water After RHR HX	8	1	1.00E-05	0	0	0	0	N	~N(623)	~N(624)	7.981	0	0	0	0	1 x Converging Tee (Through)	1.00E-05								
CV05CA	Steel Sch 40 (clean)	Water After RHR HX	6	24.5	2.812	382.7	4.365	-1.22	1.075	N	~N(627)	Centrifugal Charging Pump A	6.065	0.244	0.831	299972	0.01703	2 x Pipe Bend - r/d 1.5 (90°)	0.2085	1 x CV8471A (Gate Valve)	0.195	1 x Diverging Tee (Branch)	2.2				
CV05CB	Steel Sch 40 (clean)	Water After RHR HX	6	119.6	1.921	376.9	4.188	-0.982	1.628	N	~N(627)	Centrifugal Charging Pump B	6.065	1.103	0.523	287847	0.0171	6 x Pipe Bend - r/d 1.5 (90°)	0.2085	1 x Reducer - Contraction (8 x 6 - 5.5)	0.058	1 x CV8471B (Gate Valve)	0.195	1 x Diverging Tee (Through)	1.00E-05		
CV06A	Steel Sch 40 (clean)	Water After RHR HX	4	39.4	427.6	0	0	-2.506	0	N	~N(631)	Positive Dis. Charging Pump	4.026	0	0	0.01151	0	5 x Pipe Bend - r/d 1.5 (90°)	0.2279	1 x Reducer - Contraction (8 x 4 - 6)	0.1867	1 x CV1344(Suct. Stabilizer)	423.9	1 x CV8394(Diaphragm Valve)	2.436	1 x Diverging* Tee (Branch)	1.00E-05
CV07A(001)	Steel Sch. 160 (clean)	Water After RHR HX	3	2.7	8.631	0	0	0	0	N	Positive Dis. Charging Pump	~N(641)	2.624	0	0	0.01765	0	1 x Pipe Bend - r/d 1.5 (90°)	0.2511	1 x CV12M(Puls. Dampener)	8.379						
CV07A(002)	Steel Sch. 160 (clean)	Water After RHR HX	3	30.5	10.05	0	0	1.555	0	N	~N(641)	~N(640)	2.624	0	0	0.01765	0	1 x CV8497(Check Valve)	3.2	3 x Pipe Bend - r/d 1.5 (90°)	0.2511	1 x CV8388(Globe Valve)	6.1	1 x Diverging Tee (Through)	1.00E-05		

CV08AA(001)	Steel Sch.160 (clean)	Water After RHR HX	4	2.8	0.4721		382.7	13.58	1.189	1.851	N	Centrifugal Charging Pump A	~N(637)	3.438	0.5	1.361	529182	0.01787	2 x Pipe Bend - r/d 1.5 (90°)	0.2361														
CV08AA(002)	Steel Sch.160 (clean)	Water After RHR HX	4	4.8	2.875		327.7	11.34	2.822	6.532	N	~N(637)	~N(638)	3.438	0.602	5.93	441598	0.01803	1 x CV8481A(Check Valve)	2.975	1 x Diverging Tee (Through)	1.00E-05												
CV08AA(003)	Steel Sch.40 (clean)	Water After RHR HX	4	12.8	0.9047		327.7	8.288	1.545	1.676	N	~N(638)	~N(639)	4.026	0.717	0.958	377102	0.01772	3 x Pipe Bend - r/d 1.5 (90°)	0.2279	1 x CV8485A	0.221	1 x Diverging Tee (Through)	1.00E-05	1 x Converging Tee (Branch)	1.00E-05								
CV08BA(001)	Steel Sch.160 (clean)	Water After RHR HX	4	1.7	0.2361		378.9	13.03	0.779	0.902	N	Centrifugal Charging Pump B	~N(634)	3.438	0.28	0.822	507793	0.0179	1 x Pipe Bend - r/d 1.5 (90°)	0.2361														
CV08BA(002)	Steel Sch.160 (clean)	Water After RHR HX	4	3.7	3.211		311.9	10.79	2.686	6.217	N	~N(634)	~N(635)	3.438	0.421	5.798	420209	0.01808	1 x Pipe Bend - r/d 1.5 (90°)	0.2361	1 x CV8481B(Check Valve)	2.975	1 x Diverging Tee (Through)	1.00E-05										
CV08BA(003)	Steel Sch.40 (clean)	Water After RHR HX	4	105.1	3.333		311.9	7.888	4.468	8.444	N	~N(635)	~N(636)	4.026	5.245	3.199	358837	0.01778	4 x Pipe Bend - r/d 1.5 (90°)	0.2279	1 x CV8485B (Gate Valve)	0.221	1 x Diverging Tee (Through)	1.00E-05	1 x Converging* Tee (Branch)	2.2								
CV09A(001)	Steel Sch.160 (clean)	Water After RHR HX	4	13.3	5		247.7	8.568	2.879	6.884	N	~N(639)	~N(636)	3.438	0.909	5.895	333802	0.01833	1 x Converging* Tee (Branch)	3.2	1 x Diverging* Tee (Branch)	1.8												
CV09A(002)	Steel Sch.160 (clean)	Water After RHR HX	4	23.3	9.156		558.6	19.35	33.84	61.53	N	~N(636)	~N(643)	3.438	6.32	53.21	754011	0.01781	4 x Pipe Bend - r/d 1.5 (90°)	0.2361	1 x FE917	7.2	1 x Tee - Flow Thru Branch	1.012										
CV09D(001)	Steel Sch.160 (clean)	Water After RHR HX	3	2.8	0.2636		80	4.75	0.077	0.177	N	~N(642)	~N(640)	2.624	0.085	0.092	141236	0.02044	1 x Reducer - Contraction (4 x 3 - 4)	0.03381	1 x CV8483A(Gate Valve)	0.23	1 x Diverging Tee (Through)	1.00E-05										
CV09D(002)	Steel Sch.160 (clean)	Water After RHR HX	3	8.8	12.53		80	4.75	2.018	4.667	N	~N(639)	~N(642)	2.624	0.281	4.386	141236	0.02044	1 x CV8483B(Gate Valve)	0.23	1 x Converging Tee (Through)	1.00E-05	1 x Diverging* Tee (Branch)	12.3										
CV09D(003)	Steel Sch.160 (clean)	Water After RHR HX	3	23	11.4		80	4.75	6.03	4.743	N	~N(640)	~N(667)	2.624	0.753	3.99	141236	0.02044	1 x FE121	8.4	1 x Diverging Tee (Branch)	2	1 x Converging Tee (Through)	1.00E-05										
CV09D(004)	Steel Sch.160 (clean)	Water After RHR HX	3	12.8	1.00E-05		0	0	0	0	N	~N(667)	~N(668)	2.624	0	0	0	0	1 x Diverging Tee (Through)	1.00E-05														
CV12AA	Steel Sch.160 (clean)	Water After RHR HX	3	15.8	1.74	XXX	—	—	—	—	N	~N(632)	~N(678)	2.624	—	—	—	—	3 x Pipe Bend - r/d 1.5 (90°)	0.2511	1 x CV8387A(Globe Valve)	0.9886	1 x Diverging Tee (Branch)	1.00E-05	1 x Converging* Tee (Branch)	1.00E-05								
CV12AB	Steel Sch.160 (clean)	Water After RHR HX	3	116.7	3.247	XXX	—	—	—	—	N	~N(635)	~N(678)	2.624	—	—	—	—	9 x Pipe Bend - r/d 1.5 (90°)	0.2511	1 x CV8387B(Globe Valve)	0.9886	1 x Diverging Tee (Branch)	1.00E-05	1 x Converging* Tee (Branch)	1.00E-05								
CV12B	Steel Sch.160 (clean)	Water After RHR HX	3	0.8	0		0	0	0	0	N	~N(678)	~N(679)	2.624	0	0	0	0																
CV13B	Steel Sch.160 (clean)	Water After RHR HX	3	13.8	2.251		80	4.75	-2.748	1.239	N	~N(667)	~N(679)	2.624	0.451	0.788	141236	0.02044	1 x Pipe Bend - r/d 1.5 (90°)	0.2511	1 x Converging Tee (Branch)	1.00E-05	1 x Diverging* Tee (Branch)	1.00E-05	1 x Diverging Tee (Branch)	2								
CV43A(001)	Steel Sch.160 (clean)	Water After RHR HX	2	92	49.04		0	0	1.944	0	N	~N(668)	~N(669)	1.687	0	0	0	0	13 x Pipe Bend - r/d 1.5 (90°)	0.2791	5 x Pipe Bend - r/d 1.5 (45°)	0.1976	1 x FE139	6.8	1 x CV8345(Globe Valve)	5.891	1 x CV8346(Globe Valve)	5.891	1 x CV8348(Check Valve)	2.005	1 x CV184 (Globe Valve)	23.84	1 x Diverging Tee (Branch)	1.00E-05
CV43A(002)	Steel Sch.160 (clean)	Water After RHR HX	2	80.5	1.116		0	0	0.302	0	N	~N(669)	~N(670)	1.687	0	0	0	0	4 x Pipe Bend - r/d 1.5 (90°)	0.2791	1 x Diverging* Tee (Branch)	1.00E-05												
CV43A(003)	Steel Sch.160 (clean)	Water After RHR HX	2	117.6	2.151		0	0	1.21	0	N	~N(670)	~N(671)	1.687	0	0	0	0	7 x Pipe Bend - r/d 1.5 (90°)	0.2791	1 x Pipe Bend - r/d 1.5 (45°)	0.1976	1 x Diverging Tee (Through)	1.00E-05										
CV43BA/RC16AA	Steel Sch.160 (clean)	Water After RHR HX	2	134.4	15.41	XXX	—	—	—	—	N	~N(671)	Hot Leg A(001)	1.687	—	—	—	—	13 x Pipe Bend - r/d 1.5 (90°)	0.2791	1 x RC8038A (Y Globe Valve)	5.891	1 x RC8036A (Globe Valve)	5.891	1 x Diverging Tee (Through)	1.00E-05								
CV43BB/RC16AB	Steel Sch.160 (clean)	Water After RHR HX	2	18	13.29	XXX	—	—	—	—	N	~N(671)	Hot Leg B(001)	1.687	—	—	—	—	4 x Pipe Bend - r/d 1.5 (90°)	0.2791	2 x Pipe Bend - r/d 1.5 (45°)	0.1976	1 x RC8038B (Y Globe Valve)	5.891	1 x RC8036B (Globe Valve)	5.891	1 x Diverging Tee (Branch)	1.00E-05						
CV43BC/RC16AC	Steel Sch.160 (clean)	Water After RHR HX	2	59.1	13.46	XXX	—	—	—	—	N	~N(670)	Hot Leg C(001)	1.687	—	—	—	—	8 x Pipe Bend - r/d 1.5 (90°)	0.2791	1 x RC8038C (Y Globe Valve)	5.891	1 x RC8036C (Globe Valve)	5.891	1 x Diverging Tee (Branch)	1.00E-05								
CV43BD/RC16AD	Steel Sch.160 (clean)	Water After RHR HX	2	51.7	12.9	XXX	—	—	—	—	N	~N(669)	Hot Leg D(001)	1.687	—	—	—	—	4 x Pipe Bend - r/d 1.5 (90°)	0.2791	1 x RC8038D (Y Globe Valve)	5.891	1 x RC8036D (Globe Valve)	5.891	1 x Diverging* Tee (Branch)	1.00E-05								
CV98A	Steel Sch.40 (clean)	Water After RHR HX	6	5.5	0		638.6	4.105	-2.381	0.035	N	~N(508)	~N(518)	7.981	0.036	0	371243	0.01618																
CV98BA	Steel Sch.40 (clean)	Water After RHR HX	6	8.8	0.3769		319.8	2.053	-2.143	0.04	N	~N(518)	~N(521)	7.981	0.015	0.025	185622	0.01747	1 x Pipe Bend - r/d 1.5 (90°)	0.1969	1 x CV112D(Gate Valve)	0.18	1 x Converging Tee (Branch)	1.00E-05	1 x Diverging Tee (Branch)	1.00E-05								
CV98BB	Steel Sch.40 (clean)	Water After RHR HX	6	8.8	0.3769		319.8	2.053	-2.143	0.04	N	~N(518)	~N(521)	7.981	0.015	0.025	185622	0.01747	1 x Pipe Bend - r/d 1.5 (90°)	0.1969	1 x CV112E(Gate Valve)	0.18	1 x Converging Tee (Through)	1.00E-05	1 x Diverging Tee (Through)	1.00E-05								
CV98C	Steel Sch.40 (clean)	Water After RHR HX	6	6.5	3.2		638.8	4.105	0.379	0.878	N	~N(521)	~N(622)	7.981	0.041	0.637	371243	0.01618	1 x CV8546(Check Valve)	1.9	1 x Converging Tee (Branch)	1.5												
CVA1A/BI13C	Steel Sch.40 (clean)	Water After RHR HX	6	22.5	1.521	XXX	—	—	—	—	N	~N(626)	~N(624)	6.065	—	—	—	—	1 x 8924 (Gate Valve)	0.195	3 x Pipe Bend - r/d 1.5 (90°)	0.2085	1 x Converging Tee (Branch)	0.7										

[illegible]

Pipe(336)	Steel Sch.40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	4.228	1.57	1.16	7.185	N	B2(065)
Pipe(337)	Steel Sch.40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	4.228	1.57	1.16	7.185	N	B2(066)
Pipe(338)	Steel Sch.40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	4.228	1.57	1.16	7.184	N	B2(067)
Pipe(339)	Steel Sch.40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	4.228	1.57	1.16	7.184	N	B2(068)
Pipe(340)	Steel Sch.40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	4.228	1.57	1.159	7.184	N	B2(069)
Pipe(341)	Steel Sch.40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	4.228	1.57	1.159	7.184	N	B2(070)
Pipe(342)	Steel Sch.40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	4.228	1.57	1.159	7.183	N	B2(071)
Pipe(343)	Steel Sch.40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	4.228	1.57	1.159	7.183	N	B2(072)
Pipe(344)	Steel Sch.40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	4.228	1.57	1.159	7.183	N	B2(073)
Pipe(345)	Steel Sch.40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	4.228	1.57	1.159	7.183	N	B2(074)
Pipe(346)	Steel Sch.40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	4.225	1.57	1.159	7.182	N	B2(075)
Pipe(347)	Steel Sch.40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	4.225	1.57	1.159	7.182	N	B2(076)
Pipe(348)	Steel Sch.40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	4.225	1.57	1.159	7.182	N	B2(077)
Pipe(349)	Steel Sch.40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	4.225	1.57	1.159	7.182	N	B2(078)
Pipe(350)	Steel Sch.40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	4.225	1.57	1.159	7.182	N	B2(079)
Pipe(351)	Steel Sch.40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	4.225	1.57	1.159	7.182	N	B2(080)
Pipe(352)	Steel Sch.40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	4.225	1.57	1.159	7.182	N	B2(081)
Pipe(353)	Steel Sch.40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	4.225	1.57	1.159	7.182	N	B2(082)
Pipe(354)	Steel Sch.40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	4.225	1.57	1.159	7.182	N	B2(083)
Pipe(355)	Steel Sch.40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	4.225	1.57	1.158	7.182	N	B2(084)
Pipe(356)	Steel Sch.40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	4.225	1.57	1.158	7.182	N	B2(085)
Pipe(357)	Steel Sch.40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	4.225	1.57	1.158	7.182	N	B2(086)

RH03AB(004)	Steel Sch 40 (clean)	Water After RHR HX	8	26 9	2.472	
RH03AB(005)	Steel Sch 40 (clean)	Water After RHR HX	8	36.3	14000	
RH03AB(006)	Steel Sch 40S (clean)	Water After RHR HX	12	1.6	1 00E-05	
RH09AA(001)	Steel Sch.40 (clean)	Containment Sump Water	8	1	1.00E-05	XXX
RH09AA(002)	Steel Sch 40 (clean)	Containment Sump Water	8	1	1 00E-05	XXX
RH09AB(001)	Steel Sch.40 (clean)	Containment Sump Water	8	1	1 00E-05	XXX
RH09AB(002)	Steel Sch 40 (clean)	Containment Sump Water	8	1	1.00E-05	XXX
RH10AA(001)	Steel Sch 40 (clean)	Water After RHR HX	3	1	1.00E-05	XXX
RH10AA(002)	Steel Sch 40 (clean)	Water After RHR HX	3	1	1.00E-05	
RH10AB(001)	Steel Sch 40 (clean)	Water After RHR HX	3	1	1 00E-05	XXX
RH10AB(002)	Steel Sch 40 (clean)	Water After RHR HX	3	1	1 00E-05	
RH12A/CV99A	Steel Sch 40 (clean)	Water After RHR HX	8	26 6	5 573	XXX
RH14A	Steel Sch 40 (clean)	Water After RHR HX	8	4 4	1 979	XXX
SI01A	Steel Sch 40 (clean)	Water After RHR HX	8	28.4	0 9944	
SI01B(001)	Steel Sch.20 (clean)	Water After RHR HX	24	113 2	0 3195	
SI01B(002)	Steel Sch.20 (clean)	Water After RHR HX	24	58	0.3195	
SI01B(003)	Steel Sch 20 (clean)	Water After RHR HX	24	4 8	0.3	
SI01B(004)	Steel Sch.20 (clean)	Water After RHR HX	24	60 3	0 4524	
SI01B(005)	Steel Sch 20 (clean)	Water After RHR HX	24	7	2 00E-05	
SI01B(006)	Steel Sch.20 (clean)	Water After RHR HX	24	2	28.3	
SI01B(007)	Steel Sch.20 (clean)	Water After RHR HX	24	1	29 43	
SI02A/SIF9A	Steel Sch.40 (clean)	Water After RHR HX	8	28.3	7.068	
SI02BA(001)	Steel Sch 40 (clean)	Water After RHR HX	8	1 7	0 1598	
SI02BA(002)	Steel Sch 40 (clean)	Water After RHR HX	6	174 8	2 749	
SI02BA(003)	Steel Sch 40 (clean)	Water After RHR HX	6	3.4	0.6286	
SI02BA(004)	Steel Sch.40 (clean)	Water After RHR HX	4	1	0	
SI02BB(001)	Steel Sch.40 (clean)	Water After RHR HX	6	4 7	2 804	
SI02BB(002)	Steel Sch 40 (clean)	Water After RHR HX	6	14 7	2.837	
SI02BB(003)	Steel Sch 40 (clean)	Water After RHR HX	4	1	0	
[illegible]						

SMGA3458	Steel Sch 40 (clean)	Water After Rinse xx	12	57.1	4.916	5677	16	-4.627	2762	N	~N(504)	~N(552)	11.938	3.1	19.02	2.16E+06	0.01363	3 x Pipe Bend - r/d 1.5 (90°)	0.1815	1 x [illegible] (Check Valve)	1.8	1 x [illegible] (Gate Valve)	0.17	1 x Diverging Tee (Branch)	1.3	1 x Converging Tee (Branch)	1.1	
[illegible]	Steel Sch 160 (clean)	Water After Rinse xx	6	15.1	1.847	0	0	2.592	0	N	~N(537)	~N(544)	6.813	0	0	0	0	2 x Pipe Bend - r/d 1.5 (90°)	0.2035	1 x [illegible] (Check Valve)	0.84	1 x Diverging Tee (Branch)	1.00E-05	1 x Converging Tee (Through)	0.8			
[illegible]	Steel Sch 160 (clean)	Water After Rinse xx	6	85.1	2.11	0	0	-0.259	0	N	~N(544)	~N(543)	6.813	0	0	0	0	9 x Pipe Bend - r/d 1.5 (90°)	0.2035	1 x Pipe Bend - r/d 1.5 (45°)	0.144	1 x Reduction - Contraction (8 x 6 - 6)	0.1344					

Node List	Status	Pressure	Grade	Elev
~N(001)		121.8	675.5	420
~N(001A)		39.42	679.3	574.3
~N(002)		29.86	[illegible]	365.1
~N(003)		33.78	386.2	349.3
~N(004)		94.22	385.1	349.9
~N(005)		157.8	675.5	344.3
~N(006)		157.8	675.5	344.3
~N(007)		156.1	675.5	348.3
~N(008)		151	675.5	360
~N(009)		136	675.5	394.8
~N(010)		52.85	675.5	587.2
~N(011)		50.19	675.6	593.5
~N(012)		50.2	675.7	593.5
~N(013)		50.2	675.7	593.5
~N(014)		50.2	675.7	593.5
~N(015)		50.21	675.7	593.5
~N(016)		50.22	675.7	593.5
~N(017)		50.22	675.7	593.5
~N(018)		50.23	675.7	593.5
~N(019)		50.23	675.7	593.5
~N(020)		50.24	675.8	593.5
~N(021)		50.24	675.8	593.5
~N(022)		50.25	675.8	593.5
~N(023)		50.24	675.8	593.5
~N(024)		50.24	675.8	593.5
~N(025)		50.25	675.8	593.5
~N(026)		50.25	675.8	593.5
~N(027)		50.25	675.8	593.5
~N(028)		50.25	675.8	593.5
~N(029)		50.25	675.8	593.5
~N(030)		50.25	675.8	593.5
~N(031)		50.25	675.8	593.5
~N(032)		50.25	675.8	593.5
~N(033)		50.2	675.7	593.5
~N(034)		50.21	675.7	593.5
~N(035)		50.22	675.7	593.5
~N(036)		50.23	675.7	593.5
~N(037)		50.23	675.7	593.5
~N(038)		50.22	675.7	593.5
~N(039)		50.24	675.8	593.5
~N(040)		50.25	675.8	593.5
~N(041)		50.25	675.8	593.5
~N(042)		50.24	675.8	593.5
~N(043)		50.24	675.8	593.5
~N(044)		50.24	675.8	593.5
~N(045)		50.25	675.8	593.5
~N(046)		50.25	675.8	593.5
~N(047)		50.25	675.8	593.5
~N(048)		50.25	675.8	593.5
~N(049)		50.25	675.8	593.5
~N(050)		50.25	675.8	593.5
~N(051)		52.18	675.7	589
~N(052)		52.21	675.8	589
~N(053)		52.21	675.8	589
~N(054)		52.21	675.8	589
~N(055)		52.21	675.8	589
~N(056)		52.21	675.8	589
~N(057)		52.21	675.8	589
~N(058)		52.21	675.8	589
~N(059)		52.21	675.8	589
~N(060)		52.21	675.8	589
~N(061)		52.21	675.8	589
~N(062)		52.21	675.8	589
~N(063)		52.21	675.8	589
~N(064)		52.21	675.8	589
~N(065)		52.2	675.8	589
~N(066)		52.2	675.8	589
~N(067)		52.2	675.8	589
~N(068)		52.2	675.8	589
~N(069)		52.2	675.8	589
~N(070)		52.2	675.8	589
~N(071)		52.2	675.8	589
~N(072)		52.2	675.8	589
~N(073)		52.18	675.7	589
~N(074)		52.2	675.8	589
~N(075)		52.2	675.8	589
~N(076)		52.2	675.8	589
~N(077)		52.21	675.8	589
~N(078)		52.21	675.8	589
~N(079)		52.21	675.8	589
~N(080)		52.2	675.8	589
~N(081)		52.21	675.8	589
~N(082)		52.21	675.8	589
~N(083)		52.21	675.8	589
~N(084)		52.21	675.8	589
~N(085)		52.21	675.8	589
~N(086)		52.21	675.8	589
~N(087)		52.21	675.8	589
~N(088)		52.21	675.8	589
~N(089)		52.21	675.8	589
~N(090)		52.21	675.8	589
~N(091)		52.21	675.8	589
~N(092)		52.21	675.8	589
~N(093)		52.21	675.8	589
~N(094)		52.21	675.8	589
~N(095)		52.21	675.8	589
~N(096)		52.21	675.8	589
~N(097)		52.21	675.8	589
~N(098)		52.21	675.8	589
~N(099)		52.21	675.8	589
~N(100)		52.21	675.8	589
~N(101)		52.21	675.8	589
~N(102)		52.21	675.8	589
~N(103)		52.21	675.8	589
~N(104)		52.21	675.8	589
~N(105)		52.21	675.8	589
~N(106)		52.21	675.8	589
~N(107)		52.21	675.8	589
~N(108)		52.21	675.8	589
~N(109)		52.21	675.8	589
~N(110)		52.21	675.8	589
~N(111)		52.18	675.8	589
~N(112)		57.42	674.7	575.8
~N(113)		57.42	674.7	575.8
~N(114)		57.42	674.7	575.8
~N(115)		57.42	674.7	575.8
~N(116)		57.42	674.7	575.8
~N(117)		57.42	674.7	575.8
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~N(120)		57.41	674.7	575.8
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~N(506)	28.66	415.3	383
~N(507)	28.65	415.3	383
~N(508)	28.56	415.1	383
~N(509)	28.61	415.2	383
~N(512)	34.54	390.2	344.3
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~N(522)	153.6	696.5	375
~N(524)	34.59	390.3	344.3
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~N(529)	162.7	710.1	367.4
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~N(531)	153.8	696.5	375
~N(535)	34.5	390.1	344.3
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~N(537)	151.9	696.5	379
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~N(539)	151.9	696.5	379
~N(540)	151.9	696.5	379
~N(541)	149.5	696.5	384.5
~N(542)	148.4	696.5	387
~N(544)	149.3	696.5	385
~N(545)	149.5	696.5	384.4

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~N(549)		34.26	395.2	349.9
~N(551)		20.69	393.1	379.2
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~N(559)		34.54	390.2	344.3
~N(560)	Isolated	—	—	367.4
~N(561)		24.61	390.3	367.4
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~N(565)		118.9	695.1	421.5
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~N(572)		151.7	692	375
~N(573)		139.7	676.3	387
~N(574)		118.3	656.8	417
[illegible]				
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~N(664)		1586	4050	413
~N(665)		1034	2773	413
~N(666)		112.8	620.1	393
~N(667)		1795	4499	378.4
~N(669)		1793	4499	382.9
~N(670)		1793	4499	383.8
~N(671)		1791	4499	386.4
~N(672)		151.9	696.5	379
~N(673)		143.6	685.3	387
~N(674)		141.3	680.1	387
~N(675)		1324	3415	383
~N(676)	Isolated	—	—	379
~N(677)		1315	3393	383
~N(678)		1798	4498	370.8
~N(680)		1034	2772	412.9
~N(682)		256.3	956.1	397
~N(683)		256.2	956.1	397
~N(684)		1071	2859	413
~N(686)		277.8	1022	413
~N(687)		277.4	1021	413
~N(688)		1119	2939	382.4
~N(690)		305.1	1055	382.9
~N(691)		304.1	1055	384.9
~N(692)		1130	2966	385.6
~N(694)		263.4	963.1	387.5
~N(695)		263.2	962.8	387.5
~N(696)		1231	3229	414.5
~N(697)		862.7	2377	414.5
~N(698)		862	2376	414.5
~N(700)		134.2	691.1	414.5
~N(701)		1278	3301	381.4
~N(702)		911.2	2457	381.4
~N(703)		910.5	2455	381.4
~N(705)		148.5	696.5	381.4
~N(706)		148.4	696.3	381.4
~N(707)		134.2	691.1	414.5
~N(708)		1247	3268	414.9
~N(709)		878.1	2416	414.9
~N(710)		876.4	2410	414.9
~N(712)		132.8	687.9	414.9
~N(713)		132.6	687.6	414.9
~N(714)		1275	3304	387
~N(715)		909.1	2457	387
~N(716)		908.5	2456	387
~N(718)		148.8	697.3	387
~N(719)		148.7	697.2	387
~N(720)		151.1	696.5	380.7
~N(721)		151.1	696.5	380.7
~N(722)		151.1	696.5	380.7
~N(724)		151.1	696.5	380.7
~N(725)		151.1	696.5	380.7
~N(726)		152.3	696.5	378
~N(727)		152.3	696.5	378
~N(728)		152.3	696.5	378
~N(730)		117.5	615.9	378
~N(731)		117.5	615.9	378
~N(732)		152.3	696.5	378.1
~N(733)		152.3	696.5	378.1
~N(734)		152.3	696.5	378.1
~N(736)		152.3	696.5	378.1
~N(737)		152.3	696.5	378.1
~N(738)		151	696.5	381.1
~N(739)		151	696.5	381.1
~N(740)		151	696.5	381.1
~N(742)		116.1	615.9	381.1
~N(743)		116.1	615.9	381.1

Tank List	Surface Pressure	Level	Status	Flow	Pressure	Grade	Elev
Accumulator Tank A	1000	0		0	1000	2709	428.7
Accumulator Tank B	1000	0		0	1000	2709	428.6
Accumulator Tank C	1000	0		0	1000	2709	428.5
Accumulator Tank D	1000	0		0	1000	2709	428.5
Cont. Recirc. Sump A	18.7	11.2		3106	23.54	388.7	368.2
Cont. Recirc. Sump B	18.7	11.2		3311	23.54	388.7	368.2
Refueling Water Storage Tank	14.7	23.9		12279	25.02	417.8	384

Demand List	Demand Type	Flow	Pressure	Status	Grade	Elev
~N(556)	Flow in	0	152.4		675.5	366.8
~N(557)	Flow in	0	155.2		674.5	349.3
~N(599)	Flow out	30	1339		3433	366.5
~N(604)	Flow out	30	1340		3435	366.5
~N(623)	Flow in	0	33.66		414.4	370.5
~N(633)	Flow in	130	32.79		414.4	372.5
~N(634)	Flow out	65	1806		4517	369.6
~N(637)	Flow out	65	1806		4517	369.6
~N(641)	Flow out	0	1801		4504	367.9
~N(668)	Flow out	0	1795		4499	378.4
~N(679)	Flow out	60	1798		4498	370.8
A1(001)	Spray	3.863	55		668.7	575.4
A1(002)	Spray	3.561	56		669.6	576.3
A1(003)	Spray	3.731	55		669.1	575.8
A1(004)	Spray	3.731	55		669.1	575.8
A1(005)	Spray	3.569	55		669.6	576.3
A1(006)	Spray	3.861	55		668.7	575.4
A1(007)	Spray	3.86	55		668.7	575.4
A1(008)	Spray	3.559	55		669.6	576.3
A1(009)	Spray	3.728	55		669.1	575.8
A1(010)	Spray	3.728	55		669.1	575.8

A3(012)	Spray	5.193	55	686.6	593.3
A3(013)	Spray	5.191	55	686.6	593.3
A3(014)	Spray	5.238	55	686.8	593.5
A3(015)	Spray	5.189	55	686.6	593.3
A3(016)	Spray	5.188	55	686.6	593.3
A3(017)	Spray	5.234	55	686.8	593.5
A3(018)	Spray	5.187	55	686.6	593.3
A3(019)	Spray	5.186	55	686.6	593.3
A3(020)	Spray	5.233	55	686.8	593.5
A3(021)	Spray	5.184	55	686.6	593.3
A3(022)	Spray	5.184	55	686.6	593.3
A3(023)	Spray	5.231	55	686.8	593.5
A3(024)	Spray	5.183	55	686.6	593.3
A3(025)	Spray	5.182	55	686.6	593.3
A3(026)	Spray	5.23	55	686.8	593.5
A3(027)	Spray	5.181	55	686.6	593.3
A3(028)	Spray	5.181	55	686.6	593.3
A3(029)	Spray	5.229	55	686.8	593.5
A3(030)	Spray	5.181	55	686.6	593.3
A3(031)	Spray	5.181	55	686.6	593.3
A3(032)	Spray	5.228	55	686.8	593.5
A3(033)	Spray	5.18	55	686.6	593.3
A3(034)	Spray	5.18	55	686.6	593.3
A3(035)	Spray	5.228	55	686.8	593.5
A3(036)	Spray	5.18	55	686.6	593.3
A3(037)	Spray	5.18	55	686.6	593.3
A3(038)	Spray	5.228	55	686.8	593.5
A3(039)	Spray	5.18	55	686.6	593.3
B1(001)	Spray	5.39	55	660.3	567
B1(002)	Spray	5.39	55	660.3	567
B1(003)	Spray	5.389	55	660.3	567
B1(004)	Spray	5.389	55	660.3	567
B1(005)	Spray	5.388	55	660.3	567
B1(006)	Spray	5.388	55	660.3	567
B1(007)	Spray	5.387	55	660.3	567
B1(008)	Spray	5.387	55	660.3	567
B1(009)	Spray	5.385	55	660.3	567
B1(010)	Spray	5.386	55	660.3	567
B1(011)	Spray	5.384	55	660.3	567
B1(012)	Spray	5.384	55	660.3	567
B1(013)	Spray	5.383	55	660.3	567
B1(014)	Spray	5.383	55	660.3	567
B1(015)	Spray	5.382	55	660.3	567
B1(016)	Spray	5.382	55	660.3	567
B1(017)	Spray	5.381	55	660.3	567
B1(018)	Spray	5.381	55	660.3	567
B1(019)	Spray	5.381	55	660.3	567
B1(020)	Spray	5.381	55	660.3	567
B1(021)	Spray	5.38	55	660.3	567
B1(022)	Spray	5.38	55	660.3	567
B1(023)	Spray	5.379	55	660.3	567
B1(024)	Spray	5.379	55	660.3	567
B1(025)	Spray	5.378	55	660.3	567
B1(026)	Spray	5.378	55	660.3	567
B1(027)	Spray	5.377	55	660.3	567
B1(028)	Spray	5.377	55	660.3	567
B1(029)	Spray	5.376	55	660.3	567
B1(030)	Spray	5.376	55	660.3	567
B1(031)	Spray	5.376	55	660.3	567
B1(032)	Spray	5.376	55	660.3	567
B1(033)	Spray	5.375	55	660.3	567
B1(034)	Spray	5.375	55	660.3	567
B1(035)	Spray	5.374	55	660.3	567
B1(036)	Spray	5.374	55	660.3	567
B1(037)	Spray	5.374	55	660.3	567
B1(038)	Spray	5.374	55	660.3	567
B1(039)	Spray	5.373	55	660.3	567
B1(040)	Spray	5.373	55	660.3	567
B1(041)	Spray	5.373	55	660.3	567
B1(042)	Spray	5.373	55	660.3	567
B1(043)	Spray	5.372	55	660.3	567
B1(044)	Spray	5.372	55	660.3	567
B1(045)	Spray	5.372	55	660.3	567
B1(046)	Spray	5.372	55	660.3	567
B1(047)	Spray	5.371	55	660.3	567
B1(048)	Spray	5.371	55	660.3	567
B1(049)	Spray	5.371	55	660.3	567
B1(050)	Spray	5.371	55	660.3	567
B1(051)	Spray	5.37	55	660.3	567
B1(052)	Spray	5.37	55	660.3	567
B1(053)	Spray	5.37	55	660.3	567
B1(054)	Spray	5.37	55	660.3	567
B1(055)	Spray	5.369	55	660.3	567
B1(056)	Spray	5.369	55	660.3	567
B1(057)	Spray	5.369	55	660.3	567
B1(058)	Spray	5.369	55	660.3	567
B1(059)	Spray	5.369	55	660.3	567
B1(060)	Spray	5.368	55	660.3	567
B1(061)	Spray	5.368	55	660.3	567
B1(062)	Spray	5.368	55	660.3	567
B1(063)	Spray	5.368	55	660.3	567
B1(064)	Spray	5.368	55	660.3	567
B1(065)	Spray	5.368	55	660.3	567
B1(066)	Spray	5.368	55	660.3	567
B1(067)	Spray	5.368	55	660.3	567
B1(068)	Spray	5.368	55	660.3	567
B1(069)	Spray	5.367	55	660.3	567
B1(070)	Spray	5.367	55	660.3	567
B1(071)	Spray	5.367	55	660.3	567
B1(072)	Spray	5.367	55	660.3	567
B1(073)	Spray	5.367	55	660.3	567
B1(074)	Spray	5.367	55	660.3	567
B1(075)	Spray	5.367	55	660.3	567
B1(076)	Spray	5.367	55	660.3	567
B1(077)	Spray	5.367	55	660.3	567
B1(078)	Spray	5.367	55	660.3	567
B1(079)	Spray	5.367	55	660.3	567
B1(080)	Spray	5.367	55	660.3	567
B1(081)	Spray	5.366	55	660.3	567
B1(082)	Spray	5.366	55	660.3	567
B1(083)	Spray	5.366	55	660.3	567
B1(084)	Spray	5.366	55	660.3	567
B1(085)	Spray	5.366	55	660.3	567
B1(086)	Spray	5.366	55	660.3	567
B1(087)	Spray	5.366	55	660.3	567
B1(088)	Spray	5.366	55	660.3	567
B1(089)	Spray	5.366	55	660.3	567
B1(090)	Spray	5.366	55	660.3	567
B1(091)	Spray	5.366	55	660.3	567
B1(092)	Spray	5.366	55	660.3	567
B1(093)	Spray	5.366	55	660.3	567
B1(094)	Spray	5.366	55	660.3	567
B1(095)	Spray	5.366	55	660.3	567
B1(096)	Spray	5.366	55	660.3	567
B1(097)	Spray	5.366	55	660.3	567
B1(098)	Spray	5.366	55	660.3	567
B1(099)	Spray	5.366	55	660.3	567
B1(100)	Spray	5.366	55	660.3	567
B1(101)	Spray	5.366	55	660.3	567
B1(102)	Spray	5.366	55	660.3	567
B1(103)	Spray	5.366	55	660.3	567
B1(104)	Spray	5.366	55	660.3	567
B1(105)	Spray	5.366	55	660.3	567
B1(106)	Spray	5.366	55	660.3	567
B1(107)	Spray	5.366	55	660.3	567
B1(108)	Spray	5.366	55	660.3	567
B1(109)	Spray	5.366	55	660.3	567
B1(110)	Spray	5.366	55	660.3	567
B1(111)	Spray	5.366	55	660.3	567
B1(112)	Spray	5.366	55	660.3	567
B2(001)	Spray	4.262	55	682.3	589
B2(002)	Spray	4.259	55	682.3	589
B2(003)	Spray	4.262	55	682.3	589
B2(004)	Spray	4.259	55	682.3	589
B2(005)	Spray	4.257	55	682.3	589
B2(006)	Spray	4.257	55	682.3	589
B2(007)	Spray	4.255	55	682.3	589
B2(008)	Spray	4.255	55	682.3	589
B2(009)	Spray	4.253	55	682.3	589
B2(010)	Spray	4.253	55	682.3	589
B2(011)	Spray	4.251	55	682.3	589
B2(012)	Spray	4.251	55	682.3	589
B2(013)	Spray	4.249	55	682.3	589
B2(014)	Spray	4.249	55	682.3	589
B2(015)	Spray	4.248	55	682.3	589
B2(016)	Spray	4.248	55	682.3	589
B2(017)	Spray	4.246	55	682.3	589
B2(018)	Spray	4.245	55	682.3	589
B2(019)	Spray	4.244	55	682.3	589
B2(020)	Spray	4.244	55	682.3	589
B2(021)	Spray	4.243	55	682.3	589
B2(022)	Spray	4.243	55	682.3	589
B2(023)	Spray	4.241	55	682.3	589
B2(024)	Spray	4.241	55	682.3	589
B2(025)	Spray	4.24	55	682.3	589
B2(026)	Spray	4.24	55	682.3	589
B2(027)	Spray	4.239	55	682.3	589
B2(028)	Spray	4.239	55	682.3	589
B2(029)	Spray	4.238	55	682.3	589
B2(030)	Spray	4.238	55	682.3	589
B2(031)	Spray	4.237	55	682.3	589
B2(032)	Spray	4.237	55	682.3	589
B2(033)	Spray	4.235	55	682.3	589
B2(034)	Spray	4.235	55	682.3	589
B2(035)	Spray	4.234	55	682.3	589
B2(036)	Spray	4.234	55	682.3	589
B2(037)	Spray	4.234	55	682.3	589
B2(038)	Spray	4.234	55	682.3	589
B2(039)	Spray	4.233	55	682.3	589
B2(040)	Spray	4.233	55	682.3	589
B2(041)	Spray	4.232	55	682.3	589

B2(042)	Spray	4.232	55		682.3	589
B2(043)	Spray	4.231	55		682.3	589
B2(044)	Spray	4.231	55		682.3	589
B2(045)	Spray	4.23	55		682.3	589
B2(046)	Spray	4.23	55		682.3	589
B2(047)	Spray	4.23	55		682.3	589
B2(048)	Spray	4.23	55		682.3	589
B2(049)	Spray	4.229	55		682.3	589
B2(050)	Spray	4.229	55		682.3	589
B2(051)	Spray	4.229	55		682.3	589
B2(052)	Spray	4.229	55		682.3	589
B2(053)	Spray	4.228	55		682.3	589
B2(054)	Spray	4.228	55		682.3	589
B2(055)	Spray	4.228	55		682.3	589
B2(056)	Spray	4.228	55		682.3	589
B2(057)	Spray	4.227	55		682.3	589
B2(058)	Spray	4.227	55		682.3	589
B2(059)	Spray	4.227	55		682.3	589
B2(060)	Spray	4.227	55		682.3	589
B2(061)	Spray	4.227	55		682.3	589
B2(062)	Spray	4.227	55		682.3	589
B2(063)	Spray	4.226	55		682.3	589
B2(064)	Spray	4.226	55		682.3	589
B2(065)	Spray	4.226	55		682.3	589
B2(066)	Spray	4.226	55		682.3	589
B2(067)	Spray	4.226	55		682.3	589
B2(068)	Spray	4.226	55		682.3	589
B2(069)	Spray	4.226	55		682.3	589
B2(070)	Spray	4.226	55		682.3	589
B2(071)	Spray	4.226	55		682.3	589
B2(072)	Spray	4.226	55		682.3	589
B2(073)	Spray	4.226	55		682.3	589
B2(074)	Spray	4.226	55		682.3	589
B2(075)	Spray	4.225	55		682.3	589
B2(076)	Spray	4.225	55		682.3	589
B2(077)	Spray	4.225	55		682.3	589
B2(078)	Spray	4.225	55		682.3	589
B2(079)	Spray	4.225	55		682.3	589
B2(080)	Spray	4.225	55		682.3	589
B2(081)	Spray	4.225	55		682.3	589
B2(082)	Spray	4.225	55		682.3	589
B2(083)	Spray	4.225	55		682.3	589
B2(084)	Spray	4.225	55		682.3	589
B2(085)	Spray	4.225	55		682.3	589
B2(086)	Spray	4.225	55		682.3	589
B2(087)	Spray	4.225	55		682.3	589
B2(088)	Spray	4.225	55		682.3	589
B2(089)	Spray	4.225	55		682.3	589
B2(090)	Spray	4.225	55		682.3	589
B3(001)	Spray	4.325	55		682.3	589
B3(002)	Spray	4.325	55		682.3	589
B3(003)	Spray	4.323	55		682.3	589
B3(004)	Spray	4.324	55		682.3	589
B3(005)	Spray	4.324	55		682.3	589
B3(006)	Spray	4.324	55		682.3	589
B3(007)	Spray	4.323	55		682.3	589
B3(008)	Spray	4.323	55		682.3	589
B3(009)	Spray	4.323	55		682.3	589
B3(010)	Spray	4.323	55		682.3	589
B3(011)	Spray	4.322	55		682.3	589
B3(012)	Spray	4.322	55		682.3	589
B3(013)	Spray	4.322	55		682.3	589
B3(014)	Spray	4.322	55		682.3	589
B3(015)	Spray	4.321	55		682.3	589
B3(016)	Spray	4.321	55		682.3	589
B3(017)	Spray	4.321	55		682.3	589
B3(018)	Spray	4.321	55		682.3	589
B3(019)	Spray	4.321	55		682.3	589
B3(020)	Spray	4.321	55		682.3	589
B3(021)	Spray	4.32	55		682.3	589
B3(022)	Spray	4.32	55		682.3	589
B3(023)	Spray	4.32	55		682.3	589
B3(024)	Spray	4.32	55		682.3	589
B3(025)	Spray	4.32	55		682.3	589
B3(026)	Spray	4.32	55		682.3	589
B3(027)	Spray	4.319	55		682.3	589
B3(028)	Spray	4.319	55		682.3	589
B3(029)	Spray	4.319	55		682.3	589
B3(030)	Spray	4.319	55		682.3	589
B3(031)	Spray	4.319	55		682.3	589
B3(032)	Spray	4.319	55		682.3	589
B3(033)	Spray	4.319	55		682.3	589
B3(034)	Spray	4.319	55		682.3	589
B3(035)	Spray	4.319	55		682.3	589
B3(036)	Spray	4.319	55		682.3	589
B3(037)	Spray	4.319	55		682.3	589
B3(038)	Spray	4.319	55		682.3	589
B3(039)	Spray	4.319	55		682.3	589
B3(040)	Spray	4.319	55		682.3	589
B3(041)	Spray	4.319	55		682.3	589
B3(042)	Spray	4.319	55		682.3	589
B3(043)	Spray	4.319	55		682.3	589
B3(044)	Spray	4.319	55		682.3	589
B3(045)	Spray	4.319	55		682.3	589
B3(046)	Spray	4.319	55		682.3	589
B3(047)	Spray	4.319	55		682.3	589
B3(048)	Spray	4.319	55		682.3	589
B3(049)	Spray	4.319	55		682.3	589
B3(050)	Spray	4.319	55		682.3	589
B3(051)	Spray	4.319	55		682.3	589
Cold Leg A(001)	Boundary pressure	140.6	111		615.9	393
Cold Leg A(002)	Boundary pressure	121.9	111		615.9	393
Cold Leg B(001)	Boundary pressure	140.4	111		615.9	393
Cold Leg B(002)	Boundary pressure	114.6	111		615.9	393
Cold Leg C(001)	Boundary pressure	139.3	111		615.9	393
Cold Leg C(002)	Boundary pressure	141.2	111		615.9	393
Cold Leg D(001)	Boundary pressure	139.1	111		615.9	393
Cold Leg D(002)	Boundary pressure	138.7	111		615.9	393
Hot Leg A(001)	Boundary pressure	—	111	Isolated	—	382.7
Hot Leg A(002)	Boundary pressure	—	111	Isolated	—	393
Hot Leg B(001)	Boundary pressure	—	111	Isolated	—	382.7
Hot Leg B(002)	Boundary pressure	0	111		615.9	393
Hot Leg C(001)	Boundary pressure	—	111	Isolated	—	382.7
Hot Leg C(002)	Boundary pressure	—	111	Isolated	—	393
Hot Leg D(001)	Boundary pressure	—	111	Isolated	—	382.7
Hot Leg D(002)	Boundary pressure	0	111		615.9	393

Pump List	Operation	Flow	Status	TDH	dP	NPSHa	Suction Pressure	Discharge Pressure	Suction Elev	Discharge Elev
Centrifugal Charging Pump A	Curve	392.7		-4106	-1774	75.82	33.71	1868	368.6	368.7
Centrifugal Charging Pump B	Curve	376.9		-4106	-1774	75.27	33.47	1867	368.6	368.7
Containment Spray Pump A	Curve	—	Off	—	—	—	—	—	348.3	347.3
Containment Spray Pump B	Curve	—	Off	—	—	—	—	—	348.3	347.3
Positive Dis. Charging Pump	Fixed Flow	1.00E-05	Off	—	—	—	—	—	366.7	367.8
Residual Heat Removal Pump A	Curve	2277		-391.4	-189.1	75.84	33.71	202.3	346	347.1
Residual Heat Removal Pump B	Curve	2266		-392.8	-189.7	76.01	33.79	203	346	347.1
Safety Injection Pump A	Curve	353.2		-3022	-1305	76.94	34.15	1339	366.5	366.6
Safety Injection Pump B	Curve	325.6		-3023	-1306	77.97	34.62	1340	366.5	366.6

Component List	Flow	Status	HL	dP	Inlet Pressure	Outlet Pressure	Inlet Elev	Outlet Elev
Residual HX A	2277		22.28	9.63	183	173.3	358.7	358.7
Residual HX B	2266		22.09	9.542	182.8	173.1	358.8	358.8

Control List	Type	Set Value	Status	Flow	dP	HL	Inlet Pressure	Outlet Pressure	Elev	Cv	Fp	Cv/Area
-HV(562)	FCV	0		0	—	—	156.3	156.3	346.6	—	—	—
-HV(563)	FCV	0		0	—	—	151	151	360	—	—	—
-HV(581)	FCV	Fully open		149.4	0	0	356.9	356.9	412.9	—	—	—
-HV(649)	FCV	Fully open		149.8	0	0	282.2	282.2	413	—	—	—
-HV(650)	FCV	Fully open		139.3	0	0	326.6	326.6	382.4	—	—	—
-HV(652)	FCV	Fully open		139.1	0	0	273.6	273.6	389.5	—	—	—
-HV(666)	FCV	Fully open		155.5	0	0	134.4	134.4	414.5	—	—	—
-HV(704)	FCV	Fully open		164.8	0	0	146.7	146.7	361.4	—	—	—
-HV(711)	FCV	Fully open		155.6	0	0	132.8	132.8	414.8	—	—	—
-HV(717)	FCV	Fully open		155	0	0	148.8	148.8	387	—	—	—
-HV(723)	FCV	Fully open		0	—	—	151.1	151.1	360.7	—	—	—
-HV(729)	FCV	Fully open	Closed	—	—	—	—	—	378	—	—	—
-HV(735)	FCV	Fully open		0	—	—	152.3	152.3	378.1	—	—	—
-HV(741)	FCV	Fully open	Closed	—	—	—	—	—	361.1	—	—	—
CS01TA-1	FCV	Fully open		0	—	—	130.7	130.7	401	—	—	—
CS01TB-2	FCV	Fully open		0	—	—	133.7	133.7	399	—	—	—

Pipe Specification	Material	Schedule	Roughness	Sizing	Vel Limits	Press Limits	Valve Table
Steel Sch.40 (clean)	Steel	40	0.0018	not specified	—	—	standard
Steel Sch.80 (clean)	Steel	80	0.0018	not specified	—	—	standard
Steel Sch.140 (clean)	Steel	140	0.0018	not specified	—	—	standard
Steel Sch.40S (clean)	Stainless Pipe IPS	40S	0.0012	not specified	—	—	standard
Steel Sch.160 (clean)	Steel	160	0.0018	not specified	—	—	standard
Steel Sch.30 (clean)	Steel	30	0.0018	not specified	—	—	standard
Steel Sch.20 (clean)	Steel	20	0.0018	not specified	—	—	standard

Fluid Zone	Fluid	Temperature	Pressure	Density	Viscosity	k	Pv	Pc
Containment Sump Water	Water	100	14.7	62.24	0.6812	—	0.9496	3198
Water After RHR HX	Water	100	14.7	62.24	0.6812	—	0.9496	3198

PIPE-FLO	ver 8.0	12/2/2009 6:35
System:	0.86 LOCA A1R13 LoLo	
Lineup:	Cold Leg Injection from Sump	
Company	Exelon	
Project:	11329-147 Rev. 0	
by:	Sargent & Lundy L.L.C	
Footer		

UNITS					CALCULATION
Flow Rate	US gpm				Iteration: 15
Pressure:	psi a	Atm:	14.7	psi a	Deviation percent: 0.00659
Temperature	°F				
Viscosity	cP				
Density	lb/ft³				
Grade:	ft				
Length	ft				
Size:	in				

Pipe List	Specification	Fluid Zone	Size	Length	K	Status	Flow	Velocity	dP	HL	Tagged	From	To	Inside Dia	Pipe HL	Minor HL	Re	fp	Valves/Fittings					
CS01AA(001)	Steel Sch.30 (clean)	Containment Sump Water	16	12.3	0.445	XXX	—	—	—	—	N	~N(003)	~N(005)	15.25	—	—	—	—	2 x Pipe Bend - r/d 1.5 (90°)	0.173	1 x CS009A-1 (Gate Valve)	0.09888	1 x Converging Tee (Through)	1.00E-05
CS01AA(002)	Steel Sch.30 (clean)	Containment Sump Water	16	10.6	0.2964		0	0	0	0	N	~N(005)	~N(006)	15.25	0	0	0	0	1 x Reducer - Contraction (16 x 14 - 14)	0.02451	1 x Pipe Bend - r/d 1.5 (90°)	0.173	1 x CS002A	0.09888
CS01AA(003)	Steel Sch 30 (clean)	Containment Sump Water	14	2	0		0	0	0.864	0	N	~N(006)	Containment Spray Pump A	13.25	0	0	0	0						
CS01AB(001)	Steel Sch 30 (clean)	Containment Sump Water	16	4.3	0.1978	XXX	—	—	—	—	N	~N(236)	~N(237)	15.25	—	—	—	—	1 x Gate - Double Disc	0.09888	1 x CS009B-2 (Gate Valve)	0.09888	1 x Converging Tee (Through)	1.00E-05
CS01AB(002)	Steel Sch.30 (clean)	Containment Sump Water	16	19.3	1.236		0	0	0	0	N	~N(237)	~N(238)	15.25	0	0	0	0	3 x Elbow - Standard 90°	0.3708	1 x Reducer - Contraction (16 x 14 - 14)	0.02451	1 x CS002B(Gate Valve)	0.09888
CS01AB(003)	Steel Sch 30 (clean)	Containment Sump Water	14	2	0		0	0	0.621	0	N	~N(238)	Containment Spray Pump B	13.25	0	0	0	0						
CS02AA(001)	Steel Sch 40 (clean)	Containment Sump Water	8	2	0.05008		0	0	0.432	0	N	Containment Spray Pump A	~N(007)	7.981	0	0	0	0	1 x Reducer - Enlargement (10 x 8 - 7)	0.05008				
CS02AA(002)	Steel Sch 40 (clean)	Containment Sump Water	10	25.5	2.148		0	0	5.064	0	N	~N(007)	~N(008)	10.02	0	0	0	0	4 x Pipe Bend - r/d 1.5 (90°)	0.188	1 x CS003A (Check Valve)	1.289	1 x CV004A (Gate Valve)	0.1074
CS02AA(003)	Steel Sch.40 (clean)	Containment Sump Water	10	101.3	5.652		0	0	15.03	0	N	~N(008)	~N(009)	10.02	0	0	0	0	1 x FE-CS011	4.9	4 x Pipe Bend - r/d 1.5 (90°)	0.188	1 x Diverging Tee (Through)	1.00E-05
CS02AA(004)	Steel Sch.40 (clean)	Containment Sump Water	10	34.8	0.6713		0	0	6.27	0	N	~N(009)	CS007A-1	10.02	0	0	0	0	3 x Pipe Bend - r/d 1.5 (90°)	0.188	1 x CS007A-1 (Gate Valve)	0.1074	1 x Diverging Tee (Through)	1.00E-05
CS02AA(005)	Steel Sch.40 (clean)	Containment Sump Water	10	63.7	2.66		0	0	9.072	0	N	CS007A-1	~N(001)	10.02	0	0	0	0	8 x Pipe Bend - r/d 1.5 (90°)	0.188	1 x Pipe Bend - r/d 1.5 (45°)	0.1331	1 x CS008A (Check Valve)	1.289
CS02AA(006)	Steel Sch.40 (clean)	Containment Sump Water	10	155.7	1.261		0	0	63.2	0	N	~N(001)	~N(001A)	10.02	0	0	0	0	6 x Pipe Bend - r/d 1.5 (90°)	0.188	1 x Pipe Bend - r/d 1.5 (45°)	0.1331		
CS02AB(001)	Steel Sch.40 (clean)	Containment Sump Water	8	2	0.472		0	0	-0.432	0	N	Containment Spray Pump B	~N(239)	7.981	0	0	0	0	1 x Elbow - Standard 90°	0.4219	1 x Reducer - Enlargement (10 x 8 - 7)	0.05008		
CS02AB(002)	Steel Sch.40 (clean)	Containment Sump Water	10	9.9	2.202		0	0	0.218	0	N	~N(239)	~N(240)	10.02	0	0	0	0	2 x Elbow - Standard 90°	0.4028	1 x CV004B (Gate Valve)	0.1074	1 x CV003B (Check Valve)	1.289
CS02AB(003)	Steel Sch.40 (clean)	Containment Sump Water	10	59.1	6.511		0	0	14.9	0	N	~N(240)	~N(241)	10.02	0	0	0	0	4 x Elbow - Standard 90°	0.4028	1 x FE-CS012	4.9	1 x Diverging Tee (Through)	1.00E-05
CS02AB(004)	Steel Sch 40 (clean)	Containment Sump Water	10	33.8	1.316		0	0	7.648	0	N	~N(241)	CS007B-2	10.02	0	0	0	0	3 x Elbow - Standard 90°	0.4028	1 x CV007B-2 (Gate Valve)	0.1074	1 x Diverging Tee (Through)	1.00E-05
CS02AB(005)	Steel Sch.40 (clean)	Containment Sump Water	10	75.4	3.92		0	0	12.53	0	N	CS007B-2	~N(242)	10.02	0	0	0	0	1 x Elbow - Standard 45°	0.2148	5 x Elbow - Standard 90°	0.4028	1 x CS008B (Check Valve)	1.289
CS02AB(006)	Steel Sch.40 (clean)	Containment Sump Water	10	144.2	1		0	0	58.18	0	N	~N(242)	~N(243)	10.02	0	0	0	0	1 x CS008B (Check Valve)	1	1 x Diverging Tee (Through)	1.00E-05		
CS02AB(007)	Steel Sch.40 (clean)	Containment Sump Water	10	30.8	2.00E-05	<-->	801.7	2.45	-7.536	0.056	N	~N(244)	~N(243)	10.02	0.056	0	278182	0.01628	1 x Diverging Tee (Branch)	1.00E-05	1 x Diverging Tee (Through)	1.00E-05		
CS02B	Steel Sch 40 (clean)	Containment Sump Water	8	25.6	0.04215	<-->	444.6	2.854	-6.535	0.087	N	~N(010)	~N(001A)	7.981	0.082	0.005	258078	0.01678	1 x Reducer - Contraction (10 x 8 - 7)	0.04215	1 x Diverging Tee (Through)	1.00E-05		
CS02C	Steel Sch 40 (clean)	Containment Sump Water	6	21.5	0.0533	<-->	203	2.256	-2.693	0.066	N	~N(011)	~N(010)	6.065	0.062	0.004	155042	0.01832	1 x Reducer - Contraction (8 x 6 - 6)	0.05329	1 x Diverging Tee (Through)	1.00E-05		
CS02D(001)	Steel Sch 40 (clean)	Containment Sump Water	4	1.1	0.08157	<-->	101.5	2.56	0.006	0.015	N	~N(012)	~N(011)	4.026	0.007	0.008	116764	0.01978	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156	1 x Diverging* Tee (Branch)	1.00E-05		
CS02D(002)	Steel Sch 40 (clean)	Containment Sump Water	4	1.1	0.08157	<-->	101.5	2.56	0.006	0.015	N	~N(014)	~N(011)	4.026	0.007	0.008	116800	0.01978	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156	1 x Diverging* Tee (Branch)	1.00E-05		
CS02D(003)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	96.27	2.428	0.008	0.019	N	~N(013)	~N(012)	4.026	0.012	0.007	110768	0.01991	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
CS02D(004)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	96.25	2.428	0.008	0.019	N	~N(033)	~N(014)	4.026	0.012	0.007	110749	0.01991	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
CS02D(005)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	91.06	2.297	0.007	0.017	N	~N(015)	~N(013)	4.026	0.01	0.007	104777	0.02005	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
CS02D(006)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	91.04	2.296	0.007	0.017	N	~N(034)	~N(033)	4.026	0.01	0.007	104758	0.02005	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
CS02D(007)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	85.81	2.164	0.007	0.015	N	~N(016)	~N(015)	4.026	0.009	0.006	98736	0.02021	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
CS02D(008)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	85.84	2.165	0.007	0.015	N	~N(035)	~N(034)	4.026	0.009	0.006	98771	0.02021	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
CS02D(009)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	80.61	2.033	0.006	0.013	N	~N(017)	~N(016)	4.026	0.008	0.005	92753	0.02038	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
CS02D(010)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	80.59	2.033	0.006	0.013	N	~N(036)	~N(035)	4.026	0.008	0.005	92734	0.02038	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
CS02D(011)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	75.41	1.902	0.005	0.012	N	~N(018)	~N(017)	4.026	0.007	0.005	86775	0.02057	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				

CS02H(044)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	36.66	0.407	0	0	N	~N(102)	~N(103)	6.065	0	0	28000	0.02461				
CS02H(045)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	31.63	0.351	0	0	N	~N(099)	~N(098)	6.065	0	0	24156	0.02542				
CS02H(046)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	32.75	0.364	0	0	N	~N(101)	~N(102)	6.065	0	0	25014	0.02523				
CS02H(047)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	27.62	0.307	0	0	N	~N(092)	~N(099)	6.065	0	0	21098	0.02621				
CS02H(048)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	28.74	0.319	0	0	N	~N(107)	~N(101)	6.065	0	0	21955	0.02597				
CS02H(049)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	23.71	0.264	0	0	N	~N(093)	~N(092)	6.065	0	0	18111	0.02715				
CS02H(050)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	24.59	0.273	0	0	N	~N(106)	~N(107)	6.065	0	0	18781	0.02692				
CS02H(051)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	19.58	0.217	0	0	N	~N(094)	~N(093)	6.065	0	0	14937	0.02844				
CS02H(052)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	20.68	0.23	0	0	N	~N(105)	~N(106)	6.065	0	0	15795	0.02805				
CS02H(053)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	15.55	0.173	0	0	N	~N(091)	~N(094)	6.065	0	0	11879	0.03011				
CS02H(054)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	16.68	0.185	0	0	N	~N(108)	~N(105)	6.065	0	0	12737	0.02958				
CS02H(055)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	11.64	0.129	0	0	N	~N(090)	~N(091)	6.065	0	0	8883	0.03248				
CS02H(056)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	12.52	0.139	0	0	N	~N(109)	~N(108)	6.065	0	0	9562	0.03185				
CS02H(057)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	7.487	0.083	0	0	N	~N(089)	~N(090)	6.065	0	0	5718	0.03674				
CS02H(058)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	8.61	0.096	0	0	N	~N(110)	~N(109)	6.065	0	0	6578	0.03529				
CS02H(059)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	3.483	0.039	0	0	N	~N(100)	~N(089)	6.065	0	0	2660	0.04558				
CS02H(060)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	4.606	0.051	0	0	N	~N(111)	~N(110)	6.065	0	0	3518	0.04256				
CS02H(061)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<-->	0.427	0.006	0	0	N	~N(100)	~N(111)	6.065	0	0	325.4	0.1964				
CS02J(001)	Steel Sch 40 (clean)	Containment Sump Water	6	1.6	0.0533	<-->	190.6	2.118	0.003	0.008	N	~N(298)	~N(297)	6.065	0.004	0.004	145563	0.01847	1 x Reducer - Contraction (8 x 6 - 6)	0.05329	1 x Diverging* Tee (Branch)	1.00E-05
CS02J(002)	Steel Sch 40 (clean)	Containment Sump Water	6	1.6	0.0533	<-->	190.6	2.118	0.003	0.008	N	~N(300)	~N(297)	6.065	0.004	0.004	145563	0.01847	1 x Reducer - Contraction (8 x 6 - 6)	0.05329	1 x Diverging* Tee (Branch)	1.00E-05
CS02J(003)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	186.3	2.071	0.003	0.008	N	~N(301)	~N(298)	6.065	0.008	0	142308	0.01852				
CS02J(004)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	186.3	2.071	0.003	0.008	N	~N(302)	~N(300)	6.065	0.008	0	142308	0.01852				
CS02J(005)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	182.1	2.023	0.003	0.007	N	~N(303)	~N(301)	6.065	0.007	0	139054	0.01858				
CS02J(006)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	182.1	2.023	0.003	0.007	N	~N(304)	~N(302)	6.065	0.007	0	139054	0.01858				
CS02J(007)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	177.8	1.976	0.003	0.007	N	~N(305)	~N(303)	6.065	0.007	0	135803	0.01864				
CS02J(008)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	177.8	1.976	0.003	0.007	N	~N(306)	~N(304)	6.065	0.007	0	135803	0.01864				
CS02J(009)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	173.5	1.929	0.003	0.007	N	~N(307)	~N(305)	6.065	0.007	0	132553	0.0187				
CS02J(010)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	173.5	1.929	0.003	0.007	N	~N(308)	~N(306)	6.065	0.007	0	132553	0.0187				
CS02J(011)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	169.3	1.881	0.003	0.007	N	~N(310)	~N(307)	6.065	0.007	0	129304	0.01877				
CS02J(012)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	169.3	1.881	0.003	0.007	N	~N(309)	~N(308)	6.065	0.007	0	129304	0.01877				
CS02J(013)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	165	1.834	0.003	0.006	N	~N(311)	~N(310)	6.065	0.006	0	126057	0.01883				
CS02J(014)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	165	1.834	0.003	0.006	N	~N(312)	~N(309)	6.065	0.006	0	126057	0.01883				
CS02J(015)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	160.8	1.787	0.003	0.006	N	~N(314)	~N(311)	6.065	0.006	0	122811	0.0189				
CS02J(016)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	160.8	1.787	0.003	0.006	N	~N(313)	~N(312)	6.065	0.006	0	122811	0.0189				
CS02J(017)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	156.5	1.74	0.002	0.006	N	~N(316)	~N(314)	6.065	0.006	0	119567	0.01897				
CS02J(018)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	156.5	1.74	0.002	0.006	N	~N(317)	~N(313)	6.065	0.006	0	119567	0.01897				
CS02J(019)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	152.3	1.693	0.002	0.005	N	~N(315)	~N(316)	6.065	0.005	0	116324	0.01905				
CS02J(020)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	152.3	1.693	0.002	0.005	N	~N(318)	~N(317)	6.065	0.005	0	116324	0.01905				
CS02J(021)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	148	1.645	0.002	0.005	N	~N(320)	~N(315)	6.065	0.005	0	113082	0.01912				
CS02J(022)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	148	1.645	0.002	0.005	N	~N(319)	~N(318)	6.065	0.005	0	113082	0.01912				
CS02J(023)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	143.8	1.598	0.002	0.005	N	~N(321)	~N(320)	6.065	0.005	0	109841	0.01921				
CS02J(024)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	143.8	1.598	0.002	0.005	N	~N(322)	~N(319)	6.065	0.005	0	109841	0.01921				
CS02J(025)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	139.6	1.551	0.002	0.005	N	~N(323)	~N(321)	6.065	0.005	0	106602	0.01929				
CS02J(026)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	139.6	1.551	0.002	0.005	N	~N(324)	~N(322)	6.065	0.005	0	106602	0.01929				
CS02J(027)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	135.3	1.504	0.002	0.004	N	~N(325)	~N(323)	6.065	0.004	0	103363	0.01938				
CS02J(028)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	135.3	1.504	0.002	0.004	N	~N(326)	~N(324)	6.065	0.004	0	103363	0.01938				
CS02J(029)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	131.1	1.457	0.002	0.004	N	~N(327)	~N(325)	6.065	0.004	0	100125	0.01947				
CS02J(030)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	131.1	1.457	0.002	0.004	N	~N(328)	~N(326)	6.065	0.004	0	100125	0.01947				
CS02J(031)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	126.8	1.41	0.002	0.004	N	~N(329)	~N(327)	6.065	0.004	0	96889	0.01957				
CS02J(032)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	126.8	1.41	0.002	0.004	N	~N(330)	~N(328)	6.065	0.004	0	96889	0.01957				
CS02J(033)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	122.6	1.363	0.002	0.004	N	~N(331)	~N(329)	6.065	0.004	0	93653	0.01967				
CS02J(034)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	122.6	1.363	0.002	0.004	N	~N(332)	~N(330)	6.065	0.004	0	93653	0.01967				
CS02J(035)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	118.4	1.316	0.001	0.003	N	~N(333)	~N(331)	6.065	0.003	0	90418	0.01978				
CS02J(036)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	118.4	1.316	0.001	0.003	N	~N(334)	~N(332)	6.065	0.003	0	90418	0.01978				
CS02J(037)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	114.1	1.269	0.001	0.003	N	~N(335)	~N(333)	6.065	0.003	0	87183	0.01989				
CS02J(038)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	114.1	1.269	0.001	0.003	N	~N(336)	~N(334)	6.065	0.003	0	87183	0.01989				
CS02J(039)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	109.9	1.222	0.001	0.003	N	~N(337)	~N(335)	6.065	0.003	0	83950	0.02001				
CS02J(040)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	109.9	1.222	0.001	0.003	N	~N(338)	~N(336)	6.065	0.003	0	83950	0.02001				
CS02J(041)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	105.7	1.174	0.001	0.003	N	~N(339)	~N(337)	6.065	0.003	0	80717	0.02014				
CS02J(042)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	105.7	1.174	0.001	0.003	N	~N(340)	~N(338)	6.065	0.003	0	80717	0.02014				
CS02J(043)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	101.4	1.127	0.001	0.003	N	~N(341)	~N(339)	6.065	0.003	0	77484	0.02028				
CS02J(044)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	101.4	1.127	0.001	0.003	N	~N(342)	~N(340)	6.065	0.003	0	77484	0.02028				
CS02J(045)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	97.21	1.08	0.001	0.002	N	~N(343)	~N(341)	6.065	0.002	0	74253	0.02042				
CS02J(046)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	97.21	1.08	0.001	0.002	N	~N(344)	~N(342)	6.065	0.002	0	74253	0.02042				
CS02J(047)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	92.98	1.033	0	0.002	N	~N(345)	~N(343)	6.065	0.002	0	71021	0.02057				
CS02J(048)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	92.98	1.033	0	0.002	N	~N(346)	~N(344)	6.065	0.002	0	71021	0.02057				
CS02J(049)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	88.75	0.986	0	0.002	N	~N(347)	~N(345)	6.065	0.002	0	67790	0.02074				
CS02J(050)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	88.75	0.986	0	0.002	N	~N(348)	~N(346)	6.065	0.002	0	67790	0.02074				
CS02J(051)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	84.52	0.939	0	0.002	N	~N(349)	~N(347)	6.065	0.002	0	64560	0.02091				
CS02J(052)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	84.52	0.939	0	0.002	N	~N(350)	~N(348)	6.065	0.002	0	64560	0.02091				
CS02J(053)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	80.29	0.892	0	0.002	N	~N(351)	~N(349)	6.065	0.002	0	61330	0.0211				
CS02J(054)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	80.29	0.892	0	0.002	N	~N(352)	~N(350)	6.065	0.002	0	61330	0.0211				
CS02J(055)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]				
CS02J(056)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]				
CS02J(057)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]				
CS02J(058)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]				
CS02J(059)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]				
CS02J(060)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]				
CS02J(061)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]				
CS02J(062)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]				
CS02J(063)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]				
CS02J(064)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]				
CS02J(065)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]				
CS02J(066)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]				
CS02J(067)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]				
CS02J(068)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]				
CS02J(069)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]				
CS02J(070)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]				
CS02J(071)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]				
CS02J(072)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]				
CS02J(073)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]				
CS02J(074)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]				
CS02J(075)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	~N(373)	~N(371)	6.065	0	0	25818	0.02505				
CS02J(076)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	~N(374)	~N(372)	6.065	0	0	25818	0.02505				
CS02J(077)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	~N(375)	~N(373)	6.065	0	0	22591	0.0258				
CS02J(078)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	~N(376)	~N(374)	6.065	0	0	22591	0.0258				
CS02J(079)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	~N(377)	~N(375)	6.065	0	0	19364	0.02673				
CS02J(080)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	~N(378)	~N(376)	6.065	0	0	19364	0.02673				
CS02J(081)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	~N(379)	~N(377)	6.065	0	0	16136	0.02791				
CS02J(082)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	~N(380)	~N(378)	6.065	0	0	16136	0.02791				
CS02J(083)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	~N(381)	~N(379)	6.065	0	0	12909	0.02948				
CS02J(084)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	~N(382)	~N(380)	6.065	0	0	12909	0.02948				
CS02J(085)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	~N(383)	~N(381)	6.065	0	0	9682	0.03175				
CS02J(086)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	~N(384)	~N(382)	6.065	0	0	9682	0.03175				
CS02J(087)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	~N(385)	~N(383)	6.065	0	0	6454	0.03548				
CS02J(088)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	~N(387)	~N(384)	6.065	0	0	6454	0.03548				
CS02J(089)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	~N(386)	~N(385)	6.065	0	0	3227	0.04374				
CS02J(090)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	~N(388)	~N(387)	6.065	0	0	3227	0.04374				
CS02J(091)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	~N(389)	~N(388)	6.065	0	0	0.001151	0				
CS02LA	Steel Sch 40 (clean)	Containment Sump Water	10	2.1	15.8	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	~N(001A)	~N(112)	10.02	0.002	0.803	205561	0.01692	1 x FX-CS036 (Flow Element)	15.8	1 x Diverging Tee (Branch)	1.00E-05
[illegible]	Steel Sch 40 (clean)	Containment Sump Water	10	2.1	26.1	<-->	[illegible]	[illegible]	[illegible]	[illegible]	N	~N(243)	~N(390)	10.02	0.004	2.431	278182	0.01628	1 x FX-CS038 (Flow Element)	26.1	1 x Diverging Tee (Branch)	1.00E-05
CS02L001	Steel Sch 40 (clean)	Containment Sump Water	8	1.5	0.04215		[illegible]	[illegible]	[illegible]	[illegible]	N	~N(112)	~N(113)	7.981	0.002	0.001	129096	0.01838	1 x Reducer - Contraction (10 x 8 - 7)	0.04215	1 x Diverging* Tee (Branch)	1.00E-05
CS02L002	Steel Sch 40 (clean)	Containment Sump Water	8	1.5	0.04215		[illegible]	[illegible]	[illegible]	[illegible]	N	~N(112)	~N(114)	7.981	0.002	0.001	128982	0.01838	1 x Reducer - Contraction (10 x 8 - 7)	0.04215	1 x Diverging* Tee (Branch)	1.00E-05
CS02L003	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		[illegible]	[illegible]	[illegible]	[illegible]	N	~N(113)	~N(115)	7.981	0.003	0	126854	0.01842				
CS02L004	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		[illegible]	[illegible]	[illegible]	[illegible]	N	~N(114)	~N(203)	7.981	0.003	0	126915	0.01842				
CS02L005	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		[illegible]	[illegible]	[illegible]	[illegible]	N	~N(115)	~N(116)	7.981	0.002	0	124589	0.01847				
CS02L006	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		[illegible]	[illegible]	[illegible]	[illegible]	N	~N(203)	~N(204)	7.981	0.002	0	124749	0.01847				
CS02L007	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		[illegible]	[illegible]	[illegible]	[illegible]	N	~N(116)	~N(117)	7.981	0.002	0	122623	0.01852				
CS02L008	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		[illegible]	[illegible]	[illegible]	[illegible]	N	~N(204)	~N(206)	7.981	0.002	0	122508	0.01852				
CS02L009	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		[illegible]	[illegible]	[illegible]	[illegible]	N	~N(117)	~N(118)	7.981	0.002	0	120382	0.01857				
CS02L010	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		[illegible]	[illegible]	[illegible]	[illegible]	N	~N(206)	~N(205)	7.981	0.002	0	120442	0.01857				
CS02L011	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		[illegible]	[illegible]	[illegible]	[illegible]	N	~N(118)	~N(119)	7.981	0.002	0	118218	0.01862				
CS02L012	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		203.8	1.308	0	0.002	N	~N(205)	~N(210)	7.981	0.002	0	118278	0.01862				
CS02L013	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		200.1	1.284	0	0.002	N	~N(119)	~N(120)	7.981	0.002	0	116153	0.01867				
CS02L014	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		199.9	1.283	0	0.002	N	~N(210)	~N(209)	7.981	0.002	0	116039	0.01868				
CS02L015	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		196.3	1.26	0	0.002	N	~N(120)	~N(122)	7.981	0.002	0	113914	0.01873				
CS02L016	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		196.4	1.26	0	0.002	N	~N(209)	~N(207)	7.981	0.002	0	113974	0.01873				
CS02L017	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		192.5	1.236	0	0.002	N	~N(122)	~N(121)	7.981	0.002	0	111751	0.01878				
CS02L018	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		192.6	1.236	0	0.002	N	~N(207)	~N(208)	7.981	0.002	0	111811	0.01878				
CS02L019	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		189	1.213	0	0.002	N	~N(121)	~N(123)	7.981	0.002	0	109648	0.01884				
CS02L020	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		188.8	1.212	0	0.002	N	~N(208)	~N(218)	7.981	0.002	0	109573	0.01884				
CS02L021	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		185.1	1.188	0	0.002	N	~N(123)	~N(124)	7.981	0.002	0	107449	0.0189				
CS02L022	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		185.2	1.189	0	0.002	N	~N(218)	~N(217)	7.981	0.002	0	107510	0.0189				
CS02L023	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		181.4	1.164	0	0.002	N	~N(124)	~N(126)	7.981	0.002	0	105288	0.01896				
CS02L024	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		181.5	1.165	0	0.002	N	~N(217)	~N(215)	7.981	0.002	0	105348	0.01896				
CS02L025	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		177.8	1.141	0	0.002	N	~N(126)	~N(125)	7.981	0.002	0	103225	0.01902				
CS02L026	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		177.6	1.14	0	0.002	N	~N(215)	~N(216)	7.981	0.002	0	103111	0.01903				
CS02L027	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		174	1.117	0	0.002	N	~N(125)	~N(130)	7.981	0.002	0	100988	0.01909				
CS02L028	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		174.1	1.117	0	0.002	N	~N(216)	~N(211)	7.981	0.002	0	101049	0.01909				
CS02L029	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		170.3	1.093	0	0.002	N	~N(130)	~N(129)	7.981	0.002	0	98827	0.01916				
CS02L030	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		170.4	1.093	0	0.002	N	~N(211)	~N(212)	7.981	0.002	0	98888	0.01915				
CS02L031	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		166.7	1.07	0	0.002	N	~N(129)	~N(127)	7.981	0.002	0	96766	0.01922				
CS02L032	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		166.6	1.069	0	0.002	N	~N(212)	~N(214)	7.981	0.002	0	96651	0.01923				
CS02L033	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		162.9	1.045	0	0.001	N	~N(127)	~N(128)	7.981	0.001	0	94530	0.0193				
CS02L034	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		163	1.046	0	0.001	N	~N(214)	~N(213)	7.981	0.001	0	94590	0.01929				
CS02L035	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		159.1	1.021	0	0.001	N	~N(128)	~N(132)	7.981	0.001	0	92370	0.01937				
CS02L036	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		159.2	1.022	0	0.001	N	~N(213)	~N(231)	7.981	0.001	0	92430	0.01937				
CS02L037	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		155.6	0.999	0	0.001	N	~N(132)	~N(131)	7.981	0.001	0	90310	0.01944				
CS02L038	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		155.4	0.997	0	0.001	N	~N(231)	~N(232)	7.981	0.001	0	90195	0.01945				
CS02L039	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		151.7	0.974	0	0.001	N	~N(131)	~N(136)	7.981	0.001	0	88074	0.01952				
CS02L040	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		151.8	0.975	0	0.001	N	~N(232)	~N(227)	7.981	0.001	0	88135	0.01952				
CS02L041	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		148	0.95	0	0.001	N	~N(136)	~N(135)	7.981	0.001	0	85915	0.01961				
CS02L042	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		148.1	0.951	0	0.001	N	~N(227)	~N(228)	7.981	0.001	0	85976	0.0196				
CS02L043	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		144.5	0.927	0	0.001	N	~N(135)	~N(133)	7.981	0.001	0	83856	0.01969				
CS02L044	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		144.3	0.926	0	0.001	N	~N(228)	~N(230)	7.981	0.001	0	83741	0.01969				
CS02L045	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		140.6	0.903	0	0.001	N	~N(133)	~N(134)	7.981	0.001	0	81621	0.01976				
CS02L046	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		140.7	0.903	0	0.001	N	~N(230)	~N(229)	7.981	0.001	0	81681	0.01976				
CS02L047	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		136.9	0.879	0	0.001	N	~N(134)	~N(144)	7.981	0.001	0	79462	0.01987				
CS02L048	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		137	0.879	0	0.001	N	~N(229)	~N(219)	7.981	0.001	0	79523	0.01987				
CS02L049	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		133.4	0.856	0	0.001	N	~N(144)	~N(143)	7.981	0.001	0	77404	0.01996				
CS02L050	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		133.2	0.855	0	0.001	N	~N(219)	~N(220)	7.981	0.001	0	77288	0.01997				
CS02L051	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		129.5	0.831	0	0	N	~N(143)	~N(141)	7.981	0	0	75169	0.02006				
CS02L052	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		129.6	0.832	0	0	N	~N(220)	~N(222)	7.981	0	0	75230	0.02006				
CS02L053	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		125.8	0.807	0	0	N	~N(141)	~N(142)	7.981	0	0	73012	0.02017				
CS02L054	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		125.9	0.808	0	0	N	~N(222)	~N(221)	7.981	0	0	73072	0.02016				
CS02L055	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		122.2	0.785	0	0	N	~N(142)	~N(137)	7.981	0	0	70953	0.02027				
CS02L056	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		122	0.783	0	0	N	~N(221)	~N(226)	7.981	0	0	70834	0.02028				
CS02L057	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		118.4	0.76	0	0	N	~N(137)	~N(138)	7.981	0	0	68720	0.02039				
CS02L058	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		118.5	0.761	0	0	N	~N(226)	~N(225)	7.981	0	0	68780	0.02038				
CS02L059	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		114.7	0.736	0	0	N	~N(138)	~N(140)	7.981	0	0	66562	0.02051				
CS02L060	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		114.8	0.737	0	0	N	~N(225)	~N(223)	7.981	0	0	66623	0.0205				
CS02L061	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		111.1	0.713	0	0	N	~N(140)	~N(139)	7.981	0	0	64505	0.02062				
CS02L062	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		110.9	0.712	0	0	N	~N(223)	~N(224)	7.981	0	0	64389	0.02063				
CS02L063	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		107.3	0.689	0	0	N	~N(139)	~N(145)	7.981	0	0	62271	0.02076				
CS02L064	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		107.4	0.689	0	0	N	~N(224)	~N(175)	7.981	0	0	62332	0.02075				
CS02L065	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		103.6	0.665	0	0	N	~N(145)	~N(146)	7.981	0	0	60114	0.02089				
CS02L066	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		103.7	0.665	0	0	N	~N(175)	~N(176)	7.981	0	0	60175	0.02089				
CS02L067	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		100	0.642	0	0	N	~N(146)	~N(147)	7.981	0	0	58057	0.02103				
CS02L068	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		99.82	0.641	0	0	N	~N(176)	~N(177)	7.981	0	0	57942	0.02104				
CS02L069	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		96.17	0.617	0	0	N	~N(147)	~N(148)	7.981	0	0	55824	0.02119				
CS02L070	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		96.28	0.618	0	0	N	~N(177)	~N(179)	7.981	0	0	55885	0.02118				

CS02L071	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	92.48	0.593	0	0	N	[illegible]	[illegible]	7.981	0	0	53868	0.02135
CS02L072	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	92.56	0.594	0	0	N	[illegible]	[illegible]	7.981	0	0	53729	0.02134
CS02L073	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	88.92	0.571	0	0	N	[illegible]	[illegible]	7.981	0	0	51811	0.02151
CS02L074	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	88.72	0.568	0	0	N	[illegible]	[illegible]	7.981	0	0	51495	0.02152
CS02L075	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	85.07	0.546	0	0	N	-N(150)	-N(151)	7.981	0	0	48579	0.02169
CS02L076	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	85.17	0.547	0	0	N	-N(183)	-N(182)	7.981	0	0	49439	0.02169
CS02L077	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	81.35	0.522	0	0	N	-N(151)	-N(153)	7.981	0	0	47222	0.02188
CS02L078	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	81.46	0.523	0	0	N	-N(182)	-N(180)	7.981	0	0	47282	0.02188
CS02L079	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	77.81	0.499	0	0	N	-N(153)	-N(152)	7.981	0	0	45165	0.02208
CS02L080	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	77.81	0.498	0	0	N	-N(180)	-N(181)	7.981	0	0	45050	0.02209
CS02L081	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	73.97	0.475	0	0	N	-N(152)	-N(154)	7.981	0	0	42933	0.0223
CS02L082	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	74.07	0.475	0	0	N	-N(181)	-N(191)	7.981	0	0	42993	0.0223
CS02L083	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	70.25	0.451	0	0	N	-N(154)	-N(155)	7.981	0	0	40777	0.02254
CS02L084	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	70.36	0.452	0	0	N	-N(191)	-N(190)	7.981	0	0	40837	0.02253
CS02L085	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	66.71	0.428	0	0	N	-N(155)	-N(157)	7.981	0	0	38720	0.02278
CS02L086	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	66.51	0.427	0	0	N	-N(190)	-N(188)	7.981	0	0	38605	0.02279
CS02L087	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	62.86	0.403	0	0	N	-N(157)	-N(156)	7.981	0	0	36488	0.02306
CS02L088	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	62.97	0.404	0	0	N	-N(188)	-N(189)	7.981	0	0	36549	0.02305
CS02L089	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	59.15	0.38	0	0	N	-N(156)	-N(161)	7.981	0	0	34332	0.02336
CS02L090	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	59.25	0.38	0	0	N	-N(189)	-N(184)	7.981	0	0	34393	0.02335
CS02L091	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	55.61	0.357	0	0	N	-N(161)	-N(160)	7.981	0	0	32278	0.02367
CS02L092	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	55.41	0.356	0	0	N	-N(184)	-N(185)	7.981	0	0	32161	0.02369
CS02L093	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	51.76	0.332	0	0	N	-N(160)	-N(158)	7.981	0	0	30044	0.02404
CS02L094	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	51.86	0.333	0	0	N	-N(185)	-N(187)	7.981	0	0	30104	0.02403
CS02L095	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	48.05	0.308	0	0	N	-N(158)	-N(159)	7.981	0	0	27888	0.02444
CS02L096	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	48.15	0.309	0	0	N	-N(187)	-N(186)	7.981	0	0	27949	0.02442
CS02L097	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	44.5	0.286	0	0	N	-N(159)	-N(162)	7.981	0	0	25832	0.02486
CS02L098	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	44.31	0.284	0	0	N	-N(186)	-N(201)	7.981	0	0	25717	0.02488
CS02L099	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	40.66	0.261	0	0	N	-N(162)	-N(163)	7.981	0	0	23600	0.02537
CS02L100	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	40.76	0.262	0	0	N	-N(201)	-N(200)	7.981	0	0	23660	0.02535
CS02L101	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	36.94	0.237	0	0	N	-N(163)	-N(171)	7.981	0	0	21444	0.02593
CS02L102	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	37.05	0.238	0	0	N	-N(200)	-N(192)	7.981	0	0	21505	0.02592
CS02L103	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	33.4	0.214	0	0	N	-N(171)	-N(170)	7.981	0	0	19388	0.02655
CS02L104	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	33.2	0.213	0	0	N	-N(192)	-N(193)	7.981	0	0	19273	0.02659
CS02L105	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	29.56	0.19	0	0	N	-N(170)	-N(168)	7.981	0	0	17156	0.02734
CS02L106	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	29.66	0.19	0	0	N	-N(193)	-N(195)	7.981	0	0	17217	0.02732
CS02L107	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	25.84	0.166	0	0	N	-N(168)	-N(169)	7.981	0	0	15001	0.02826
CS02L108	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	25.95	0.167	0	0	N	-N(195)	-N(194)	7.981	0	0	15061	0.02823
CS02L109	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	22.3	0.143	0	0	N	-N(169)	-N(164)	7.981	0	0	12945	0.02932
CS02L110	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	22.1	0.142	0	0	N	-N(194)	-N(199)	7.981	0	0	12829	0.02939
CS02L111	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	18.46	0.118	0	0	N	-N(164)	-N(165)	7.981	0	0	10713	0.03079
CS02L112	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	18.56	0.119	0	0	N	-N(199)	-N(198)	7.981	0	0	10773	0.03075
CS02L113	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	14.74	0.095	0	0	N	-N(165)	-N(167)	7.981	0	0	8557	0.0327
CS02L114	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	14.85	0.095	0	0	N	-N(198)	-N(196)	7.981	0	0	8618	0.03264
CS02L115	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	11.2	0.072	0	0	N	-N(167)	-N(166)	7.981	0	0	6501	0.03531
CS02L116	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	11	0.071	0	0	N	-N(196)	-N(197)	7.981	0	0	6386	0.03549
CS02L117	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	7.355	0.047	0	0	N	-N(166)	-N(172)	7.981	0	0	4269	0.03999
CS02L118	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	7.459	0.048	0	0	N	-N(197)	-N(202)	7.981	0	0	4330	0.03982
CS02L119	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	3.642	0.023	0	0	N	-N(172)	-N(173)	7.981	0	0	2114	0.05029
CS02L120	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	3.748	0.024	0	0	N	-N(202)	-N(174)	7.981	0	0	2174	0.0498
CS02L121	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	0.099	0	0	0	N	-N(173)	-N(174)	7.981	0	0	57.62	1.111
CS02M(001)	Steel Sch 40 (clean)	Containment Sump Water	10	1.8	4.405	300.8	1.225	0.045	0.103	N	-N(390)	-N(391)	10.02	0	0.103	139077	0.0179
CS02M(002)	Steel Sch 40 (clean)	Containment Sump Water	10	1.8	4.405	300.9	1.225	0.045	0.103	N	-N(390)	-N(392)	10.02	0	0.103	139105	0.0179
CS02M(003)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	295.4	1.896	0.002	0.005	N	-N(391)	-N(393)	7.981	0.005	0	171481	0.01765
CS02M(004)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	295.5	1.897	0.002	0.005	N	-N(392)	-N(394)	7.981	0.005	0	171515	0.01765
CS02M(005)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	290	1.862	0.002	0.005	N	-N(393)	-N(395)	7.981	0.005	0	168353	0.01769
CS02M(006)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	290.1	1.862	0.002	0.005	N	-N(394)	-N(396)	7.981	0.005	0	168387	0.01769
CS02M(007)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	284.7	1.827	0.002	0.005	N	-N(395)	-N(397)	7.981	0.005	0	165225	0.01774
CS02M(008)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	284.7	1.827	0.002	0.005	N	-N(396)	-N(398)	7.981	0.005	0	165259	0.01774
CS02M(009)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	279.3	1.792	0.002	0.005	N	-N(397)	-N(399)	7.981	0.005	0	162099	0.01779
CS02M(010)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	279.3	1.793	0.002	0.005	N	-N(398)	-N(400)	7.981	0.005	0	162133	0.01779
CS02M(011)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	273.9	1.758	0.002	0.005	N	-N(399)	-N(401)	7.981	0.005	0	158973	0.01783
CS02M(012)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	273.9	1.758	0.002	0.005	N	-N(400)	-N(402)	7.981	0.005	0	159007	0.01783
CS02M(013)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	268.5	1.723	0.002	0.005	N	[illegible]	[illegible]	7.981	0.005	0	155847	0.01788
CS02M(014)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	268.5	1.724	0.002	0.004	N	[illegible]	[illegible]	7.981	0.004	0	155882	0.01788
CS02M(015)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	263.1	1.689	0.002	0.004	N	[illegible]	[illegible]	7.981	0.004	0	152723	0.01793
CS02M(016)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	263.1	1.689	0.002	0.004	N	[illegible]	[illegible]	7.981	0.004	0	152757	0.01793
CS02M(017)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	257.7	1.654	0.002	0.004	N	[illegible]	[illegible]	7.981	0.004	0	149598	0.01798
CS02M(018)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	257.8	1.655	0.002	0.004	N	[illegible]	[illegible]	7.981	0.004	0	149632	0.01799
CS02M(019)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	252.3	1.62	0.002	0.004	N	[illegible]	[illegible]	7.981	0.004	0	146475	0.01804
CS02M(020)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	252.4	1.62	0.002	0.004	N	[illegible]	[illegible]	7.981	0.004	0	146509	0.01804
CS02M(021)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	247	1.586	0.002	0.004	N	[illegible]	[illegible]	7.981	0.004	0	143352	0.0181
CS02M(022)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	247	1.586	0.002	0.004	N	-N(410)	-N(412)	7.981	0.004	0	143386	0.0181
CS02M(023)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	241.6	1.551	0.002	0.004	N	-N(411)	-N(413)	7.981	0.004	0	140229	0.01815
CS02M(024)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	241.6	1.551	0.002	0.004	N	-N(412)	-N(414)	7.981	0.004	0	140263	0.01815
CS02M(025)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	236.2	1.516	0.002	0.004	N	-N(413)	-N(415)	7.981	0.004	0	137107	0.01821
CS02M(026)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	236.3	1.516	0.002	0.004	N	-N(414)	-N(416)	7.981	0.004	0	137141	0.01821
CS02M(027)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	230.8	1.482	0.001	0.003	N	-N(415)	-N(417)	7.981	0.003	0	133985	0.01827
CS02M(028)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	230.9	1.482	0.001	0.003	N	-N(416)	-N(418)	7.981	0.003	0	134019	0.01827
CS02M(029)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	225.5	1.447	0.001	0.003	N	-N(417)	-N(419)	7.981	0.003	0	130864	0.01834
CS02M(030)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	225.5	1.447	0.001	0.003	N	-N(418)	-N(420)	7.981	0.003	0	130898	0.01834
CS02M(031)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	220.1	1.413	0.001	0.003	N	-N(419)	-N(421)	7.981	0.003	0	127743	0.0184
CS02M(032)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	220.1	1.413	0.001	0.003	N	-N(420)	-N(422)	7.981	0.003	0	127778	0.0184
CS02M(033)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	214.7	1.378	0.001	0.003	N	-N(421)	-N(423)	7.981	0.003	0	124623	0.01847
CS02M(034)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	214.8	1.378	0.001	0.003	N	-N(422)	-N(424)	7.981	0.003	0	124657	0.01847
CS02M(035)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	209.3	1.344	0.001	0.003	N	-N(423)	-N(425)	7.981	0.003	0	121503	0.01854
CS02M(036)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	209.4	1.344	0.001	0.003	N	-N(424)	-N(426)	7.981	0.003	0	121537	0.01854
CS02M(037)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	204	1.309	0.001	0.003	N	-N(425)	-N(427)	7.981	0.003	0	118384	0.01862
CS02M(038)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	204	1.309	0.001	0.003	N	-N(426)	-N(428)	7.981	0.003	0	118418	0.01862
CS02M(039)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	198.6	1.275	0.001	0.003	N	-N(427)	-N(429)	7.981	0.003	0	115264	0.01869
CS02M(040)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	198.6	1.275	0.001	0.003	N	-N(428)	-N(430)	7.981	0.003	0	115299	0.01869
CS02M(041)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	193.2	1.24	0.001	0.002	N	-N(429)	-N(431)	7.981	0.002	0	112146	0.01877
CS02M(042)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	193.3	1.24	0.001	0.002	N	-N(430)	-N(432)	7.981	0.002	0	112180	0.01877
CS02M(043)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	187.8	1.206	0	0.002	N	-N(431)	-N(433)	7.981	0.002	0	109027	0.01886
CS02M(044)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	187.9	1.206	0	0.002	N	-N(432)	-N(434)	7.981	0.002	0	109061	0.01886
CS02M(045)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	182.5	1.171	0	0.002	N	-N(433)	-N(435)	7.981	0.002	0	105909	0.01894
CS02M(046)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	182.5	1.171	0	0.002	N	-N(434)	-N(436)	7.981	0.002	0	105943	0.01894
CS02M(047)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	177.1	1.137	0	0.002	N	-N(435)	-N(437)	7.981	0.002	0	102791	0.01904
CS02M(048)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	177.1	1.137	0	0.002	N	-N(436)	-N(438)	7.981	0.002	0	102825	0.01903
CS02M(049)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	171.7	1.102	0	0.002	N	-N(437)	-N(439)	7.981	0.002	0	99673	0.01913
CS02M(050)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	171.8	1.103	0	0.002	N	-N(438)	-N(440)	7.981	0.002	0	99707	0.01913
CS02M(051)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	166.3	1.068	0	0.002	N	-N(439)	-N(441)	7.981	0.002	0	96556	0.01923
CS02M(052)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	166.4	1.068	0	0.002	N	-N(440)	-N(442)	7.981	0.002	0	96590	0.01923
CS02M(053)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	161	1.033	0	0.002	N	-N(441)	-N(443)	7.981	0.002	0	93439	0.01933
CS02M(054)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	161	1.034	0	0.002	N	-N(442)	-N(444)	7.981	0.002	0	93473	0.01933
CS02M(055)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	155.6	0.999	0	0.002	N	-N(443)	-N(445)	7.981	0.002	0	90322	0.01944
CS02M(056)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	155.7	0.999	0	0.002	N	-N(444)	-N(446)	7.981	0.002	0	90356	0.01944
CS02M(057)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	150.2	0.964	0	0.002	N	-N(445)	-N(447)	7.981	0.002	0	87205	0.01956
CS02M(058)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	150.3	0.965	0	0.002	N	-N(446)	-N(448)	7.981	0.002	0	87239	0.01956
CS02M(059)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	144.9	0.93	0	0.001	N	-N(447)	-N(449)	7.981	0.001	0	84069	0.01968
CS02M(060)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	144.9	0.93	0	0.001	N	-N(448)	-N(450)	7.981	0.001	0	84123	0.01968
CS02M(061)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	139.5	0.895	0	0.001	N	-N(449)	-N(451)	7.981	0.001	0	80972	0.01981
CS02M(062)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	139.6	0.896	0	0.001	N	-N(450)	-N(452)	7.981	0.001	0	81006	0.0198
CS02M(063)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	134.1	0.861	0	0.001	N	-N(451)	-N(453)	7.981	0.001	0	77856	0.01994
CS02M(064)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	134.2	0.861	0	0.001	N	-N(452)	-N(454)	7.981	0.001	0	77890	0.01994
CS02M(065)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	128.8	0.826	0	0.001	N	-N(453)	-N(455)	7.981	0.001	0	74740	0.02008
CS02M(066)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	128.8	0.827	0	0.001	N	-N(454)	-N(456)	7.981	0.001	0	74774	0.02008
CS02M(067)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	123.4	0.792	0	0.001	N	-N(455)	-N(457)	7.981	0.001	0	71625	0.02024
CS02M(068)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	123.5	0.792	0	0.001	N	-N(456)	-N(458)	7.981	0.001	0	71659	0.02023
CS02M(069)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	118	0.758	0	0	N	-N(457)	-N(459)	7.981	0	0	68509	0.0204
CS02M(070)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	118.1	0.758	0	0	N	-N(458)	-N(460)	7.981	0	0	68543	0.0204
CS02M(071)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	112.7	0.723	0	0	N	-N(459)	-N(461)	7.981	0	0	65393	0.02057
CS02M(072)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	112.7	0.723	0	0	N	-N(460)	-N(462)	7.981	0	0	65427	0.02057
CS02M(073)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	107.3	0.689	0	0	N	-N(461)	-N(463)	7.981	0	0	62278	0.02076
CS02M(074)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	107.4	0.689	0	0	N	-N(462)	-N(464)	7.981	0	0	62312	0.02075
CS02M(075)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	101.9	0.654	0	0	N	-N(463)	-N(465)	7.981	0	0	59163	0.02096
CS02M(076)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	102	0.655	0	0	N	-N(464)	-N(466)	7.981	0	0	59197	0.02095
CS02M(077)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	96.56	0.62	0	0	N	-N(465)	-N(467)	7.981	0	0	56048	0.02117
CS02M(078)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	96.62	0.62	0	0	N	-N(466)	-N(468)	7.981	0	0	56082	0.02117
CS02M(079)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	91.19	0.585	0	0	N	-N(467)	-N(469)	7.981	0	0	52932	0.0214
CS02M(080)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	91.25	0.586	0	0	N	-N(468)	-N(470)	7.981	0	0	52966	0.0214
CS02M(081)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	85.83	0.551	0	0	N	-N(469)	-N(471)	7.981	0	0	49817	0.02166
CS02M(082)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	85.89	0.551	0	0	N	-N(470)	-N(472)	7.981	0	0	49851	0.02165
CS02M(083)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	80.46	0.516	0	0	N	-N(471)	-N(473)	7.981	0	0	46703	0.02193
CS02M(084)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	80.52	0.517	0	0	N	-N(472)	-N(474)	7.981	0	0	46737	0.02193
CS02M(085)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	75.09	0.482	0	0	N	-N(473)	-N(475)	7.981	0	0	43588	0.02224
CS02M(086)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	75.15	0.482	0	0	N	-N(474)	-N(476)	7.981	0	0	43622	0.02223
CS02M(087)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	69.73	0.448	0	0	N	-N(475)	-N(477)	7.981	0	0	40473	0.02257
CS02M(088)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	69.79	0.448	0	0	N	-N(476)	-N(478)	7.981	0	0	40507	0.02257
CS02M(089)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	64.36	0.413	0	0	N	-N(477)	-N(479)	7.981	0	0	37358	0.02295
CS02M(090)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	64.42	0.413	0	0	N	-N(478)	-N(480)	7.981	0	0	37392	0.02295
CS02M(091)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	59	0.379	0	0	N	-N(479)	-N(481)	7.981	0	0	34243	0.02337
CS02M(092)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	59.05	0.379	0	0	N	-N(480)	-N(482)	7.981	0	0	34277	0.02337
CS02M(093)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	53.63	0.344	0	0	N	-N(481)	-N(483)	7.981	0	0	31129	0.02386
CS02M(094)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	53.69	0.345	0	0	N	-N(482)	-N(484)	7.981	0	0	31163	0.02385
CS02M(095)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	48.26	0.31	0	0	N	-N(483)	-N(485)	7.981	0	0	28014	0.02441
CS02M(096)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	48.32	0.31	0	0	N	-N(484)	-N(486)	7.981	0	0	28048	0.0244
CS02M(097)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	42.9	0.275	0	0	N	-N(485)	-N(487)	7.981	0	0	24899	0.02506
CS02M(098)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	42.96	0.276	0	0	N	-N(486)	-N(488)	7.981	0	0	24933	0.02505
CS02M(099)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	37.53	0.241	0	0	N	-N(487)	-N(489)	7.981	0	0	21785	0.02584
CS02M(100)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	37.59	0.241	0	0	N	-N(488)	-N(490)	7.981	0	0	21819	0.02583
CS02M(101)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	32.17	0.206	0	0	N	-N(489)	-N(491)	7.981	0	0	18670	0.02679
CS02M(102)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	32.22	0.207	0	0	N	-N(490)	-N(492)	7.981	0	0	18704	0.02678
CS02M(103)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	26.8	0.172	0	0	N	-N(491)	-N(493)	7.981	0	0	15556	0.028
CS02M(104)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	26.86	0.172	0	0	N	-N(492)	-N(494)	7.981	0	0	15590	0.02799
CS02M(105)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	21.43	0.138	0	0	N	-N(493)	-N(495)	7.981	0	0	12441	0.02962
CS02M(106)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	21.49	0.138	0	0	N	-N(494)	-N(496)	7.981	0	0	12475	0.0296
CS02M(107)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	16.07	0.103	0	0	N	-N(495)	-N(497)	7.981	0	0	9327	0.03195
CS02M(108)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	16.13	0.104	0	0	N	-N(496)	-N(498)	7.981	0	0	9361	0.03192
CS02M(109)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	10.7	0.069	0	0	N	-N(497)	-N(499)	7.981	0	0	6212	0.03577
CS02M(110)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	10.76	0.069	0	0	N	-N(498)	-N(500)	7.981	0	0	6246	0.03571
CS02M(111)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	5.336	0.034	0	0	N	-N(499)	-N(501)	7.981	0	0	3098	0.04424
CS02M(112)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	5.395	0.035	0	0	N	-N(500)	-N(502)	7.981	0	0	3132	0.04409
CS02M(113)	Steel Sch 40 (clean)	Containment Sump Water	8	3.8	0	0.029	0	0	0	N	-N(502)	-N(501)	7.981	0	0	17.03	3.758
CS05AA	Steel Sch 40 (clean)	Containment Sump Water	3	1	9.8	0	0	0	0	N	-N(008)	-N(563)	3.068	0	0	0	0
CS05AB	Steel Sch 40 (clean)	Containment Sump Water	3	1	11.1	0	0	0	0	N	-N(240)	-N(562)	3.068	0	0	0	0
CS06AA	Steel Sch 40 (clean)	Containment Sump Water	6	1	1	0	0	-1.382	0	N	-N(563)	-N(556)	6.065	0	0	0	0
CS06AB	Steel Sch 40 (clean)	Containment Sump Water	6	1	1	0	0	1.08	0	N	-N(562)	-N(557)	6.065	0	0	0	0
CS23AA	Steel Sch 30 (clean)	Containment Sump Water	14	15.7	1.00E-05	0	0	-6.4	0	N	-N(556)	-N(005)	13.25	0	0	0	0
CS23AB	Steel Sch 30 (clean)	Containment Sump Water	14	4.8	1.00E-05	0	0	-2.117	0	N	-N(557)	-N(237)	13.25	0	0	0	0
CV05B(001)	Steel Sch 40 (clean)	Water After RHR HX	8	17.5	0.8	678.2	4.353	0.155	0.359	N	-N(622)	-N(627)	7.981	0.124	0.235	383665	0.01607
CV05B(002)	Steel Sch 40 (clean)	Water After RHR HX	8	21.7	17.86	130	0.834	0.066	0.198	N	-N(631)	-N(622)	7.981	0.007	0.191	75458	0.02005
CV05B(003)	Steel Sch 40 (clean)	Water After RHR HX	8	16.8	0	130	0.834	0.002	0.005	N	-N(633)	-N(631)	7.981	0.005	0	75458	0.02005
CV05B(004)	Steel Sch 40 (clean)	Water After RHR HX	8	18.5	0.5907	0	0	0	0	N	-N(625)	-N(633)	7.981	0	0	0	0
CV05B(005)	Steel Sch 40 (clean)	Water After RHR HX	8	13.7	1.2	0	0	0.664	0	N	-N(624)	-N(625)	7.981	0	0	0	0
CV05B(006)	Steel Sch 40 (clean)	Water After RHR HX	8	1	1.00E-05	0	0	0	0	N	-N(623)	-N(624)	7.981	0	0	0	0
CV05CA	Steel Sch 40 (clean)	Water After RHR HX	6	24.5	2.812	347.4	3.862	-1.32	0.844	N	-N(627)	Centrifugal Charging Pump A	6.065	0.194	0.65	265380	0.01723
CV05CB	Steel Sch 40 (clean)	Water After RHR HX	6	118.8	1.921	330.8	3.676	-1.139	1.264	N	-N(627)	Centrifugal Charging Pump B	6.065	0.861	0.403	252649	0.01732
CV06A	Steel Sch 40 (clean)	Water After RHR HX	4	39.4	427.6	0	0	-2.506	0	N	-N(631)	Positive Dis. Charging Pump	4.026	0	0	0.01151	0
CV07A(001)	Steel Sch.160 (clean)	Water After RHR HX	3	2.7	8.631	0	0	0	0	N	Positive Dis. Charging Pump	-N(641)	2.624	0	0	0.01765	0
CV07A(002)	Steel Sch.160 (clean)	Water After RHR HX	3	30.5	10.85	0	0	1.565	0	N	-N(641)	-N(640)	2.624	0	0	0.01765	0

CS02M(001)	1 x Reducer - Contraction (10 x 8 - 7)	0.1047	1 x Diverging* Tee (Branch)	4.3						
CS02M(002)	1 x Reducer - Contraction (10 x 8 - 7)	0.1047	1 x Diverging* Tee (Branch)	4.3						
CS05AA	1 x Diverging Tee (Branch)	9.8								
CS05AB	1 x Diverging Tee (Branch)	11.1								
CS06AA	1 x Converging Tee (Branch)	1								
CS06AB	1 x Converging Tee (Branch)	1								
CS23AA	1 x Converging Tee (Branch)	1.00E-05								
CS23AB	1 x Converging Tee (Branch)	1.00E-05								
CV05B(001)	1 x Diverging* Tee (Branch)	0.8								
CV05B(002)	3 x Pipe Bend - r/d 1.5 (90°)	0.1909	1 x Converging Tee (Through)	16.5	1 x Diverging* Tee (Branch)	0.8				
CV05B(004)	3 x Pipe Bend - r/d 1.5 (90°)	0.1909	1 x Converging Tee (Through)	1.00E-05						
CV05B(005)	1 x Converging* Tee (Branch)	1.2								
CV05B(006)	1 x Converging Tee (Through)	1.00E-05								
CV05CA	2 x Pipe Bend - r/d 1.5 (90°)	0.2065	1 x CV8471A (Gate Valve)	0.195	1 x Diverging Tee (Branch)	2.2				
CV05CB	8 x Pipe Bend - r/d 1.5 (90°)	0.2065	1 x Reducer - Contraction (8 x 6 - 5.5)	0.058	1 x CV8471B (Gate Valve)	0.195	1 x Diverging Tee (Through)	1.00E-05		
CV06A	5 x Pipe Bend - r/d 1.5 (90°)	0.2279	1 x Reducer - Contraction (8 x 4 - 6)	0.1667	1 x CV13M(Suct. Stabilizer)	423.9	1 x CV8394(Diaphragm Valve)	2.436	1 x Diverging* Tee (Branch)	1.00E-05
CV07A(001)	1 x Pipe Bend - r/d 1.5 (90°)	0.2511	1 x CV12M(Puls. Dampener)	8.379						
CV07A(002)	1 x CV8497(Check Valve)	3.2	3 x Pipe Bend - r/d 1.5 (90°)	0.2511	1 x CV8386(Globe Valve)	6.1	1 x Diverging Tee (Through)	1.00E-05		

CV08AA(001)	Steel Sch.160 (clean)	Water After RHR HX	4	2.8	0.4721		347.4	12.02	1.016	1.451	N	Centrifugal Charging Pump A	~N(637)	3.438	0.393	1.058	464158	0.01797	2 x Pipe Bend - r/d 1.5 (90°)	0.2361														
CV08AA(002)	Steel Sch 160 (clean)	Water After RHR HX	4	4.8	2.975		282.4	9.789	2.098	4.855	N	~N(637)	~N(638)	3.438	0.451	4.404	380574	0.01816	1 x CV8481A(Check Valve)	2.975	1 x Diverging Tee (Through)	1.00E-05												
CV08AA(003)	Steel Sch 40 (clean)	Water After RHR HX	4	12.8	0.9047		282.4	7.124	1.361	1.25	N	~N(638)	~N(639)	4.026	0.538	0.712	324991	0.01791	3 x Pipe Bend - r/d 1.5 (90°)	0.2279	1 x CV8485A	0.221	1 x Diverging Tee (Through)	1.00E-05	1 x Converging Tee (Branch)	1.00E-05								
CV08BA(001)	Steel Sch 160 (clean)	Water After RHR HX	4	1.7	0.2361		330.8	11.44	0.69	0.596	N	Centrifugal Charging Pump B	~N(634)	3.438	0.217	0.479	445899	0.01802	1 x Pipe Bend - r/d 1.5 (90°)	0.2361														
CV08BA(002)	Steel Sch.160 (clean)	Water After RHR HX	4	3.7	3.211		265.8	9.193	1.952	4.518	N	~N(634)	~N(635)	3.438	0.309	4.209	358115	0.01825	1 x Pipe Bend - r/d 1.5 (90°)	0.2361	1 x CV8481B(Check Valve)	2.975	1 x Diverging Tee (Through)	1.00E-05										
CV08BA(003)	Steel Sch 40 (clean)	Water After RHR HX	4	103.1	3.233		265.8	6.703	3.459	6.106	N	~N(635)	~N(636)	4.026	3.653	2.253	305812	0.01798	4 x Pipe Bend - r/d 1.5 (90°)	0.2279	1 x CV8485B (Gate Valve)	0.221	1 x Diverging Tee (Through)	1.00E-05	1 x Converging* Tee (Branch)	2.1								
CV09A(001)	Steel Sch.160 (clean)	Water After RHR HX	4	13.3	5.5		202.4	7.002	2.091	4.839	N	~N(639)	~N(636)	3.438	0.656	4.183	272778	0.01858	1 x Converging* Tee (Branch)	3.4	1 x Diverging* Tee (Branch)	2.1												
CV09A(002)	Steel Sch 160 (clean)	Water After RHR HX	4	23.3	9.158		486.2	16.19	25.89	43.12	N	~N(636)	~N(643)	3.438	5.87	37.25	630694	0.01773	4 x Pipe Bend - r/d 1.5 (90°)	0.2361	1 x FE917	7.2	1 x Tee - Flow Thru Branch	1.012										
CV09D(001)	Steel Sch.160 (clean)	Water After RHR HX	3	2.6	0.2638		80	4.75	0.077	0.177	N	~N(642)	~N(640)	2.624	0.085	0.092	141236	0.02044	1 x Reducer - Contraction (4 x 3 - 4)	0.03381	1 x CV8483A(Gate Valve)	0.23	1 x Diverging Tee (Through)	1.00E-05										
CV09D(002)	Steel Sch.160 (clean)	Water After RHR HX	3	8.5	9.93		80	4.75	1.623	3.757	N	~N(639)	~N(642)	2.624	0.281	3.476	141236	0.02044	1 x CV8483B(Gate Valve)	0.23	1 x Converging Tee (Through)	1.00E-05	1 x Diverging* Tee (Branch)	9.7										
CV09D(003)	Steel Sch.160 (clean)	Water After RHR HX	3	23	11.4		80	4.75	5.03	4.743	N	~N(640)	~N(667)	2.824	0.753	3.99	141236	0.02044	1 x FE121	9.4	1 x Diverging Tee (Branch)	2	1 x Converging Tee (Through)	1.00E-05										
CV09D(004)	Steel Sch.160 (clean)	Water After RHR HX	3	12.5	1.00E-06		0	0	0	0	N	~N(667)	~N(668)	2.624	0	0	0	0	1 x Diverging Tee (Through)	1.00E-06														
CV12AA	Steel Sch.160 (clean)	Water After RHR HX	3	15.6	1.74	XXX	—	—	—	—	N	~N(638)	~N(678)	2.624	—	—	—	—	3 x Pipe Bend - r/d 1.5 (90°)	0.2511	1 x CV8387A(Globe Valve)	0.9866	1 x Diverging Tee (Branch)	1.00E-05	1 x Converging* Tee (Branch)	1.00E-05								
CV12AB	Steel Sch.160 (clean)	Water After RHR HX	3	116.7	3.247	XXX	—	—	—	—	N	~N(635)	~N(678)	2.624	—	—	—	—	9 x Pipe Bend - r/d 1.5 (90°)	0.2511	1 x CV8387B(Globe Valve)	0.9866	1 x Diverging Tee (Branch)	1.00E-05	1 x Converging* Tee (Branch)	1.00E-05								
CV12B	Steel Sch.160 (clean)	Water After RHR HX	3	0.8	0		0	0	0	0	N	~N(678)	~N(679)	2.624	0	0	0	0																
CV13B	Steel Sch.160 (clean)	Water After RHR HX	3	13.8	2.251		80	4.75	-2.748	1.239	N	~N(667)	~N(679)	2.824	0.451	0.788	141236	0.02044	1 x Pipe Bend - r/d 1.5 (90°)	0.2511	1 x Converging Tee (Branch)	1.00E-05	1 x Diverging* Tee (Branch)	1.00E-05	1 x Diverging Tee (Branch)	2								
CV43A(001)	Steel Sch 160 (clean)	Water After RHR HX	2	92	49.04		0	0	1.944	0	N	~N(668)	~N(669)	1.687	0	0	0	0	13 x Pipe Bend - r/d 1.5 (90°)	0.2791	6 x Pipe Bend - r/d 1.5 (45°)	0.1976	1 x FE139	6.8	1 x CV8345(Globe Valve)	5.891	1 x CV8346(Globe Valve)	5.891	1 x CV8348(Check Valve)	2.005	1 x CV184 (Globe Valve)	23.84	1 x Diverging Tee (Branch)	1.00E-05
CV43A(002)	Steel Sch 160 (clean)	Water After RHR HX	2	60.5	1.116		0	0	0.302	0	N	~N(669)	~N(670)	1.687	0	0	0	0	4 x Pipe Bend - r/d 1.5 (90°)	0.2791	1 x Diverging* Tee (Branch)	1.00E-05												
CV43A(003)	Steel Sch.160 (clean)	Water After RHR HX	2	117.8	2.151		0	0	1.21	0	N	~N(670)	~N(671)	1.687	0	0	0	0	7 x Pipe Bend - r/d 1.5 (90°)	0.2791	1 x Pipe Bend - r/d 1.5 (45°)	0.1976	1 x Diverging Tee (Through)	1.00E-05										
CV43BA/RC18AA	Steel Sch 160 (clean)	Water After RHR HX	2	134.4	15.41	XXX	—	—	—	—	N	~N(671)	Hot Leg A(001)	1.687	—	—	—	—	13 x Pipe Bend - r/d 1.5 (90°)	0.2791	1 x RC8038A (Y Globe Valve)	5.891	1 x RC8036A (Globe Valve)	5.891	1 x Diverging Tee (Through)	1.00E-05								
CV43BB/RC16AB	Steel Sch.160 (clean)	Water After RHR HX	2	18	13.29	XXX	—	—	—	—	N	~N(671)	Hot Leg B(001)	1.687	—	—	—	—	4 x Pipe Bend - r/d 1.5 (90°)	0.2791	2 x Pipe Bend - r/d 1.5 (45°)	0.1976	1 x RC8038B (Y Globe Valve)	5.891	1 x RC8036B (Globe Valve)	5.891	1 x Diverging Tee (Branch)	1.00E-05						
CV43BC/RC16AC	Steel Sch 160 (clean)	Water After RHR HX	2	59.1	13.46	XXX	—	—	—	—	N	~N(670)	Hot Leg C(001)	1.687	—	—	—	—	6 x Pipe Bend - r/d 1.5 (90°)	0.2791	1 x RC8038C (Y Globe Valve)	5.891	1 x RC8036C (Globe Valve)	5.891	1 x Diverging Tee (Branch)	1.00E-05								
CV43BD/RC16AD	Steel Sch 160 (clean)	Water After RHR HX	2	51.7	12.9	XXX	—	—	—	—	N	~N(509)	Hot Leg D(001)	1.687	—	—	—	—	4 x Pipe Bend - r/d 1.5 (90°)	0.2791	1 x RC8038D (Y Globe Valve)	5.891	1 x RC8036D (Globe Valve)	5.891	1 x Diverging* Tee (Branch)	1.00E-05								
CV98A	Steel Sch 40 (clean)	Water After RHR HX	8	5.5	0		548.2	3.519	-2.365	0.026	N	~N(508)	~N(518)	7.981	0.026	0	318208	0.0164																
CV98BA	Steel Sch 40 (clean)	Water After RHR HX	8	8.8	0.3769		274.1	1.759	-2.147	0.029	N	~N(518)	~N(521)	7.981	0.011	0.018	159104	0.01783	1 x Pipe Bend - r/d 1.5 (90°)	0.1969	1 x CV112D(Gate Valve)	0.18	1 x Converging Tee (Branch)	1.00E-05	1 x Diverging Tee (Branch)	1.00E-05								
CV98BB	Steel Sch 40 (clean)	Water After RHR HX	8	8.8	0.3769		274.1	1.759	-2.147	0.029	N	~N(518)	~N(521)	7.961	0.011	0.018	159104	0.01783	1 x Pipe Bend - r/d 1.5 (90°)	0.1969	1 x CV112E(Gate Valve)	0.18	1 x Converging Tee (Through)	1.00E-05	1 x Diverging Tee (Through)	1.00E-05								
CV98C	Steel Sch 40 (clean)	Water After RHR HX	8	6.5	3.2		548.2	3.519	0.279	0.645	N	~N(521)	~N(522)	7.961	0.03	0.616	318208	0.0164	1 x CV8546(Check Valve)	1.9	1 x Converging Tee (Branch)	1.3												
CVA1A/SI13C	Steel Sch 40 (clean)	Water After RHR HX	6	22.5	1.521	XXX	—	—	—	—	N	~N(626)	~N(624)	6.065	—	—	—	—	1 x SI8924 (Gate Valve)	0.195	3 x Pipe Bend - r/d 1.5 (90°)	0.2085	1 x Converging Tee (Branch)	0.7										
CVJ4A	Steel Sch.160 (clean)	Water After RHR HX	4	19.8	1.72		468.2	16.19	9.151	11.98	N	~N(643)	~N(644)	3.438	4.982	6.998	630694	0.01773	3 x Pipe Bend - r/d 1.5 (90°)	0.2361	1 x Tee - Flow Thru Branch	1.012												
[illegible]																																		

Pipe(155)	[illegible]																					
Pipe(156)	[illegible]																					
Pipe(157)	[illegible]																					
Pipe(158)	[illegible]																					
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Pipe(184)	[illegible]																					
Pipe(185)	[illegible]																					
Pipe(186)	[illegible]																					
Pipe(187)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.715	1.38	2.399	5.553	N	~N(178)	A1(070)	1.049	0.005	5.548	16407	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(188)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.544	1.317	2.399	5.053	N	~N(177)	A1(068)	1.049	0.004	5.049	15652	0.03086	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(189)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.847	1.429	2.398	5.954	N	~N(176)	A1(065)	1.049	0.005	5.944	16989	0.03041	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(190)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.715	1.381	2.4	5.555	N	~N(175)	A1(064)	1.049	0.006	5.548	16410	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(191)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.731	1.386	2.419	5.599	N	~N(203)	A1(004)	1.049	0.005	5.594	16476	0.03056	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(192)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.861	1.434	2.418	5.997	N	~N(204)	A1(006)	1.049	0.006	5.991	17050	0.03039	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(193)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.559	1.322	2.417	5.095	N	~N(206)	A1(008)	1.049	0.006	5.09	15715	0.03084	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(194)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.728	1.385	2.416	5.592	N	~N(205)	A1(010)	1.049	0.005	5.587	16465	0.03058	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(195)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.859	1.434	2.415	5.99	N	~N(210)	A1(012)	1.049	0.006	5.984	17041	0.03039	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(196)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.556	1.321	2.414	5.088	N	~N(209)	A1(014)	1.049	0.005	5.083	15705	0.03085	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(197)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.726	1.384	2.413	5.586	N	~N(207)	A1(016)	1.049	0.005	5.581	16456	0.03058	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(198)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.857	1.433	2.412	5.984	N	~N(208)	A1(018)	1.049	0.006	5.978	17032	0.03039	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(199)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.554	1.32	2.411	5.082	N	~N(218)	A1(020)	1.049	0.005	5.077	15696	0.03085	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(200)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.724	1.384	2.411	5.58	N	~N(217)	A1(022)	1.049	0.005	5.575	16447	0.03058	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(201)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.855	1.432	2.41	5.978	N	~N(215)	A1(024)	1.049	0.005	5.973	17024	0.03039	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(202)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.552	1.32	2.409	5.076	N	~N(216)	A1(026)	1.049	0.004	5.072	15687	0.03085	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(203)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.723	1.383	2.408	5.575	N	~N(211)	A1(028)	1.049	0.005	5.57	16439	0.03059	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(204)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.853	1.432	2.408	5.973	N	~N(212)	A1(030)	1.049	0.005	5.968	17017	0.0304	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(205)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.551	1.319	2.407	5.072	N	~N(214)	A1(032)	1.049	0.005	5.067	15680	0.03085	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(206)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.721	1.382	2.406	5.57	N	~N(213)	A1(034)	1.049	0.005	5.565	16433	0.03059	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(207)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.852	1.431	2.406	5.969	N	~N(231)	A1(036)	1.049	0.006	5.963	17010	0.0304	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(208)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.549	1.319	2.405	5.067	N	~N(232)	A1(038)	1.049	0.004	5.063	15673	0.03086	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(209)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.72	1.382	2.405	5.566	N	~N(227)	A1(040)	1.049	0.005	5.561	16427	0.03059	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(210)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.851	1.431	2.404	5.965	N	~N(228)	A1(042)	1.049	0.006	5.959	17005	0.0304	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(211)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.548	1.318	2.404	5.064	N	~N(230)	A1(044)	1.049	0.005	5.059	15668	0.03086	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(212)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.718	1.382	2.403	5.563	N	~N(229)	A1(046)	1.049	0.006	5.557	16421	0.03059	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(213)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.85	1.43	2.403	5.961	N	~N(219)	A1(048)	1.049	0.005	5.956	17000	0.0304	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(214)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.547	1.318	2.402	5.06	N	~N(220)	A1(050)	1.049	0.004	5.056	15663	0.03086	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(215)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.717	1.381	2.402	5.559	N	~N(222)	A1(052)	1.049	0.005	5.554	16417	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(216)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.849	1.43	2.401	5.958	N	~N(221)	A1(054)	1.049	0.005	5.953	16996	0.0304	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(217)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.546	1.317	2.401	5.058	N	~N(226)	A1(056)	1.049	0.005	5.053	15658	0.03086	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(218)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.717	1.381	2.401	5.557	N	~N(225)	A1(058)	1.049	0.005	5.552	16413	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(219)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.848	1.43	2.4	5.956	N	~N(223)	A1(060)	1.049	0.005	5.951	16992	0.0304	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(220)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.545	1.317	2.4	5.055	N	~N(224)	A1(062)	1.049	0.004	5.051	15655	0.03086	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(221)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.325	1.607	4.461	7.526	N	B3(001)	~N(246)	1.049	0.007	7.519	19101	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(222)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.533	1.684	4.78	8.265	N	B3(003)	~N(248)	1.049	0.007	8.258	20018	0.02955	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(223)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.325	1.607	4.461	7.526	N	B3(002)	~N(247)	1.049	0.007	7.519	19101	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(224)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.324	1.607	4.46	7.523	N	B3(004)	~N(249)	1.049	0.007	7.516	19098	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(225)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.324	1.606	4.459	7.521	N	B3(005)	~N(250)	1.049	0.007	7.514	19095	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(226)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.324	1.606	4.459	7.521	N	B3(006)	~N(251)	1.049	0.007	7.514	19095	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(227)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.323	1.606	4.458	7.519	N	B3(007)	~N(252)	1.049	0.007	7.512	19092	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(228)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.323	1.606	4.458	7.519	N	B3(008)	~N(253)	1.049	0.007	7.512	19092	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(229)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.323	1.606	4.457	7.517	N	B3(009)	~N(254)	1.049	0.007	7.51	19089	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(230)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.323	1.606	4.457	7.517	N	B3(010)	~N(255)	1.049	0.007	7.51	19089	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(231)	[illegible]																					
Pipe(232)	[illegible]																					
Pipe(233)	[illegible]																					
Pipe(234)	[illegible]																					
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Pipe(245)	[illegible]																					
Pipe(246)	[illegible]																					
Pipe(247)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.605	4.452	7.506	N	B3(027)	~N(272)	1.049	0.007	7.499	19076	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(248)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.605	4.452	7.506	N	B3(028)	~N(273)	1.049	0.007	7.499	19075	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(249)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.605	4.452	7.505	N	B3(029)	~N(274)	1.049	0.007	7.498	19075	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(250)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.605	4.452	7.505	N	B3(030)	~N(275)	1.049	0.007	7.498	19075	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(251)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.605	4.452	7.505	N	B3(031)	~N(276)	1.049	0.007	7.498	19074	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(252)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.605	4.452	7.505	N	B3(032)	~N(277)	1.049	0.007	7.498	19074	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(253)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.605	4.451	7.504	N	B3(033)	~N(278)	1.049	0.007	7.497	19073	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(254)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.605	4.451	7.504	N	B3(034)	~N(279)	1.049	0.007	7.497	19073	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(255)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.605	4.451	7.504	N	B3(035)	~N(280)	1.049	0.007	7.497	19073	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(256)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.605	4.451	7.504	N	B3(036)	~N(281)	1.049	0.007	7.497	19073	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(257)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.605	4.451	7.503	N	B3(037)	~N(282)	1.049	0.006	7.497	19073	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(258)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.605	4.451	7.503	N	B3(038)	~N(283)	1.049	0.006	7.497	19073	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(259)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.605	4.451	7.503	N	B3(039)	~N(284)	1.049	0.007	7.496	19072	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(260)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.605	4.451	7.503	N	B3(040)	~N(285)	1.049	0.007	7.496	19072	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(261)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.605	4.451	7.503	N	B3(041)	~N(286)	1.049	0.007	7.496	19072	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(262)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.605	4.451	7.503	N	B3(042)	~N(287)	1.049	0.007	7.496	19072	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(263)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.604	4.451	7.503	N	B3(043)	~N(288)	1.049	0.007	7.496	19072	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(264)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.604	4.451	7.503	N	B3(044)	~N(289)	1.049	0.007	7.496	19072	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(265)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.604	4.451	7.503	N	B3(045)	~N(290)	1.049	0.007	7.496	19072	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(266)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.604	4.451	7.503	N	B3(046)	~N(291)	1.049	0.007	7.496	19072	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(267)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.604	4.451	7.503	N	B3(047)	~N(292)	1.049	0.007	7.496	19072	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(268)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.604	4.451	7.503	N	B3(048)	~N(293)	1.049	0.007	7.496	19072	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(269)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.604	4.451	7.503	N	B3(049)	~N(294)	1.049	0.007	7.496	19072	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(270)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.604	4.451	7.503	N	B3(050)	~N(295)	1.049	0.007	7.496	19072	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(271)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.604	4.451	7.503	N	B3(051)	~N(296)	1.049	0.007	7.496	19072	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(272)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.262	1.583	1.212	7.306	N	B2(001)	~N(298)	1.049	0.007	7.299	18820	0.02986	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(273)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.262	1.583	1.212	7.306	N	B2(002)	~N(300)	1.049	0.007	7.299	18820	0.02986	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(274)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.259	1.582	1.209	7.298	N	B2(003)	~N(301)	1.049	0.007	7.291	18810	0.02987	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(275)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.259	1.582	1.209	7.298	N	B2(004)	~N(302)	1.049	0.007	7.291	18810	0.02987	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(276)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.257	1.582	1.206	7.291	N	B2(005)	~N(303)	1.049	0.007	7.284	18800	0.02987	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(277)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.257	1.582	1.206	7.291	N	B2(006)	~N(304)	1.049	0.007	7.284	18800	0.02987	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(278)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.255	1.581	1.202	7.283	N	B2(007)	~N(305)	1.049	0.006	7.277	18791	0.02987	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(279)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.255	1.581	1.202	7.283	N	B2(008)	~N(306)	1.049	0.006	7.277	18791	0.02987	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(280)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.253	1.58	1.199	7.277	N	B2(009)	~N(307)	1.049	0.007	7.27	18782	0.02987	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(281)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.253	1.58	1.199	7.277	N	B2(010)	~N(308)	1.049	0.007	7.27	18782	0.02987	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(282)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.251	1.579	1.197	7.27	N	B2(011)	~N(310)	1.049	0.007	7.263	18773	0.02988	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(283)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.251	1.579	1.197	7.27	N	B2(012)	~N(309)	1.049	0.007	7.263	18773	0.02988	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(284)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.249	1.579	1.194	7.264	N	B2(013)	~N(311)	1.049	0.007	7.257	18765	0.02988	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(285)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.249	1.579	1.194	7.264	N	B2(014)	~N(312)	1.049	0.007	7.257	18765	0.02988	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(286)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.248	1.578	1.191	7.258	N	B2(015)	~N(314)	1.049	0.007	7.251	18758	0.02988	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(287)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.248	1.578	1.191	7.258	N	B2(016)	~N(313)	1.049	0.007	7.251	18758	0.02988	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(288)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.246	1.577	1.189	7.252	N	B2(017)	~N(316)	1.049	0.006	7.246	18750	0.02988	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(289)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.246	1.577	1.189	7.252	N	B2(018)	~N(317)	1.049	0.006	7.246	18750	0.02988	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(290)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.244	1.577	1.187	7.247	N	B2(019)	~N(315)	1.049	0.007	7.24	18744	0.02988	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(291)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.244	1.577	1.187	7.247	N	B2(020)	~N(318)	1.049	0.007	7.24	18744	0.02988	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(292)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.243	1.576	1.184	7.242	N	B2(021)	~N(320)	1.049	0.007	7.235	18737	0.02989	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(293)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.243	1.576	1.184	7.242	N	B2(022)	~N(319)	1.049	0.007	7.235	18737	0.02989	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(294)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.241	1.576	1.182	7.237	N	B2(023)	~N(321)	1.049	0.007	7.23	18731	0.02989	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(295)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.241	1.576	1.182	7.237	N	B2(024)	~N(322)	1.049	0.007	7.23	18731	0.02989	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(296)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.24	1.575	1.18	7.232	N	B2(025)	~N(323)	1.049	0.006	7.226	18725	0.02989	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(297)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.24	1.575	1.18	7.232	N	B2(026)	~N(324)	1.049	0.006	7.226	18725	0.02989	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(298)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.239	1.575	1.179	7.228	N	B2(027)	~N(325)	1.049	0.007	7.221	18719	0.02989	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(299)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.239	1.575	1.179	7.228	N	B2(028)	~N(326)	1.049	0.007	7.221	18719	0.02989	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(300)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.238	1.574	1.177	7.224	N	B2(029)	~N(327)	1.049	0.007	7.217	18714	0.02989	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(301)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.238	1.574	1.177	7.224	N	B2(030)	~N(328)	1.049	0.007	7.217	18714	0.02989	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(302)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.237	1.574	1.175	7.22	N	B2(031)	~N(329)	1.049	0.006	7.214	18709	0.02989	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(303)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.237	1.574	1.175	7.22	N	B2(032)	~N(330)	1.049	0.006	7.214	18709	0.02989	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(304)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.235	1.574	1.174	7.217	N	B2(033)	~N(331)	1.049	0.007	7.21	18704	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(305)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.235	1.574	1.174	7.217	N	B2(034)	~N(332)	1.049	0.007	7.21	18704	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(306)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.234	1.573	1.172	7.213	N	B2(035)	~N(333)	1.049	0.006	7.207	18700	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(307)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.234	1.573	1.172	7.213	N	B2(036)	~N(334)	1.049	0.006	7.207	18700	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(308)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.234	1.573	1.171	7.21	N	B2(037)	~N(335)	1.049	0.006	7.204	18696	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(309)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.234	1.573	1.171	7.21	N	B2(038)	~N(336)	1.049	0.006	7.204	18696	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(310)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.233	1.573	1.17	7.207	N	B2(039)	~N(337)	1.049	0.006	7.201	18692	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(311)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.233	1.573	1.17	7.207	N	B2(040)	~N(338)	1.049	0.006	7.201	18692	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(312)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.232	1.572	1.168	7.204	N	B2(041)	~N(339)	1.049	0.006	7.198	18689	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(313)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.232	1.572	1.168	7.204	N	B2(042)	~N(340)	1.049	0.006	7.198	18689	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(314)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.231	1.572	1.167	7.202	N	B2(043)	~N(341)	1.049	0.007	7.195	18685	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(315)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.231	1.572	1.167	7.202	N	B2(044)	~N(342)	1.049	0.007	7.195	18685	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(316)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.23	1.572	1.166	7.2	N	B2(045)	~N(343)	1.049	0.007	7.193	18682	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(317)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.23	1.572	1.166	7.2	N	B2(046)	~N(344)	1.049	0.007	7.193	18682	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(318)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.23	1.571	1.165	7.197	N	B2(047)	~N(345)	1.049	0.006	7.191	18679	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(319)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.23	1.571	1.165	7.197	N	B2(048)	~N(346)	1.049	0.006	7.191	18679	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(320)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.229	1.571	1.164	7.195	N	B2(049)	~N(347)	1.049	0.006	7.189	18677	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(321)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.229	1.571	1.164	7.195	N	B2(050)	~N(348)	1.049	0.006	7.189	18677	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(322)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.229	1.571	1.164	7.194	N	B2(051)	~N(349)	1.049	0.007	7.187	18675	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(323)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.229	1.571	1.164	7.194	N	B2(052)	~N(350)	1.049	0.007	7.187	18675	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(324)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.228	1.571	1.163	7.192	N	B2(053)	~N(351)	1.049	0.007	7.185	18672	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(325)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.228	1.571	1.163	7.192	N	B2(054)	~N(352)	1.049	0.007	7.185	18672	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(326)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.228	1.571	1.162	7.19	N	B2(055)	~N(353)	1.049	0.006	7.184	18670	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(327)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.228	1.571	1.162	7.19	N	B2(056)	~N(354)	1.049	0.006	7.184	18670	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(328)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.227	1.571	1.162	7.189	N	B2(057)	~N(355)	1.049	0.006	7.183	18669	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(329)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.227	1.571	1.162	7.189	N	B2(058)	~N(356)	1.049	0.006	7.183	18669	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(330)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.227	1.57	1.161	7.188	N	B2(059)	~N(357)	1.049	0.007	7.181	18667	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(331)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.227	1.57	1.161	7.188	N	B2(060)	~N(358)	1.049	0.007	7.181	18667	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(332)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.227	1.57	1.161	7.187	N	B2(061)	~N(359)	1.049	0.007	7.18	18666	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(333)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.227	1.57	1.161	7.187	N	B2(062)	~N(360)	1.049	0.007	7.18	18666	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(334)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.226	1.57	1.16	7.186	N	B2(063)	~N(361)	1.049	0.007	7.179	18665	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(335)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.226	1.57	1.16	7.186	N	B2(064)	~N(362)	1.049	0.007	7.179	18665	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1

Pipe(336)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.226	1.57	1.16	7.185	N	B2(065)
Pipe(337)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.226	1.57	1.16	7.185	N	B2(066)
Pipe(338)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.226	1.57	1.16	7.184	N	B2(067)
Pipe(339)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.226	1.57	1.16	7.184	N	B2(068)
Pipe(340)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.226	1.57	1.159	7.184	N	B2(069)
Pipe(341)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.226	1.57	1.159	7.184	N	B2(070)
Pipe(342)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.226	1.57	1.159	7.183	N	B2(071)
Pipe(343)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.226	1.57	1.159	7.183	N	B2(072)
Pipe(344)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.226	1.57	1.159	7.183	N	B2(073)
Pipe(345)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.226	1.57	1.159	7.183	N	B2(074)
Pipe(346)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.225	1.57	1.159	7.182	N	B2(075)
Pipe(347)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.225	1.57	1.159	7.182	N	B2(076)
Pipe(348)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.225	1.57	1.159	7.182	N	B2(077)
Pipe(349)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.225	1.57	1.159	7.182	N	B2(078)
Pipe(350)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.225	1.57	1.159	7.182	N	B2(079)
Pipe(351)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.225	1.57	1.158	7.182	N	B2(080)
Pipe(352)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.225	1.57	1.158	7.182	N	B2(081)
Pipe(353)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.225	1.57	1.159	7.182	N	B2(082)
Pipe(354)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.225	1.57	1.159	7.182	N	B2(083)
Pipe(355)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.225	1.57	1.159	7.182	N	B2(084)
Pipe(356)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.225	1.57	1.158	7.182	N	B2(085)
Pipe(357)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.225	1.57	1.158	7.182	N	B2(086)
Pipe(358)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.225	1.57	1.158	7.182	N	B2(087)

RH03AB(004)	Steel Sch.40 (clean)	Water After RHR HX	8	28.9	2.472		0	
RH03AB(005)	Steel Sch 40 (clean)	Water After RHR HX	8	36.3	14000		0	
RH03AB(006)	Steel Sch 40S (clean)	Water After RHR HX	12	1.5	1.00E-05		0	
RH09AA(001)	Steel Sch.40 (clean)	Containment Sump Water	8	1	1.00E-05	XXX	—	
RH09AA(002)	Steel Sch 40 (clean)	Containment Sump Water	8	1	1.00E-05	XXX	—	
RH09AB(001)	Steel Sch.40 (clean)	Containment Sump Water	8	1	1.00E-05	XXX	—	
RH09AB(002)	Steel Sch 40 (clean)	Containment Sump Water	8	1	1.00E-05	XXX	—	
RH10AA(001)	Steel Sch 40 (clean)	Water After RHR HX	3	1	1.00E-05	XXX	—	
RH10AA(002)	Steel Sch 40 (clean)	Water After RHR HX	3	1	1.00E-05		0	
RH10AB(001)	Steel Sch 40 (clean)	Water After RHR HX	3	1	1.00E-05	XXX	—	
RH10AB(002)	Steel Sch 40 (clean)	Water After RHR HX	3	1	1.00E-05		0	
RH12A/CV99A	Steel Sch 40 (clean)	Water After RHR HX	8	28.6	5.573	XXX	—	
RH14A	Steel Sch 40 (clean)	Water After RHR HX	8	4.4	1.979	XXX	—	
SI01A	Steel Sch.40 (clean)	Water After RHR HX	8	28.4	0.9844		0	
SI01B(001)	Steel Sch.20 (clean)	Water After RHR HX	24	113.2	0.3195		13740	
SI01B(002)	Steel Sch.20 (clean)	Water After RHR HX	24	58	0.3195		13249	
SI01B(003)	Steel Sch 20 (clean)	Water After RHR HX	24	4.6	0.4		6719	
SI01B(004)	Steel Sch 20 (clean)	Water After RHR HX	24	60.3	0.4524		6719	
SI01B(005)	Steel Sch.20 (clean)	Water After RHR HX	24	7	2.00E-05		6719	
SI01B(006)	Steel Sch 20 (clean)	Water After RHR HX	24	2	60.7		648.2	
SI01B(007)	Steel Sch 20 (clean)	Water After RHR HX	24	1	29.43		648.2	
SI02A/SIF9A	Steel Sch 40 (clean)	Water After RHR HX	8	28.3	13.47		491.5	
SI02BA(001)	Steel Sch 40 (clean)	Water After RHR HX	6	1.7	0.1598		279.2	

BI82AB/BB	Steel Sch.40 (clean)	Water After RHR HX	12	57.1	4.915	6530	18.73	-0.915	30.98	N	~N(504)	~N(552)	11.936	4.23	26.75	2.33E+06	0.01364	3 x Pipe Bend - r/d 1.5 (90°)	0.1915	1 x BI(MAB)(Check Valve)	1.8	1 x B(B81)B(Gate Valve)	0.17	1 x Diverging Tee (Branch)	1.3	1 x Converging Tee (Branch) 1.1
BIA4A	Steel Sch.160 (clean)	Water After RHR HX	8	15.1	1.847	0	0	2.582	0	N	~N(537)	~N(544)	6.813	0	0	0	0	2 x Pipe Bend - r/d 1.5 (90°)	0.2035	1 x BIB41A (Check Valve)	0.84	1 x Diverging Tee (Branch)	1.00E-06	1 x Converging Tee (Through)	0.6	
BIA4B	Steel Sch.160 (clean)	Water After RHR HX	8	85.1	2.11	0	0	-0.259	0	N	~N(544)	~N(545)	6.813	0	0	0	0	8 x Pipe Bend - r/d 1.5 (90°)	0.2035	1 x Pipe Bend - r/d 1.5 (45°)	0.144	1 x Reducer - Contraction (S x 8 - 8)	0.1344			

Node List	Status	Pressure	Grade	Elev
~N(001)		121.6	675.5	428
~N(001A)		58.42	675.5	574.3
~N(002)		29.88	390.2	355.1
~N(003)		32.82	390.2	348.3
~N(004)		35.23	397.4	348.9
~N(005)		157.8	675.5	344.3
~N(006)		157.8	675.5	344.3
~N(007)		156.1	675.6	348.3
~N(008)		151	675.5	360
~N(009)		136	675.5	394.8
~N(010)		52.85	675.5	587.2
~N(011)		50.19	675.6	593.6
~N(012)		50.2	675.7	593.5
~N(013)		50.2	675.7	593.5
~N(014)		50.2	675.7	593.5
~N(015)		50.21	675.7	593.5
~N(016)		50.22	675.7	593.5
~N(017)		50.22	675.7	593.5
~N(018)		50.23	675.7	593.5
~N(019)		50.23	675.7	593.5
~N(020)		50.24	675.8	593.5
~N(021)		50.24	675.8	593.5
~N(022)		50.25	675.8	593.5
~N(023)		50.24	675.8	593.5
~N(024)		50.24	675.8	593.5
~N(025)		50.25	675.8	593.5
~N(026)		50.25	675.8	593.5
~N(027)		50.25	675.8	593.5
~N(028)		50.25	675.8	593.5
~N(029)		50.25	675.8	593.5
~N(030)		50.25	675.8	593.5
~N(031)		50.25	675.8	593.5
~N(032)		50.25	675.8	593.5
~N(033)		50.2	675.7	593.5
~N(034)		50.21	675.7	593.5
~N(035)		50.22	675.7	593.5
~N(036)		50.23	675.7	593.5
~N(037)		50.23	675.7	593.5
~N(038)		50.22	675.7	593.5
~N(039)		50.24	675.8	593.5
~N(040)		50.25	675.8	593.5
~N(041)		50.25	675.8	593.5
~N(042)		50.24	675.8	593.5
~N(043)		50.24	675.8	593.5
~N(044)		50.24	675.8	593.5
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~N(046)		50.25	675.8	593.5
~N(047)		50.25	675.8	593.5
~N(048)		50.25	675.8	593.5
~N(049)		50.25	675.8	593.5
~N(050)		50.25	675.8	593.5
~N(051)		52.18	675.7	589
~N(052)		52.21	675.8	589
~N(053)		52.21	675.8	589
~N(054)		52.21	675.8	589
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~N(073)		52.18	675.7	589
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-N(232)	57.41	674.7	575.8
-N(234)	29.82	388.9	354.9
-N(235)	32.81	392.1	349.9
-N(236)	34.36	389.9	344.4
-N(237)	157.3	674.6	344.4
-N(238)	157.3	674.5	344.4
-N(239)	155.5	674.6	348.3
-N(240)	158.3	674.5	345.8
-N(241)	141.4	674.5	381.3
-N(242)	121.2	674.5	428
-N(243)	62.01	674.5	565
-N(244)	54.47	674.6	582.5
-N(245)	50.5	674.7	591.8
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-N(297)	53.78	675	584.5
-N(298)	53.79	675	584.5
-N(300)	53.79	675	584.5
-N(301)	53.79	675	584.5
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-N(315)	53.81	675	584.5
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-N(318)	53.81	675	584.5
-N(319)	53.82	675	584.5
-N(320)	53.82	675	584.5
-N(321)	53.82	675	584.5
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-N(323)	53.82	675.1	584.5
-N(324)	53.82	675.1	584.5
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-N(328)	53.82	675.1	584.5
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-N(345)	53.83	675.1	584.5
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~N(362)	53.84	675.1	584.5
~N(363)	53.84	675.1	584.5
~N(364)	53.84	675.1	584.5
~N(365)	53.84	675.1	584.5
~N(366)	53.84	675.1	584.5
~N(367)	53.84	675.1	584.5
~N(368)	53.84	675.1	584.5
~N(369)	53.84	675.1	584.5
~N(370)	53.84	675.1	584.5
~N(371)	53.84	675.1	584.5
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~N(373)	53.84	675.1	584.5
~N(374)	53.84	675.1	584.5
~N(375)	53.84	675.1	584.5
~N(376)	53.84	675.1	584.5
~N(377)	53.84	675.1	584.5
~N(378)	53.84	675.1	584.5
~N(379)	53.84	675.1	584.5
~N(380)	53.84	675.1	584.5
~N(381)	53.84	675.1	584.5
~N(382)	53.84	675.1	584.5
~N(383)	53.84	675.1	584.5
~N(384)	53.84	675.1	584.5
~N(385)	53.84	675.1	584.5
~N(387)	53.84	675.1	584.5
~N(388)	53.84	675.1	584.5
~N(389)	53.84	675.1	584.5
~N(390)	60.09	672.1	567
~N(391)	60.05	672	567
~N(392)	60.05	672	567
~N(393)	60.05	672	567
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~N(395)	60.04	672	567
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~N(400)	60.04	672	567
~N(401)	60.04	671.9	567
~N(402)	60.04	671.9	567
~N(403)	60.04	671.9	567
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~N(405)	60.03	671.9	567
~N(406)	60.03	671.9	567
~N(407)	60.03	671.9	567
~N(408)	60.03	671.9	567
~N(409)	60.03	671.9	567
~N(410)	60.03	671.9	567
~N(411)	60.03	671.9	567
~N(412)	60.03	671.9	567
~N(413)	60.03	671.9	567
~N(414)	60.03	671.9	567
~N(415)	60.03	671.9	567
~N(416)	60.03	671.9	567
~N(417)	60.02	671.9	567
~N(418)	60.02	671.9	567
~N(419)	60.02	671.9	567
~N(420)	60.02	671.9	567
~N(421)	60.02	671.9	567
~N(422)	60.02	671.9	567
~N(423)	60.02	671.9	567
~N(424)	60.02	671.9	567
~N(425)	60.02	671.9	567
~N(426)	60.02	671.9	567
~N(427)	60.02	671.9	567
~N(428)	60.02	671.9	567
~N(429)	60.02	671.9	567
~N(430)	60.02	671.9	567
~N(431)	60.02	671.9	567
~N(432)	60.02	671.9	567
~N(433)	60.02	671.9	567
~N(434)	60.02	671.9	567
~N(435)	60.01	671.9	567
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~N(441)	60.01	671.9	567
~N(442)	60.01	671.9	567
~N(443)	60.01	671.9	567
~N(444)	60.01	671.9	567
~N(445)	60.01	671.9	567
~N(446)	60.01	671.9	567
~N(447)	60.01	671.9	567
~N(448)	60.01	671.9	567
~N(449)	60.01	671.9	567
~N(450)	60.01	671.9	567
~N(451)	60.01	671.9	567
~N(452)	60.01	671.9	567
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~N(454)	60.01	671.9	567
~N(455)	60.01	671.9	567
~N(456)	60.01	671.9	567
~N(457)	60.01	671.9	567
~N(458)	60.01	671.9	567
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~N(483)	60	671.9	567
~N(484)	60	671.9	567
~N(485)	60	671.9	567
~N(486)	60	671.9	567
~N(487)	60	671.9	567
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~N(491)	60	671.9	567
~N(492)	60	671.9	567
~N(493)	60	671.9	567
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~N(501)	60	671.9	567
~N(502)	60	671.9	567
~N(503)	33.61	425.6	381.8
~N(504)	32.83	424.5	383
~N(505)	32.55	424.3	383
~N(506)	32.41	424	383
~N(507)	32.4	424	383
~N(508)	32.31	423.8	383
~N(509)	32.34	423.8	383
~N(512)	37.65	397.4	344.3
~N(513)	25.4	392.1	367.3
~N(514)	28.68	392.1	359.7
~N(515)	28.68	392.1	359.7
~N(516)	26.26	392.1	365.3
~N(517)	25.4	392.1	367.3
~N(518)	22.07	392.1	375
~N(519)	22.07	392.1	375
~N(520)	22.07	392.1	375
~N(521)	22.07	392.1	375
~N(522)	22.07	392.1	375
~N(524)	35.33	392.1	344.3
~N(525)	25.31	392.1	367.5
~N(526)	28.64	392.1	359.8
~N(527)	28.64	392.1	359.8
~N(528)	25.35	392.1	367.4
~N(529)	25.35	392.1	367.4
~N(530)	22.07	392.1	375
~N(531)	22.07	392.1	375
~N(535)	37.65	397.4	344.3
~N(536)	35.33	392.1	344.3
~N(537)	20.34	392.1	379
~N(538)	35.8	423.8	375
~N(539)	20.34	392.1	379
~N(540)	20.34	392.1	379
~N(541)	17.97	392.1	384.5
~N(542)	18.89	392.1	387
~N(544)	17.75	392.1	385
~N(545)	18.01	392.1	384.4

~N(546)		17.1	392.1	366.5
~N(548)		22.71	397.5	379
~N(549)		35.28	397.5	349.9
~N(551)		20.88	393.5	379.2
~N(552)		33.54	393.5	349.9
~N(553)		33.24	392.8	349.9
~N(558)	Isolated	—	—	367.3
~N(559)		37.65	397.4	344.3
~N(560)	Isolated	—	—	367.4
~N(561)		25.35	392.1	367.4
~N(564)		15.81	392.1	389.5
~N(565)		1.963	392.1	421.5
~N(566)		824.5	2292	417.8
~N(569)		15.81	392.1	389.5
~N(570)		836.6	2292	389.5
~N(571)		835.6	2292	391.7
~N(572)		22.07	392.1	375
~N(573)		18.69	392.1	387
~N(574)		3.927	392.1	417
~N(575)		824.8	2292	417
~N(576)		837	2292	388.4
~N(577)		17.97	392.1	384.5
~N(578)		837.2	2292	388
~N(579)		838.8	2292	384.5
~N(580)		1007	2709	413.1
~N(581)		836.4	2292	389.6
~N(583)		1007	2709	413.3
~N(588)		1007	2709	413.3
~N(589)		1007	2709	413.3
~N(590)		35.04	423.4	376.3
~N(591)		35.03	423.4	376.3
~N(592)		38.74	422	366.4
~N(593)		38.65	421.9	366.5
~N(595)		34.92	423.1	376.3
~N(596)		39.07	422.8	366.4
~N(598)		34.92	423.1	376.3
~N(600)		1420	3630	377.5
~N(601)		20.77	392.1	378
~N(602)		20.77	392.1	378
~N(603)		833.7	2292	396
~N(605)		1421	3634	377.5
~N(606)		20.77	392.1	378
~N(607)		20.77	392.1	378
~N(610)		833.7	2292	396
~N(613)		1419	3629	377.5
~N(614)		1411	3615	383
~N(615)		1409	3608	380
~N(616)		1388	3599	420.2
~N(618)		34.67	423.7	377.5
~N(619)		38.74	422	366.4
~N(621)		36.82	423.7	372.5
~N(622)		36.54	423.1	372.5
~N(624)		37.49	423.3	370.5
~N(625)		36.63	423.3	372.5
~N(626)	Isolated	—	—	366.4
~N(627)		36.38	422.7	372.6
~N(631)		36.62	423.3	372.5
~N(635)		2024	5021	369.6
~N(636)		2020	5014	371.5
~N(638)		2024	5021	369.6
~N(639)		2023	5019	371.5
~N(640)		2021	5016	371.5
~N(642)		2021	5016	371.5
~N(643)		1995	4971	388.3
~N(644)		1985	4959	397.5
~N(645)		1984	4956	396.5
~N(646)		1984	4955	396.5
~N(647)		1955	4887	395
~N(648)		1913	4814	420.1
~N(649)		1953	4872	385
~N(650)		1922	4798	382.4
~N(651)		1543	3921	382.4
~N(652)		836.2	2295	393
~N(654)		1901	4789	423.2
~N(655)		1515	3805	423.2
~N(656)		836.3	2295	393
~N(659)		1926	4811	385.6
~N(660)		1550	3940	385.6
~N(661)		836.2	2295	393
~N(664)		1886	4697	413
~N(665)		1479	3803	413
~N(666)		836.3	2295	393
~N(667)		2016	5011	378.4
~N(668)		2014	5011	382.9
~N(670)		2014	5011	383.6
~N(671)		2012	5011	386.4
~N(672)		20.34	392.1	379
~N(673)		16.89	392.1	387
~N(674)		16.89	392.1	387
~N(675)		1418	3630	383
~N(676)	Isolated	—	—	379
~N(677)		1413	3619	383
~N(678)		2019	5009	370.8
~N(680)		1479	3802	412.9
~N(682)		936.8	2531	397
~N(683)		936.5	2531	397
~N(684)		1505	3863	413
~N(686)		949.5	2577	413
~N(687)		949.4	2577	413
~N(688)		1543	3920	382.4
~N(690)		972.7	2600	382.9
~N(691)		971.7	2600	384.9
~N(692)		1550	3939	385.6
~N(694)		942.8	2536	387.5
~N(695)		942.7	2536	387.5
~N(696)		1365	3539	414.5
~N(697)		1187	3129	414.5
~N(698)		1187	3128	414.5
~N(700)		835.9	2315	414.5
~N(701)		1394	3575	381.4
~N(702)		1218	3167	381.4
~N(703)		1218	3166	381.4
~N(705)		848.7	2312	381.4
~N(706)		848.7	2312	381.4
~N(707)		835.9	2315	414.5
~N(708)		1373	3559	414.9
~N(709)		1195	3147	414.9
~N(710)		1194	3144	414.9
~N(712)		834.1	2312	414.9
~N(713)		834.1	2312	414.9
~N(714)		1392	3576	387
~N(715)		1216	3167	387
~N(716)		1215	3166	387
~N(718)		847.7	2315	387
~N(719)		847.7	2315	387
~N(720)		19.61	392.1	380.7
~N(721)		19.61	392.1	380.7
~N(722)		19.61	392.1	380.7
~N(724)		19.61	392.1	380.7
~N(725)		19.61	392.1	380.7
~N(726)		20.77	392.1	378
~N(727)		20.77	392.1	378
~N(728)		20.77	392.1	378
~N(730)		841.5	2292	378
~N(731)		841.5	2292	378
~N(732)		20.73	392.1	378.1
~N(733)		20.73	392.1	378.1
~N(734)		20.73	392.1	378.1
~N(735)		20.73	392.1	378.1
~N(737)		20.73	392.1	378.1
~N(738)		19.44	392.1	381.1
~N(739)		19.44	392.1	381.1
~N(740)		19.44	392.1	381.1
~N(742)		849.1	2292	381.1
~N(743)		849.1	2292	381.1

Tank List	Surface Pressure	Level	Status	Flow	Pressure	Grade	Elev
Accumulator Tank A	1000	0		0	1000	2798	428.7
Accumulator Tank B	1000	0		0	1000	2798	428.8
Accumulator Tank C	1000	0		0	1000	2798	428.8
Accumulator Tank D	1000	0		0	1000	2798	428.5
Cont. Recirc. Sump A	17.3	18.1		8171	21.86	384.3	368.2
Cont. Recirc. Sump B	17.3	18.1		8530	21.86	384.3	368.2
Refueling Water Storage Tank	14.7	32.3		13146	29.66	427.3	394

Demand List	Demand Type	Flow	Pressure	Status	Grade	Elev
~N(536)	Flow in	0	152.4		673.5	356.9
~N(537)	Flow in	0	150.2		674.5	349.9
~N(599)	Flow out	30	1429		3641	362.6
~N(604)	Flow out	30	1438		3634	366.6
~N(623)	Flow in	0	37.49		423.3	370.5
~N(633)	Flow in	130	36.63		423.3	372.5
~N(634)	Flow out	65	2026		5023	368.6
~N(637)	Flow out	65	2027		5025	368.6
~N(641)	Flow out	0	2016		5015	367.9
~N(669)	Flow out	0	2016		5011	378.4
~N(679)	Flow out	60	2019		5009	370.8
A1(001)	Spray	3.883	55		659.7	573.4
A1(002)	Spray	3.561	55		658.6	576.3
A1(003)	Spray	3.731	55		659.1	573.9
A1(004)	Spray	3.731	55		659.1	573.9
A1(005)	Spray	3.558	55		658.6	576.3
A1(006)	Spray	3.881	55		659.7	573.4
A1(007)	Spray	3.88	55		658.7	573.4
A1(008)	Spray	3.558	55		658.6	576.3
A1(009)	Spray	3.728	55		659.1	573.9
A1([illegible])	Spray	3.729	55		659.1	573.9

A1(011)	Spray	3.557	55	669.6	576.3
A1(012)	Spray	3.859	55	668.7	575.4
A1(013)	Spray	3.858	55	668.7	575.4
A1(014)	Spray	3.556	55	669.6	576.3
A1(015)	Spray	3.726	55	669.1	575.8
A1(016)	Spray	3.726	55	669.1	575.8
A1(017)	Spray	3.555	55	669.6	576.3
A1(018)	Spray	3.857	55	668.7	575.4
A1(019)	Spray	3.856	55	668.7	575.4
A1(020)	Spray	3.554	55	669.6	576.3
A1(021)	Spray	3.724	55	669.1	575.8
A1(022)	Spray	3.724	55	669.1	575.8
A1(023)	Spray	3.553	55	669.6	576.3
A1(024)	Spray	3.855	55	668.7	575.4
A1(025)	Spray	3.854	55	668.7	575.4
A1(026)	Spray	3.552	55	669.6	576.3
A1(027)	Spray	3.723	55	669.1	575.8
A1(028)	Spray	3.723	55	669.1	575.8
A1(029)	Spray	3.551	55	669.6	576.3
A1(030)	Spray	3.853	55	668.7	575.4
A1(031)	Spray	3.853	55	668.7	575.4
A1(032)	Spray	3.551	55	669.6	576.3
A1(033)	Spray	3.721	55	669.1	575.8
A1(034)	Spray	3.721	55	669.1	575.8
A1(035)	Spray	3.55	55	669.6	576.3
A1(036)	Spray	3.852	55	668.7	575.4
A1(037)	Spray	3.851	55	668.7	575.4
A1(038)	Spray	3.549	55	669.6	576.3
A1(039)	Spray	3.72	55	669.1	575.8
A1(040)	Spray	3.72	55	669.1	575.8
A1(041)	Spray	3.549	55	669.6	576.3
A1(042)	Spray	3.851	55	668.7	575.4
A1(043)	Spray	3.85	55	668.7	575.4
A1(044)	Spray	3.548	55	669.6	576.3
A1(045)	Spray	3.718	55	669.1	575.8
A1(046)	Spray	3.718	55	669.1	575.8
A1(047)	Spray	3.547	55	669.6	576.3
A1(048)	Spray	3.85	55	668.7	575.4
A1(049)	Spray	3.849	55	668.7	575.4
A1(050)	Spray	3.547	55	669.6	576.3
A1(051)	Spray	3.717	55	669.1	575.8
A1(052)	Spray	3.717	55	669.1	575.8
A1(053)	Spray	3.546	55	669.6	576.3
A1(054)	Spray	3.849	55	668.7	575.4
A1(055)	Spray	3.848	55	668.7	575.4
A1(056)	Spray	3.546	55	669.6	576.3
A1(057)	Spray	3.717	55	669.1	575.8
A1(058)	Spray	3.717	55	669.1	575.8
A1(059)	Spray	3.545	55	669.6	576.3
A1(060)	Spray	3.848	55	668.7	575.4
A1(061)	Spray	3.848	55	668.7	575.4
A1(062)	Spray	3.545	55	669.6	576.3
A1(063)	Spray	3.716	55	669.1	575.8
A1(064)	Spray	3.716	55	669.1	575.8
A1(065)	Spray	3.544	55	669.6	576.3
A1(066)	Spray	3.847	55	668.7	575.4
A1(067)	Spray	3.847	55	668.7	575.4
A1(068)	Spray	3.544	55	669.6	576.3
A1(069)	Spray	3.715	55	669.1	575.8
A1(070)	Spray	3.715	55	669.1	575.8
A1(071)	Spray	3.544	55	669.6	576.3
A1(072)	Spray	3.847	55	668.7	575.4
A1(073)	Spray	3.846	55	668.7	575.4
A1(074)	Spray	3.544	55	669.6	576.3
A1(075)	Spray	3.715	55	669.1	575.8
A1(076)	Spray	3.715	55	669.1	575.8
A1(077)	Spray	3.543	55	669.6	576.3
A1(078)	Spray	3.846	55	668.7	575.4
A1(079)	Spray	3.846	55	668.7	575.4
A1(080)	Spray	3.543	55	669.6	576.3
A1(081)	Spray	3.714	55	669.1	575.8
A1(082)	Spray	3.714	55	669.1	575.8
A1(083)	Spray	3.543	55	669.6	576.3
A1(084)	Spray	3.846	55	668.7	575.4
A1(085)	Spray	3.846	55	668.7	575.4
A1(086)	Spray	3.543	55	669.6	576.3
A1(087)	Spray	3.714	55	669.1	575.8
A1(088)	Spray	3.714	55	669.1	575.8
A1(089)	Spray	3.543	55	669.6	576.3
A1(090)	Spray	[illegible]	55	668.7	575.4
A1(091)	Spray	[illegible]	55	668.7	575.4
A1(092)	Spray	[illegible]	55	669.6	576.3
A1(093)	Spray	[illegible]	55	669.1	575.8
A1(094)	Spray	[illegible]	55	669.1	575.8
A1(095)	Spray	[illegible]	55	669.6	576.3
A1(096)	Spray	[illegible]	55	668.7	575.4
A1(097)	Spray	[illegible]	55	668.7	575.4
A1(098)	Spray	[illegible]	55	669.6	576.3
A1(099)	Spray	[illegible]	55	669.1	575.8
A1(100)	Spray	[illegible]	55	669.1	575.8
A1(101)	Spray	[illegible]	55	669.6	576.3
A1(102)	Spray	[illegible]	55	668.7	575.4
A1(103)	Spray	[illegible]	55	668.7	575.4
A1(104)	Spray	[illegible]	55	669.6	576.3
A1(105)	Spray	[illegible]	55	669.1	575.8
A1(106)	Spray	[illegible]	55	669.1	575.8
A1(107)	Spray	[illegible]	55	669.6	576.3
A1(108)	Spray	[illegible]	55	668.7	575.4
A1(109)	Spray	[illegible]	55	668.7	575.4
A1(110)	Spray	[illegible]	55	669.6	576.3
A1(111)	Spray	[illegible]	55	669.1	575.8
A1(112)	Spray	[illegible]	55	669.1	575.8
A1(113)	Spray	[illegible]	55	669.6	576.3
A1(114)	Spray	[illegible]	55	668.7	575.4
A1(115)	Spray	3.845	55	668.7	575.4
A1(116)	Spray	3.542	55	669.6	576.3
A1(117)	Spray	3.714	55	669.1	575.8
A1(118)	Spray	3.714	55	669.1	575.8
A1(119)	Spray	3.542	55	669.6	576.3
A1(120)	Spray	3.845	55	668.7	575.4
A2(001)	Spray	4.19	55	682.8	589.5
A2(002)	Spray	3.922	55	682	588.7
A2(003)	Spray	4.015	55	682.3	589
A2(004)	Spray	4.015	55	682.3	589
A2(005)	Spray	3.92	55	682	588.7
A2(006)	Spray	4.166	55	682.8	589.5
A2(007)	Spray	4.165	55	682.8	589.5
A2(008)	Spray	3.919	55	682	588.7
A2(009)	Spray	4.012	55	682.3	589
A2(010)	Spray	4.012	55	682.3	589
A2(011)	Spray	3.917	55	682	588.7
A2(012)	Spray	4.163	55	682.8	589.5
A2(013)	Spray	4.162	55	682.8	589.5
A2(014)	Spray	3.916	55	682	588.7
A2(015)	Spray	4.01	55	682.3	589
A2(016)	Spray	4.01	55	682.3	589
A2(017)	Spray	3.915	55	682	588.7
A2(018)	Spray	4.161	55	682.8	589.5
A2(019)	Spray	4.161	55	682.8	589.5
A2(020)	Spray	3.914	55	682	588.7
A2(021)	Spray	4.008	55	682.3	589
A2(022)	Spray	4.008	55	682.3	589
A2(023)	Spray	3.913	55	682	588.7
A2(024)	Spray	4.159	55	682.8	589.5
A2(025)	Spray	4.159	55	682.8	589.5
A2(026)	Spray	3.912	55	682	588.7
A2(027)	Spray	4.006	55	682.3	589
A2(028)	Spray	4.006	55	682.3	589
A2(029)	Spray	3.912	55	682	588.7
A2(030)	Spray	4.158	55	682.8	589.5
A2(031)	Spray	4.158	55	682.8	589.5
A2(032)	Spray	3.911	55	682	588.7
A2(033)	Spray	4.005	55	682.3	589
A2(034)	Spray	4.005	55	682.3	589
A2(035)	Spray	3.911	55	682	588.7
A2(036)	Spray	4.157	55	682.8	589.5
A2(037)	Spray	4.157	55	682.8	589.5
A2(038)	Spray	3.91	55	682	588.7
A2(039)	Spray	4.005	55	682.3	589
A2(040)	Spray	4.004	55	682.3	589
A2(041)	Spray	3.91	55	682	588.7
A2(042)	Spray	4.157	55	682.8	589.5
A2(043)	Spray	4.156	55	682.8	589.5
A2(044)	Spray	3.91	55	682	588.7
A2(045)	Spray	4.004	55	682.3	589
A2(046)	Spray	4.004	55	682.3	589
A2(047)	Spray	3.91	55	682	588.7
A2(048)	Spray	4.156	55	682.8	589.5
A2(049)	Spray	4.156	55	682.8	589.5
A2(050)	Spray	3.91	55	682	588.7
A2(051)	Spray	4.004	55	682.3	589
A2(052)	Spray	4.004	55	682.3	589
A2(053)	Spray	3.909	55	682	588.7
A2(054)	Spray	4.156	55	682.8	589.5
A2(055)	Spray	4.156	55	682.8	589.5
A2(056)	Spray	3.909	55	682	588.7
A2(057)	Spray	4.004	55	682.3	589
A2(058)	Spray	4.004	55	682.3	589
A2(059)	Spray	3.909	55	682	588.7
A2(060)	Spray	4.179	55	682.8	589.5
A3(001)	Spray	5.211	55	686.6	593.3
A3(002)	Spray	5.258	55	686.8	593.5
A3(003)	Spray	5.207	55	686.6	593.3
A3(004)	Spray	5.207	55	686.6	593.3
A3(005)	Spray	5.25	55	686.8	593.5
A3(006)	Spray	5.203	55	686.6	593.3
A3(007)	Spray	5.199	55	686.6	593.3
A3(008)	Spray	5.247	55	686.8	593.5
A3(009)	Spray	5.196	55	686.6	593.3
A3(010)	Spray	5.195	55	686.6	593.3
A3(011)	Spray	5.241	55	686.8	593.5

A3(012)	Spray	5.193	55	686.6	593.3
A3(013)	Spray	5.191	55	686.6	593.3
A3(014)	Spray	5.236	55	686.8	593.5
A3(015)	Spray	5.188	55	686.6	593.3
A3(016)	Spray	5.188	55	686.6	593.3
A3(017)	Spray	5.234	55	686.8	593.5
A3(018)	Spray	5.187	55	686.6	593.3
A3(019)	Spray	5.185	55	686.6	593.3
A3(020)	Spray	5.233	55	686.8	593.5
A3(021)	Spray	5.184	55	686.6	593.3
A3(022)	Spray	5.184	55	686.6	593.3
A3(023)	Spray	5.231	55	686.8	593.5
A3(024)	Spray	5.183	55	686.6	593.3
A3(025)	Spray	5.182	55	686.6	593.3
A3(026)	Spray	5.23	55	686.8	593.5
A3(027)	Spray	5.181	55	686.6	593.3
A3(028)	Spray	5.181	55	686.6	593.3
A3(029)	Spray	5.229	55	686.8	593.5
A3(030)	Spray	5.181	55	686.6	593.3
A3(031)	Spray	5.181	55	686.6	593.3
A3(032)	Spray	5.228	55	686.8	593.5
A3(033)	Spray	5.18	55	686.6	593.3
A3(034)	Spray	5.18	55	686.6	593.3
A3(035)	Spray	5.228	55	686.8	593.5
A3(036)	Spray	5.18	55	686.6	593.3
A3(037)	Spray	5.18	55	686.6	593.3
A3(038)	Spray	5.226	55	686.8	593.5
A3(039)	Spray	5.18	55	686.6	593.3
B1(001)	Spray	5.39	55	660.3	567
B1(002)	Spray	5.39	55	660.3	567
B1(003)	Spray	5.389	55	660.3	567
B1(004)	Spray	5.389	55	660.3	567
B1(005)	Spray	5.388	55	660.3	567
B1(006)	Spray	5.388	55	660.3	567
B1(007)	Spray	5.387	55	660.3	567
B1(008)	Spray	5.387	55	660.3	567
B1(009)	Spray	5.385	55	660.3	567
B1(010)	Spray	5.386	55	660.3	567
B1(011)	Spray	5.384	55	660.3	567
B1(012)	Spray	5.384	55	660.3	567
B1(013)	Spray	5.383	55	660.3	567
B1(014)	Spray	5.383	55	660.3	567
B1(015)	Spray	5.382	55	660.3	567
B1(016)	Spray	5.382	55	660.3	567
B1(017)	Spray	5.381	55	660.3	567
B1(018)	Spray	5.381	55	660.3	567
B1(019)	Spray	5.381	55	660.3	567
B1(020)	Spray	5.381	55	660.3	567
B1(021)	Spray	5.38	55	660.3	567
B1(022)	Spray	5.38	55	660.3	567
B1(023)	Spray	5.379	55	660.3	567
B1(024)	Spray	5.379	55	660.3	567
B1(025)	Spray	5.378	55	660.3	567
B1(026)	Spray	5.378	55	660.3	567
B1(027)	Spray	5.377	55	660.3	567
B1(028)	Spray	5.377	55	660.3	567
B1(029)	Spray	5.376	55	660.3	567
B1(030)	Spray	5.376	55	660.3	567
B1(031)	Spray	5.376	55	660.3	567
B1(032)	Spray	5.376	55	660.3	567
B1(033)	Spray	5.375	55	660.3	567
B1(034)	Spray	5.375	55	660.3	567
B1(035)	Spray	5.374	55	660.3	567
B1(036)	Spray	5.374	55	660.3	567
B1(037)	Spray	5.374	55	660.3	567
B1(038)	Spray	5.374	55	660.3	567
B1(039)	Spray	5.373	55	660.3	567
B1(040)	Spray	5.373	55	660.3	567
B1(041)	Spray	5.373	55	660.3	567
B1(042)	Spray	5.373	55	660.3	567
B1(043)	Spray	5.372	55	660.3	567
B1(044)	Spray	5.372	55	660.3	567
B1(045)	Spray	5.372	55	660.3	567
B1(046)	Spray	5.372	55	660.3	567
B1(047)	Spray	5.371	55	660.3	567
B1(048)	Spray	5.371	55	660.3	567
B1(049)	Spray	5.371	55	660.3	567
B1(050)	Spray	5.371	55	660.3	567
B1(051)	Spray	5.37	55	660.3	567
B1(052)	Spray	5.37	55	660.3	567
B1(053)	Spray	5.37	55	660.3	567
B1(054)	Spray	5.37	55	660.3	567
B1(055)	Spray	5.369	55	660.3	567
B1(056)	Spray	5.369	55	660.3	567
B1(057)	Spray	5.369	55	660.3	567
B1(058)	Spray	5.369	55	660.3	567
B1(059)	Spray	5.369	55	660.3	567
B1(060)	Spray	5.369	55	660.3	567
B1(061)	Spray	5.368	55	660.3	567
B1(062)	Spray	5.368	55	660.3	567
B1(063)	Spray	5.368	55	660.3	567
B1(064)	Spray	5.368	55	660.3	567
B1(065)	Spray	5.368	55	660.3	567
B1(066)	Spray	5.368	55	660.3	567
B1(067)	Spray	5.368	55	660.3	567
B1(068)	Spray	5.368	55	660.3	567
B1(069)	Spray	5.367	55	660.3	567
B1(070)	Spray	5.367	55	660.3	567
B1(071)	Spray	5.367	55	660.3	567
B1(072)	Spray	5.367	55	660.3	567
B1(073)	Spray	5.367	55	660.3	567
B1(074)	Spray	5.367	55	660.3	567
B1(075)	Spray	5.367	55	660.3	567
B1(076)	Spray	5.367	55	660.3	567
B1(077)	Spray	5.367	55	660.3	567
B1(078)	Spray	5.367	55	660.3	567
B1(079)	Spray	5.367	55	660.3	567
B1(080)	Spray	5.367	55	660.3	567
B1(081)	Spray	5.366	55	660.3	567
B1(082)	Spray	5.366	55	660.3	567
B1(083)	Spray	5.366	55	660.3	567
B1(084)	Spray	5.366	55	660.3	567
B1(085)	Spray	5.366	55	660.3	567
B1(086)	Spray	5.366	55	660.3	567
B1(087)	Spray	5.366	55	660.3	567
B1(088)	Spray	5.366	55	660.3	567
B1(089)	Spray	5.366	55	660.3	567
B1(090)	Spray	5.366	55	660.3	567
B1(091)	Spray	5.366	55	660.3	567
B1(092)	Spray	5.366	55	660.3	567
B1(093)	Spray	5.366	55	660.3	567
B1(094)	Spray	5.366	55	660.3	567
B1(095)	Spray	5.366	55	660.3	567
B1(096)	Spray	5.366	55	660.3	567
B1(097)	Spray	5.366	55	660.3	567
B1(098)	Spray	5.366	55	660.3	567
B1(099)	Spray	5.366	55	660.3	567
B1(100)	Spray	5.366	55	660.3	567
B1(101)	Spray	5.366	55	660.3	567
B1(102)	Spray	5.366	55	660.3	567
B1(103)	Spray	5.366	55	660.3	567
B1(104)	Spray	5.366	55	660.3	567
B1(105)	Spray	5.366	55	660.3	567
B1(106)	Spray	5.366	55	660.3	567
B1(107)	Spray	5.366	55	660.3	567
B1(108)	Spray	5.366	55	660.3	567
B1(109)	Spray	5.366	55	660.3	567
B1(110)	Spray	5.366	55	660.3	567
B1(111)	Spray	5.366	55	660.3	567
B1(112)	Spray	5.366	55	660.3	567
B2(001)	Spray	4.262	55	682.3	589
B2(002)	Spray	4.262	55	682.3	589
B2(003)	Spray	4.259	55	682.3	589
B2(004)	Spray	4.259	55	682.3	589
B2(005)	Spray	4.257	55	682.3	589
B2(006)	Spray	4.257	55	682.3	589
B2(007)	Spray	4.255	55	682.3	589
B2(008)	Spray	4.255	55	682.3	589
B2(009)	Spray	4.253	55	682.3	589
B2(010)	Spray	4.253	55	682.3	589
B2(011)	Spray	4.251	55	682.3	589
B2(012)	Spray	4.251	55	682.3	589
B2(013)	Spray	4.249	55	682.3	589
B2(014)	Spray	4.249	55	682.3	589
B2(015)	Spray	4.248	55	682.3	589
B2(016)	Spray	4.248	55	682.3	589
B2(017)	Spray	4.248	55	682.3	589
B2(018)	Spray	4.248	55	682.3	589
B2(019)	Spray	4.244	55	682.3	589
B2(020)	Spray	4.244	55	682.3	589
B2(021)	Spray	4.243	55	682.3	589
B2(022)	Spray	4.243	55	682.3	589
B2(023)	Spray	4.241	55	682.3	589
B2(024)	Spray	4.241	55	682.3	589
B2(025)	Spray	4.24	55	682.3	589
B2(026)	Spray	4.24	55	682.3	589
B2(027)	Spray	4.239	55	682.3	589
B2(028)	Spray	4.239	55	682.3	589
B2(029)	Spray	4.238	55	682.3	589
B2(030)	Spray	4.238	55	682.3	589
B2(031)	Spray	4.237	55	682.3	589
B2(032)	Spray	4.237	55	682.3	589
B2(033)	Spray	4.235	55	682.3	589
B2(034)	Spray	4.235	55	682.3	589
B2(035)	Spray	4.234	55	682.3	589
B2(036)	Spray	4.234	55	682.3	589
B2(037)	Spray	4.234	55	682.3	589
B2(038)	Spray	4.234	55	682.3	589
B2(039)	Spray	4.233	55	682.3	589
B2(040)	Spray	4.233	55	682.3	589
B2(041)	Spray	4.232	55	682.3	589

B2(042)	Spray	4.232	55		682.3	589
B2(043)	Spray	4.231	55		682.3	589
B2(044)	Spray	4.231	55		682.3	589
B2(045)	Spray	4.23	55		682.3	589
B2(046)	Spray	4.23	55		682.3	589
B2(047)	Spray	4.23	55		682.3	589
B2(048)	Spray	4.23	55		682.3	589
B2(049)	Spray	4.229	55		682.3	589
B2(050)	Spray	4.229	55		682.3	589
B2(051)	Spray	4.229	55		682.3	589
B2(052)	Spray	4.229	55		682.3	589
B2(053)	Spray	4.228	55		682.3	589
B2(054)	Spray	4.228	55		682.3	589
B2(055)	Spray	4.228	55		682.3	589
B2(056)	Spray	4.228	55		682.3	589
B2(057)	Spray	4.227	55		682.3	589
B2(058)	Spray	4.227	55		682.3	589
B2(059)	Spray	4.227	55		682.3	589
B2(060)	Spray	4.227	55		682.3	589
B2(061)	Spray	4.227	55		682.3	589
B2(062)	Spray	4.227	55		682.3	589
B2(063)	Spray	4.226	55		682.3	589
B2(064)	Spray	4.226	55		682.3	589
B2(065)	Spray	4.226	55		682.3	589
B2(066)	Spray	4.226	55		682.3	589
B2(067)	Spray	4.226	55		682.3	589
B2(068)	Spray	4.226	55		682.3	589
B2(069)	Spray	4.226	55		682.3	589
B2(070)	Spray	4.226	55		682.3	589
B2(071)	Spray	4.226	55		682.3	589
B2(072)	Spray	4.226	55		682.3	589
B2(073)	Spray	4.226	55		682.3	589
B2(074)	Spray	4.226	55		682.3	589
B2(075)	Spray	4.225	55		682.3	589
B2(076)	Spray	4.225	55		682.3	589
B2(077)	Spray	4.225	55		682.3	589
B2(078)	Spray	4.225	55		682.3	589
B2(079)	Spray	4.225	55		682.3	589
B2(080)	Spray	4.225	55		682.3	589
B2(081)	Spray	4.225	55		682.3	589
B2(082)	Spray	4.225	55		682.3	589
B2(083)	Spray	4.225	55		682.3	589
B2(084)	Spray	4.225	55		682.3	589
B2(085)	Spray	4.225	55		682.3	589
B2(086)	Spray	4.225	55		682.3	589
B2(087)	Spray	4.225	55		682.3	589
B2(088)	Spray	4.225	55		682.3	589
B2(089)	Spray	4.225	55		682.3	589
B2(090)	Spray	4.225	55		682.3	589
B3(001)	Spray	4.325	55		682.3	589
B3(002)	Spray	4.325	55		682.3	589
B3(003)	Spray	4.323	55		682.3	589
B3(004)	Spray	4.324	55		682.3	589
B3(005)	Spray	4.324	55		682.3	589
B3(006)	Spray	4.324	55		682.3	589
B3(007)	Spray	4.323	55		682.3	589
B3(008)	Spray	4.323	55		682.3	589
B3(009)	Spray	4.323	55		682.3	589
B3(010)	Spray	4.323	55		682.3	589
B3(011)	Spray	4.322	55		682.3	589
B3(012)	Spray	4.322	55		682.3	589
B3(013)	Spray	4.322	55		682.3	589
B3(014)	Spray	4.322	55		682.3	589
B3(015)	Spray	4.321	55		682.3	589
B3(016)	Spray	4.321	55		682.3	589
B3(017)	Spray	4.321	55		682.3	589
B3(018)	Spray	4.321	55		682.3	589
B3(019)	Spray	4.321	55		682.3	589
B3(020)	Spray	4.321	55		682.3	589
B3(021)	Spray	4.32	55		682.3	589
B3(022)	Spray	4.32	55		682.3	589
B3(023)	Spray	4.32	55		682.3	589
B3(024)	Spray	4.32	55		682.3	589
B3(025)	Spray	4.32	55		682.3	589
B3(026)	Spray	4.32	55		682.3	589
B3(027)	Spray	4.319	55		682.3	589
B3(028)	Spray	4.319	55		682.3	589
B3(029)	Spray	4.319	55		682.3	589
B3(030)	Spray	4.319	55		682.3	589
B3(031)	Spray	4.319	55		682.3	589
B3(032)	Spray	4.319	55		682.3	589
B3(033)	Spray	4.319	55		682.3	589
B3(034)	Spray	4.319	55		682.3	589
B3(035)	Spray	4.319	55		682.3	589
B3(036)	Spray	4.319	55		682.3	589
B3(037)	Spray	4.319	55		682.3	589
B3(038)	Spray	4.319	55		682.3	589
B3(039)	Spray	4.319	55		682.3	589
B3(040)	Spray	4.319	55		682.3	589
B3(041)	Spray	4.319	55		682.3	589
B3(042)	Spray	4.319	55		682.3	589
B3(043)	Spray	4.319	55		682.3	589
B3(044)	Spray	4.319	55		682.3	589
B3(045)	Spray	4.319	55		682.3	589
B3(046)	Spray	4.319	55		682.3	589
B3(047)	Spray	4.319	55		682.3	589
B3(048)	Spray	4.319	55		682.3	589
B3(049)	Spray	4.319	55		682.3	589
B3(050)	Spray	4.319	55		682.3	589
B3(051)	Spray	4.319	55		682.3	589
Cold Leg A(001)	Boundary pressure	117.8	835		2292	393
Cold Leg A(002)	Boundary pressure	108.2	835		2292	393
Cold Leg B(001)	Boundary pressure	117.4	835		2292	393
Cold Leg B(002)	Boundary pressure	108	835		2292	393
Cold Leg C(001)	Boundary pressure	116.5	835		2292	393
Cold Leg C(002)	Boundary pressure	107.6	835		2292	393
Cold Leg D(001)	Boundary pressure	116.4	835		2292	393
Cold Leg D(002)	Boundary pressure	107.8	835		2292	393
Hot Leg A(001)	Boundary pressure	—	835	Isolated	—	382.7
Hot Leg A(002)	Boundary pressure	—	835	Isolated	—	393
Hot Leg B(001)	Boundary pressure	—	835	Isolated	—	382.7
Hot Leg B(002)	Boundary pressure	0	835		2292	393
Hot Leg C(001)	Boundary pressure	—	835	Isolated	—	382.7
Hot Leg C(002)	Boundary pressure	—	835	Isolated	—	393
Hot Leg D(001)	Boundary pressure	—	835	Isolated	—	382.7
Hot Leg D(002)	Boundary pressure	0	835		2292	393

Pump List	Operation	Flow	Status	TDH	dP	NPSHa	Suction Pressure	Discharge Pressure	Suction Elev	Discharge Elev
Centrifugal Charging Pump A	Curve	347.4		-4605	-1989	85.08	37.7	2027	368.6	368.7
Centrifugal Charging Pump B	Curve	330.8		-4604	-1989	84.86	37.52	2027	368.6	368.7
Containment Spray Pump A	Curve	—	Off	—	—	—	—	—	346.3	347.3
Containment Spray Pump B	Curve	—	Off	—	—	—	—	—	346.3	347.3
Positive Dis. Charging Pump	Fixed Flow	1.00E-05	Off	—	—	—	—	—	366.7	367.9
Residual Heat Removal Pump A	Curve	—	Off	—	—	—	—	—	346	347.1
Residual Heat Removal Pump B	Curve	—	Off	—	—	—	—	—	346	347.1
Safety Injection Pump A	Curve	279.2		-3219	-1391	87.22	38.63	1429	366.5	366.6
Safety Injection Pump B	Curve	212.4		-3215	-1389	88.11	39.01	1428	366.5	366.6

Component List	Flow	Status	HL	dP	Inlet Pressure	Outlet Pressure	Inlet Elev	Outlet Elev
Residual HX A	—	Off	—	—	—	—	359.7	359.7
Residual HX B	—	Off	—	—	—	—	359.8	359.8

Control List	Type	Set Value	Status	Flow	dP	HL	Inlet Pressure	Outlet Pressure	Elev	Cv	Fp	QMax
~N(562)	FCV	0		0	—	—	156.3	156.3	346.8	—	—	—
~N(563)	FCV	0		0	—	—	151	151	360	—	—	—
~N(681)	FCV	Fully open		117.4	0	0	1005	1005	412.9	—	—	—
~N(685)	FCV	Fully open		117.8	0	0	952.7	952.7	413	—	—	—
~N(689)	FCV	Fully open		116.5	0	0	987.9	987.9	382.4	—	—	—
~N(693)	FCV	Fully open		116.4	0	0	950.2	950.2	385.8	—	—	—
~N(699)	FCV	Fully open		108	0	0	836	836	414.5	—	—	—
~N(704)	FCV	Fully open		107.6	0	0	848.8	848.8	381.4	—	—	—
~N(711)	FCV	Fully open		108.2	0	0	834.2	834.2	414.9	—	—	—
~N(717)	FCV	Fully open		107.8	0	0	847.8	847.8	387	—	—	—
~N(723)	FCV	Fully open		0	—	—	19.61	19.61	380.7	—	—	—
~N(729)	FCV	Fully open	Closed	—	—	—	—	—	378	—	—	—
~N(735)	FCV	Fully open		0	—	—	20.73	20.73	378.1	—	—	—
~N(741)	FCV	Fully open	Closed	—	—	—	—	—	381.1	—	—	—
CS007A-1	FCV	Fully open		0	—	—	130.7	130.7	407	—	—	—
CS007B-2	FCV	Fully open		0	—	—	133.7	133.7	399	—	—	—

Pipe Specification	Material	Schedule	Roughness	Sizing	Vel Limits	Press Limits	Valve Table
Steel Sch.40 (clean)	Steel	40	0.0018	not specified	—	—	standard
Steel Sch.80 (clean)	Steel	80	0.0018	not specified	—	—	standard
Steel Sch.140 (clean)	Steel	140	0.0018	not specified	—	—	standard
Steel Sch.40S (clean)	Stainless Pipe IPS	40S	0.0018	not specified	—	—	standard
Steel Sch.160 (clean)	Steel	160	0.0018	not specified	—	—	standard
Steel Sch.30 (clean)	Steel	30	0.0018	not specified	—	—	standard
Steel Sch.20 (clean)	Steel	20	0.0018	not specified	—	—	standard

Fluid Zone	Fluid	Temperature	Pressure	Density	Viscosity	k	Pv	Pc
Containment Sump Water	Water	100	14.7	62.24	0.6812	—	0.9498	3198
Water After RHR HX	Water	100	14.7	62.24	0.6812	—	0.9498	3198

PIPE-FLO ver 8.0 12/2/2009 8:51
System: 0.86 LOCA A1R13 After 6
Lineup: Cold Leg Injection from Sump

Company: Exelon
Project: 11329-147 Rev. 0
by: Sargent & Lundy L.L.C.
Footer:

UNITS
Flow Rate: US gpm
Pressure: psi a — Atm. 14.7 psi a
Temperature: °F
Viscosity: cP
Density: lb/ft³
Grade: ft
Length: ft
Size: in

CALCULATION
Iteration: 15
Deviation percent: 0.007098

Pipe List	Specification	Fluid Zone	Size	Length	K	Status	Flow	Velocity	dP	HL	Tagged	From	To	Inside Dia	Pipe HL	Minor HL	Re	f/p	Valves/Fittings					
CS01AA(001)	Steel Sch.30 (clean)	Containment Sump Water	16	12.3	0.445	XXX	—	—	—	—	N	~N(003)	~N(005)	15.25	—	—	—	—	2 x Pipe Bend - r/d 1.5 (90°)	0.173	1 x CS009A-1 (Gate Valve)	0.09888	1 x Converging Tee (Through)	1.00E-05
CS01AA(002)	Steel Sch.30 (clean)	Containment Sump Water	16	10.6	0.2964		0	0	0	0	N	~N(005)	~N(006)	15.25	0	0	0	0	1 x Reducer - Contraction (16 x 14 - 14)	0.02451	1 x Pipe Bend - r/d 1.5 (90°)	0.173	1 x CS002A	0.09888
CS01AA(003)	Steel Sch.30 (clean)	Containment Sump Water	14	2	0		0	0	0.864	0	N	~N(006)	Containment Spray Pump A	13.25	0	0	0	0						
CS01AB(001)	Steel Sch.30 (clean)	Containment Sump Water	16	4.3	0.1978	XXX	—	—	—	—	N	~N(236)	~N(237)	15.25	—	—	—	—	1 x Gate - Double Disc	0.09888	1 x CS009B-2 (Gate Valve)	0.09888	1 x Converging Tee (Through)	1.00E-05
CS01AB(002)	Steel Sch.30 (clean)	Containment Sump Water	16	19.3	1.236		0	0	0	0	N	~N(237)	~N(238)	15.25	0	0	0	0	3 x Elbow - Standard 90°	0.3708	1 x Reducer - Contraction (16 x 14 - 14)	0.02451	1 x CS002B(Gate Valve)	0.09888
CS01AB(003)	Steel Sch.30 (clean)	Containment Sump Water	14	2	0		0	0	0.821	0	N	~N(238)	Containment Spray Pump B	13.25	0	0	0	0						
CS02AA(001)	Steel Sch.40 (clean)	Containment Sump Water	8	2	0.05008		0	0	0.432	0	N	Containment Spray Pump A	~N(007)	7.981	0	0	0	0	1 x Reducer - Enlargement (10 x 8 - 7)	0.05008				
CS02AA(002)	Steel Sch.40 (clean)	Containment Sump Water	10	25.5	2.148		0	0	5.054	0	N	~N(007)	~N(008)	10.02	0	0	0	0	4 x Pipe Bend - r/d 1.5 (90°)	0.168	1 x CS003A (Check Valve)	1.289	1 x CV004A (Gate Valve)	0.1074
CS02AA(003)	Steel Sch.40 (clean)	Containment Sump Water	10	101.3	5.652		0	0	15.03	0	N	~N(008)	~N(009)	10.02	0	0	0	0	1 x FE-CS011	4.9	4 x Pipe Bend - r/d 1.5 (90°)	0.168	1 x Diverging Tee (Through)	1.00E-05
CS02AA(004)	Steel Sch.40 (clean)	Containment Sump Water	10	34.8	0.6713		0	0	6.27	0	N	~N(009)	CS007A-1	10.02	0	0	0	0	3 x Pipe Bend - r/d 1.5 (90°)	0.168	1 x CS007A-1 (Gate Valve)	0.1074	1 x Diverging Tee (Through)	1.00E-05
CS02AA(005)	Steel Sch.40 (clean)	Containment Sump Water	10	63.7	2.55		0	0	9.072	0	N	CS007A-1	~N(001)	10.02	0	0	0	0	8 x Pipe Bend - r/d 1.5 (90°)	0.168	1 x Pipe Bend - r/d 1.5 (45°)	0.1331	1 x CS008A (Check Valve)	1.289
CS02AA(006)	Steel Sch.40 (clean)	Containment Sump Water	10	156.7	1.261		0	0	83.2	0	N	~N(001)	~N(001A)	10.02	0	0	0	0	6 x Pipe Bend - r/d 1.5 (90°)	0.168	1 x Pipe Bend - r/d 1.5 (45°)	0.1331		
CS02AB(001)	Steel Sch.40 (clean)	Containment Sump Water	8	2	0.472		0	0	-0.432	0	N	Containment Spray Pump B	~N(239)	7.981	0	0	0	0	1 x Elbow - Standard 90°	0.4219	1 x Reducer - Enlargement (10 x 8 - 7)	0.05008		
CS02AB(002)	Steel Sch.40 (clean)	Containment Sump Water	10	9.9	2.202		0	0	0.216	0	N	~N(239)	~N(240)	10.02	0	0	0	0	2 x Elbow - Standard 90°	0.4028	1 x CV004B (Gate Valve)	0.1074	1 x CV003B (Check Valve)	1.289
CS02AB(003)	Steel Sch.40 (clean)	Containment Sump Water	10	59.1	6.511		0	0	14.9	0	N	~N(240)	~N(241)	10.02	0	0	0	0	4 x Elbow - Standard 90°	0.4028	1 x FE-CS012	4.9	1 x Diverging Tee (Through)	1.00E-05
CS02AB(004)	Steel Sch.40 (clean)	Containment Sump Water	10	33.8	1.316		0	0	7.846	0	N	~N(241)	CS007B-2	10.02	0	0	0	0	3 x Elbow - Standard 90°	0.4028	1 x CV007B-2 (Gate Valve)	0.1074	1 x Diverging Tee (Through)	1.00E-05
CS02AB(005)	Steel Sch.40 (clean)	Containment Sump Water	10	75.4	3.92		0	0	12.63	0	N	CS007B-2	~N(242)	10.02	0	0	0	0	1 x Elbow - Standard 45°	0.2148	6 x Elbow - Standard 90°	0.4028	1 x CS008B (Check Valve)	1.289
CS02AB(006)	Steel Sch.40 (clean)	Containment Sump Water	10	144.2	1		0	0	59.18	0	N	~N(242)	~N(243)	10.02	0	0	0	0	1 x CS008B (Check Valve)	1	1 x Diverging Tee (Through)	1.00E-05		
CS02AB(007)	Steel Sch.40 (clean)	Containment Sump Water	10	30.8	2.00E-05	<—>	801.7	2.45	-7.536	0.056	N	~N(244)	~N(243)	10.02	0.056	0	278182	0.01628	1 x Diverging Tee (Branch)	1.00E-05	1 x Diverging Tee (Through)	1.00E-05		
CS02B	Steel Sch.40 (clean)	Containment Sump Water	8	25.8	0.04216	<—>	444.6	2.854	-5.535	0.067	N	~N(010)	~N(001A)	7.981	0.062	0.005	258078	0.01678	1 x Reducer - Contraction (10 x 8 - 7)	0.04215	1 x Diverging Tee (Through)	1.00E-05		
CS02C	Steel Sch.40 (clean)	Containment Sump Water	6	21.5	0.0533	<—>	203	2.256	-2.693	0.066	N	~N(011)	~N(010)	6.065	0.062	0.004	155042	0.01832	1 x Reducer - Contraction (8 x 6 - 6)	0.05329	1 x Diverging Tee (Through)	1.00E-05		
CS02D(001)	Steel Sch.40 (clean)	Containment Sump Water	4	1.1	0.08157	<—>	101.5	2.56	0.006	0.015	N	~N(012)	~N(011)	4.026	0.007	0.008	116764	0.01878	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156	1 x Diverging' Tee (Branch)	1.00E-05		
CS02D(002)	Steel Sch.40 (clean)	Containment Sump Water	4	1.1	0.08157	<—>	101.5	2.56	0.006	0.015	N	~N(014)	~N(011)	4.026	0.007	0.008	116800	0.01878	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156	1 x Diverging' Tee (Branch)	1.00E-05		
CS02D(003)	Steel Sch.40 (clean)	Containment Sump Water	4	2.1	0.08156	<—>	96.27	2.428	0.008	0.019	N	~N(013)	~N(012)	4.026	0.012	0.007	110768	0.01991	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
CS02D(004)	Steel Sch.40 (clean)	Containment Sump Water	4	2.1	0.08156	<—>	96.25	2.428	0.008	0.019	N	~N(033)	~N(014)	4.026	0.012	0.007	110749	0.01991	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
CS02D(005)	Steel Sch.40 (clean)	Containment Sump Water	4	2.1	0.08156	<—>	91.08	2.297	0.007	0.017	N	~N(015)	~N(013)	4.026	0.01	0.007	104777	0.02005	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				

CS02H(044)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<--->	36.66	0.407
CS02H(045)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<--->	31.63	0.351
CS02H(046)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<--->	32.75	0.364
CS02H(047)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<--->	27.62	0.307
CS02H(048)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<--->	28.74	0.319
CS02H(049)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<--->	23.71	0.264
CS02H(050)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<--->	24.66	0.273
CS02H(051)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<--->	19.56	0.217
CS02H(052)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<--->	20.68	0.23
CS02H(053)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<--->	15.56	0.173
CS02H(054)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<--->	16.68	0.185
CS02H(055)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<--->	11.64	0.129
CS02H(056)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<--->	12.52	0.139
CS02H(057)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<--->	7.487	0.083
CS02H(058)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<--->	8.61	0.096
CS02H(059)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<--->	3.483	0.039
CS02H(060)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<--->	4.606	0.051
CS02H(061)	Steel Sch 40 (clean)	Containment Sump Water	6	3.6	0	<--->	0.427	0.005
CS02J(001)	Steel Sch 40 (clean)	Containment Sump Water	6	1.6	0.0533	<--->	190.6	2.118
CS02J(002)	Steel Sch 40 (clean)	Containment Sump Water	6	1.6	0.0533	<--->	190.6	2.118
CS02J(003)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<--->	186.3	2.071
CS02J(004)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<--->	186.3	2.071
CS02J(005)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<--->	182.1	2.023

CS02L071	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	82.46	0.583	0	0	N	~N(148)	~N(149)	7.981	0	0	53668	0.02135
CS02L072	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	82.56	0.584	0	0	N	~N(179)	~N(178)	7.981	0	0	53728	0.02134
CS02L073	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	88.82	0.571	0	0	N	~N(149)	~N(150)	7.981	0	0	51611	0.02151
CS02L074	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	88.72	0.569	0	0	N	~N(178)	~N(183)	7.981	0	0	51495	0.02152
CS02L075	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	85.07	0.546	0	0	N	~N(150)	~N(151)	7.981	0	0	49378	0.02189
CS02L076	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	85.17	0.547	0	0	N	~N(183)	~N(182)	7.981	0	0	49439	0.02189
CS02L077	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	81.35	0.522	0	0	N	~N(151)	~N(153)	7.981	0	0	47222	0.02188
CS02L078	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	81.46	0.523	0	0	N	~N(182)	~N(180)	7.981	0	0	47282	0.02188
CS02L079	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	77.81	0.499	0	0	N	~N(153)	~N(152)	7.981	0	0	45165	0.02208
CS02L080	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	77.61	0.498	0	0	N	~N(180)	~N(181)	7.981	0	0	45050	0.02209
CS02L081	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	73.97	0.475	0	0	N	~N(152)	~N(154)	7.981	0	0	42933	0.0223
CS02L082	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	74.07	0.475	0	0	N	~N(181)	~N(191)	7.981	0	0	42993	0.0223
CS02L083	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	70.25	0.451	0	0	N	~N(154)	~N(155)	7.981	0	0	40777	0.02254
CS02L084	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	70.36	0.452	0	0	N	~N(191)	~N(190)	7.981	0	0	40837	0.02253
CS02L085	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	66.71	0.428	0	0	N	~N(155)	~N(157)	7.981	0	0	38720	0.02278
CS02L086	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	66.51	0.427	0	0	N	~N(190)	~N(188)	7.981	0	0	38605	0.02279
CS02L087	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	62.86	0.403	0	0	N	~N(157)	~N(156)	7.981	0	0	36488	0.02306
CS02L088	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	62.97	0.404	0	0	N	~N(188)	~N(189)	7.981	0	0	36549	0.02305
CS02L089	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	59.15	0.38	0	0	N	~N(156)	~N(161)	7.981	0	0	34332	0.02336
CS02L090	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	59.25	0.38	0	0	N	~N(189)	~N(184)	7.981	0	0	34393	0.02335
CS02L091	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	55.61	0.357	0	0	N	~N(161)	~N(160)	7.981	0	0	32276	0.02367
CS02L092	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	55.41	0.356	0	0	N	~N(184)	~N(185)	7.981	0	0	32161	0.02369
CS02L093	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	51.76	0.332	0	0	N	~N(160)	~N(158)	7.981	0	0	30044	0.02404
CS02L094	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	51.86	0.333	0	0	N	~N(185)	~N(187)	7.981	0	0	30104	0.02403
CS02L095	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	48.05	0.308	0	0	N	~N(158)	~N(159)	7.981	0	0	27888	0.02444
CS02L096	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	48.15	0.309	0	0	N	~N(187)	~N(186)	7.981	0	0	27949	0.02442
CS02L097	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	44.6	0.286	0	0	N	~N(159)	~N(162)	7.981	0	0	25832	0.02480
CS02L098	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	44.31	0.284	0	0	N	~N(186)	~N(201)	7.981	0	0	25717	0.02488
CS02L099	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	40.66	0.261	0	0	N	~N(162)	~N(183)	7.981	0	0	23600	0.02537

CV08AA(001)	Steel Sch 160 (clean)	Water After RHR HX	4	2.8	0.4721		347.2	12.01	1.015	1.449	N	Centrifugal Charging Pump A	~N(637)	3.438	0.393	1.056	467825	0.01798	2 x Pipe Bend - r/d 1.5 (90°)	0.2361														
CV08AA(002)	Steel Sch 160 (clean)	Water After RHR HX	4	4.8	2.976		282.2	9.781	2.094	4.847	N	~N(637)	~N(638)	3.438	0.43	4.397	380241	0.01818	1 x CV8481A(Check Valve)	2.975	1 x Diverging Tee (Through)	1.00E-05												
CV08AA(003)	Steel Sch 40 (clean)	Water After RHR HX	4	12.8	0.9047		282.2	7.118	1.36	1.248	N	~N(638)	~N(639)	4.026	0.537	0.711	324707	0.01791	3 x Pipe Bend - r/d 1.5 (90°)	0.2279	1 x CV8485A	0.221	1 x Diverging Tee (Through)	1.00E-05	1 x Converging Tee (Branch)	1.00E-05								
CV08BA(001)	Steel Sch 160 (clean)	Water After RHR HX	4	1.7	0.2361		330.5	11.43	0.889	0.895	N	Centrifugal Charging Pump B	~N(634)	3.438	0.216	0.479	445360	0.01802	1 x Pipe Bend - r/d 1.5 (90°)	0.2361														
CV08BA(002)	Steel Sch 160 (clean)	Water After RHR HX	4	3.7	3.211		265.5	9.184	1.948	4.51	N	~N(634)	~N(635)	3.438	0.309	4.201	357778	0.01825	1 x Pipe Bend - r/d 1.5 (90°)	0.2361	1 x CV8481B(Check Valve)	2.975	1 x Diverging Tee (Through)	1.00E-05										
CV08BA(003)	Steel Sch 40 (clean)	Water After RHR HX	4	103.1	3.233		265.5	6.697	3.454	5.095	N	~N(635)	~N(636)	4.026	3.846	2.249	305523	0.01799	4 x Pipe Bend - r/d 1.5 (90°)	0.2279	1 x CV8485B (Gate Valve)	0.221	1 x Diverging Tee (Through)	1.00E-05	1 x Converging* Tee (Branch)	2.1								
CV09A(001)	Steel Sch 160 (clean)	Water After RHR HX	4	13.3	6.5		202.2	6.993	2.086	4.627	N	~N(639)	~N(636)	3.438	0.654	4.173	272445	0.01858	1 x Converging* Tee (Branch)	3.4	1 x Diverging* Tee (Branch)	2.1												
CV09A(002)	Steel Sch 160 (clean)	Water After RHR HX	4	23.3	9.156		467.7	16.18	25.85	43.03	N	~N(636)	~N(643)	3.438	5.86	37.17	630222	0.01773	4 x Pipe Bend - r/d 1.5 (90°)	0.2361	1 x FE917	7.2	1 x Tee - Flow Thru Branch	1.012										
CV09D(001)	Steel Sch 160 (clean)	Water After RHR HX	3	2.8	0.2638		80	4.75	0.077	0.177	N	~N(642)	~N(640)	2.624	0.085	0.092	141236	0.02044	1 x Reducer - Contraction (4 x 3 - 4)	0.03381	1 x CV8483A(Gate Valve)	0.23	1 x Diverging Tee (Through)	1.00E-05										
CV09D(002)	Steel Sch 160 (clean)	Water After RHR HX	3	8.6	9.83		80	4.75	1.523	3.757	N	~N(639)	~N(642)	2.624	0.281	3.476	141236	0.02044	1 x CV8483B(Gate Valve)	0.23	1 x Converging Tee (Through)	1.00E-05	1 x Diverging* Tee (Branch)	9.7										
CV09D(003)	Steel Sch 160 (clean)	Water After RHR HX	3	23	11.4		80	4.75	5.03	4.743	N	~N(640)	~N(667)	2.624	0.753	3.99	141236	0.02044	1 x FE121	9.4	1 x Diverging Tee (Branch)	2	1 x Converging Tee (Through)	1.00E-05										
CV09D(004)	Steel Sch 160 (clean)	Water After RHR HX	3	12.5	1.00E-05		0	0	0	0	N	~N(667)	~N(668)	2.624	0	0	0	0	1 x Diverging Tee (Through)	1.00E-05														
CV12AA	Steel Sch 160 (clean)	Water After RHR HX	3	15.6	1.74	XXX	—	—	—	—	N	~N(638)	~N(678)	2.824	—	—	—	—	3 x Pipe Bend - r/d 1.5 (90°)	0.2511	1 x CV8387A(Globe Valve)	0.9866	1 x Diverging Tee (Branch)	1.00E-05	1 x Converging* Tee (Branch)	1.00E-05								
CV12AB	Steel Sch 160 (clean)	Water After RHR HX	3	116.7	3.247	XXX	—	—	—	—	N	~N(635)	~N(678)	2.824	—	—	—	—	9 x Pipe Bend - r/d 1.5 (90°)	0.2511	1 x CV8387B(Globe Valve)	0.9866	1 x Diverging Tee (Branch)	1.00E-05	1 x Converging* Tee (Branch)	1.00E-05								
CV12B	Steel Sch 160 (clean)	Water After RHR HX	3	0.8	0		0	0	0	0	N	~N(678)	~N(679)	2.824	0	0	0	0																
CV13B	Steel Sch 160 (clean)	Water After RHR HX	3	13.8	2.251		80	4.75	-2.748	1.239	N	~N(667)	~N(679)	2.624	0.451	0.788	141236	0.02044	1 x Pipe Bend - r/d 1.5 (90°)	0.2511	1 x Converging Tee (Branch)	1.00E-05	1 x Diverging* Tee (Branch)	1.00E-05	1 x Diverging Tee (Branch)	2								
CV43A(001)	Steel Sch 160 (clean)	Water After RHR HX	2	92	49.04		0	0	1.944	0	N	~N(668)	~N(669)	1.687	0	0	0	0	13 x Pipe Bend - r/d 1.5 (90°)	0.2791	5 x Pipe Bend - r/d 1.5 (45°)	0.1976	1 x FE139	6.8	1 x CV8345(Globe Valve)	5.891	1 x CV8346(Globe Valve)	5.891	1 x CV8348(Check Valve)	2.305	1 x CV184 (Globe Valve)	23.94	1 x Diverging Tee (Branch)	1.00E-05
CV43A(002)	Steel Sch 160 (clean)	Water After RHR HX	2	60.5	1.116		0	0	0.302	0	N	~N(669)	~N(670)	1.687	0	0	0	0	4 x Pipe Bend - r/d 1.5 (90°)	0.2791	1 x Diverging* Tee (Branch)	1.00E-05												
CV43A(003)	Steel Sch 160 (clean)	Water After RHR HX	2	117.8	2.151		0	0	1.21	0	N	~N(670)	~N(671)	1.687	0	0	0	0	7 x Pipe Bend - r/d 1.5 (90°)	0.2791	1 x Pipe Bend - r/d 1.5 (45°)	0.1976	1 x Diverging Tee (Through)	1.00E-05										
CV43BA/RC16AA	Steel Sch 160 (clean)	Water After RHR HX	2	134.4	15.41	XXX	—	—	—	—	N	~N(671)	Hot Leg A(001)	1.687	—	—	—	—	13 x Pipe Bend - r/d 1.5 (90°)	0.2791	1 x RC8038A (Y Globe Valve)	5.891	1 x RC8036A (Globe Valve)	5.891	1 x Diverging Tee (Through)	1.00E-05								
CV43BB/RC16AB	Steel Sch 160 (clean)	Water After RHR HX	2	19	13.29	XXX	—	—	—	—	N	~N(671)	Hot Leg B(001)	1.687	—	—	—	—	4 x Pipe Bend - r/d 1.5 (90°)	0.2791	2 x Pipe Bend - r/d 1.5 (45°)	0.1976	1 x RC8038B (Y Globe Valve)	5.891	1 x RC8036B (Globe Valve)	5.891	1 x Diverging Tee (Branch)	1.00E-05						
CV43BC/RC16AC	Steel Sch 160 (clean)	Water After RHR HX	2	59.1	13.46	XXX	—	—	—	—	N	~N(670)	Hot Leg C(001)	1.687	—	—	—	—	6 x Pipe Bend - r/d 1.5 (90°)	0.2791	1 x RC8038C (Y Globe Valve)	5.891	1 x RC8036C (Globe Valve)	5.891	1 x Diverging Tee (Branch)	1.00E-05								
CV43BD/RC16AD	Steel Sch 160 (clean)	Water After RHR HX	2	51.7	12.9	XXX	—	—	—	—	N	~N(669)	Hot Leg D(001)	1.687	—	—	—	—	4 x Pipe Bend - r/d 1.5 (90°)	0.2791	1 x RC8038D (Y Globe Valve)	5.891	1 x RC8036D (Globe Valve)	5.891	1 x Diverging* Tee (Branch)	1.00E-05								
CV98A	Steel Sch 40 (clean)	Water After RHR HX	8	5.5	0		547.7	3.515	-2.365	0.026	N	~N(506)	~N(618)	7.981	0.026	0	317918	0.01641																
CV98BA	Steel Sch 40 (clean)	Water After RHR HX	8	8.8	0.3789		273.9	1.758	-2.147	0.029	N	~N(618)	~N(621)	7.981	0.011	0.018	158959	0.01783	1 x Pipe Bend - r/d 1.5 (90°)	0.1989	1 x CV112D(Gate Valve)	0.18	1 x Converging Tee (Branch)	1.00E-05	1 x Diverging Tee (Branch)	1.00E-05								
CV98BB	Steel Sch 40 (clean)	Water After RHR HX	8	8.8	0.3789		273.9	1.758	-2.147	0.029	N	~N(618)	~N(621)	7.981	0.011	0.018	158959	0.01783	1 x Pipe Bend - r/d 1.5 (90°)	0.1989	1 x CV112E(Gate Valve)	0.18	1 x Converging Tee (Through)	1.00E-05	1 x Diverging Tee (Through)	1.00E-05								
CV98C	Steel Sch 40 (clean)	Water After RHR HX	8	6.5	3.2		547.7	3.515	0.278	0.844	N	~N(621)	~N(622)	7.981	0.031	0.613	317918	0.01641	1 x CV8546(Check Valve)	1.9	1 x Converging Tee (Branch)	1.3												
CVA1A/SI13C	Steel Sch 40 (clean)	Water After RHR HX	8	22.5	1.521	XXX	—	—	—	—	N	~N(526)	~N(524)	8.065	—	—	—	—	1 x SI8924 (Gate Valve)	0.195	3 x Pipe Bend - r/d 1.5 (90°)	0.2085	1 x Converging Tee (Branch)	0.7										
CVJ4A	Steel Sch 160 (clean)	Water After RHR HX	4	19.8	1.72		467.7	16.18	9.14	11.96	N	~N(643)	~N(644)	3.438	4.977	6.963	630222	0.01773	2 x Pipe Bend - r/d 1.5 (90°)	0.2361	1 x Tee - Flow Thru Branch	1.012												
Pipe(002)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.19	1.557	2.835	7.063	N	A2(001)	~N(073)	1.049	0.006	7.057	18504	0.02996	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1												
Pipe(003)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.015	1.492	2.802	6.485	N	A2(003)	~N(072)	1.049	0.006	6.479	17731	0.03018	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1												
Pipe(004)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	3.92	1.456	2.8	6.182	N	A2(005)	~N(071)	1.049	0.006	6.176	17311	0.0303	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1												
Pipe(005)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	3.922	1.457	2.803	6.189	N	A2(002)	~N(070)	1.049	0.006	6.183	17321	0.0303	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1												
Pipe(007)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.015	1.492	2.802	6.485	N	A2(004)	~N(067)	1.049	0.006	6.479	17731	0.03018	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1												
Pipe(008)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.166	1.548	2.8	6.981	N	A2(006)	~N(068)	1.049	0.006	6.975	18397	0.02998	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1												
Pipe(009)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.165	1.547	2.799	6.978	N	A2(007)	~N(074)	1.049	0.006	6.972	18393	0.02998	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1												
Pipe(010)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	3.919	1.456	2.799	6.178	N	A2(008)	~N(069)	1.049	0.006	6.172	17306	0.03031	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1												
Pipe(011)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.012	1.491	2.797	6.475	N	A2(009)	~N(075)	1.049	0.006	6.469	17718	0.03018	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1												
Pipe(012)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.012	1.491	2.797	6.475	N	A2(010)	~N(066)	1.049	0.006	6.469	17717	0.03018	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1												
Pipe(013)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	3.917	1.455	2.796	6.173	N	A2(011)	~N(078)	1.049	0.006	6.167	17299	0.03031	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1												
Pipe(014)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.163	1.547	2.796	6.972	N	A2(012)	~N(065)	1.049	0.006	6.965	18385	0.02998	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1												
Pipe(015)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.162	1.546	2.795	6.97	N	A2(013)	~N(080)	1.049	0.006	6.964	18382	0.02999	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1												
Pipe(016)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	3.916	1.455	2.795	6.17	N	A2(014)	~N(064)	1.049	0.006	6.164	17294	0.03031	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1												
Pipe(017)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.01	1.49	2.794	6.468	N	A2(015)	~N(081)	1.049	0.006	6.462	17707	0.03018	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1												
Pipe(018)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.01	1.49	2.794	6.467	N	A2(016)	~N(060)	1.049	0.006	6.461	17707	0.03018	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1												
Pipe(019)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	3.915	1.454	2.793	6.165	N	A2(017)	~N(082)	1.049	0.005	6.16	17288	0.03031	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1												
Pipe(020)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.161	1.546	2.793	6.965	N	A2(018)	~N(059)	1.049	0.006	6.959	18375	0.02999	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1												
Pipe(021)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.161	1.546	2.792	6.963	N	A2(019)	~N(079)	1.049	0.006	6.957	18373	0.02999	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1												

Pipe(155)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.542	1.316	2.397	5.048	N	~N(168)	A1(107)	1.049	0.005	5.043	15643	0.03087	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(156)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.845	1.429	2.397	5.948	N	~N(164)	A1(109)	1.049	0.006	5.942	16981	0.03041	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(157)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.714	1.38	2.397	5.548	N	~N(165)	A1(111)	1.049	0.005	5.543	16400	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(158)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.542	1.316	2.397	5.048	N	~N(167)	A1(113)	1.049	0.005	5.043	15643	0.03087	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(159)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.845	1.429	2.397	5.948	N	~N(166)	A1(115)	1.049	0.006	5.942	16981	0.03041	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(160)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.714	1.38	2.397	5.548	N	~N(172)	A1(117)	1.049	0.005	5.543	16400	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(161)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.542	1.316	2.397	5.048	N	~N(173)	A1(119)	1.049	0.005	5.043	15643	0.03087	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(162)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.845	1.429	2.397	5.948	N	~N(174)	A1(120)	1.049	0.006	5.942	16981	0.03041	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(163)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.714	1.38	2.397	5.548	N	~N(202)	A1(118)	1.049	0.005	5.543	16400	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(164)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.542	1.316	2.397	5.048	N	~N(197)	A1(116)	1.049	0.005	5.043	15643	0.03087	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(165)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.845	1.429	2.397	5.948	N	~N(198)	A1(114)	1.049	0.006	5.942	16981	0.03041	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(166)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.714	1.38	2.397	5.548	N	~N(196)	A1(112)	1.049	0.005	5.543	16400	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(167)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.542	1.316	2.397	5.048	N	~N(199)	A1(110)	1.049	0.005	5.043	15643	0.03087	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(168)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.845	1.429	2.397	5.948	N	~N(194)	A1(108)	1.049	0.006	5.942	16981	0.03041	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(169)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.714	1.38	2.397	5.548	N	~N(195)	A1(106)	1.049	0.005	5.543	16400	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(170)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.542	1.316	2.397	5.048	N	~N(193)	A1(104)	1.049	0.005	5.043	15643	0.03087	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(171)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.845	1.429	2.397	5.948	N	~N(192)	A1(102)	1.049	0.005	5.943	16981	0.03041	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(172)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.714	1.38	2.397	5.548	N	~N(200)	A1(100)	1.049	0.005	5.543	16400	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(173)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.542	1.316	2.397	5.048	N	~N(201)	A1(098)	1.049	0.004	5.044	15644	0.03087	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(174)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.845	1.429	2.397	5.949	N	~N(186)	A1(096)	1.049	0.006	5.943	16982	0.03041	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(175)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.714	1.38	2.397	5.549	N	~N(187)	A1(094)	1.049	0.005	5.544	16401	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(176)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.543	1.316	2.397	5.049	N	~N(185)	A1(092)	1.049	0.005	5.044	15645	0.03087	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(177)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.846	1.429	2.397	5.949	N	~N(184)	A1(090)	1.049	0.005	5.944	16982	0.03041	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(178)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.714	1.38	2.397	5.549	N	~N(189)	A1(088)	1.049	0.005	5.544	16402	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(179)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.543	1.316	2.397	5.05	N	~N(188)	A1(086)	1.049	0.005	5.045	15646	0.03087	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(180)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.846	1.429	2.398	5.95	N	~N(190)	A1(084)	1.049	0.006	5.944	16983	0.03041	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(181)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.714	1.38	2.398	5.55	N	~N(191)	A1(082)	1.049	0.005	5.545	16403	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(182)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.543	1.316	2.398	5.051	N	~N(181)	A1(080)	1.049	0.005	5.046	15647	0.03087	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(183)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.846	1.429	2.398	5.951	N	~N(180)	A1(078)	1.049	0.006	5.945	16985	0.03041	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(184)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.715	1.38	2.398	5.551	N	~N(182)	A1(076)	1.049	0.005	5.546	16405	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(185)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.544	1.317	2.398	5.052	N	~N(183)	A1(074)	1.049	0.005	5.047	15649	0.03087	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(186)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.847	1.429	2.399	5.952	N	~N(178)	A1(072)	1.049	0.005	5.947	16987	0.03041	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(187)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.715	1.38	2.399	5.553	N	~N(179)	A1(070)	1.049	0.005	5.548	16407	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(188)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.544	1.317	2.399	5.053	N	~N(177)	A1(068)	1.049	0.004	5.049	15652	0.03088	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(189)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.847	1.429	2.399	5.954	N	~N(176)	A1(066)	1.049	0.006	5.948	16989	0.03041	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(190)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.718	1.381	2.4	5.555	N	~N(175)	A1(064)	1.049	0.006	5.549	16410	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(191)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.731	1.386	2.419	5.599	N	~N(203)	A1(004)	1.049	0.005	5.594	16476	0.03058	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(192)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.861	1.434	2.418	5.997	N	~N(204)	A1(006)	1.049	0.006	5.991	17050	0.03039	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(193)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.559	1.322	2.417	5.095	N	~N(206)	A1(008)	1.049	0.005	5.09	15715	0.03064	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(194)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.728	1.385	2.416	5.592	N	~N(205)	A1(010)	1.049	0.005	5.587	16465	0.03058	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(195)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.859	1.434	2.415	5.99	N	~N(210)	A1(012)	1.049	0.006	5.984	17041	0.03039	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(196)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.556	1.321	2.414	5.088	N	~N(209)	A1(014)	1.049	0.005	5.083	15705	0.03065	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(197)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.726	1.384	2.413	5.586	N	~N(207)	A1(016)	1.049	0.005	5.581	16458	0.03058	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(198)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.857	1.433	2.412	5.984	N	~N(208)	A1(018)	1.049	0.006	5.978	17032	0.03039	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(199)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.554	1.32	2.411	5.082	N	~N(218)	A1(020)	1.049	0.005	5.077	15696	0.03065	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(200)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.724	1.384	2.411	5.58	N	~N(217)	A1(022)	1.049	0.005	5.575	16447	0.03058	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(201)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.855	1.432	2.41	5.978	N	~N(215)	A1(024)	1.049	0.005	5.973	17024	0.03039	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(202)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.552	1.32	2.409	5.076	N	~N(216)	A1(026)	1.049	0.004	5.072	15687	0.03065	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(203)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.723	1.383	2.408	5.575	N	~N(211)	A1(028)	1.049	0.005	5.57	16439	0.03059	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(204)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.853	1.432	2.408	5.973	N	~N(212)	A1(030)	1.049	0.005	5.968	17017	0.0304	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(205)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.551	1.319	2.407	5.072	N	~N(214)	A1(032)	1.049	0.005	5.067	15680	0.03065	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(206)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.721	1.382	2.406	5.57	N	~N(213)	A1(034)	1.049	0.005	5.565	16433	0.03059	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(207)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.852	1.431	2.406	5.969	N	~N(231)	A1(036)	1.049	0.006	5.963	17010	0.0304	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(208)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.549	1.319	2.405	5.067	N	~N(232)	A1(038)	1.049	0.004	5.063	15673	0.03066	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(209)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.72	1.382	2.405	5.566	N	~N(227)	A1(040)	1.049	0.005	5.561	16427	0.03059	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(210)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.851	1.431	2.404	5.965	N	~N(228)	A1(042)	1.049	0.006	5.959	17005	0.0304	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(211)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.548	1.318	2.404	5.064	N	~N(230)	A1(044)	1.049	0.005	5.059	15668	0.03066	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(212)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.718	1.382	2.403	5.563	N	~N(229)	A1(046)	1.049	0.006	5.557	16421	0.03059	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(213)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.85	1.43	2.403	5.961	N	~N(219)	A1(048)	1.049	0.005	5.956	17000	0.0304	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(214)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.547	1.318	2.402	5.06	N	~N(220)	A1(050)	1.049	0.004	5.056	15663	0.03066	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(215)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.717	1.381	2.402	5.559	N	~N(222)	A1(052)	1.049	0.005	5.554	16417	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(216)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.849	1.43	2.401	5.959	N	~N(221)	A1(054)	1.049	0.006	5.953	16996	0.0304	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(217)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.546	1.317	2.401	5.058	N	~N(226)	A1(056)	1.049	0.005	5.053	15658	0.03066	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(218)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.717	1.381	2.401	5.557	N	~N(225)	A1(058)	1.049	0.005	5.552	16413	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(219)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.848	1.43	2.4	5.956	N	~N(223)	A1(060)	1.049	0.005	5.951	16992	0.0304	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(220)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.545	1.317	2.4	5.055	N	~N(224)	A1(062)	1.049	0.004	5.051	15656	0.03066	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(221)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.325	1.607	4.461	7.526	N	B3(001)	~N(246)	1.049	0.007	7.519	19101	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(222)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.533	1.684	4.78	8.265	N	B3(003)	~N(248)	1.049	0.007	8.258	20018	0.02955	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(223)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.325	1.607	4.461	7.526	N	B3(002)	~N(247)	1.049	0.007	7.519	19101	0.02978	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(224)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.324	1.607	4.46	7.523	N	B3(004)	~N(249)	1.049	0.007	7.516	19098	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(225)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.324	1.606	4.459	7.521	N	B3(005)	~N(250)	1.049	0.007	7.514	19095	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(226)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.324	1.606	4.459	7.521	N	B3(006)	~N(251)	1.049	0.007	7.514	19095	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(227)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.323	1.606	4.458	7.519	N	B3(007)	~N(252)	1.049	0.007	7.512	19092	0.02978	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(228)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.323	1.606	4.458	7.519	N	B3(008)	~N(253)	1.049	0.007	7.512	19092	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(229)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.323	1.606	4.457	7.517	N	B3(009)	~N(254)	1.049	0.007	7.51	19089	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(230)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.323	1.606	4.457	7.517	N	B3(010)	~N(255)	1.049	0.007	7.51	19089	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(231)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.322	1.606	4.456	7.515	N	B3(011)	~N(256)	1.049	0.007	7.508	19087	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(232)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.322	1.606	4.456	7.515	N	B3(012)	~N(257)	1.049	0.007	7.508	19087	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(233)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.322	1.606	4.455	7.513	N	B3(013)	~N(258)	1.049	0.007	7.506	19085	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(234)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.322	1.606	4.455	7.513	N	B3(014)	~N(259)	1.049	0.006	7.507	19085	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(235)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.321	1.605	4.455	7.512	N	B3(015)	~N(260)	1.049	0.007	7.505	19083	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(236)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.321	1.605	4.455	7.512	N	B3(016)	~N(261)	1.049	0.007	7.505	19083	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(237)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.321	1.605	4.454	7.51	N	B3(017)	~N(262)	1.049	0.006	7.504	19081	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(238)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.321	1.605	4.454	7.511	N	B3(018)	~N(263)	1.049	0.007	7.504	19081	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(239)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.321	1.605	4.454	7.509	N	B3(019)	~N(264)	1.049	0.007	7.502	19080	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(240)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.321	1.605	4.454	7.509	N	B3(020)	~N(265)	1.049	0.007	7.502	19080	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(241)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.32	1.605	4.453	7.508	N	B3(021)	~N(266)	1.049	0.007	7.501	19079	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(242)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.32	1.605	4.453	7.508	N	B3(022)	~N(267)	1.049	0.007	7.501	19079	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(243)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.32	1.605	4.453	7.507	N	B3(023)	~N(268)	1.049	0.007	7.5	19077	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(244)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.32	1.605	4.453	7.507	N	B3(024)	~N(269)	1.049	0.007	7.5	19077	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(245)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.32	1.605	4.452	7.506	N	B3(025)	~N(270)	1.049	0.006	7.5	19076	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(246)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.32	1.605	4.452	7.506	N	B3(026)	~N(271)	1.049	0.006	7.5	19076	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(247)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.605	4.452	7.506	N	B3(027)	~N(272)	1.049	0.007	7.499	19075	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(248)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.605	4.452	7.506	N	B3(028)	~N(273)	1.049	0.007	7.499	19075	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(249)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.605	4.452	7.505	N	B3(029)	~N(274)	1.049	0.007	7.498	19075	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(250)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.605	4.452	7.505	N	B3(030)	~N(275)	1.049	0.007	7.498	19075	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(251)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.605	4.452	7.505	N	B3(031)	~N(276)	1.049	0.007	7.498	19074	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(252)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.605	4.452	7.505	N	B3(032)	~N(277)	1.049	0.007	7.498	19074	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(253)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.605	4.451	7.504	N	B3(033)	~N(278)	1.049	0.007	7.497	19073	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(254)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.318	1.605	4.451	7.504	N	B3(034)	~N(279)	1.049	0.007	7.497	19073	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(255)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.605	4.451	7.504	N	B3(035)	~N(280)	1.049	0.007	7.497	19073	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(256)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.605	4.451	7.504	N	B3(036)	~N(281)	1.049	0.007	7.497	19073	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(257)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.318	1.605	4.451	7.503	N	B3(037)	~N(282)	1.049	0.006	7.497	19073	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(258)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.605	4.451	7.503	N	B3(038)	~N(283)	1.049	0.006	7.497	19073	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(259)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.318	1.605	4.451	7.503	N	B3(039)	~N(284)	1.049	0.007	7.496	19072	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(260)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.605	4.451	7.503	N	B3(040)	~N(285)	1.049	0.007	7.496	19072	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(261)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.605	4.451	7.503	N	B3(041)	~N(286)	1.049	0.007	7.496	19072	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(262)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.318	1.605	4.451	7.503	N	B3(042)	~N(287)	1.049	0.007	7.496	19072	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(263)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.604	4.451	7.503	N	B3(043)	~N(288)	1.049	0.007	7.496	19072	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(264)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.318	1.604	4.451	7.503	N	B3(044)	~N(289)	1.049	0.007	7.496	19072	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(265)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.604	4.451	7.503	N	B3(045)	~N(290)	1.049	0.007	7.496	19072	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(266)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.318	1.604	4.451	7.503	N	B3(046)	~N(291)	1.049	0.007	7.496	19072	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(267)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.604	4.451	7.503	N	B3(047)	~N(292)	1.049	0.007	7.496	19072	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(268)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.604	4.451	7.503	N	B3(048)	~N(293)	1.049	0.007	7.496	19072	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(269)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.604	4.451	7.503	N	B3(049)	~N(294)	1.049	0.007	7.496	19072	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(270)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.604	4.451	7.503	N	B3(050)	~N(295)	1.049	0.007	7.496	19072	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(271)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.604	4.451	7.503	N	B3(051)	~N(296)	1.049	0.007	7.496	19072	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(272)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.262	1.583	1.212	7.306	N	B2(001)	~N(298)	1.049	0.007	7.299	18820	0.02986	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(273)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.262	1.583	1.212	7.306	N	B2(002)	~N(300)	1.049	0.007	7.299	18820	0.02986	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(274)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.258	1.582	1.209	7.298	N	B2(003)	~N(301)	1.049	0.007	7.291	18810	0.02987	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(275)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.258	1.582	1.209	7.298	N	B2(004)	~N(302)	1.049	0.007	7.291	18810	0.02987	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(276)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.257	1.582	1.206	7.291	N	B2(005)	~N(303)	1.049	0.007	7.284	18800	0.02987	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(277)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.257	1.582	1.206	7.291	N	B2(006)	~N(304)	1.049	0.007	7.284	18800	0.02987	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(278)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.255	1.581	1.202	7.283	N	B2(007)	~N(305)	1.049	0.006	7.277	18791	0.02987	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(279)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.255	1.581	1.202	7.283	N	B2(008)	~N(306)	1.049	0.006	7.277	18791	0.02987	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(280)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.253	1.58	1.199	7.277	N	B2(009)	~N(307)	1.049	0.007	7.27	18782	0.02987	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(281)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.253	1.58	1.199	7.277	N	B2(010)	~N(308)	1.049	0.007	7.27	18782	0.02987	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(282)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.251	1.579	1.197	7.27	N	B2(011)	~N(310)	1.049	0.007	7.263	18773	0.02988	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(283)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.251	1.579	1.197	7.27	N	B2(012)	~N(309)	1.049	0.007	7.263	18773	0.02988	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(284)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.249	1.579	1.194	7.264	N	B2(013)	~N(311)	1.049	0.007	7.257	18765	0.02988	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(285)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.249	1.579	1.194	7.264	N	B2(014)	~N(312)	1.049	0.007	7.257	18765	0.02988	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(286)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.248	1.578	1.191	7.258	N	B2(015)	~N(314)	1.049	0.007	7.251	18758	0.02988	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(287)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.248	1.578	1.191	7.258	N	B2(016)	~N(313)	1.049	0.007	7.251	18758	0.02988	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(288)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.246	1.577	1.189	7.252	N	B2(017)	~N(318)	1.049	0.006	7.246	18750	0.02988	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(289)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.246	1.577	1.189	7.252	N	B2(018)	~N(317)	1.049	0.006	7.246	18750	0.02988	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(290)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.244	1.577	1.187	7.247	N	B2(019)	~N(315)	1.049	0.007	7.24	18744	0.02988	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(291)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.244	1.577	1.187	7.247	N	B2(020)	~N(316)	1.049	0.007	7.24	18744	0.02988	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(292)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.243	1.576	1.184	7.242	N	B2(021)	~N(320)	1.049	0.007	7.235	18737	0.02989	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(293)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.243	1.576	1.184	7.242	N	B2(022)	~N(319)	1.049	0.007	7.235	18737	0.02989	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(294)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.241	1.576	1.182	7.237	N	B2(023)	~N(321)	1.049	0.007	7.23	18731	0.02989	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(295)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.241	1.576	1.182	7.237	N	B2(024)	~N(322)	1.049	0.007	7.23	18731	0.02989	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(296)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.24	1.575	1.18	7.232	N	B2(025)	~N(323)	1.049	0.006	7.226	18725	0.02989	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(297)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.24	1.575	1.18	7.232	N	B2(026)	~N(324)	1.049	0.006	7.226	18725	0.02989	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(298)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.238	1.575	1.179	7.228	N	B2(027)	~N(325)	1.049	0.007	7.221	18719	0.02989	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(299)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.238	1.575	1.179	7.228	N	B2(028)	~N(326)	1.049	0.007	7.221	18719	0.02989	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(300)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.238	1.574	1.177	7.224	N	B2(029)	~N(327)	1.049	0.007	7.217	18714	0.02989	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(301)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.238	1.574	1.177	7.224	N	B2(030)	~N(328)	1.049	0.007	7.217	18714	0.02989	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(302)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.237	1.574	1.175	7.22	N	B2(031)	~N(329)	1.049	0.006	7.214	18709	0.02989	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(303)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.237	1.574	1.175	7.22	N	B2(032)	~N(330)	1.049	0.006	7.214	18709	0.02989	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(304)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.235	1.574	1.174	7.217	N	B2(033)	~N(331)	1.049	0.007	7.21	18704	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(305)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.235	1.574	1.174	7.217	N	B2(034)	~N(332)	1.049	0.007	7.21	18704	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(306)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.234	1.573	1.172	7.213	N	B2(035)	~N(333)	1.049	0.006	7.207	18700	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(307)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.234	1.573	1.172	7.213	N	B2(036)	~N(334)	1.049	0.006	7.207	18700	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(308)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.234	1.573	1.171	7.21	N	B2(037)	~N(335)	1.049	0.006	7.204	18696	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(309)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.234	1.573	1.171	7.21	N	B2(038)	~N(336)	1.049	0.006	7.204	18696	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(310)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.233	1.573	1.17	7.207	N	B2(039)	~N(337)	1.049	0.006	7.201	18692	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(311)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.233	1.573	1.17	7.207	N	B2(040)	~N(338)	1.049	0.006	7.201	18692	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(312)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.232	1.572	1.168	7.204	N	B2(041)	~N(339)	1.049	0.006	7.198	18689	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(313)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.232	1.572	1.168	7.204	N	B2(042)	~N(340)	1.049	0.006	7.198	18689	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(314)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.231	1.572	1.167	7.202	N	B2(043)	~N(341)	1.049	0.007	7.195	18685	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(315)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.231	1.572	1.167	7.202	N	B2(044)	~N(342)	1.049	0.007	7.195	18685	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(316)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.23	1.572	1.166	7.2	N	B2(045)	~N(343)	1.049	0.007	7.193	18682	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(317)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.23	1.572	1.166	7.2	N	B2(046)	~N(344)	1.049	0.007	7.193	18682	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(318)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.23	1.571	1.165	7.197	N	B2(047)	~N(345)	1.049	0.006	7.191	18679	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(319)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.23	1.571	1.165	7.197	N	B2(048)	~N(346)	1.049	0.006	7.191	18679	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(320)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.229	1.571	1.164	7.195	N	B2(049)	~N(347)	1.049	0.006	7.189	18677	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(321)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.229	1.571	1.164	7.195	N	B2(050)	~N(348)	1.049	0.006	7.189	18677	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(322)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.229	1.571	1.164	7.194	N	B2(051)	~N(349)	1.049	0.007	7.187	18675	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(323)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.229	1.571	1.164	7.194	N	B2(052)	~N(350)	1.049	0.007	7.187	18675	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(324)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.228	1.571	1.163	7.192	N	B2(053)	~N(351)	1.049	0.007	7.185	18672	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(325)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.228	1.571	1.163	7.192	N	B2(054)	~N(352)	1.049	0.007	7.185	18672	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(326)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.228	1.571	1.162	7.19	N	B2(055)	~N(353)	1.049	0.006	7.184	18670	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(327)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.228	1.571	1.162	7.19	N	B2(056)	~N(354)	1.049	0.006	7.184	18670	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(328)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.227	1.571	1.162	7.189	N	B2(057)	~N(355)	1.049	0.006	7.183	18669	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(329)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.227	1.571	1.162	7.189	N	B2(058)	~N(356)	1.049	0.006	7.183	18669	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(330)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.227	1.57	1.161	7.188	N	B2(059)	~N(357)	1.049	0.007	7.181	18667	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(331)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.227	1.57	1.161	7.188	N	B2(060)	~N(358)	1.049	0.007	7.181	18667	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(332)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.227	1.57	1.161	7.187	N	B2(061)	~N(359)	1.049	0.007	7.18	18666	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(333)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.227	1.57	1.161	7.187	N	B2(062)	~N(360)	1.049	0.007	7.18	18666	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(334)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.226	1.57	1.16	7.186	N	B2(063)	~N(361)	1.049	0.007	7.179	18665	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(335)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.226	1.57	1.16	7.186	N	B2(064)	~N(362)	1.049	0.007	7.179	18665	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1

Pipe(336)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.226	1.57	1.16	7.185	N	B2(065)	~N(363)	1.049	0.006	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(337)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.226	1.57	1.16	7.185	N	B2(066)	~N(364)	1.049	0.006	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(338)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.226	1.57	1.16	7.184	N	B2(067)	~N(365)	1.049	0.006	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(339)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.226	1.57	1.16	7.184	N	B2(068)	~N(366)	1.049	0.006	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(340)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.226	1.57	1.159	7.184	N	B2(069)	~N(367)	1.049	0.007	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(341)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.226	1.57	1.159	7.184	N	B2(070)	~N(368)	1.049	0.007	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(342)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.226	1.57	1.159	7.183	N	B2(071)	~N(369)	1.049	0.006	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(343)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.226	1.57	1.159	7.183	N	B2(072)	~N(370)	1.049	0.006	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(344)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.226	1.57	1.159	7.183	N	B2(073)	~N(371)	1.049	0.007	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(345)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.226	1.57	1.159	7.183	N	B2(074)	~N(372)	1.049	0.007	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(346)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.225	1.57	1.159	7.182	N	B2(075)	~N(373)	1.049	0.006	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(347)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.225	1.57	1.158	7.182	N	B2(076)	~N(374)	1.049	0.006	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(348)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.225	1.57	1.158	7.182	N	B2(077)	~N(375)	1.049	0.006	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(349)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.225	1.57	1.158	7.182	N	B2(078)	~N(376)	1.049	0.006	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(350)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.225	1.57	1.159	7.182	N	B2(079)	~N(377)	1.049	0.007	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(351)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.225	1.57	1.159	7.182	N	B2(080)	~N(378)	1.049	0.007	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(352)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.225	1.57	1.158	7.182	N	B2(081)	~N(379)	1.049	0.007	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(353)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.225	1.57	1.159	7.182	N	B2(082)	~N(380)	1.049	0.007	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(354)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.225	1.57	1.159	7.182	N	B2(083)	~N(381)	1.049	0.007	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(355)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.225	1.57	1.159	7.182	N	B2(084)	~N(382)	1.049	0.007	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(356)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.225	1.57	1.158	7.182	N	B2(085)	~N(383)	1.049	0.007	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(357)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.225	1.57	1.158	7.182	N	B2(086)	~N(384)	1.049	0.007	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(358)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.225	1.57	1.158	7.182	N	B2(087)	~N(385)	1.049	0.007	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(359)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.225	1.57	1.158	7.182	N	B2(088)	~N(387)	1.049	0.007	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(360)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.225	1.57	1.158	7.182	N	B2(089)	~N(388)	1.049	0.007	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(361)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.225	1.57	1.158	7.182	N	B2(090)	~N(389)	1.049	0.007	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(362)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.39	2.003	5.049	11.69	N	~N(391)	B1(001)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(363)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.39	2.003	5.049	11.69	N	~N(392)	B1(002)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(364)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.389	2.002	5.047	11.68	N	~N(393)	B1(003)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(365)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.389	2.002	5.047	11.68	N	~N(394)	B1(004)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(366)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.388	2.002	5.045	11.68	N	~N(395)	B1(005)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(367)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.388	2.002	5.045	11.68	N	~N(396)	B1(006)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(368)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.387	2.001	5.042	11.67	N	~N(397)	B1(007)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(369)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.387	2.001	5.042	11.67	N	~N(398)	B1(008)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(370)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.385	2.001	5.04	11.67	N	~N(399)	B1(009)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(371)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.386	2.001	5.04	11.67	N	~N(400)	B1(010)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(372)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.384	2	5.038	11.66	N	~N(401)	B1(011)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(373)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.384	2	5.038	11.66	N	~N(402)	B1(012)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(374)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.383	2	5.036	11.66	N	~N(403)	B1(013)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(375)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.383	2	5.036	11.66	N	~N(404)	B1(014)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(376)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.382	2	5.035	11.66	N	~N(405)	B1(015)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(377)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.382	2	5.035	11.66	N	~N(406)	B1(016)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(378)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.381	1.999	5.033	11.65	N	~N(407)	B1(017)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(379)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.381	1.999	5.033	11.65	N	~N(408)	B1(018)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(380)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.381	1.999	5.031	11.65	N	~N(409)	B1(019)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(381)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.381	1.999	5.031	11.65	N	~N(410)	B1(020)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(382)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.38	1.999	5.029	11.64	N	~N(411)	B1(021)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(383)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.38	1.999	5.029	11.64	N	~N(412)	B1(022)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(384)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.379	1.998	5.028	11.64	N	~N(413)	B1(023)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(385)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.379	1.998	5.028	11.64	N	~N(414)	B1(024)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(386)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.378	1.998	5.026	11.63	N	~N(415)	B1(025)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(387)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.378	1.998	5.026	11.63	N	~N(416)	B1(026)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(388)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.377	1.998	5.025	11.63	N	~N(417)	B1(027)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(389)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.377	1.998	5.025	11.63	N	~N(418)	B1(028)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(390)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.376	1.997	5.023	11.63	N	~N(419)	B1(029)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(391)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.376	1.997	5.023	11.63	N	~N(420)	B1(030)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(392)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.376	1.997	5.022	11.63	N	~N(421)	B1(031)	1.049	0.02	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(393)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.376	1.997	5.022	11.63	N	~N(422)	B1(032)	1.049	0.02	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(394)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.375	1.997	5.021	11.62	N	~N(423)	B1(033)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(395)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.375	1.997	5.021	11.62	N	~N(424)	B1(034)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(396)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.374	1.997	5.02	11.62	N	~N(425)	B1(035)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(397)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.374	1.997	5.02	11.62	N	~N(426)	B1(036)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(398)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.374	1.996	5.018	11.62	N	~N(427)	B1(037)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(399)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.374	1.997	5.018	11.62	N	~N(428)	B1(038)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(400)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.373	1.996	5.017	11.61	N	~N(429)	B1(039)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(401)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.373	1.996	5.017	11.61	N	~N(430)	B1(040)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(402)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.373	1.996	5.016	11.61	N	~N(431)	B1(041)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(403)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.373	1.996	5.016	11.61	N	~N(432)	B1(042)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(404)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.372	1.996	5.015	11.61	N	~N(433)	B1(043)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(405)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.372	1.996	5.015	11.61	N	~N(434)	B1(044)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(406)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.372	1.996	5.014	11.61	N	~N(435)	B1(045)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(407)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.372	1.996	5.014	11.61	N	~N(436)	B1(046)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(408)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.371	1.996	5.013	11.61	N	~N(437)	B1(047)	1.049	0.02	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(409)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.371	1.996	5.013	11.61	N	~N(438)	B1(048)	1.049	0.02	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(410)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.371	1.995	5.013	11.6	N	~N(439)	B1(049)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(411)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.371	1.995	5.013	11.6	N	~N(440)	B1(050)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(412)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.37	1.995	5.012	11.6	N	~N(441)	B1(051)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(413)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.37	1.995	5.012	11.6	N	~N(442)	B1(052)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(414)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.37	1.995	5.011	11.6	N	~N(443)	B1(053)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(415)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.37	1.995	5.011	11.6	N	~N(444)	B1(054)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(416)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.369	1.995	5.01	11.6	N	~N(445)	B1(055)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(417)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.369	1.995	5.01	11.6	N	~N(446)	B1(056)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(418)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.369	1.995	5.01	11.6	N	~N(447)	B1(057)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(419)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.369	1.995	5.01	11.6	N	~N(448)	B1(058)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(420)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.369	1.995	5.009	11.59	N	~N(449)	B1(059)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(421)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.368	1.995	5.009	11.59	N	~N(450)	B1(060)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(422)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.368	1.995	5.009	11.59	N	~N(451)	B1(061)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(423)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.368	1.995	5.009	11.59	N	~N(452)	B1(062)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(424)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.368	1.994	5.008	11.59	N	~N(453)	B1(063)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(425)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.368	1.994	5.008	11.59	N	~N(454)	B1(064)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(426)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.368	1.994	5.007	11.59	N	~N(455)	B1(065)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(427)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.368	1.994	5.007	11.59	N	~N(456)	B1(066)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(428)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.368	1.994	5.007	11.59	N	~N(457)	B1(067)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(429)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.368	1.994	5.007	11.59	N	~N(458)	B1(068)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(430)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.367	1.994	5.007	11.59	N	~N(459)	B1(069)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(431)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.367	1.994	5.007	11.59	N	~N(460)	B1(070)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(432)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.367	1.994	5.006	11.59	N	~N(461)	B1(071)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(433)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.367	1.994	5.006	11.59	N	~N(462)	B1(072)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(434)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.367	1.994	5.006	11.59	N	~N(463)	B1(073)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(435)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.367	1.994	5.006	11.59	N	~N(464)	B1(074)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(436)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.367	1.994	5.006	11.59	N	~N(465)	B1(075)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(437)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.367	1.994	5.006	11.59	N	~N(466)	B1(076)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(438)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.367	1.994	5.005	11.58	N	~N(467)	B1(077)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(439)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.367	1.994	5.005	11.58	N	~N(468)	B1(078)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(440)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.367	1.994	5.005	11.58	N	~N(469)	B1(079)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(441)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.367	1.994	5.005	11.58	N	~N(470)	B1(080)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(442)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.005	11.58	N	~N(471)	B1(081)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(443)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.005	11.58	N	~N(472)	B1(082)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(444)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.005	11.58	N	~N(473)	B1(083)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(445)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.005	11.58	N	~N(474)	B1(084)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(446)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.004	11.58	N	~N(475)	B1(085)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(447)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.004	11.58	N	~N(476)	B1(086)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(448)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.004	11.58	N	~N(477)	B1(087)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(449)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.004	11.58	N	~N(478)	B1(088)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(450)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.004	11.58	N	~N(479)	B1(089)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(451)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.004	11.58	N	~N(480)	B1(090)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(452)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.004	11.58	N	~N(481)	B1(091)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(453)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.004	11.58	N	~N(482)	B1(092)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(454)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.004	11.58	N	~N(483)	B1(093)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(455)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.004	11.58	N	~N(484)	B1(094)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(456)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.004	11.58	N	~N(485)	B1(095)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(457)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.004	11.58	N	~N(486)	B1(096)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(458)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.004	11.58	N	~N(487)	B1(097)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(459)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.004	11.58	N	~N(488)	B1(098)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(460)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.004	11.58	N	~N(489)	B1(099)	1.049	0.01	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(461)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.004	11.58	N	~N(490)	B1(100)	1.049	0.01	11.57	23696	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(462)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.004	11.58	N	~N(491)	B1(101)	1.049	0.01	11.57	23696	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(463)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.004	11.58	N	~N(492)	B1(102)	1.049	0.01	11.57	23696	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(464)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.004	11.58	N	~N(493)	B1(103)	1.049	0.01	11.57	23696	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(465)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.004	11.58	N	~N(494)	B1(104)	1.049	0.01	11.57	23696	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(466)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.003	11.58	N	~N(495)	B1(105)	1.049	0.01	11.57	23696	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(467)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.003	11.58	N	~N(496)	B1(106)	1.049	0.01	11.57	23695	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(468)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.003	11.58	N	~N(497)	B1(107)	1.049	0.01	11.57	23696	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(469)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.003	11.58	N	~N(498)	B1(108)	1.049	0.01	11.57	23696	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(470)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.003	11.58	N	~N(499)	B1(109)	1.049	0.01	11.57	23696	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(471)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.003	11.58	N	~N(500)	B1(110)	1.049	0.01	11.57	23696	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(472)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.003	11.58	N	~N(501)	B1(111)	1.049	0.01	11.57	23696	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(473)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.003	11.58	N	~N(502)	B1(112)	1.049	0.01	11.57	23696	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(474)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.863	1.435	2.42	8.002	N	~N(113)	A1(001)	1.049	0.006	5.996	17058	0.03038	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
RC04AA	Steel Sch 140 (clean)	Water After RHR HX	12	10.3	0.318	XXX	—	—	—	—	N	~N(546)	Hot Leg A(002)	10.5	—	—	—	—	1 x Pipe Bend - r/d 1.5 (90°)	0.1862	1 x Pipe Bend - r/d 1.5 (45°)	0.1318	1 x Diverging Tee (Through)	1.00E-05				
RC04AA/RHD1AA	Steel Sch 140 (clean)	Water After RHR HX	12	149.6	2.723	XXX	—	—	—	—	N	~N(545)	~N(548)	10.5	—	—	—	—	13 x Pipe Bend - r/d 1.5 (90°)	0.1862	1 x Pipe Bend - r/d 1.5 (45°)	0.1318	1 x RH8701B-2	0.17				
RC04AB	Steel Sch 140 (clean)	Water After RHR HX	12	9.7	1.118	XXX	—	—	—	—	N	~N(542)	Hot Leg C(002)	10.5	—	—	—	—	1 x Pipe Bend - r/d 1.5 (90°)	0.1862	1 x Pipe Bend - r/d 1.5 (45°)	0.1318	1 x Diverging* Tee (Branch)	0.8				
RC04AB/RH01AB	Steel Sch 140 (clean)	Water After RHR HX	12	148.4	3.227	XXX	—	—	—	—	N	~N(542)	~N(551)	10.5	—	—	—	—	15 x Pipe Bend - r/d 1.5 (90°)	0.1862	2 x Pipe Bend - r/d 1.5 (45°)	0.1318	1 x RH8702B-2	0.17	1 x Diverging* Tee (Branch)	1.00E-05		
RC05AA	Steel Sch 160 (clean)	Water After RHR HX	6	7	2.841		0	0	-1.296	0	N	~N(610)	Hot Leg B(002)	5.187	0	0	0	0	1 x Pipe Bend - r/d 1.5 (90°)	0.2156	1 x SI8949D	2.625						
RC05AB	Steel Sch 160 (clean)	Water After RHR HX	6	12.8	3.656		0	0	1.06	0	N	~N(541)	~N(542)	5.187	0	0	0	0	2 x Pipe Bend - r/d 1.5 (90°)	0.2156	1 x SI8949C (Check Valve)	2.625	1 x Converging Tee (Branch)	0.6				
RC35AA	Steel Sch 160 (clean)	Water After RHR HX	6	7.6	4.056		0	0	0.907	0	N	~N(545)	~N(546)	5.187	0	0	0	0	2 x Pipe Bend - r/d 1.5 (90°)	0.2156	1 x SI8949A (Check Valve)	2.625	1 x Diverging Tee (Branch)	1				
RC35AB	Steel Sch 160 (clean)	Water After RHR HX	6	7	2.841		0	0	-1.296	0	N	~N(607)	Hot Leg D(002)	5.187	0	0	0	0	1 x Pipe Bend - r/d 1.5 (90°)	0.2156	1 x SI8949D	2.625						
RC45AA	Steel Sch 160 (clean)	Water After RHR HX	3	0.6	3.805		117.7	6.988	1.263	2.924	N	~N(656)	Cold Leg A(001)	2.824	0.041	2.883	207786	0.01979	1 x Reducer - Enlargement (3 x 1.5 - 3.5)	3.805								
RC45AB	Steel Sch 160 (clean)	Water After RHR HX	3	0.6	3.805		117.3	6.965	1.255	2.905	N	~N(666)	Cold Leg B(001)	2.824	0.041	2.864	207096	0.01979	1 x Reducer - Enlargement (3 x 1.5 - 3.5)	3.805								
RC45AC	Steel Sch 160 (clean)	Water After RHR HX	3	0.6	3.805		116.4	6.911	1.235	2.86	N	~N(652)	Cold Leg C(001)	2.824	0.04	2.82	205492	0.0198	1 x Reducer - Enlargement (3 x 1.5 - 3.5)	3.805								
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Cold Leg D(001)	2.824	0.04	2.816	205351	0.01981	1 x Reducer - Enlargement (3 x 1.5 - 3.5)	3.805								
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	~N(549)	12	0	0	0	0	7 x Pipe Bend - r/d 1.5 (90°)	0.1813	1 x RH8701A-1	0.17	1 x Converging Tee (Through)	1.00E-05				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	~N(004)	12	0.089	0	2.08E+06	0.01364	1 x Converging Tee (Branch)	1.00E-05								
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	~N(552)	12	0	0	0	0	5 x Pipe Bend - r/d 1.5 (90°)	0.1813	1 x RH8701A-1	0.17	1 x Converging Tee (Through)	1.00E-05				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	~N(553)	12	0.248	0.286	2.20E+06	0.01361	1 x Reducer - Enlargement (18 x 12 - 14)	0.07038	1 x Converging Tee (Branch)	1.00E-05	1 x Converging Tee (Through)	1.00E-05				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	~N(235)	15	0.017	0.557	1.76E+06	0.0133	1 x Reducer - Enlargement (12 x 16 - 0)	0.335	1 x Converging Tee (Branch)	1.00E-05						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	~N(002)	15	0.101	5.376	1.66E+06	0.01334	1 x Pipe Bend - r/d 1.5 (45°)	0.1229	1 x Diverging* Tee (Branch)	3.5	1 x Converging Tee (Through)	1.00E-05				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	~N(512)	16	0	0	0	0	1 x Pipe Bend - r/d 1.5 (90°)	0.1736	1 x Converging Tee (Through)	1.00E-05	1 x Diverging* Tee (Branch)	1.00E-05				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	~N(535)	16	0	0	0	0	1 x Pipe Bend - r/d 1.5 (90°)	0.1736								
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Residual Heat Removal Pump A	13.124	0	0	0	0	1 x Pipe Bend - r/d 1.5 (90°)	0.1782	1 x Reducer - Contraction (16 x 14 - 14)	0.01254						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	~N(234)	15	0.111	1.534	1.76E+06	0.0133	1 x Pipe Bend - r/d 1.5 (45°)	0.1229	1 x Converging Tee (Through)	1.00E-05	1 x Diverging Tee (Branch)	1.00E-05	1 x Diverging* Tee (Branch)	0.8		
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	~N(524)	15	0	0	0	0	2 x Pipe Bend - r/d 1.5 (90°)	0.1736	1 x Converging Tee (Through)	1.00E-05	1 x Diverging* Tee (Branch)	1.00E-05				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	~N(536)	16	0	0	0	0										
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Residual Heat Removal Pump B	13.124	0	0	0	0	1 x Pipe Bend - r/d 1.5 (90°)	0.1782	1 x Reducer - Contraction (16 x 14 - 14)	0.01254						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	~N(513)	7.981	—	—	—	—	1 x FE610	1.7	1 x RH8724A (Gate Valve)	0.182	1 x RH8730A (Check Valve)	1.89	7 x Pipe Bend - r/d 1.5 (90°)	0.1969		
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	~N(514)	7.981	0	0	0	0	3 x Pipe Bend - r/d 1.5 (90°)	0.1969	1 x Diverging Tee (Through)	1.00E-05	2 x Pipe Bend - r/d 1.5 (45°)	0.1394				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Residual HX A	13.124	0	0	0	0	1 x Reducer - Enlargement (14 x 8 - 13)	1.465								
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	~N(525)	7.981	0	0	0	0	1 x FE611	1.7	1 x RH8724B (Gate Valve)	0.182	1 x RH8730B (Check Valve)	1.89	10 x Pipe Bend - r/d 1.5 (90°)	0.1969	2 x Pipe Bend - r/d 1.5 (45°)	0.1394
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	~N(526)	7.981	0	0	0	0	3 x Pipe Bend - r/d 1.5 (90°)	0.1969	1 x Diverging Tee (Through)	1.00E-05	2 x Pipe Bend - r/d 1.5 (45°)	0.1394				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Residual HX B	13.124	0	0	0	0	1 x Reducer - Enlargement (14 x 8 - 13)	1.465								
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	~N(515)	13.124	0	0	0	0	1 x Reducer - Contraction (14 x 8 - 13)	0.7153								
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	~N(516)	7.981	0	0	0	0	3 x Pipe Bend - r/d 1.5 (90°)	0.1969	2 x Pipe Bend - r/d 1.5 (45°)	0.1394						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	~N(517)	7.981	0	0	0	0	2 x Pipe Bend - r/d 1.5 (90°)	0.1969	1 x RH606 (Butterfly Valve)	2.252	1 x Diverging Tee (Through)	1.00E-05	1 x Converging* Tee (Branch)	1.2		
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	~N(518)	7.981	0	0	0	0	6 x Pipe Bend - r/d 1.5 (90°)	0.1969	1 x FE618	1.6						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	~N(519)	7.981	0	0	0	0	1 x Pipe Bend - r/d 1.5 (90°)	0.1969	1 x Diverging Tee (Through)	1.00E-05	1 x Converging* Tee (Branch)	1.2				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	~N(519)	7.981	0	0	0	0	1 x RH8716A-1(Gate Valve)	0.182	1 x Diverging Tee (Through)	1.00E-05	1 x Converging* Tee (Branch)	11000				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	~N(520)	7.981	0	0	0	0	1 x Reducer - Enlargement (12 x 8 - 8)	0.1909	1 x Diverging Tee (Through)	1.00E-05						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	~N(521)	12	0	0	0	0	1 x Converging* Tee (Branch)	1.00E-05	1 x Diverging Tee (Through)	1.00E-05						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	~N(527)	13.124	0	0	0	0	1 x Reducer - Contraction (14 x 8 - 13)	0.7153								
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	~N(528)	7.981	0	0	0	0	3 x Pipe Bend - r/d 1.5 (90°)	0.1969	2 x Pipe Bend - r/d 1.5 (45°)	0.1394						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	~N(529)	7.981	0	0	0	0	1 x RH607(Butterfly Valve)	2.252	1 x Diverging Tee (Through)	1.00E-05	1 x Converging* Tee (Branch)	1.2				

RH03AB(004)	Steel Sch 40 (clean)	Water After RHR HX	8	28 9	2 472		0
RH03AB(005)	Steel Sch 40 (clean)	Water After RHR HX	8	36 3	14000		0
RH03AB(006)	Steel Sch 40S (clean)	Water After RHR HX	12	1.5	1 00E-05		0
RH09AA(001)	Steel Sch 40 (clean)	Containment Sump Water	8	1	1 00E-05	XXX	—
RH09AA(002)	Steel Sch 40 (clean)	Containment Sump Water	8	1	1 00E-05	XXX	—
RH09AB(001)	Steel Sch 40 (clean)	Containment Sump Water	8	1	1 00E-05	XXX	—
RH09AB(002)	Steel Sch 40 (clean)	Containment Sump Water	8	1	1 00E-05	XXX	—
RH10AA(001)	Steel Sch 40 (clean)	Water After RHR HX	3	1	1.00E-05	XXX	—
RH10AA(002)	Steel Sch 40 (clean)	Water After RHR HX	3	1	1 00E-05		0
RH10AB(001)	Steel Sch 40 (clean)	Water After RHR HX	3	1	1 00E-05	XXX	—
RH10AB(002)	Steel Sch 40 (clean)	Water After RHR HX	3	1	1 00E-05		0
RH12A/CV99A	Steel Sch 40 (clean)	Water After RHR HX	8	28 6	5 573	XXX	—
RH14A	Steel Sch 40 (clean)	Water After RHR HX	8	4 4	1 879	XXX	—
SI01A	Steel Sch 40 (clean)	Water After RHR HX	8	28 4	0 9644		0
SI01B(001)	Steel Sch.20 (clean)	Water After RHR HX	24	113 2	0 3195		12117
SI01B(002)	Steel Sch.20 (clean)	Water After RHR HX	24	58	0 3195		11627
SI01B(003)	Steel Sch.20 (clean)	Water After RHR HX	24	4.8	0 4		5930
SI01B(004)	Steel Sch.20 (clean)	Water After RHR HX	24	60.3	0 4524		5930
SI01B(005)	Steel Sch.20 (clean)	Water After RHR HX	24	7	2 00E-05		5930
SI01B(006)	Steel Sch.20 (clean)	Water After RHR HX	24	2	38 6		547.7
SI01B(007)	Steel Sch.20 (clean)	Water After RHR HX	24	1	29 43		547.7
SI02A/SIF8A	Steel Sch 40 (clean)	Water After RHR HX	8	28.3	11.37		490 3
SI02BA(001)	Steel Sch 40 (clean)	Water After RHR HX	8	1.7	0 1588		278 7

BM3AB/BG	Steel Sch 40 (clean)	Water After RHR HX	12	57.1	4.915	3667	18.34	-4.105	23.8	N	~N(504)	~N(552)	11.939	3.24	20.35	2.21E+06	0.01361	3 x Pipe Bend - r/d 1.5 (90°)	0.1815	1 x SI8958B(Check Valve)	1.8	1 x SI8812B(Gate Valve)	0.17	1 x Diverging Tee (Branch)	1.3	1 x Converging Tee (Branch)	1.1		
BIAA4	Steel Sch 160 (clean)	Water After RHR HX	8	13.1	1.847	0	0	2.382	0	N	~N(537)	~N(544)	6.813	0	0	0	0	2 x Pipe Bend - r/d 1.5 (90°)	0.2035	1 x SI8841A (Check Valve)	0.84	1 x Diverging Tee (Branch)	1.00E-05	1 x Converging Tee (Through)	0.6				
BIAA5	Steel Sch 160 (clean)	Water After RHR HX	8	80.1	2.11	0	0	-0.259	0	N	~N(544)	~N(545)	6.813	0	0	0	0	9 x Pipe Bend - r/d 1.5 (90°)	0.2035	1 x Pipe Bend - r/d 1.5 (45°)	0.144	1 x Reducer - Contraction (8 x 6 - 6)	0.1344						

Node List	Status	Pressure	Grade	Elev
~N(001)		121.8	675.6	426
~N(001A)		58.42	675.5	574.2
~N(002)		39.66	369.7	330.1
~N(003)		32.58	369.7	348.3
~N(004)		34.27	365.2	349.8
~N(005)		157.8	675.5	344.3
~N(006)		157.8	675.5	344.3
~N(007)		156.1	675.5	348.3
~N(008)		151	675.5	360
~N(009)		136	675.5	394.8
~N(010)		52.85	675.5	587.2
~N(011)		50.19	675.6	593.5
~N(012)		50.2	675.7	593.5
~N(013)		50.2	675.7	593.5
~N(014)		50.2	675.7	593.5
~N(015)		50.21	675.7	593.5
~N(016)		50.22	675.7	593.5
~N(017)		50.22	675.7	593.5
~N(018)		50.23	675.7	593.5
~N(019)		50.23	675.7	593.5
~N(020)		50.24	675.8	593.5
~N(021)		50.24	675.8	593.5
~N(022)		50.25	675.8	593.5
~N(023)		50.24	675.8	593.5
~N(024)		50.24	675.8	593.5
~N(025)		50.25	675.8	593.5
~N(026)		50.25	675.8	593.5
~N(027)		50.25	675.8	593.5
~N(028)		50.25	675.8	593.5
~N(029)		50.25	675.8	593.5
~N(030)		50.25	675.8	593.5
~N(031)		50.25	675.8	593.5
~N(032)		50.25	675.8	593.5
~N(033)		50.2	675.7	593.5
~N(034)		50.21	675.7	593.5
~N(035)		50.22	675.7	593.5
~N(036)		50.23	675.7	593.5
~N(037)		50.23	675.7	593.5
~N(038)		50.22	675.7	593.5
~N(039)		50.24	675.8	593.5
~N(040)		50.25	675.8	593.5
~N(041)		50.25	675.8	593.5
~N(042)		50.24	675.8	593.5
~N(043)		50.24	675.8	593.5
~N(044)		50.24	675.8	593.5
~N(045)		50.25	675.8	593.5
~N(046)		50.25	675.8	593.5
~N(047)		50.25	675.8	593.5
~N(048)		50.25	675.8	593.5
~N(049)		50.25	675.8	593.5
~N(050)		50.25	675.8	593.5
~N(051)		52.16	675.7	589
~N(052)		52.21	675.8	589
~N(053)		52.21	675.8	589
~N(054)		52.21	675.8	589
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~N(064)		52.21	675.8	589
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~N(070)		52.2	675.8	589
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~N(073)		52.18	675.7	589
~N(074)		52.2	675.8	589
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~N(079)		52.21	675.8	589
~N(080)		52.2	675.8	589
~N(081)		52.21	675.8	589
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~N(087)		52.21	675.8	589
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~N(104)		52.21	675.8	589
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~N(112)		57.42	674.7	575.8
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~N(218)	57.41	674.7	575.8
~N(219)	57.4	674.6	575.8
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~N(226)	57.4	674.6	575.8
~N(227)	57.4	674.7	575.8
~N(228)	57.4	674.7	575.8
~N(229)	57.4	674.6	575.8
~N(230)	57.4	674.6	575.8
~N(231)	57.41	674.7	575.8
~N(232)	57.41	674.7	575.8
~N(234)	29.63	389.5	354.9
~N(235)	32.61	391.1	349.9
~N(236)	34.17	389.5	344.4
~N(237)	157.3	674.5	344.4
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~N(244)	54.47	674.6	582.5
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~N(270)	60.55	674.8	591.8
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~N(272)	60.55	674.8	591.8
~N(273)	60.55	674.8	591.8
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~N(319)	53.82	675	584.5
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~N(321)	53.82	675	584.5
~N(322)	53.82	675	584.5
~N(323)	53.82	675.1	584.5
~N(324)	53.82	675.1	584.5
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~N(330)	53.82	675.1	584.5
~N(331)	53.83	675.1	584.5
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~N(339)	53.83	675.1	584.5
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~N(341)	53.83	675.1	584.5
~N(342)	53.83	675.1	584.5
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~N(345)	53.83	675.1	584.5
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~N(348)	53.84	675.1	584.5
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~N(350)	53.84	675.1	584.5
~N(351)	53.84	675.1	584.5
~N(352)	53.84	675.1	584.5
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~N(355)	53.84	675.1	584.5
~N(356)	53.84	675.1	584.5

-N(357)	53.84	675.1	584.5
-N(358)	53.84	675.1	584.5
-N(359)	53.84	675.1	584.5
-N(360)	53.84	675.1	584.5
-N(361)	53.84	675.1	584.5
-N(362)	53.84	675.1	584.5
-N(363)	53.84	675.1	584.5
-N(364)	53.84	675.1	584.5
-N(365)	53.84	675.1	584.5
-N(366)	53.84	675.1	584.5
-N(367)	53.84	675.1	584.5
-N(368)	53.84	675.1	584.5
-N(369)	53.84	675.1	584.5
-N(370)	53.84	675.1	584.5
-N(371)	53.84	675.1	584.5
-N(372)	53.84	675.1	584.5
-N(373)	53.84	675.1	584.5
-N(374)	53.84	675.1	584.5
-N(375)	53.84	675.1	584.5
-N(376)	53.84	675.1	584.5
-N(377)	53.84	675.1	584.5
-N(378)	53.84	675.1	584.5
-N(379)	53.84	675.1	584.5
-N(380)	53.84	675.1	584.5
-N(381)	53.84	675.1	584.5
-N(382)	53.84	675.1	584.5
-N(383)	53.84	675.1	584.5
-N(384)	53.84	675.1	584.5
-N(385)	53.84	675.1	584.5
-N(387)	53.84	675.1	584.5
-N(388)	53.84	675.1	584.5
-N(389)	53.84	675.1	584.5
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-N(392)	60.05	672	567
-N(393)	60.05	672	567
-N(394)	60.05	672	567
-N(395)	60.04	672	567
-N(396)	60.04	672	567
-N(397)	60.04	672	567
-N(398)	60.04	672	567
-N(399)	60.04	672	567
-N(400)	60.04	672	567
-N(401)	60.04	671.9	567
-N(402)	60.04	671.9	567
-N(403)	60.04	671.9	567
-N(404)	60.04	671.9	567
-N(405)	60.03	671.9	567
-N(406)	60.03	671.9	567
-N(407)	60.03	671.9	567
-N(408)	60.03	671.9	567
-N(409)	60.03	671.9	567
-N(410)	60.03	671.9	567
-N(411)	60.03	671.9	567
-N(412)	60.03	671.9	567
-N(413)	60.03	671.9	567
-N(414)	60.03	671.9	567
-N(415)	60.03	671.9	567
-N(416)	60.03	671.9	567
-N(417)	60.02	671.9	567
-N(418)	60.02	671.9	567
-N(419)	60.02	671.9	567
-N(420)	60.02	671.9	567
-N(421)	60.02	671.9	567
-N(422)	60.02	671.9	567
-N(423)	60.02	671.9	567
-N(424)	60.02	671.9	567
-N(425)	60.02	671.9	567
-N(426)	60.02	671.9	567
-N(427)	60.02	671.9	567
-N(428)	60.02	671.9	567
-N(429)	60.02	671.9	567
-N(430)	60.02	671.9	567
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-N(433)	60.02	671.9	567
-N(434)	60.02	671.9	567
-N(435)	60.01	671.9	567
-N(436)	60.01	671.9	567
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-N(438)	60.01	671.9	567
-N(439)	60.01	671.9	567
-N(440)	60.01	671.9	567
-N(441)	60.01	671.9	567
-N(442)	60.01	671.9	567
-N(443)	60.01	671.9	567
-N(444)	60.01	671.9	567
-N(445)	60.01	671.9	567
-N(446)	60.01	671.9	567
-N(447)	60.01	671.9	567
-N(448)	60.01	671.9	567
-N(449)	60.01	671.9	567
-N(450)	60.01	671.9	567
-N(451)	60.01	671.9	567
-N(452)	60.01	671.9	567
-N(453)	60.01	671.9	567
-N(454)	60.01	671.9	567
-N(455)	60.01	671.9	567
-N(456)	60.01	671.9	567
-N(457)	60.01	671.9	567
-N(458)	60.01	671.9	567
-N(459)	60.01	671.9	567
-N(460)	60.01	671.9	567
-N(461)	60.01	671.9	567
-N(462)	60.01	671.9	567
-N(463)	60.01	671.9	567
-N(464)	60.01	671.9	567
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-N(467)	60.01	671.9	567
-N(468)	60.01	671.9	567
-N(469)	60	671.9	567
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-N(473)	60	671.9	567
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-N(476)	60	671.9	567
-N(477)	60	671.9	567
-N(478)	60	671.9	567
-N(479)	60	671.9	567
-N(480)	60	671.9	567
-N(481)	60	671.9	567
-N(482)	60	671.9	567
-N(483)	60	671.9	567
-N(484)	60	671.9	567
-N(485)	60	671.9	567
-N(486)	60	671.9	567
-N(487)	60	671.9	567
-N(488)	60	671.9	567
-N(489)	60	671.9	567
-N(490)	60	671.9	567
-N(491)	60	671.9	567
-N(492)	60	671.9	567
-N(493)	60	671.9	567
-N(494)	60	671.9	567
-N(495)	60	671.9	567
-N(496)	60	671.9	567
-N(497)	60	671.9	567
-N(498)	60	671.9	567
-N(499)	60	671.9	567
-N(500)	60	671.9	567
-N(501)	60	671.9	567
-N(502)	60	671.9	567
-N(503)	29.75	416.6	381.8
-N(504)	28.88	415.8	383
-N(505)	28.82	415.7	383
-N(506)	28.7	415.4	383
-N(507)	28.7	415.4	383
-N(508)	28.82	415.2	383
-N(509)	28.85	415.3	383
-N(512)	36.89	395.2	344.3
-N(513)	24.99	391.1	367.3
-N(514)	28.27	391.1	359.7
-N(515)	28.27	391.1	359.7
-N(516)	25.85	391.1	363.3
-N(517)	24.99	391.1	367.3
-N(518)	21.66	391.1	375
-N(519)	21.66	391.1	375
-N(520)	21.66	391.1	375
-N(521)	21.66	391.1	375
-N(522)	21.66	391.1	375
-N(524)	34.92	391.1	344.3
-N(525)	24.9	391.1	367.5
-N(526)	28.23	391.1	359.8
-N(527)	28.23	391.1	359.8
-N(528)	24.94	391.1	367.4
-N(529)	24.94	391.1	367.4
-N(530)	21.66	391.1	375
-N(531)	21.66	391.1	375
-N(536)	36.89	395.2	344.3
-N(536)	34.92	391.1	344.3
-N(537)	19.93	391.1	379
-N(538)	32.11	415.5	375
-N(539)	19.93	391.1	379
-N(540)	19.93	391.1	379
-N(541)	17.56	391.1	384.5
-N(542)	15.48	391.1	387
-N(544)	17.34	391.1	385
-N(545)	17.6	391.1	384.4

~N(546)		16.89	391.1	386.5
~N(548)		21.74	385.3	379
~N(549)		34.31	395.3	349.9
~N(551)		20.33	382.2	379.2
~N(552)		32.98	382.2	349.9
~N(553)		32.75	391.7	349.9
~N(558)	Isolated	—	—	367.3
~N(559)		36.89	395.2	344.3
~N(560)	Isolated	—	—	367.4
~N(561)		24.94	391.1	367.4
~N(564)		15.4	391.1	389.5
~N(565)		1.573	391.1	421.5
~N(566)		824.5	2292	417.5
~N(569)		15.4	391.1	389.5
~N(570)		836.5	2292	389.5
~N(571)		835.6	2292	391.7
~N(572)		21.66	391.1	375
~N(573)		16.48	391.1	387
~N(574)		3.518	391.1	417
~N(575)		824.8	2292	417
~N(576)		837	2292	388.4
~N(577)		17.56	391.1	384.5
~N(578)		837.2	2292	388
~N(579)		838.8	2292	384.5
~N(580)		1007	2709	413.1
~N(581)		836.4	2292	389.6
~N(583)		1007	2709	413.3
~N(588)		1007	2709	413.3
~N(589)		1007	2709	413.3
~N(590)		31.33	414.8	376.3
~N(591)		31.32	414.8	376.3
~N(592)		35.03	413.5	366.4
~N(593)		34.94	413.4	366.5
~N(595)		31.21	414.5	376.3
~N(596)		35.36	414.2	366.4
~N(598)		31.21	414.5	376.3
~N(600)		1417	3623	377.5
~N(601)		20.37	391.1	378
~N(602)		20.37	391.1	378
~N(603)		833.7	2292	396
~N(605)		1418	3626	377.5
~N(606)		20.37	391.1	378
~N(607)		20.37	391.1	378
~N(610)		833.7	2292	396
~N(613)		1416	3621	377.5
~N(614)		1406	3608	383
~N(615)		1406	3601	380
~N(616)		1385	3592	420.2
~N(618)		30.99	415.2	377.5
~N(619)		35.03	413.5	366.4
~N(621)		33.13	415.2	372.5
~N(622)		32.65	414.5	372.5
~N(624)		33.81	414.7	370.5
~N(625)		32.94	414.7	372.5
~N(626)	Isolated	—	—	366.4
~N(627)		32.7	414.2	372.5
~N(631)		32.94	414.7	372.5
~N(635)		2021	5015	369.8
~N(636)		2018	5009	371.6
~N(638)		2021	5015	369.8
~N(639)		2020	5013	371.5
~N(640)		2018	5010	371.5
~N(642)		2018	5010	371.5
~N(643)		1992	4968	368.3
~N(644)		1983	4954	397.5
~N(645)		1982	4950	396.5
~N(646)		1981	4949	396.5
~N(647)		1953	4881	395
~N(648)		1910	4808	420.1
~N(649)		1951	4868	385
~N(650)		1920	4793	382.4
~N(651)		1542	3917	382.4
~N(652)		836.2	2295	393
~N(654)		1899	4784	423.2
~N(655)		1513	3882	423.2
~N(656)		836.3	2295	383
~N(659)		1924	4806	385.6
~N(660)		1549	3936	386.6
~N(661)		836.2	2295	393
~N(664)		1863	4682	413
~N(665)		1478	3800	413
~N(666)		836.3	2295	383
~N(667)		2013	5005	378.4
~N(669)		2011	5005	382.9
~N(670)		2011	5006	383.9
~N(671)		2010	5006	386.4
~N(672)		19.83	391.1	379
[illegible]		18.48	391.1	387
[illegible]		16.48	391.1	387
[illegible]		1414	3623	383
[illegible]	Isolated	—	—	379
[illegible]		1418	3613	383
[illegible]		2016	5004	370.9
[illegible]		1477	3796	412.9
[illegible]		836.3	2530	397
[illegible]		836.3	2530	397
[illegible]		1504	3800	413
[illegible]		849.2	2576	413
[illegible]		849.1	2576	413
[illegible]		1541	3918	382.4
[illegible]		972.4	2500	384.9
[illegible]		971.4	2500	384.9
[illegible]		1548	3935	385.6
[illegible]		942.6	2535	387.5
[illegible]		942.5	2535	387.5
[illegible]		1362	3532	414.5
[illegible]		1183	3134	414.5
[illegible]		1185	3123	414.5
[illegible]		833.9	2313	414.5
[illegible]		1391	3567	381.4
[illegible]		1216	3182	381.4
[illegible]		1218	3181	381.4
[illegible]		848.7	2312	381.4
[illegible]		848.7	2312	381.4
[illegible]		835.9	2315	414.8
[illegible]		1370	3551	414.8
[illegible]		1183	3142	414.8
[illegible]		1181	3136	414.8
[illegible]		834.1	2312	414.8
[illegible]		834.1	2312	414.8
[illegible]		1389	3568	387
[illegible]		1213	3182	387
[illegible]		1215	3181	387
[illegible]		847.6	2315	387
[illegible]		847.8	2315	387
[illegible]		19.2	391.1	380.7
[illegible]		19.2	391.1	380.7
[illegible]		19.2	391.1	380.7
[illegible]		19.2	391.1	380.7
[illegible]		19.2	391.1	380.7
[illegible]		19.2	391.1	380.7
[illegible]		20.37	391.1	378
[illegible]		20.37	391.1	378
~N(728)		20.37	391.1	378
~N(730)		841.5	2292	378
~N(731)		841.5	2292	378
~N(732)		20.32	391.1	378.1
~N(733)		20.32	391.1	378.1
~N(734)		20.32	391.1	378.1
~N(736)		20.32	391.1	378.1
~N(737)		20.32	391.1	378.1
~N(738)		19.03	391.1	381.1
~N(739)		19.03	391.1	381.1
~N(740)		19.03	391.1	381.1
~N(742)		840.1	2292	381.1
~N(743)		840.1	2292	381.1

Tank List	Surface Pressure	Level	Status	Flow	Pressure	Grade	Elev
Accumulator Tank A	1000	0		0	1000	2709	428.7
Accumulator Tank B	1000	0		0	1000	2709	428.6
Accumulator Tank C	1000	0		0	1000	2709	428.6
Accumulator Tank D	1000	0		0	1000	2709	428.5
Cont. Recirc. Sump A	17.3	11		5363	22.05	385.2	368.2
Cont. Recirc. Sump B	17.3	11		5697	22.05	385.2	368.2
Refueling Water Storage Tank	14.7	24		12117	25.07	418	394

Demand List	Demand Type	Flow	Pressure	Status	Grade	Elev
~N(556)	Flow in	0	152.4		675.5	356.8
~N(557)	Flow in	0	155.2		674.5	349.3
~N(599)	Flow out	30	1426		3633	385.6
~N(604)	Flow out	30	1425		3630	386.6
~N(623)	Flow in	0	33.81		414.7	370.5
~N(633)	Flow in	130	32.94		414.7	372.5
~N(634)	Flow out	65	2023		5019	369.8
~N(637)	Flow out	65	2024		5020	369.8
~N(641)	Flow out	0	2020		5010	367.9
~N(668)	Flow out	0	2013		5005	378.4
~N(679)	Flow out	60	2016		5004	370.8
A1(001)	Spray	3.863	55		668.7	575.4
A1(002)	Spray	3.561	55		669.6	576.3
A1(003)	Spray	3.731	55		669.1	575.8
A1(004)	Spray	3.731	55		669.1	575.8
A1(005)	Spray	3.559	55		669.6	576.3
A1(006)	Spray	3.861	55		668.7	575.4
A1(007)	Spray	3.86	55		668.7	575.4
A1(008)	Spray	3.559	55		669.6	576.3
A1(009)	Spray	3.728	55		669.1	575.8
A1(010)	Spray	3.728	55		669.1	575.8

A1(011)	Spray	3.557	55	669.6	576.3
A1(012)	Spray	3.858	55	668.7	575.4
A1(013)	Spray	3.858	55	668.7	575.4
A1(014)	Spray	3.556	55	669.6	576.3
A1(015)	Spray	3.728	55	669.1	575.8
A1(016)	Spray	3.726	55	669.1	575.8
A1(017)	Spray	3.555	55	669.6	576.3
A1(018)	Spray	3.857	55	668.7	575.4
A1(019)	Spray	3.856	55	668.7	575.4
A1(020)	Spray	3.554	55	669.6	576.3
A1(021)	Spray	3.724	55	669.1	575.8
A1(022)	Spray	3.724	55	669.1	575.8
A1(023)	Spray	3.553	55	669.6	576.3
A1(024)	Spray	3.855	55	668.7	575.4
A1(025)	Spray	3.854	55	668.7	575.4
A1(026)	Spray	3.552	55	669.6	576.3
A1(027)	Spray	3.723	55	669.1	575.8
A1(028)	Spray	3.723	55	669.1	575.8
A1(029)	Spray	3.551	55	669.6	576.3
A1(030)	Spray	3.853	55	668.7	575.4
A1(031)	Spray	3.853	55	668.7	575.4
A1(032)	Spray	3.551	55	669.6	576.3
A1(033)	Spray	3.721	55	669.1	575.8
A1(034)	Spray	3.721	55	669.1	575.8
A1(035)	Spray	3.55	55	669.6	576.3
A1(036)	Spray	3.852	55	668.7	575.4
A1(037)	Spray	3.851	55	668.7	575.4
A1(038)	Spray	3.549	55	669.6	576.3
A1(039)	Spray	3.72	55	669.1	575.8
A1(040)	Spray	3.72	55	669.1	575.8
A1(041)	Spray	3.548	55	669.6	576.3
A1(042)	Spray	3.851	55	668.7	575.4
A1(043)	Spray	3.85	55	668.7	575.4
A1(044)	Spray	3.548	55	669.6	576.3
A1(045)	Spray	3.718	55	669.1	575.8
A1(046)	Spray	3.718	55	669.1	575.8
A1(047)	Spray	3.547	55	669.6	576.3
A1(048)	Spray	3.85	55	668.7	575.4
A1(049)	Spray	3.849	55	668.7	575.4
A1(050)	Spray	3.547	55	669.6	576.3
A1(051)	Spray	3.717	55	669.1	575.8
A1(052)	Spray	3.717	55	669.1	575.8
A1(053)	Spray	3.546	55	669.6	576.3
A1(054)	Spray	3.849	55	668.7	575.4
A1(055)	Spray	3.848	55	668.7	575.4
A1(056)	Spray	3.546	55	669.6	576.3
A1(057)	Spray	3.717	55	669.1	575.8
A1(058)	Spray	3.717	55	669.1	575.8
A1(059)	Spray	3.545	55	669.6	576.3
A1(060)	Spray	3.848	55	668.7	575.4
A1(061)	Spray	3.848	55	668.7	575.4
A1(062)	Spray	3.545	55	669.6	576.3
A1(063)	Spray	3.716	55	669.1	575.8
A1(064)	Spray	3.716	55	669.1	575.8
A1(065)	Spray	3.544	55	669.6	576.3
A1(066)	Spray	3.847	55	668.7	575.4
A1(067)	Spray	3.847	55	668.7	575.4
A1(068)	Spray	3.544	55	669.6	576.3
A1(069)	Spray	3.715	55	669.1	575.8
A1(070)	Spray	3.715	55	669.1	575.8
A1(071)	Spray	3.544	55	669.6	576.3
A1(072)	Spray	3.847	55	668.7	575.4
A1(073)	Spray	3.846	55	668.7	575.4
A1(074)	Spray	3.544	55	669.6	576.3
A1(075)	Spray	3.715	55	669.1	575.8
A1(076)	Spray	3.715	55	669.1	575.8
A1(077)	Spray	3.543	55	669.6	576.3
A1(078)	Spray	3.846	55	668.7	575.4
A1(079)	Spray	3.846	55	668.7	575.4
A1(080)	Spray	3.543	55	669.6	576.3
A1(081)	Spray	3.714	55	669.1	575.8
A1(082)	Spray	3.714	55	669.1	575.8
A1(083)	Spray	3.543	55	669.6	576.3
A1(084)	Spray	3.846	55	668.7	575.4
A1(085)	Spray	3.846	55	668.7	575.4
A1(086)	Spray	3.543	55	669.6	576.3
A1(087)	Spray	3.714	55	669.1	575.8
A1(088)	Spray	3.714	55	669.1	575.8
A1(089)	Spray	3.543	55	669.6	576.3
A1(090)	Spray	3.846	55	668.7	575.4
A1(091)	Spray	3.845	55	668.7	575.4
A1(092)	Spray	3.543	55	669.6	576.3
A1(093)	Spray	3.714	55	669.1	575.8
A1(094)	Spray	3.714	55	669.1	575.8
A1(095)	Spray	3.542	55	669.6	576.3
A1(096)	Spray	3.845	55	668.7	575.4
A1(097)	Spray	3.845	55	668.7	575.4
A1(098)	Spray	3.542	55	669.6	576.3
A1(099)	Spray	3.714	55	669.1	575.8
A1(100)	Spray	3.714	55	669.1	575.8
A1(101)	Spray	3.542	55	669.6	576.3
A1(102)	Spray	3.845	55	668.7	575.4
A1(103)	Spray	3.845	55	668.7	575.4
A1(104)	Spray	3.542	55	669.6	576.3
A1(105)	Spray	3.714	55	669.1	575.8
A1(106)	Spray	3.714	55	669.1	575.8
A1(107)	Spray	3.542	55	669.6	576.3
A1(108)	Spray	3.845	55	668.7	575.4
A1(109)	Spray	3.845	55	668.7	575.4
A1(110)	Spray	3.542	55	669.6	576.3
A1(111)	Spray	3.714	55	669.1	575.8
A1(112)	Spray	3.714	55	669.1	575.8
A1(113)	Spray	3.542	55	669.6	576.3
A1(114)	Spray	3.845	55	668.7	575.4
A1(115)	Spray	3.845	55	668.7	575.4
A1(116)	Spray	3.542	55	669.6	576.3
A1(117)	Spray	3.714	55	669.1	575.8
A1(118)	Spray	3.714	55	669.1	575.8
A1(119)	Spray	3.542	55	669.6	576.3
A1(120)	Spray	3.845	55	668.7	575.4
A2(001)	Spray	4.19	55	682.8	589.5
A2(002)	Spray	3.927	55	682	588.7
A2(003)	Spray	4.015	55	682.3	589
A2(004)	Spray	4.015	55	682.3	589
A2(005)	Spray	3.92	55	682	588.7
A2(006)	Spray	4.186	55	682.8	589.5
A2(007)	Spray	4.185	55	682.8	589.5
A2(008)	Spray	3.919	55	682	588.7
A2(009)	Spray	4.012	55	682.3	589
A2(010)	Spray	4.012	55	682.3	589
A2(011)	Spray	3.917	55	682	588.7
A2(012)	Spray	4.183	55	682.8	589.5
A2(013)	Spray	4.182	55	682.8	589.5
A2(014)	Spray	3.916	55	682	588.7
A2(015)	Spray	4.01	55	682.3	589
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

A3(012)	Spray	5.193	55	686.6	593.3
A3(013)	Spray	5.191	55	686.6	593.3
A3(014)	Spray	5.238	55	686.8	593.5
A3(015)	Spray	5.188	55	686.6	593.3
A3(016)	Spray	5.188	55	686.6	593.3
A3(017)	Spray	5.234	55	686.8	593.5
A3(018)	Spray	5.187	55	686.6	593.3
A3(019)	Spray	5.185	55	686.6	593.3
A3(020)	Spray	5.233	55	686.8	593.5
A3(021)	Spray	5.184	55	686.6	593.3
A3(022)	Spray	5.184	55	686.6	593.3
A3(023)	Spray	5.231	55	686.8	593.5
A3(024)	Spray	5.183	55	686.6	593.3
A3(025)	Spray	5.182	55	686.6	593.3
A3(026)	Spray	5.23	55	686.8	593.5
A3(027)	Spray	5.181	55	686.6	593.3
A3(028)	Spray	5.181	55	686.6	593.3
A3(029)	Spray	5.229	55	686.8	593.5
A3(030)	Spray	5.181	55	686.6	593.3
A3(031)	Spray	5.181	55	686.6	593.3
A3(032)	Spray	5.228	55	686.8	593.5
A3(033)	Spray	5.18	55	686.6	593.3
A3(034)	Spray	5.18	55	686.6	593.3
A3(035)	Spray	5.228	55	686.8	593.5
A3(036)	Spray	5.18	55	686.6	593.3
A3(037)	Spray	5.18	55	686.6	593.3
A3(038)	Spray	5.228	55	686.8	593.5
A3(039)	Spray	5.18	55	686.6	593.3
B1(001)	Spray	5.39	55	660.3	567
B1(002)	Spray	5.39	55	660.3	567
B1(003)	Spray	5.389	55	660.3	567
B1(004)	Spray	5.389	55	660.3	567
B1(005)	Spray	5.388	55	660.3	567
B1(006)	Spray	5.388	55	660.3	567
B1(007)	Spray	5.387	55	660.3	567
B1(008)	Spray	5.387	55	660.3	567
B1(009)	Spray	5.385	55	660.3	567
B1(010)	Spray	5.386	55	660.3	567
B1(011)	Spray	5.384	55	660.3	567
B1(012)	Spray	5.384	55	660.3	567
B1(013)	Spray	5.383	55	660.3	567
B1(014)	Spray	5.383	55	660.3	567
B1(015)	Spray	5.382	55	660.3	567
B1(016)	Spray	5.382	55	660.3	567
B1(017)	Spray	5.381	55	660.3	567
B1(018)	Spray	5.381	55	660.3	567
B1(019)	Spray	5.381	55	660.3	567
B1(020)	Spray	5.381	55	660.3	567
B1(021)	Spray	5.38	55	660.3	567
B1(022)	Spray	5.38	55	660.3	567
B1(023)	Spray	5.379	55	660.3	567
B1(024)	Spray	5.379	55	660.3	567
B1(025)	Spray	5.378	55	660.3	567
B1(026)	Spray	5.378	55	660.3	567
B1(027)	Spray	5.377	55	660.3	567
B1(028)	Spray	5.377	55	660.3	567
B1(029)	Spray	5.376	55	660.3	567
B1(030)	Spray	5.376	55	660.3	567
B1(031)	Spray	5.376	55	660.3	567
B1(032)	Spray	5.376	55	660.3	567
B1(033)	Spray	5.375	55	660.3	567
B1(034)	Spray	5.375	55	660.3	567
B1(035)	Spray	5.374	55	660.3	567
B1(036)	Spray	5.374	55	660.3	567
B1(037)	Spray	5.374	55	660.3	567
B1(038)	Spray	5.374	55	660.3	567
B1(039)	Spray	5.373	55	660.3	567
B1(040)	Spray	5.373	55	660.3	567
B1(041)	Spray	5.373	55	660.3	567
B1(042)	Spray	5.373	55	660.3	567
B1(043)	Spray	5.372	55	660.3	567
B1(044)	Spray	5.372	55	660.3	567
B1(045)	Spray	5.372	55	660.3	567
B1(046)	Spray	5.372	55	660.3	567
B1(047)	Spray	5.371	55	660.3	567
B1(048)	Spray	5.371	55	660.3	567
B1(049)	Spray	5.371	55	660.3	567
B1(050)	Spray	5.371	55	660.3	567
B1(051)	Spray	5.37	55	660.3	567
B1(052)	Spray	5.37	55	660.3	567
B1(053)	Spray	5.37	55	660.3	567
B1(054)	Spray	5.37	55	660.3	567
B1(055)	Spray	5.369	55	660.3	567
B1(056)	Spray	5.369	55	660.3	567
B1(057)	Spray	5.369	55	660.3	567
B1(058)	Spray	5.369	55	660.3	567
B1(059)	Spray	5.369	55	660.3	567
B1(060)	Spray	5.369	55	660.3	567
B1(061)	Spray	5.368	55	660.3	567
B1(062)	Spray	5.368	55	660.3	567
B1(063)	Spray	5.368	55	660.3	567
B1(064)	Spray	5.368	55	660.3	567
B1(065)	Spray	5.368	55	660.3	567
B1(066)	Spray	5.368	55	660.3	567
B1(067)	Spray	5.368	55	660.3	567
B1(068)	Spray	5.368	55	660.3	567
B1(069)	Spray	5.367	55	660.3	567
B1(070)	Spray	5.367	55	660.3	567
B1(071)	Spray	5.367	55	660.3	567
B1(072)	Spray	5.367	55	660.3	567
B1(073)	Spray	5.367	55	660.3	567
B1(074)	Spray	5.367	55	660.3	567
B1(075)	Spray	5.367	55	660.3	567
B1(076)	Spray	5.367	55	660.3	567
B1(077)	Spray	5.367	55	660.3	567
B1(078)	Spray	5.367	55	660.3	567
B1(079)	Spray	5.367	55	660.3	567
B1(080)	Spray	5.367	55	660.3	567
B1(081)	Spray	5.366	55	660.3	567
B1(082)	Spray	5.366	55	660.3	567
B1(083)	Spray	5.366	55	660.3	567
B1(084)	Spray	5.366	55	660.3	567
B1(085)	Spray	5.366	55	660.3	567
B1(086)	Spray	5.366	55	660.3	567
B1(087)	Spray	5.366	55	660.3	567
B1(088)	Spray	5.366	55	660.3	567
B1(089)	Spray	5.366	55	660.3	567
B1(090)	Spray	5.366	55	660.3	567
B1(091)	Spray	[illegible]	55	660.3	567
B1(092)	Spray	[illegible]	55	660.3	567
B1(093)	Spray	[illegible]	55	660.3	567
B1(094)	Spray	[illegible]	55	660.3	567
B1(095)	Spray	[illegible]	55	660.3	567
B1(096)	Spray	[illegible]	55	660.3	567
B1(097)	Spray	[illegible]	55	660.3	567
B1(098)	Spray	[illegible]	55	660.3	567
B1(099)	Spray	[illegible]	55	660.3	567
B1(100)	Spray	[illegible]	55	660.3	567
B1(101)	Spray	[illegible]	55	660.3	567
B1(102)	Spray	[illegible]	55	660.3	567
B1(103)	Spray	[illegible]	55	660.3	567
B1(104)	Spray	[illegible]	55	660.3	567
B1(105)	Spray	[illegible]	55	660.3	567
B1(106)	Spray	[illegible]	55	660.3	567
B1(107)	Spray	[illegible]	55	660.3	567
B1(108)	Spray	[illegible]	55	660.3	567
B1(109)	Spray	[illegible]	55	660.3	567
B1(110)	Spray	[illegible]	55	660.3	567
B1(111)	Spray	[illegible]	55	660.3	567
B1(112)	Spray	[illegible]	55	660.3	567
B2(001)	Spray	[illegible]	55	662.3	[illegible]
B2(002)	Spray	[illegible]	55	662.3	[illegible]
B2(003)	Spray	[illegible]	55	662.3	[illegible]
B2(004)	Spray	[illegible]	55	662.3	[illegible]
B2(005)	Spray	[illegible]	55	662.3	[illegible]
B2(006)	Spray	[illegible]	55	662.3	[illegible]
B2(007)	Spray	[illegible]	55	662.3	[illegible]
B2(008)	Spray	[illegible]	55	662.3	[illegible]
B2(009)	Spray	[illegible]	55	662.3	[illegible]
B2(010)	Spray	[illegible]	55	662.3	[illegible]
B2(011)	Spray	[illegible]	55	662.3	[illegible]
B2(012)	Spray	[illegible]	55	662.3	[illegible]
B2(013)	Spray	[illegible]	55	662.3	[illegible]
B2(014)	Spray	[illegible]	55	662.3	[illegible]
B2(015)	Spray	[illegible]	55	662.3	[illegible]
B2(016)	Spray	[illegible]	55	662.3	[illegible]
B2(017)	Spray	[illegible]	55	662.3	[illegible]
B2(018)	Spray	[illegible]	55	662.3	[illegible]
B2(019)	Spray	[illegible]	55	662.3	[illegible]
B2(020)	Spray	[illegible]	55	662.3	[illegible]
B2(021)	Spray	[illegible]	55	662.3	[illegible]
B2(022)	Spray	[illegible]	55	662.3	[illegible]
B2(023)	Spray	[illegible]	55	662.3	[illegible]
B2(024)	Spray	[illegible]	55	662.3	[illegible]
B2(025)	Spray	[illegible]	55	662.3	[illegible]
B2(026)	Spray	[illegible]	55	662.3	[illegible]
B2(027)	Spray	[illegible]	55	662.3	[illegible]
B2(028)	Spray	[illegible]	55	662.3	[illegible]
B2(029)	Spray	[illegible]	55	662.3	[illegible]
B2(030)	Spray	[illegible]	55	662.3	[illegible]
B2(031)	Spray	[illegible]	55	662.3	[illegible]
B2(032)	Spray	[illegible]	55	662.3	[illegible]
B2(033)	Spray	[illegible]	55	662.3	[illegible]
B2(034)	Spray	[illegible]	55	662.3	[illegible]
B2(035)	Spray	[illegible]	55	662.3	[illegible]
B2(036)	Spray	[illegible]	55	662.3	[illegible]
B2(037)	Spray	[illegible]	55	662.3	[illegible]
B2(038)	Spray	[illegible]	55	662.3	[illegible]
B2(039)	Spray	[illegible]	55	662.3	[illegible]
B2(040)	Spray	[illegible]	55	662.3	[illegible]
B2(041)	Spray	[illegible]	55	662.3	[illegible]

B2(042)	Spray	4 232	55		682.3	589
B2(043)	Spray	4 231	55		682.3	589
B2(044)	Spray	4 231	55		682.3	589
B2(045)	Spray	4 23	55		682.3	589
B2(046)	Spray	4 23	55		682.3	589
B2(047)	Spray	4 23	55		682.3	589
B2(048)	Spray	4 23	55		682.3	589
B2(049)	Spray	4 229	55		682.3	589
B2(050)	Spray	4 229	55		682.3	589
B2(051)	Spray	4 229	55		682.3	589
B2(052)	Spray	4 229	55		682.3	589
B2(053)	Spray	4 228	55		682.3	589
B2(054)	Spray	4 228	55		682.3	589
B2(055)	Spray	4 228	55		682.3	589
B2(056)	Spray	4 228	55		682.3	589
B2(057)	Spray	4 227	55		682.3	589
B2(058)	Spray	4 227	55		682.3	589
B2(059)	Spray	4 227	55		682.3	589
B2(060)	Spray	4 227	55		682.3	589
B2(061)	Spray	4 227	55		682.3	589
B2(062)	Spray	4 227	55		682.3	589
B2(063)	Spray	4 226	55		682.3	589
B2(064)	Spray	4 226	55		682.3	589
B2(065)	Spray	4 226	55		682.3	589
B2(066)	Spray	4 226	55		682.3	589
B2(067)	Spray	4 226	55		682.3	589
B2(068)	Spray	4 226	55		682.3	589
B2(069)	Spray	4 226	55		682.3	589
B2(070)	Spray	4 226	55		682.3	589
B2(071)	Spray	4 226	55		682.3	589
B2(072)	Spray	4 226	55		682.3	589
B2(073)	Spray	4 226	55		682.3	589
B2(074)	Spray	4 226	55		682.3	589
B2(075)	Spray	4.225	55		682.3	589
B2(076)	Spray	4 225	55		682.3	589
B2(077)	Spray	4 225	55		682.3	589
B2(078)	Spray	4.225	55		682.3	589
B2(079)	Spray	4 225	55		682.3	589
B2(080)	Spray	4 225	55		682.3	589
B2(081)	Spray	4 225	55		682.3	589
B2(082)	Spray	4 225	55		682.3	589
B2(083)	Spray	4 225	55		682.3	589
B2(084)	Spray	4 225	55		682.3	589
B2(085)	Spray	4 225	55		682.3	589
B2(086)	Spray	4 225	55		682.3	589
B2(087)	Spray	4 225	55		682.3	589
B2(088)	Spray	4 225	55		682.3	589
B2(089)	Spray	4 225	55		682.3	589
B2(090)	Spray	4 225	55		682.3	589
B3(001)	Spray	4 325	55		682.3	589
B3(002)	Spray	4 325	55		682.3	589
B3(003)	Spray	4 325	55		682.3	589
B3(004)	Spray	4 324	55		682.3	589
B3(005)	Spray	4 324	55		682.3	589
B3(006)	Spray	4 324	55		682.3	589
B3(007)	Spray	4 323	55		682.3	589
B3(008)	Spray	4 323	55		682.3	589
B3(009)	Spray	4 323	55		682.3	589
B3(010)	Spray	4 323	55		682.3	589
B3(011)	Spray	4 322	55		682.3	589
B3(012)	Spray	4 322	55		682.3	589
B3(013)	Spray	4 322	55		682.3	589
B3(014)	Spray	4 322	55		682.3	589
B3(015)	Spray	4 321	55		682.3	589
B3(016)	Spray	4.321	55		682.3	589
B3(017)	Spray	4 321	55		682.3	589
B3(018)	Spray	4 321	55		682.3	589
B3(019)	Spray	4 321	55		682.3	589
B3(020)	Spray	4 321	55		682.3	589
B3(021)	Spray	4.32	55		682.3	589
B3(022)	Spray	4.32	55		682.3	589
B3(023)	Spray	4.32	55		682.3	589
B3(024)	Spray	4 32	55		682.3	589
B3(025)	Spray	4 32	55		682.3	589
B3(026)	Spray	4 32	55		682.3	589
B3(027)	Spray	4 319	55		682.3	589
B3(028)	Spray	4 319	55		682.3	589
B3(029)	Spray	4.319	55		682.3	589
B3(030)	Spray	4 319	55		682.3	589
B3(031)	Spray	4 319	55		682.3	589
B3(032)	Spray	4 319	55		682.3	589
B3(033)	Spray	4 319	55		682.3	589
B3(034)	Spray	4 319	55		682.3	589
B3(035)	Spray	4 319	55		682.3	589
B3(036)	Spray	4 319	55		682.3	589
B3(037)	Spray	4.319	55		682.3	589
B3(038)	Spray	4 319	55		682.3	589
B3(039)	Spray	4 319	55		682.3	589
B3(040)	Spray	4 319	55		682.3	589
B3(041)	Spray	4 319	55		682.3	589
B3(042)	Spray	4 319	55		682.3	589
B3(043)	Spray	4 319	55		682.3	589
B3(044)	Spray	4 319	55		682.3	589
B3(045)	Spray	4 319	55		682.3	589
B3(046)	Spray	4 319	55		682.3	589
B3(047)	Spray	4 319	55		682.3	589
B3(048)	Spray	4 319	55		682.3	589
B3(049)	Spray	4.319	55		682.3	589
B3(050)	Spray	4 319	55		682.3	589
B3(051)	Spray	4.319	55		682.3	589
Cold Leg A(001)	Boundary pressure	117 7	835		2292	393
Cold Leg A(002)	Boundary pressure	107.8	835		2292	393
Cold Leg B(001)	Boundary pressure	117.3	835		2292	393
Cold Leg B(002)	Boundary pressure	107 7	835		2292	393
Cold Leg C(001)	Boundary pressure	116.4	835		2292	393
Cold Leg C(002)	Boundary pressure	107.3	835		2292	393
Cold Leg D(001)	Boundary pressure	116.3	835		2292	393
Cold Leg D(002)	Boundary pressure	107.5	835		2292	393
Hot Leg A(001)	Boundary pressure	—	835	Isolated	—	382 7
Hot Leg A(002)	Boundary pressure	—	835	Isolated	—	393
Hot Leg B(001)	Boundary pressure	—	835	Isolated	—	382 7
Hot Leg B(002)	Boundary pressure	0	835		2292	393
Hot Leg C(001)	Boundary pressure	—	835	Isolated	—	382 7
Hot Leg C(002)	Boundary pressure	—	835	Isolated	—	393
Hot Leg D(001)	Boundary pressure	—	835	Isolated	—	382.7
Hot Leg D(002)	Boundary pressure	0	835		2292	393

Pump List	Operation	Flow	Status	TDH	dP	NPSHa	Suction Pressure	Discharge Pressure	Suction Elev	Discharge Elev
Centrifugal Charging Pump A	Curve	347.2		-4606	-1991	76.56	34 02	2025	368 6	368 7
Centrifugal Charging Pump B	Curve	330.5		-4607	-1990	76 13	33 84	2024	368 6	368 7
Containment Spray Pump A	Curve	—	Off	—	—	—	—	—	346.3	347.3
Containment Spray Pump B	Curve	—	Off	—	—	—	—	—	346.3	347.3
Positive Dis. Charging Pump	Fixed Flow	1 00E-05	Off	—	—	—	—	—	368 7	367 9
Residual Heat Removal Pump A	Curve	—	Off	—	—	—	—	—	346	347.1
Residual Heat Removal Pump B	Curve	—	Off	—	—	—	—	—	346	347.1
Safety Injection Pump A	Curve	278 7		-3220	-1391	78.64	34 92	1426	365 5	366 6
Safety Injection Pump B	Curve	211.6		-3216	-1389	79 53	35.31	1425	365.5	366.6

Component List	Flow	Status	HL	dP	Inlet Pressure	Outlet Pressure	Inlet Elev	Outlet Elev
Residual HX A	—	Off	—	—	—	—	359 7	359 7
Residual HX B	—	Off	—	—	—	—	359 8	359 8

Control List	Type	Set Value	Status	Flow	dP	HL	Inlet Pressure	Outlet Pressure	Elev	Cv	Fp	CMax
~N(562)	FCV	0		0	—	—	156.3	156.3	346 8	—	—	—
~N(563)	FCV	0		0	—	—	151	151	360	—	—	—
~N(681)	FCV	Fully open		117.3	0	0	1005	1005	412 9	—	—	—
~N(685)	FCV	Fully open		117 7	0	0	952 5	952.5	413	—	—	—
~N(689)	FCV	Fully open		116 4	0	0	987.5	987.5	382 4	—	—	—
~N(693)	FCV	Fully open		116.3	0	0	950	950	385.6	—	—	—
~N(699)	FCV	Fully open		107.7	0	0	836	836	414 5	—	—	—
~N(704)	FCV	Fully open		107.3	0	0	848 8	848 8	381 4	—	—	—
~N(711)	FCV	Fully open		107 8	0	0	834 2	834.2	414 9	—	—	—
~N(717)	FCV	Fully open		107 5	0	0	847.7	847.7	387	—	—	—
~N(723)	FCV	Fully open		0	—	—	19 2	19 2	380.7	—	—	—
~N(729)	FCV	Fully open	Closed	—	—	—	—	—	378	—	—	—
~N(735)	FCV	Fully open		0	—	—	20 32	20.32	378 1	—	—	—
~N(741)	FCV	Fully open	Closed	—	—	—	—	—	381.1	—	—	—
CS007A-1	FCV	Fully open		0	—	—	130 7	130 7	407	—	—	—
CS007B-2	FCV	Fully open		0	—	—	133.7	133 7	399	—	—	—

Pipe Specification	Material	Schedule	Roughness	Sizing	Vel Limits	Press Limits	Valve Table
Steel Sch.40 (clean)	Steel	40	0.0018	not specified	—	—	standard
Steel Sch.80 (clean)	Steel	80	0.0018	not specified	—	—	standard
Steel Sch 140 (clean)	Steel	140	0.0018	not specified	—	—	standard
Steel Sch.40S (clean)	Stainless Pipe IPS	40S	0.0018	not specified	—	—	standard
Steel Sch.160 (clean)	Steel	160	0.0018	not specified	—	—	standard
Steel Sch.30 (clean)	Steel	30	0.0018	not specified	—	—	standard
Steel Sch.20 (clean)	Steel	20	0.0018	not specified	—	—	standard

Fluid Zone	Fluid	Temperature	Pressure	Density	Viscosity	k	Pv	Pc
Containment Sump Water	Water	160	14.7	62.24	0.8812	—	0.9486	3196
Water After RHR HX	Water	100	14.7	62.24	0.8812	—	0.9486	3196

UNITS					CALCULATION
Flow Rate	US gpm				Iteration 15
Pressure	psi a	Atm:	14.7	psi a	Deviation percent: 0.007485
Temperature	°F				
Viscosity	cP				
Density	lb/ft³				
Grade	ft				
Length	ft				
Size	in				

Pipe List	Specification	Fluid Zone	Size	Length	K	Status	Flow	Velocity	dP	HL	Tagged	From	To	Inside Dia	Pipe HL	Minor HL	Re	ftp	Valves/Fittings
CS01AA(001)	Steel Sch 30 (clean)	Containment Sump Water	16	12.5	0.445	XXX	—	—	—	—	N	~N(003)	~N(005)	15.25	—	—	—	—	2 x Pipe Bend
CS01AA(002)	Steel Sch 30 (clean)	Containment Sump Water	16	10.6	0.2964		0	0	0	0	N	~N(005)	~N(006)	15.25	0	0	0	0	1 x Reducer
CS01AA(003)	Steel Sch 30 (clean)	Containment Sump Water	14	2	0		0	0	0.864	0	N	~N(006)	Containment Spray Pump A	13.25	0	0	0	0	
CS01AB(001)	Steel Sch 30 (clean)	Containment Sump Water	16	4.3	0.1978	XXX	—	—	—	—	N	~N(236)	~N(237)	15.25	—	—	—	—	1 x Gate - Double Disc
CS01AB(002)	Steel Sch 30 (clean)	Containment Sump Water	16	19.3	1.236		0	0	0	0	N	~N(237)	~N(238)	15.25	0	0	0	0	3 x Elbow - Standard
CS01AB(003)	Steel Sch 30 (clean)	Containment Sump Water	14	2	0		0	0	0.821	0	N	~N(238)	Containment Spray Pump B	13.25	0	0	0	0	
CS02AA(001)	Steel Sch 40 (clean)	Containment Sump Water	8	2	0.05008		0	0	0.432	0	N	Containment Spray Pump A	~N(007)	7.981	0	0	0	0	1 x Reducer - Enlargement
CS02AA(002)	Steel Sch 40 (clean)	Containment Sump Water	10	25.5	2.148		0	0	5.054	0	N	~N(007)	~N(008)	10.02	0	0	0	0	4 x Pipe Bend
CS02AA(003)	Steel Sch 40 (clean)	Containment Sump Water	10	101.5	5.652		0	0	15.03	0	N	~N(008)	~N(009)	10.02	0	0	0	0	1 x FE-CS011
CS02AA(004)	Steel Sch 40 (clean)	Containment Sump Water	10	34.8	0.6713		0	0	5.27	0	N	~N(009)	CS007A-1	10.02	0	0	0	0	3 x Pipe Bend
CS02AA(005)	Steel Sch 40 (clean)	Containment Sump Water	10	63.7	2.55		0	0	9.072	0	N	CS007A-1	~N(001)	10.02	0	0	0	0	6 x Pipe Bend
CS02AA(006)	Steel Sch 40 (clean)	Containment Sump Water	10	155.7	1.261		0	0	63.2	0	N	~N(001)	~N(001A)	10.02	0	0	0	0	6 x Pipe Bend
CS02AB(001)	Steel Sch 40 (clean)	Containment Sump Water	8	2	0.472		0	0	-0.432	0	N	Containment Spray Pump B	~N(239)	7.981	0	0	0	0	1 x Elbow - Standard
CS02AB(002)	Steel Sch 40 (clean)	Containment Sump Water	10	9.9	2.202		0	0	0.216	0	N	~N(239)	~N(240)	10.02	0	0	0	0	2 x Elbow - Standard
CS02AB(003)	Steel Sch 40 (clean)	Containment Sump Water	10	59.1	6.511		0	0	14.9	0	N	~N(240)	~N(241)	10.02	0	0	0	0	4 x Elbow - Standard
CS02AB(004)	Steel Sch 40 (clean)	Containment Sump Water	10	33.8	1.316		0	0	7.646	0	N	~N(241)	CS007B-2	10.02	0	0	0	0	3 x Elbow - Standard
CS02AB(005)	Steel Sch 40 (clean)	Containment Sump Water	10	75.4	3.92		0	0	12.53	0	N	CS007B-2	~N(242)	10.02	0	0	0	0	1 x Elbow - Standard
CS02AB(006)	Steel Sch 40 (clean)	Containment Sump Water	10	144.2	1		0	0	59.18	0	N	~N(242)	~N(243)	10.02	0	0	0	0	1 x CS008B (Check Valve)
CS02AB(007)	Steel Sch 40 (clean)	Containment Sump Water	10	30.8	2.00E-05	<-->	601.7	2.45	-7.536	0.056	N	~N(244)	~N(243)	10.02	0.056	0	278182	0.01828	1 x Diverging Tee (Through)
CS02B	Steel Sch 40 (clean)	Containment Sump Water	8	25.6	0.04216	<-->	444.8	2.854	-5.535	0.087	N	~N(010)	~N(001A)	7.981	0.082	0.005	258078	0.01676	1 x Reducer - Contraction
CS02C	Steel Sch 40 (clean)	Containment Sump Water	6	21.6	0.0533	<-->	203	2.256	-2.893	0.066	N	~N(011)	~N(010)	6.065	0.062	0.004	155042	0.01832	1 x Reducer - Contraction
CS02D(001)	Steel Sch 40 (clean)	Containment Sump Water	4	1.1	0.08157	<-->	101.5	2.56	0.006	0.015	N	~N(012)	~N(011)	4.026	0.007	0.008	116764	0.01978	1 x Reducer - Contraction
CS02D(002)	Steel Sch 40 (clean)	Containment Sump Water	4	1.1	0.08157	<-->	101.5	2.56	0.006	0.015	N	~N(014)	~N(011)	4.026	0.007	0.008	116800	0.01978	1 x Reducer - Contraction
CS02D(003)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	96.27	2.428	0.008	0.019	N	~N(013)	~N(012)	4.026	0.012	0.007	110768	0.01991	1 x Reducer - Contraction
CS02D(004)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	96.25	2.428	0.008	0.019	N	~N(033)	~N(014)	4.026	0.012	0.007	110749	0.01991	1 x Reducer - Contraction
CS02D(005)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	91.06	2.297	0.007	0.017	N	~N(015)	~N(013)	4.026	0.01	0.007	104777	0.02005	1 x Reducer - Contraction
CS02D(006)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	91.04	2.296	0.007	0.017	N	~N(034)	~N(033)	4.026	0.01	0.007	104758	0.02005	1 x Reducer - Contraction
CS02D(007)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	85.81	2.164	0.007	0.015	N	~N(016)	~N(015)	4.026	0.009	0.006	98736	0.02021	1 x Reducer - Contraction
CS02D(008)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	85.84	2.165	0.007	0.015	N	~N(035)	~N(034)	4.026	0.009	0.006	98771	0.02021	1 x Reducer - Contraction
CS02D(009)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	80.61	2.033	0.006	0.013	N	~N(017)	~N(016)	4.026	0.008	0.005	92753	0.02038	1 x Reducer - Contraction
CS02D(010)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	80.59	2.033	0.006	0.013	N	~N(036)	~N(035)	4.026	0.008	0.005	92734	0.02038	1 x Reducer - Contraction
CS02D(011)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	75.41	1.902	0.005	0.012	N	~N(018)	~N(017)	4.026	0.007	0.005	86775	0.02057	1 x Reducer - Contraction
CS02D(012)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	75.4	1.902	0.005	0.012	N	~N(037)	~N(036)	4.026	0.007	0.005	86756	0.02057	1 x Reducer - Contraction
CS02D(013)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	70.17	1.77	0.004	0.01	N	~N(019)	~N(018)	4.026	0.006	0.004	80745	0.02079	1 x Reducer - Contraction
CS02D(014)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	70.2	1.771	0.004	0.01	N	~N(038)	~N(037)	4.026	0.006	0.004	80780	0.02078	1 x Reducer - Contraction
CS02D(015)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	64.98	1.639	0.004	0.009	N	~N(020)	~N(019)	4.026	0.006	0.003	74772	0.02102	1 x Reducer - Contraction
CS02D(016)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	64.97	1.639	0.004	0.009	N	~N(044)	~N(038)	4.026	0.006	0.003	74753	0.02102	1 x Reducer - Contraction
CS02D(017)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	59.79	1.508	0.003	0.008	N	~N(021)	~N(020)	4.026	0.005	0.003	68802	0.02129	1 x Reducer - Contraction
CS02D(018)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	59.78	1.508	0.003	0.008	N	~N(043)	~N(044)	4.026	0.005	0.003	68783	0.02129	1 x Reducer - Contraction
CS02D(019)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	54.56	1.376	0.003	0.006	N	~N(024)	~N(021)	4.026	0.004	0.002	62779	0.0216	1 x Reducer - Contraction
CS02D(020)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	54.59	1.377	0.003	0.006	N	~N(042)	~N(043)	4.026	0.004	0.002	62815	0.0216	1 x Reducer - Contraction
CS02D(021)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	49.37	1.245	0.002	0.005	N	~N(023)	~N(024)	4.026	0.003	0.002	56813	0.02195	1 x Reducer - Contraction
CS02D(022)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	49.36	1.245	0.002	0.005	N	~N(039)	~N(042)	4.026	0.003	0.002	56794	0.02196	1 x Reducer - Contraction
CS02D(023)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	44.19	1.115	0.002	0.004	N	~N(022)	~N(023)	4.026	0.002	0.002	50848	0.02237	1 x Reducer - Contraction
CS02D(024)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	44.17	1.114	0.002	0.004	N	~N(040)	~N(039)	4.026	0.002	0.002	50829	0.02237	1 x Reducer - Contraction
CS02D(025)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	38.96	0.983	0.001	0.003	N	~N(030)	~N(022)	4.026	0.002	0.001	44829	0.02287	1 x Reducer - Contraction
CS02D(026)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	38.99	0.983	0.001	0.003	N	~N(041)	~N(040)	4.026	0.002	0.001	44865	0.02286	1 x Reducer - Contraction
CS02D(027)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	33.78	0.852	0.001	0.003	N	~N(029)	~N(030)	4.026	0.003	0	38867	0.02347	1 x Reducer - Contraction
CS02D(028)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	33.76	0.852	0.001	0.003	N	~N(045)	~N(041)	4.026	0.003	0	38848	0.02347	1 x Reducer - Contraction
CS02D(029)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	28.6	0.721	0	0.002	N	~N(028)	~N(029)	4.026	0.002	0	32905	0.02423	1 x Reducer - Contraction
CS02D(030)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	28.58	0.721	0	0.002	N	~N(046)	~N(045)	4.026	0.002	0	32886	0.02423	1 x Reducer - Contraction
CS02D(031)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	23.37	0.589	0	0.001	N	~N(025)	~N(028)	4.026	0.001	0	26888	0.02523	1 x Reducer - Contraction
CS02D(032)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	23.4	0.59	0	0.001	N	~N(047)	~N(046)	4.026	0.001	0	26924	0.02523	1 x Reducer - Contraction
CS02D(033)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	18.19	0.459	0	0	N	~N(026)	~N(025)	4.026	0	0	20927	0.02662	1 x Reducer - Contraction
CS02D(034)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	18.17	0.458	0	0	N	~N(050)	~N(047)	4.026	0	0	20908	0.02662	1 x Reducer - Contraction
CS02D(035)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	13.01	0.328	0	0	N	~N(027)	~N(026)	4.026	0	0	14966	0.02873	1 x Reducer - Contraction
CS02D(036)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	12.99	0.328	0	0	N	~N(049)	~N(050)	4.026	0	0	14947	0.02874	1 x Reducer - Contraction
CS02D(037)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	7.779	0.196	0	0	N	~N(031)	~N(027)	4.026	0	0	8951	0.03266	1 x Reducer - Contraction
CS02D(038)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	7.81	0.197	0	0	N	~N(048)	~N(049)	4.026	0	0	8986	0.03263	1 x Reducer - Contraction
CS02D(039)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	2.598	0.066	0	0	N	~N(032)	~N(031)	4.026	0	0	2990	0.04498	1 x Reducer - Contraction
CS02D(040)	Steel Sch 40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	2.582	0.065	0	0	N	~N(032)	~N(048)	4.026	0	0	2971	0.04508	1 x Reducer - Contraction
CS02E	Steel Sch 40 (clean)	Containment Sump Water	6	23.3	0.1378	<-->	220.8	2.451	-3.978	0.091	N	~N(245)	~N(244)	6.065	0.078	0.013	168460	0.01813	1 x Reducer - Contraction
CS02F(001)	Steel Sch 40 (clean)	Containment Sump Water	6	1.4	4.3	<-->	110.3	1.226	0.044	0.102	N	~N(246)	~N(245)	6.065	0.002	0.1	84239	0.02	1 x Diverging' Tee (Branch)
CS02F(002)	Steel Sch 40 (clean)	Containment Sump Water	6	1.4	4.3	<-->	110.3	1.225	0.044	0.101	N	~N(247)	~N(245)	6.065	0.001	0.1	84221	0.02	1 x Diverging' Tee (Branch)
CS02F(003)	Steel Sch 40 (clean)	Containment Sump Water	6	2.9	0	<-->	106	1.178	[illegible]	[illegible]	N	[illegible]	[illegible]	6.065	[illegible]	[illegible]	[illegible]	[illegible]	
CS02F(004)	Steel Sch 40 (clean)	Containment Sump Water	6	2.9	0	<-->	105.9	1.177	[illegible]	[illegible]	N	[illegible]	[illegible]	6.065	[illegible]	[illegible]	[illegible]	[illegible]	
CS02F(005)	Steel Sch 40 (clean)	Containment Sump Water	6	2.9	0	<-->	101.4	1.127	[illegible]	[illegible]	N	[illegible]	[illegible]	6.065	[illegible]	[illegible]	[illegible]	[illegible]	
CS02F(006)	Steel Sch 40 (clean)	Containment Sump Water	6	2.9	0	<-->	101.6	1.129	[illegible]	[illegible]	N	[illegible]	[illegible]	6.065	[illegible]	[illegible]	[illegible]	[illegible]	
CS02F(007)	Steel Sch 40 (clean)	Containment Sump Water	6	2.9	0	<-->	97.11	1.079	[illegible]	[illegible]	N	[illegible]	[illegible]	6.065	[illegible]	[illegible]	[illegible]	[illegible]	
CS02F(008)	Steel Sch 40 (clean)	Containment Sump Water	6	2.9	0	<-->	97.29	1.081	[illegible]	[illegible]	N	[illegible]	[illegible]	6.065	[illegible]	[illegible]	[illegible]	[illegible]	
CS02F(009)	Steel Sch 40 (clean)	Containment Sump Water	6	2.9	0	<-->	92.78	1.031	[illegible]	[illegible]	N	[illegible]	[illegible]	6.065	[illegible]	[illegible]	[illegible]	[illegible]	
CS02F(010)	Steel Sch 40 (clean)	Containment Sump Water	6	2.9	0	<-->	92.97	1.033	[illegible]	[illegible]	N	[illegible]	[illegible]	6.065	[illegible]	[illegible]	[illegible]	[illegible]	
CS02F(011)	Steel Sch 40 (clean)	Containment Sump Water	6	2.9	0	<-->	88.46	0.983	[illegible]	[illegible]	N	[illegible]	[illegible]	6.065	[illegible]	[illegible]	[illegible]	[illegible]	

[illegible]																						
CS02J(018)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	156.5	1.74	0.002	0.006	N	-N(317)	-N(313)	6.065	0.006	0	119567	0.01897				
CS02J(019)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	152.3	1.693	0.002	0.005	N	-N(315)	-N(316)	6.065	0.005	0	116324	0.01906				
CS02J(020)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	152.3	1.693	0.002	0.005	N	-N(316)	-N(317)	6.065	0.005	0	116324	0.01905				
CS02J(021)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	148	1.645	0.002	0.005	N	-N(320)	-N(315)	6.065	0.005	0	113062	0.01912				
CS02J(022)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	148	1.645	0.002	0.006	N	-N(319)	-N(318)	6.065	0.005	0	113062	0.01912				
CS02J(023)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	143.8	1.598	0.002	0.005	N	-N(321)	-N(320)	6.065	0.005	0	109841	0.01921				
CS02J(024)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	143.8	1.598	0.002	0.005	N	-N(322)	-N(319)	6.065	0.005	0	109841	0.01921				
CS02J(025)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	139.6	1.551	0.002	0.005	N	-N(323)	-N(321)	6.065	0.005	0	106602	0.01929				
CS02J(026)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	139.6	1.551	0.002	0.006	N	-N(324)	-N(322)	6.065	0.005	0	106602	0.01929				
CS02J(027)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	135.3	1.504	0.002	0.004	N	-N(325)	-N(323)	6.065	0.004	0	103363	0.01938				
CS02J(028)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	135.3	1.504	0.002	0.004	N	-N(326)	-N(324)	6.065	0.004	0	103363	0.01938				
CS02J(029)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	131.1	1.457	0.002	0.004	N	-N(327)	-N(325)	6.065	0.004	0	100125	0.01947				
CS02J(030)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	131.1	1.457	0.002	0.004	N	-N(328)	-N(326)	6.065	0.004	0	100125	0.01947				
CS02J(031)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	126.8	1.41	0.002	0.004	N	-N(329)	-N(327)	6.065	0.004	0	96889	0.01957				
CS02J(032)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	126.8	1.41	0.002	0.004	N	-N(330)	-N(328)	6.065	0.004	0	96889	0.01957				
CS02J(033)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	122.6	1.363	0.002	0.004	N	-N(331)	-N(329)	6.065	0.004	0	93653	0.01967				
CS02J(034)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	122.6	1.363	0.002	0.004	N	-N(332)	-N(330)	6.065	0.004	0	93653	0.01967				
CS02J(035)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	118.4	1.316	0.001	0.003	N	-N(333)	-N(331)	6.065	0.003	0	90418	0.01978				
CS02J(036)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	118.4	1.316	0.001	0.003	N	-N(334)	-N(332)	6.065	0.003	0	90418	0.01978				
CS02J(037)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	114.1	1.269	0.001	0.003	N	-N(335)	-N(333)	6.065	0.003	0	87183	0.01989				
CS02J(038)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	114.1	1.269	0.001	0.003	N	-N(336)	-N(334)	6.065	0.003	0	87183	0.01989				
CS02J(039)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	109.9	1.222	0.001	0.003	N	-N(337)	-N(335)	6.065	0.003	0	83950	0.02001				
CS02J(040)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	109.9	1.222	0.001	0.003	N	-N(338)	-N(336)	6.065	0.003	0	83950	0.02001				
CS02J(041)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	105.7	1.174	0.001	0.003	N	-N(339)	-N(337)	6.065	0.003	0	80717	0.02014				
CS02J(042)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	105.7	1.174	0.001	0.003	N	-N(340)	-N(338)	6.065	0.003	0	80717	0.02014				
CS02J(043)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	101.4	1.127	0.001	0.003	N	-N(341)	-N(339)	6.065	0.003	0	77484	0.02028				
CS02J(044)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	101.4	1.127	0.001	0.003	N	-N(342)	-N(340)	6.065	0.003	0	77484	0.02028				
CS02J(045)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	97.21	1.08	0.001	0.002	N	-N(343)	-N(341)	6.065	0.002	0	74253	0.02042				
CS02J(046)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	97.21	1.08	0.001	0.002	N	-N(344)	-N(342)	6.065	0.002	0	74253	0.02042				
CS02J(047)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	92.98	1.033	0	0.002	N	-N(345)	-N(343)	6.065	0.002	0	71021	0.02057				
CS02J(048)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	92.98	1.033	0	0.002	N	-N(346)	-N(344)	6.065	0.002	0	71021	0.02057				
CS02J(049)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	88.75	0.986	0	0.002	N	-N(347)	-N(345)	6.065	0.002	0	67790	0.02074				
CS02J(050)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	88.75	0.986	0	0.002	N	-N(348)	-N(346)	6.065	0.002	0	67790	0.02074				
CS02J(051)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	84.52	0.939	0	0.002	N	-N(349)	-N(347)	6.065	0.002	0	64560	0.02091				
CS02J(052)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	84.52	0.939	0	0.002	N	-N(350)	-N(348)	6.065	0.002	0	64560	0.02091				
CS02J(053)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	80.29	0.892	0	0.002	N	-N(351)	-N(349)	6.065	0.002	0	61330	0.0211				
CS02J(054)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	80.29	0.892	0	0.002	N	-N(352)	-N(350)	6.065	0.002	0	61330	0.0211				
CS02J(055)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	76.07	0.845	0	0.001	N	-N(353)	-N(351)	6.065	0.001	0	58101	0.02131				
CS02J(056)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	76.07	0.845	0	0.001	N	-N(354)	-N(352)	6.065	0.001	0	58101	0.02131				
CS02J(057)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	71.84	0.798	0	0.001	N	-N(355)	-N(353)	6.065	0.001	0	54871	0.02153				
CS02J(058)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	71.84	0.798	0	0.001	N	-N(356)	-N(354)	6.065	0.001	0	54871	0.02153				
CS02J(059)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	67.61	0.751	0	0.001	N	-N(357)	-N(355)	6.065	0.001	0	51842	0.02177				
CS02J(060)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	67.61	0.751	0	0.001	N	-N(358)	-N(356)	6.065	0.001	0	51842	0.02177				
CS02J(061)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	63.38	0.704	0	0.001	N	-N(359)	-N(357)	6.065	0.001	0	48414	0.02204				
CS02J(062)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	63.38	0.704	0	0.001	N	-N(360)	-N(358)	6.065	0.001	0	48414	0.02204				
CS02J(063)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	59.16	0.657	0	0	N	-N(361)	-N(359)	6.065	0	0	45185	0.02233				
CS02J(064)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	59.16	0.657	0	0	N	-N(362)	-N(360)	6.065	0	0	45185	0.02233				
CS02J(065)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	54.93	0.611	0	0	N	-N(363)	-N(361)	6.065	0	0	41957	0.02265				
CS02J(066)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	54.93	0.611	0	0	N	-N(364)	-N(362)	6.065	0	0	41957	0.02265				
CS02J(067)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	50.7	0.564	0	0	N	-N(365)	-N(363)	6.065	0	0	38729	0.02301				
CS02J(068)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	50.7	0.564	0	0	N	-N(366)	-N(364)	6.065	0	0	38729	0.02301				
CS02J(069)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	46.48	0.517	0	0	N	-N(367)	-N(365)	6.065	0	0	35501	0.02342				
CS02J(070)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	46.48	0.517	0	0	N	-N(368)	-N(366)	6.065	0	0	35501	0.02342				
CS02J(071)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	42.25	0.47	0	0	N	-N(369)	-N(367)	6.065	0	0	32274	0.02388				
CS02J(072)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	42.25	0.47	0	0	N	-N(370)	-N(368)	6.065	0	0	32274	0.02388				
CS02J(073)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	38.03	0.423	0	0	N	-N(371)	-N(369)	6.065	0	0	29046	0.02442				
CS02J(074)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	38.03	0.423	0	0	N	-N(372)	-N(370)	6.065	0	0	29046	0.02442				
CS02J(075)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	33.8	0.376	0	0	N	-N(373)	-N(371)	6.065	0	0	25818	0.02505				
CS02J(076)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	33.8	0.376	0	0	N	-N(374)	-N(372)	6.065	0	0	25818	0.02505				
CS02J(077)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	29.58	0.329	0	0	N	-N(375)	-N(373)	6.065	0	0	22591	0.0258				
CS02J(078)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	29.58	0.329	0	0	N	-N(376)	-N(374)	6.065	0	0	22591	0.0258				
CS02J(079)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	25.35	0.282	0	0	N	-N(377)	-N(375)	6.065	0	0	19364	0.02673				
CS02J(080)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	25.35	0.282	0	0	N	-N(378)	-N(376)	6.065	0	0	19364	0.02673				
CS02J(081)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	21.13	0.235	0	0	N	-N(379)	-N(377)	6.065	0	0	16136	0.02791				
CS02J(082)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	21.13	0.235	0	0	N	-N(380)	-N(378)	6.065	0	0	16136	0.02791				
CS02J(083)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	16.9	0.188	0	0	N	-N(381)	-N(379)	6.065	0	0	12909	0.02948				
CS02J(084)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	16.9	0.188	0	0	N	-N(382)	-N(380)	6.065	0	0	12909	0.02948				
CS02J(085)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	12.68	0.141	0	0	N	-N(383)	-N(381)	6.065	0	0	9682	0.03175				
CS02J(086)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	12.68	0.141	0	0	N	-N(384)	-N(382)	6.065	0	0	9682	0.03175				
CS02J(087)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	8.45	0.094	0	0	N	-N(385)	-N(383)	6.065	0	0	6454	0.03548				
CS02J(088)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	8.45	0.094	0	0	N	-N(387)	-N(384)	6.065	0	0	6454	0.03548				
CS02J(089)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	4.225	0.047	0	0	N	-N(388)	-N(385)	6.065	0	0	3227	0.04374				
CS02J(090)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	4.225	0.047	0	0	N	-N(389)	-N(387)	6.065	0	0	3227	0.04374				
CS02J(091)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0		0	0	0	0	N	-N(389)	-N(388)	6.065	0	0	0.001151	0				
CS02KA	Steel Sch 40 (clean)	Containment Sump Water	10	2	15.8		444.6	1.81	0.998	0.805	N	-N(001A)	-N(112)	10.02	0.002	0.803	205561	0.01892	1 x FX-CS036 (Flow Element)	15.8	1 x Diverging Tee (Branch)	1.00E-05
CS02KB	Steel Sch 40 (clean)	Containment Sump Water	10	2.7	26.1		601.7	2.45	1.916	2.435	N	-N(243)	-N(390)	10.02	0.004	2.431	278182	0.01828	1 x FX-CS038 (Flow Element)	26.1	1 x Diverging Tee (Branch)	1.00E-05
CS02L001	Steel Sch 40 (clean)	Containment Sump Water	8	1.5	0.04216		222.4	1.428	0.001	0.003	N	-N(112)	-N(113)	7.981	0.002	0.001	129096	0.01838	1 x Reducer - Contraction (10 x 8 - 7)	0.04215	1 x Diverging* Tee (Branch)	1.00E-05
CS02L002	Steel Sch 40 (clean)	Containment Sump Water	8	1.5	0.04216		222.2	1.426	0.001	0.003	N	-N(112)	-N(114)	7.981	0.002	0.001	128962	0.01838	1 x Reducer - Contraction (10 x 8 - 7)	0.04215	1 x Diverging* Tee (Branch)	1.00E-05
CS02L003	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		218.5	1.403	0.001	0.003	N	-N(113)	-N(115)	7.981	0.003	0	126854	0.01842				
CS02L004	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		218.7	1.403	0.001	0.003	N	-N(114)	-N(203)	7.981	0.003	0	126915	0.01842				
CS02L005	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		214.8	1.379	0.001	0.002	N	-N(115)	-N(116)	7.981	0.002	0	124689	0.01847				
CS02L006	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		214.8	1.379	0.001	0.002	N	-N(203)	-N(204)	7.981	0.002	0	124749	0.01847				
CS02L007	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		211.3	1.356	0.001	0.002	N	-N(116)	-N(117)	7.981	0.002	0	122623	0.01852				
CS02L008	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		211.1	1.355	0.001	0.002	N	-N(204)	-N(206)	7.981	0.002	0	122506	0.01852				
CS02L009	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		207.4	1.331	0	0.002	N	-N(117)	-N(118)	7.981	0.002	0	120382	0.01857				
CS02L010	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		207.5	1.332	0	0.002	N	-N(206)	-N(205)	7.981	0.002	0	120442	0.01857				
CS02L011	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		203.7	1.307	0	0.002	N	-N(118)	-N(119)	7.981	0.002	0	118219	0.01862				
CS02L012	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		203.8	1.308	0	0.002	N	-N(205)	-N(210)	7.981	0.002	0	118278	0.01862				
CS02L013	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		200.1	1.284	0	0.002	N	-N(119)	-N(120)	7.981	0.002	0	116153	0.01867				
CS02L014	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		199.9	1.283	0	0.002	N	-N(210)	-N(209)	7.981	0.002	0	116039	0.01868				
CS02L015	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		196.3	1.26	0	0.002	N	-N(120)	-N(122)	7.981	0.002	0	113914	0.01873				
CS02L016	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		196.4	1.26	0	0.002	N	-N(209)	-N(207)	7.981	0.002	0	113974	0.01873				
CS02L017	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		192.5	1.236	0	0.002	N	-N(122)	-N(121)	7.981	0.002	0	111751	0.01878				
CS02L018	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		192.6	1.236	0	0.002	N	-N(207)	-N(208)	7.981	0.002	0	111811	0.01878				
CS02L019	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		189	1.213	0	0.002	N	-N(121)	-N(123)	7.981	0.002	0	109688	0.01884				
CS02L020	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		188.8	1.212	0	0.002	N	-N(208)	-N(218)	7.981	0.002	0	109573	0.01884				
CS02L021	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		185.1	1.188	0	0.002	N	-N(123)	-N(124)	7.981	0.002	0	107449	0.0189				
CS02L022	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		185.2	1.189	0	0.002	N	-N(218)	-N(217)	7.981	0.002	0	107510	0.0189				
CS02L023	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		181.4	1.164	0	0.002	N	-N(124)	-N(126)	7.981	0.002	0	105288	0.01896				
CS02L024	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		181.5	1.165	0	0.002	N	-N(217)	-N(215)	7.981	0.002	0	105348	0.01896				
CS02L025	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		177.8	1.141	0	0.002	N	-N(126)	-N(125)	7.981	0.002	0	103225	0.01902				
CS02L026	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		177.6	1.14	0	0.002	N	-N(215)	-N(216)	7.981	0.002	0	103111	0.01903				
CS02L027	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		174	1.117	0	0.002	N	-N(125)	-N(130)	7.981	0.002	0	100988	0.01909				
CS02L028	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		174.1	1.117	0	0.002	N	-N(216)	-N(211)	7.981	0.002	0	101049	0.01909				
CS02L029	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		170.3	1.093	0	0.002	N	-N(130)	-N(129)	7.981	0.002	0	98827	0.01916				
CS02L030	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		170.4	1.093	0	0.002	N	-N(211)	-N(212)	7.981	0.002	0	98888	0.01915				
CS02L031	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		166.7	1.07	0	0.002	N	-N(129)	-N(127)	7.981	0.002	0	96766	0.01922				
CS02L032	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		166.5	1.069	0	0.002	N	-N(212)	-N(214)	7.981	0.002	0	96651	0.01923				
CS02L033	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		162.9	1.045	0	0.001	N	-N(127)	-N(128)	7.981	0.001	0	94530	0.0193				
CS02L034	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		163	1.046	0	0.001	N	-N(214)	-N(213)	7.981	0.001	0	94590	0.01929				
CS02L035	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		159.1	1.021	0	0.001	N	-N(128)	-N(132)	7.981	0.001	0	92370	0.01937				
CS02L036	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		159.2	1.022	0	0.001	N	-N(213)	-N(231)	7.981	0.001	0	92430	0.01937				
CS02L037	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		155.6	0.999	0	0.001	N	-N(132)	-N(131)	7.981	0.001	0	90310	0.01944				
CS02L038	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		155.4	0.997	0	0.001	N	-N(231)	-N(232)	7.981	0.001	0	90195	0.01945				
CS02L039	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		151.7	0.974	0	0.001	N	-N(131)	-N(136)	7.981	0.001	0	88074	0.01952				
CS02L040	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		151.8	0.975	0	0.001	N	-N(232)	-N(227)	7.981	0.001	0	88135	0.01952				
CS02L041	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		148	0.95	0	0.001	N	-N(136)	-N(135)	7.981	0.001	0	85915	0.01961				
CS02L042	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		148.1	0.951	0	0.001	N	-N(227)	-N(228)	7.981	0.001	0	85976	0.0196				
CS02L043	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		144.5	0.927	0	0.001	N	-N(135)	-N(133)	7.981	0.001	0	83856	0.01968				
CS02L044	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		144.3	0.926	0	0.001	N	-N(228)	-N(230)	7.981	0.001	0	83741	0.01969				
CS02L045	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		140.8	0.903	0	0.001	N	-N(133)	-N(134)	7.981	0.001	0	81621	0.01978				
CS02L046	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		140.7	0.903	0	0.001	N	-N(230)	-N(229)	7.981	0.001	0	81681	0.01978				
CS02L047	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		136.9	0.879	0	0.001	N	-N(134)	-N(144)	7.981	0.001	0	79462	0.01987				
CS02L048	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		137	0.879	0	0.001	N	-N(229)	-N(219)	7.981	0.001	0	79523	0.01987				
CS02L049	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		133.4	0.856	0	0.001	N	-N(144)	-N(143)	7.981	0.001	0	77404	0.01996				
CS02L050	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		133.2	0.855	0	0.001	N	-N(219)	-N(220)	7.981	0.001	0	77288	0.01997				
CS02L051	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		129.5	0.831	0	0	N	-N(143)	-N(141)	7.981	0	0	75169	0.02006				
CS02L052	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		129.6	0.832	0	0	N	-N(220)	-N(222)	7.981	0	0	75230	0.02006				
CS02L053	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		125.8	0.807	0	0	N	-N(141)	-N(142)	7.981	0	0	73012	0.02017				
CS02L054	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		125.9	0.808	0	0	N	-N(222)	-N(221)	7.981	0	0	73072	0.02016				
CS02L055	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		122.2	0.785	0	0	N	-N(142)	-N(137)	7.981	0	0	70953	0.02027				
CS02L056	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		122	0.783	0	0	N	-N(221)	-N(226)	7.981	0	0	70838	0.02028				
CS02L057	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		118.4	0.76	0	0	N	-N(137)	-N(138)	7.981	0	0	68720	0.02039				
CS02L058	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		118.5	0.761	0	0	N	-N(226)	-N(225)	7.981	0	0	68780	0.02038				
CS02L059	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		114.7	0.736	0	0	N	-N(138)	-N(140)	7.981	0	0	66562	0.02051				
CS02L060	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		114.8	0.737	0	0	N	-N(225)	-N(223)	7.981	0	0	66623	0.0205				
CS02L061	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		111.1	0.713	0	0	N	-N(140)	-N(139)	7.981	0	0	64505	0.02062				
CS02L062	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		110.9	0.712	0	0	N	-N(223)	-N(224)	7.981	0	0	64389	0.02063				
CS02L063	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		107.3	0.689	0	0	N	-N(139)	-N(145)	7.981	0	0	62271	0.02076				
CS02L064	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		107.4	0.689	0	0	N	-N(224)	-N(175)	7.981	0	0	62332	0.02075				
CS02L065	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		103.6	0.665	0	0	N	-N(145)	-N(146)	7.981	0	0	60114	0.02089				
CS02L066	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		103.7	0.665	0	0	N	-N(175)	-N(176)	7.981	0	0	60175	0.02089				
CS02L067	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		100	0.642	0	0	N	-N(146)	-N(147)	7.981	0	0	58057	0.02103				
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CS02L071	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		92.46	0.593	0	0
CS02L072	Steel Sch.40 (clean)	Containment Sump Water	8	3	0		92.56	0.594	0	0
CS02L073	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		88.92	0.571	0	0
CS02L074	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		88.72	0.569	0	0
CS02L075	Steel Sch.40 (clean)	Containment Sump Water	8	3	0		85.07	0.546	0	0
CS02L076	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		85.17	0.547	0	0
CS02L077	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		81.35	0.522	0	0
CS02L078	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		81.46	0.523	0	0
CS02L079	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		77.81	0.499	0	0
CS02L080	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		77.61	0.498	0	0
CS02L081	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		73.97	0.475	0	0
CS02L082	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		74.07	0.475	0	0
CS02L083	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		70.25	0.451	0	0
CS02L084	Steel Sch.40 (clean)	Containment Sump Water	8	3	0		70.36	0.452	0	0
CS02L085	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		66.71	0.428	0	0
CS02L086	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		66.51	0.427	0	0
CS02L087	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		62.80	0.403	0	0
CS02L088	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		62.97	0.404	0	0
CS02L089	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		59.15	0.38	0	0
CS02L090	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		59.25	0.38	0	0
CS02L091	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		55.61	0.357	0	0
CS02L092	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		55.41	0.356	0	0
CS02L093	Steel Sch.40 (clean)	Containment Sump Water	8	3	0		51.76	0.332	0	0

CV08AA(001)	Steel Sch.160 (clean)	Water After RHR HX	4	2.8	0.4721		387
CV08AA(002)	Steel Sch 160 (clean)	Water After RHR HX	4	4.8	2.875		322
CV08AA(003)	Steel Sch 40 (clean)	Water After RHR HX	4	12.8	0.9047		322
CV08BA(001)	Steel Sch.160 (clean)	Water After RHR HX	4	1.7	0.2361		371.1
CV08BA(002)	Steel Sch.160 (clean)	Water After RHR HX	4	3.7	3.211		306.1
CV08BA(003)	Steel Sch 40 (clean)	Water After RHR HX	4	103.1	3.333		306.1
CV09A(001)	Steel Sch.160 (clean)	Water After RHR HX	4	13.3	5.1		242
CV09A(002)	Steel Sch.160 (clean)	Water After RHR HX	4	23.3	9.156		548.1
CV09D(001)	Steel Sch.160 (clean)	Water After RHR HX	3	2.6	0.2638		80
CV09D(002)	Steel Sch.160 (clean)	Water After RHR HX	3	8.6	12.23		80
CV09D(003)	Steel Sch.160 (clean)	Water After RHR HX	3	23	11.4		80
CV09D(004)	Steel Sch.160 (clean)	Water After RHR HX	3	12.5	1.00E-06		0
CV12AA	Steel Sch 160 (clean)	Water After RHR HX	3	15.8	1.74	XXX	---
CV12AB	Steel Sch.160 (clean)	Water After RHR HX	3	116.7	3.247	XXX	---
CV12B	Steel Sch.160 (clean)	Water After RHR HX	3	0.8	0		0
CV13B	Steel Sch.160 (clean)	Water After RHR HX	3	13.8	2.251		80
CV43A(001)	Steel Sch.160 (clean)	Water After RHR HX	2	92	49.04		0
CV43A(002)	Steel Sch.160 (clean)	Water After RHR HX	2	60.5	1.116		0
CV43A(003)	Steel Sch.160 (clean)	Water After RHR HX	2	117.8	2.151		0
CV43BA/RC16AA	Steel Sch.160 (clean)	Water After RHR HX	2	134.4	15.41	XXX	---
CV43BB/RC16AB	Steel Sch.160 (clean)	Water After RHR HX	2	19	13.29	XXX	---
CV43BC/RC16AC	Steel Sch.160 (clean)	Water After RHR HX	2	59.1	13.46	XXX	---
CV43BD/RC16AD	Steel Sch 160 (clean)	Water After RHR HX	2	51.7	12.9	XXX	---
CV98A	Steel Sch 40 (clean)	Water After RHR HX	8	6.5	0		828.1
CV98BA	Steel Sch 40 (clean)	Water After RHR HX	8	8.8	0.3788		314
CV98BB	Steel Sch 40 (clean)	Water After RHR HX	8	8.8	0.3788		314
CV98C	Steel Sch 40 (clean)	Water After RHR HX	8	6.5	3.2		828.1
CVA1A/SI13C	Steel Sch.40 (clean)	Water After RHR HX	6	22.5	1.621	XXX	---
CVJ4A	Steel Sch.160 (clean)	Water After RHR HX	4	19.8	1.72		548.1
Pipe(002)	Steel Sch.40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	4.19
Pipe(003)	Steel Sch.40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	4.015
Pipe(004)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	3.92
Pipe(006)	Steel Sch.40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	3.922
Pipe(007)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	4.015
Pipe(008)	Steel Sch.40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	4.186
Pipe(009)	Steel Sch.40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	4.165
Pipe(010)	Steel Sch.40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	3.919
Pipe(011)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	4.012
Pipe(012)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	4.012
Pipe(013)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	3.917
Pipe(014)	Steel Sch.40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	4.163
Pipe(015)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	4.162
Pipe(016)	Steel Sch.40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	3.916
Pipe(017)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	4.01
Pipe(018)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	4.01
Pipe(019)	Steel Sch.40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	3.915
Pipe(020)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	4.161
Pipe(021)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	4.161
Pipe(022)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	3.914
Pipe(023)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	4.008
Pipe(024)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	4.008
Pipe(025)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	3.913
Pipe(026)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	4.159
Pipe(027)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	4.159
Pipe(028)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	3.912

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Pipe(159)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.845	1.429	2.397	5.948	N	-N(166)	A1(115)	1.049	0.006	5.942	16981	0.03041	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(160)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.714	1.38	2.397	5.548	N	-N(172)	A1(117)	1.049	0.005	5.543	16400	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(161)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.542	1.316	2.397	6.048	N	-N(173)	A1(119)	1.049	0.005	6.043	15643	0.03087	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(162)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.845	1.429	2.397	5.948	N	-N(174)	A1(120)	1.049	0.006	5.942	16981	0.03041	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(163)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.714	1.38	2.397	5.548	N	-N(202)	A1(118)	1.049	0.005	5.543	16400	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(164)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.542	1.316	2.397	6.048	N	-N(197)	A1(116)	1.049	0.005	6.043	15643	0.03087	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(165)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.845	1.429	2.397	5.948	N	-N(196)	A1(114)	1.049	0.006	5.942	16981	0.03041	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(166)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.714	1.38	2.397	5.548	N	-N(198)	A1(112)	1.049	0.005	5.543	16400	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(167)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.542	1.316	2.397	6.048	N	-N(199)	A1(110)	1.049	0.005	6.043	15643	0.03087	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(168)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.845	1.429	2.397	5.948	N	-N(194)	A1(108)	1.049	0.006	5.942	16981	0.03041	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(169)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.714	1.38	2.397	5.548	N	-N(195)	A1(106)	1.049	0.005	5.543	16400	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(170)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.542	1.316	2.397	6.048	N	-N(193)	A1(104)	1.049	0.005	6.043	15643	0.03087	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(171)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.845	1.429	2.397	5.948	N	-N(192)	A1(102)	1.049	0.006	5.943	16981	0.03041	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(172)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.714	1.38	2.397	5.548	N	-N(200)	A1(100)	1.049	0.005	5.543	16400	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(173)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.542	1.316	2.397	6.048	N	-N(201)	A1(098)	1.049	0.004	6.044	15644	0.03087	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(174)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.845	1.429	2.397	5.949	N	-N(186)	A1(096)	1.049	0.006	5.943	16982	0.03041	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(175)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.714	1.38	2.397	5.549	N	-N(187)	A1(094)	1.049	0.005	5.544	16401	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(176)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.543	1.316	2.397	6.049	N	-N(185)	A1(092)	1.049	0.005	6.044	15645	0.03087	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(177)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.846	1.429	2.397	5.949	N	-N(184)	A1(090)	1.049	0.005	5.944	16982	0.03041	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(178)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.714	1.38	2.397	5.549	N	-N(189)	A1(088)	1.049	0.005	5.544	16402	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(179)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.543	1.316	2.397	6.05	N	-N(188)	A1(086)	1.049	0.005	6.045	15646	0.03087	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(180)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.846	1.429	2.398	5.95	N	-N(190)	A1(084)	1.049	0.006	5.944	16983	0.03041	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(181)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.714	1.38	2.398	5.55	N	-N(191)	A1(082)	1.049	0.005	5.545	16403	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(182)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.543	1.316	2.398	6.051	N	-N(181)	A1(080)	1.049	0.005	6.046	15647	0.03087	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(183)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.846	1.429	2.398	5.951	N	-N(180)	A1(078)	1.049	0.006	5.945	16985	0.03041	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(184)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.715	1.38	2.398	5.551	N	-N(182)	A1(076)	1.049	0.006	5.546	16405	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(185)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.544	1.317	2.398	6.052	N	-N(183)	A1(074)	1.049	0.005	6.047	15649	0.03087	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(186)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.847	1.429	2.399	5.952	N	-N(178)	A1(072)	1.049	0.005	5.947	16987	0.03041	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(187)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.715	1.38	2.399	5.553	N	-N(179)	A1(070)	1.049	0.005	5.548	16407	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(188)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.544	1.317	2.399	6.053	N	-N(177)	A1(068)	1.049	0.004	6.049	15652	0.03086	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(189)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.847	1.429	2.399	5.954	N	-N(176)	A1(066)	1.049	0.006	5.948	16989	0.03041	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(190)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.718	1.381	2.4	5.555	N	-N(175)	A1(064)	1.049	0.006	5.549	16410	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(191)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.731	1.386	2.419	5.599	N	-N(203)	A1(004)	1.049	0.005	5.594	16476	0.03058	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(192)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.861	1.434	2.418	5.997	N	-N(204)	A1(006)	1.049	0.006	5.991	17050	0.03039	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(193)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.559	1.322	2.417	6.095	N	-N(206)	A1(008)	1.049	0.005	6.09	15715	0.03084	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(194)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.728	1.385	2.416	5.592	N	-N(205)	A1(010)	1.049	0.005	5.587	16465	0.03058	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(195)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.859	1.434	2.415	5.99	N	-N(210)	A1(012)	1.049	0.006	5.984	17041	0.03039	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(196)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.556	1.321	2.414	6.088	N	-N(209)	A1(014)	1.049	0.005	6.083	15705	0.03085	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(197)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.726	1.384	2.413	5.586	N	-N(207)	A1(016)	1.049	0.005	5.581	16456	0.03058	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(198)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.857	1.433	2.412	5.984	N	-N(208)	A1(018)	1.049	0.006	5.978	17032	0.03039	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(199)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.554	1.32	2.411	6.082	N	-N(218)	A1(020)	1.049	0.005	6.077	15696	0.03085	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(200)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.724	1.384	2.411	5.58	N	-N(217)	A1(022)	1.049	0.005	5.575	16447	0.03058	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(201)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.855	1.432	2.41	5.978	N	-N(215)	A1(024)	1.049	0.005	5.973	17024	0.03039	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(202)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.552	1.32	2.409	6.076	N	-N(216)	A1(026)	1.049	0.004	6.072	15687	0.03085	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(203)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.723	1.383	2.408	5.575	N	-N(211)	A1(028)	1.049	0.005	5.57	16439	0.03059	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(204)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.853	1.432	2.408	5.973	N	-N(212)	A1(030)	1.049	0.005	5.968	17017	0.0304	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(205)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.551	1.319	2.407	6.072	N	-N(214)	A1(032)	1.049	0.005	6.067	15680	0.03085	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(206)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.721	1.382	2.406	5.57	N	-N(213)	A1(034)	1.049	0.005	5.565	16433	0.03059	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(207)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.852	1.431	2.406	5.969	N	-N(231)	A1(036)	1.049	0.006	5.963	17010	0.0304	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(208)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.549	1.319	2.405	6.067	N	-N(232)	A1(038)	1.049	0.004	6.063	15673	0.03086	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(209)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.72	1.382	2.405	5.566	N	-N(227)	A1(040)	1.049	0.005	5.561	16427	0.03059	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(210)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.851	1.431	2.404	5.965	N	-N(228)	A1(042)	1.049	0.006	5.959	17005	0.0304	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(211)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.548	1.318	2.404	6.064	N	-N(230)	A1(044)	1.049	0.006	6.058	15668	0.03086	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(212)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.718	1.382	2.403	5.563	N	-N(229)	A1(046)	1.049	0.006	5.557	16421	0.03059	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(213)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.85	1.43	2.403	5.961	N	-N(219)	A1(048)	1.049	0.005	5.956	17000	0.0304	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(214)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.547	1.318	2.402	6.06	N	-N(220)	A1(050)	1.049	0.004	6.056	15663	0.03086	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(215)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.717	1.381	2.402	5.559	N	-N(222)	A1(052)	1.049	0.005	5.554	16417	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(216)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.849	1.43	2.401	5.958	N	-N(221)	A1(054)	1.049	0.006	5.953	16996	0.0304	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(217)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.546	1.317	2.401	6.058	N	-N(226)	A1(056)	1.049	0.005	6.053	15658	0.03086	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(218)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.717	1.381	2.401	5.557	N	-N(225)	A1(058)	1.049	0.005	5.552	16413	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(219)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.848	1.43	2.4	5.956	N	-N(223)	A1(060)	1.049	0.005	5.951	16992	0.0304	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(220)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.545	1.317	2.4	6.055	N	-N(224)	A1(062)	1.049	0.004	6.051	15655	0.03086	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(221)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.325	1.607	4.461	7.526	N	B3(001)	-N(246)	1.049	0.007	7.519	19101	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(222)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.533	1.684	4.78	8.265	N	B3(003)	-N(248)	1.049	0.007	8.258	20018	0.02955	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(223)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.325	1.607	4.461	7.526	N	B3(002)	-N(247)	1.049	0.007	7.519	19101	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(224)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.324	1.607	4.46	7.523	N	B3(004)	-N(249)	1.049	0.007	7.516	19098	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(225)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.324	1.606	4.459	7.521	N	B3(005)	-N(250)	1.049	0.007	7.514	19095	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(226)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.324	1.606	4.459	7.521	N	B3(006)	-N(251)	1.049	0.007	7.514	19096	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(227)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.323	1.606	4.458	7.519	N	B3(007)	-N(252)	1.049	0.007	7.512	19092	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(228)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.323	1.606	4.458	7.519	N	B3(008)	-N(253)	1.049	0.007	7.512	19092	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(229)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.323	1.606	4.457	7.517	N	B3(009)	-N(254)	1.049	0.007	7.51	19089	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(230)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.323	1.606	4.457	7.517	N	B3(010)	-N(255)	1.049	0.007	7.51	19089	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(231)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.322	1.606	4.456	7.515	N	B3(011)	-N(256)	1.049	0.007	7.508	19087	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(232)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.322	1.606	4.456	7.515	N	B3(012)	-N(257)	1.049	0.007	7.508	19087	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(233)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.322	1.606	4.455	7.513	N	B3(013)	-N(258)	1.049	0.007	7.506	19086	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(234)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.322	1.606	4.455	7.513	N	B3(014)	-N(259)	1.049	0.006	7.507	19085	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(235)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.321	1.605	4.455	7.512	N	B3(015)	-N(260)	1.049	0.007	7.505	19083	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(236)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.321	1.605	4.455	7.512	N	B3(016)	-N(261)	1.049	0.007	7.505	19083	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(237)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.321	1.605	4.454	7.51	N	B3(017)	-N(262)	1.049	0.006	7.504	19081	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(238)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.321	1.605	4.454	7.511	N	B3(018)	-N(263)	1.049	0.007	7.504	19081	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(239)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.321	1.605	4.454	7.509	N	B3(019)	-N(264)	1.049	0.007	7.502	19080	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(240)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.321	1.605	4.454	7.509	N	B3(020)	-N(265)	1.049	0.007	7.502	19080	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(241)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.32	1.605	4.453	7.508	N	B3(021)	-N(266)	1.049	0.007	7.501	19079	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(242)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.32	1.605	4.453	7.508	N	B3(022)	-N(267)	1.049	0.007	7.501	19079	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(243)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.32	1.605	4.453	7.507	N	B3(023)	-N(268)	1.049	0.007	7.5	19077	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(244)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.32	1.605	4.453	7.507	N	B3(024)	-N(269)	1.049	0.007	7.5	19077	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(245)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.32	1.605	4.452	7.506	N	B3(025)	-N(270)	1.049	0.006	7.5	19076	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(246)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.32	1.605	4.452	7.506	N	B3(026)	-N(271)	1.049	0.006	7.5	19076	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(247)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.605	4.452	7.506	N	B3(027)	-N(272)	1.049	0.007	7.499	19075	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(248)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.605	4.452	7.506	N	B3(028)	-N(273)	1.049	0.007	7.499	19075	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(249)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.605	4.452	7.505	N	B3(029)	-N(274)	1.049	0.007	7.498	19075	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(250)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.605	4.452	7.505	N	B3(030)	-N(275)	1.049	0.007	7.498	19075	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(251)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.605	4.452	7.505	N	B3(031)	-N(276)	1.049	0.007	7.498	19074	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(252)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.605	4.452	7.505	N	B3(032)	-N(277)	1.049	0.007	7.498	19074	0.02978	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(253)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.605	4.451	7.504	N	B3(033)	-N(278)	1.049	0.007	7.497	19073	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(254)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.605	4.451	7.504	N	B3(034)	-N(279)	1.049	0.007	7.497	19073	0.02978	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(255)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.605	4.451	7.504	N	B3(035)	-N(280)	1.049	0.007	7.497	19073	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(256)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.605	4.451	7.504	N	B3(036)	-N(281)	1.049	0.007	7.497	19073	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(257)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.605	4.451	7.503	N	B3(037)	-N(282)	1.049	0.006	7.497	19073	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(258)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.605	4.451	7.503	N	B3(038)	-N(283)	1.049	0.006	7.497	19073	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(259)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.605	4.451	7.503	N	B3(039)	-N(284)	1.049	0.007	7.496	19072	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(260)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.605	4.451	7.503	N	B3(040)	-N(285)	1.049	0.007	7.496	19072	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(261)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.605	4.451	7.503	N	B3(041)	-N(286)	1.049	0.007	7.496	19072	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(262)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.605	4.451	7.503	N	B3(042)	-N(287)	1.049	0.007	7.496	19072	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(263)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.604	4.451	7.503	N	B3(043)	-N(288)	1.049	0.007	7.496	19072	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(264)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.604	4.451	7.503	N	B3(044)	-N(289)	1.049	0.007	7.496	19072	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(265)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.604	4.451	7.503	N	B3(045)	-N(290)	1.049	0.007	7.496	19072	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(266)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.604	4.451	7.503	N	B3(046)	-N(291)	1.049	0.007	7.496	19072	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(267)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.604	4.451	7.503	N	B3(047)	-N(292)	1.049	0.007	7.496	19072	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(268)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.604	4.451	7.503	N	B3(048)	-N(293)	1.049	0.007	7.496	19072	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(269)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.604	4.451	7.503	N	B3(049)	-N(294)	1.049	0.007	7.496	19072	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(270)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.604	4.451	7.503	N	B3(050)	-N(295)	1.049	0.007	7.496	19072	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(271)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.604	4.451	7.503	N	B3(051)	-N(296)	1.049	0.007	7.496	19072	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(272)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.262	1.583	1.212	7.306	N	B2(001)	-N(298)	1.049	0.007	7.299	18820	0.02986	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(273)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.262	1.583	1.212	7.306	N	B2(002)	-N(300)	1.049	0.007	7.299	18820	0.02986	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(274)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.259	1.582	1.209	7.298	N	B2(003)	-N(301)	1.049	0.007	7.291	18810	0.02987	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(275)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.259	1.582	1.209	7.298	N	B2(004)	-N(302)	1.049	0.007	7.291	18810	0.02987	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(276)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.257	1.582	1.206	7.291	N	B2(005)	-N(303)	1.049	0.007	7.284	18800	0.02987	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(277)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.257	1.582	1.206	7.291	N	B2(006)	-N(304)	1.049	0.007	7.284	18800	0.02987	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(278)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.255	1.581	1.202	7.283	N	B2(007)	-N(305)	1.049	0.006	7.277	18791	0.02987	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(279)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.255	1.581	1.202	7.283	N	B2(008)	-N(306)	1.049	0.006	7.277	18791	0.02987	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(280)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.253	1.58	1.199	7.277	N	B2(009)	-N(307)	1.049	0.007	7.27	18782	0.02987	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(281)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.253	1.58	1.199	7.277	N	B2(010)	-N(308)	1.049	0.007	7.27	18782	0.02987	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(282)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.251	1.579	1.197	7.27	N	B2(011)	-N(310)	1.049	0.007	7.263	18773	0.02988	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(283)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.251	1.579	1.197	7.27	N	B2(012)	-N(309)	1.049	0.007	7.263	18773	0.02988	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(284)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.249	1.579	1.194	7.264	N	B2(013)	-N(311)	1.049	0.007	7.257	18765	0.02988	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(285)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.249	1.579	1.194	7.264	N	B2(014)	-N(312)	1.049	0.007	7.257	18765	0.02988	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(286)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.248	1.578	1.191	7.258	N	B2(015)	-N(314)	1.049	0.007	7.251	18758	0.02988	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(287)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.248	1.578	1.191	7.258	N	B2(016)	-N(313)	1.049	0.007	7.251	18758	0.02988	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(288)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.246	1.577	1.189	7.252	N	B2(017)	-N(318)	1.049	0.006	7.246	18750	0.02988	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(289)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.246	1.577	1.189	7.252	N	B2(018)	-N(317)	1.049	0.006	7.246	18750	0.02988	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(290)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.244	1.577	1.187	7.247	N	B2(019)	-N(315)	1.049	0.007	7.24	18744	0.02988	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(291)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.244	1.577	1.187	7.247	N	B2(020)	-N(316)	1.049	0.007	7.24	18744	0.02988	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(292)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.243	1.576	1.184	7.242	N	B2(021)	-N(320)	1.049	0.007	7.235	18737	0.02989	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(293)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.243	1.576	1.184	7.242	N	B2(022)	-N(319)	1.049	0.007	7.235	18737	0.02989	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(294)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.241	1.576	1.182	7.237	N	B2(023)	-N(321)	1.049	0.007	7.23	18731	0.02989	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(295)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.241	1.576	1.182	7.237	N	B2(024)	-N(322)	1.049	0.007	7.23	18731	0.02989	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(296)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.24	1.575	1.18	7.232	N	B2(025)	-N(323)	1.049	0.006	7.226	18725	0.02989	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(297)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.24	1.575	1.18	7.232	N	B2(026)	-N(324)	1.049	0.006	7.226	18725	0.02989	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(298)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.239	1.575	1.179	7.228	N	B2(027)	-N(325)	1.049	0.007	7.221	18719	0.02989	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(299)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.239	1.575	1.179	7.228	N	B2(028)	-N(326)	1.049	0.007	7.221	18719	0.02989	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(300)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.238	1.574	1.177	7.224	N	B2(029)	-N(327)	1.049	0.007	7.217	18714	0.02989	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(301)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.238	1.574	1.177	7.224	N	B2(030)	-N(328)	1.049	0.007	7.217	18714	0.02989	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(302)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.237	1.574	1.175	7.22	N	B2(031)	-N(329)	1.049	0.006	7.214	18709	0.02989	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(303)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.237	1.574	1.175	7.22	N	B2(032)	-N(330)	1.049	0.006	7.214	18709	0.02989	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(304)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.235	1.574	1.174	7.217	N	B2(033)	-N(331)	1.049	0.007	7.21	18704	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(305)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.235	1.574	1.174	7.217	N	B2(034)	-N(332)	1.049	0.007	7.21	18704	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(306)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.234	1.573	1.172	7.213	N	B2(035)	-N(333)	1.049	0.006	7.207	18700	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(307)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.234	1.573	1.172	7.213	N	B2(036)	-N(334)	1.049	0.006	7.207	18700	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(308)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.234	1.573	1.171	7.21	N	B2(037)	-N(335)	1.049	0.006	7.204	18696	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(309)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.234	1.573	1.171	7.21	N	B2(038)	-N(336)	1.049	0.006	7.204	18696	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(310)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.233	1.573	1.17	7.207	N	B2(039)	-N(337)	1.049	0.006	7.201	18692	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(311)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.233	1.573	1.17	7.207	N	B2(040)	-N(338)	1.049	0.006	7.201	18692	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(312)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.232	1.572	1.168	7.204	N	B2(041)	-N(339)	1.049	0.006	7.198	18689	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(313)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.232	1.572	1.168	7.204	N	B2(042)	-N(340)	1.049	0.006	7.198	18689	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(314)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.231	1.572	1.167	7.202	N	B2(043)	-N(341)	1.049	0.007	7.195	18685	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(315)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.231	1.572	1.167	7.202	N	B2(044)	-N(342)	1.049	0.007	7.195	18685	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(316)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.23	1.572	1.166	7.2	N	B2(045)	-N(343)	1.049	0.007	7.193	18682	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(317)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.23	1.572	1.166	7.2	N	B2(046)	-N(344)	1.049	0.007	7.193	18682	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(318)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.23	1.571	1.165	7.197	N	B2(047)	-N(345)	1.049	0.006	7.191	18679	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(319)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.23	1.571	1.165	7.197	N	B2(048)	-N(346)	1.049	0.006	7.191	18679	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(320)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.229	1.571	1.164	7.195	N	B2(049)	-N(347)	1.049	0.006	7.189	18677	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(321)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.229	1.571	1.164	7.195	N	B2(050)	-N(348)	1.049	0.006	7.189	18677	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(322)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.229	1.571	1.164	7.194	N	B2(051)	-N(349)	1.049	0.007	7.187	18675	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(323)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.229	1.571	1.164	7.194	N	B2(052)	-N(350)	1.049	0.007	7.187	18675	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(324)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.228	1.571	1.163	7.192	N	B2(053)	-N(351)	1.049	0.007	7.185	18672	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(325)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.228	1.571	1.163	7.192	N	B2(054)	-N(352)	1.049	0.007	7.185	18672	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(326)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.228	1.571	1.162	7.19	N	B2(055)	-N(353)	1.049	0.006	7.184	18670	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(327)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.228	1.571	1.162	7.19	N	B2(056)	-N(354)	1.049	0.006	7.184	18670	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(328)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.227	1.571	1.162	7.189	N	B2(057)	-N(355)	1.049	0.006	7.183	18669	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(329)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.227	1.571	1.162	7.189	N	B2(058)	-N(356)	1.049	0.006	7.183	18669	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(330)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.227	1.57	1.161	7.188	N	B2(059)	-N(357)	1.049	0.007	7.181	18667	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(331)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.227	1.57	1.161	7.188	N	B2(060)	-N(358)	1.049	0.007	7.181	18667	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(332)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.227	1.57	1.161	7.187	N	B2(061)	-N(359)	1.049	0.007	7.18	18666	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(333)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.227	1.57	1.161	7.187	N	B2(062)	-N(360)	1.049	0.007	7.18	18666	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(334)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.226	1.57	1.16	7.186	N	B2(063)	-N(361)	1.049	0.007	7.179	18665	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(335)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.226	1.57	1.16	7.186	N	B2(064)	-N(362)	1.049	0.007	7.179	18665	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1

Pipe(336)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	4.226	1.57	1.16	7.165	N	B2([illegible])	~N(363)	1.049	0.006	7.179	18653	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(337)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	4.226	1.57	1.16	7.165	N	B2([illegible])	~N(364)	1.049	0.006	7.179	18653	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(338)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	4.225	1.57	1.16	7.164	N	B2([illegible])	~N(365)	1.049	0.006	7.178	18653	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(339)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	4.226	1.57	1.16	7.164	N	B2([illegible])	~N(366)	1.049	0.006	7.178	18653	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(340)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	4.226	1.57	1.159	7.164	N	B2([illegible])	~N(367)	1.049	0.007	7.177	18652	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(341)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	4.226	1.57	1.159	7.164	N	B2([illegible])	~N(368)	1.049	0.007	7.177	18652	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(342)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	4.226	1.57	1.159	7.163	N	B2([illegible])	~N(369)	1.049	0.007	7.177	18651	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(343)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	4.226	1.57	1.159	7.163	N	B2([illegible])	~N(370)	1.049	0.007	7.177	18651	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(344)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	4.226	1.57	1.159	7.163	N	B2([illegible])	~N(371)	1.049	0.007	7.176	18650	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(345)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	4.225	1.57	1.158	7.163	N	B2([illegible])	~N(372)	1.049	0.007	7.176	18650	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(346)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	4.225	1.57	1.158	7.162	N	B2([illegible])	~N(373)	1.049	0.007	7.176	18649	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(347)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	4.225	1.57	1.158	7.162	N	B2([illegible])	~N(374)	1.049	0.007	7.176	18649	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(348)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	4.225	1.57	1.158	7.162	N	B2([illegible])	~N(375)	1.049	0.007	7.176	18648	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(349)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	4.225	1.57	1.158	7.162	N	B2([illegible])	~N(376)	1.049	0.007	7.176	18648	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(350)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	4.225	1.57	1.158	7.162	N	B2([illegible])	~N(377)	1.049	0.007	7.175	18647	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(351)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	4.225	1.57	1.158	7.162	N	B2([illegible])	~N(378)	1.049	0.007	7.175	18647	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(352)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	4.225	1.57	1.158	7.162	N	B2([illegible])	~N(379)	1.049	0.007	7.175	18646	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(353)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	4.225	1.57	1.158	7.162	N	B2([illegible])	~N(380)	1.049	0.007	7.175	18646	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(354)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	4.225	1.57	1.158	7.162	N	B2([illegible])	~N(381)	1.049	0.007	7.175	18645	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(355)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	4.225	1.57	1.158	7.162	N	B2([illegible])	~N(382)	1.049	0.007	7.175	18645	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(356)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	4.225	1.57	1.158	7.162	N	B2([illegible])	~N(383)	1.049	0.007	7.175	18645	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(357)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	4.225	1.57	1.158	7.162	N	B2([illegible])	~N(384)	1.049	0.007	7.175	18644	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(358)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	4.225	1.57	1.158	7.162	N	B2([illegible])	~N(385)	1.049	0.007	7.175	18644	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(359)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	4.225	1.57	1.158	7.162	N	B2([illegible])	~N(387)	1.049	0.007	7.175	18644	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(360)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	4.225	1.57	1.158	7.162	N	B2([illegible])	~N(388)	1.049	0.007	7.175	18644	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(361)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<--->	4.225	1.57	1.158	7.162	N	B2([illegible])	~N(389)	1.049	0.007	7.175	18644	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(362)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.39	2.003	5.049	11.69	N	~N(391)	B1(001)	1.049	0.01	11.68	23804	0.02874	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(363)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.39	2.003	5.049	11.69	N	~N(392)	B1(002)	1.049	0.01	11.68	23804	0.02874	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(364)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.389	2.002	5.047	11.68	N	~N(393)	B1(003)	1.049	0.01	11.67	23798	0.02874	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(365)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.389	2.002	5.047	11.68	N	~N(394)	B1(004)	1.049	0.01	11.67	23798	0.02874	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(366)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.388	2.002	5.045	11.68	N	~N(395)	B1(005)	1.049	0.01	11.67	23793	0.02874	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(367)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.388	2.002	5.045	11.68	N	~N(396)	B1(006)	1.049	0.01	11.67	23793	0.02874	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(368)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.387	2.001	5.042	11.67	N	~N(397)	B1(007)	1.049	0.01	11.66	23788	0.02874	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(369)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.387	2.001	5.042	11.67	N	~N(398)	B1(008)	1.049	0.01	11.66	23788	0.02874	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(370)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.385	2.001	5.04	11.67	N	~N(399)	B1(009)	1.049	0.01	11.66	23783	0.02874	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(371)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.386	2.001	5.04	11.67	N	~N(400)	B1(010)	1.049	0.01	11.66	23783	0.02874	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(372)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.384	2	5.038	11.66	N	~N(401)	B1(011)	1.049	0.01	11.65	23778	0.02874	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(373)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.384	2	5.038	11.66	N	~N(402)	B1(012)	1.049	0.01	11.65	23778	0.02874	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(374)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.383	2	5.036	11.66	N	~N(403)	B1(013)	1.049	0.01	11.65	23774	0.02874	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(375)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.383	2	5.036	11.66	N	~N(404)	B1(014)	1.049	0.01	11.65	23774	0.02874	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(376)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.382	2	5.035	11.65	N	~N(405)	B1(015)	1.049	0.01	11.64	23769	0.02874	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(377)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.382	2	5.035	11.65	N	~N(406)	B1(016)	1.049	0.01	11.64	23769	0.02874	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(378)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.381	1.999	5.033	11.65	N	~N(407)	B1(017)	1.049	0.01	11.64	23765	0.02874	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(379)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.381	1.999	5.033	11.65	N	~N(408)	B1(018)	1.049	0.01	11.64	23765	0.02874	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(380)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.381	1.999	5.031	11.65	N	~N(409)	B1(019)	1.049	0.01	11.64	23761	0.02874	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(381)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.381	1.999	5.031	11.65	N	~N(410)	B1(020)	1.049	0.01	11.64	23761	0.02874	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(382)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.38	1.999	5.029	11.64	N	~N(411)	B1(021)	1.049	0.01	11.63	23757	0.02874	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(383)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.38	1.999	5.029	11.64	N	~N(412)	B1(022)	1.049	0.01	11.63	23757	0.02874	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(384)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.379	1.998	5.028	11.64	N	~N(413)	B1(023)	1.049	0.01	11.63	23754	0.02874	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(385)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.379	1.998	5.028	11.64	N	~N(414)	B1(024)	1.049	0.01	11.63	23754	0.02874	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(386)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.378	1.998	5.026	11.63	N	~N(415)	B1(025)	1.049	0.01	11.62	23750	0.02874	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(387)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.378	1.998	5.026	11.63	N	~N(416)	B1(026)	1.049	0.01	11.62	23750	0.02874	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(388)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.377	1.998	5.025	11.63	N	~N(417)	B1(027)	1.049	0.01	11.62	23747	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(389)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.377	1.998	5.025	11.63	N	~N(418)	B1(028)	1.049	0.01	11.62	23747	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(390)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.376	1.997	5.023	11.63	N	~N(419)	B1(029)	1.049	0.01	11.62	23743	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(391)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.376	1.997	5.023	11.63	N	~N(420)	B1(030)	1.049	0.01	11.62	23743	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(392)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.376	1.997	5.022	11.63	N	~N(421)	B1(031)	1.049	0.02	11.61	23740	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(393)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.376	1.997	5.022	11.63	N	~N(422)	B1(032)	1.049	0.02	11.61	23740	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(394)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.375	1.997	5.021	11.62	N	~N(423)	B1(033)	1.049	0.01	11.61	23737	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(395)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.375	1.997	5.021	11.62	N	~N(424)	B1(034)	1.049	0.01	11.61	23737	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(396)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.374	1.997	5.02	11.62	N	~N(425)	B1(035)	1.049	0.01	11.61	23734	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(397)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.374	1.997	5.02	11.62	N	~N(426)	B1(036)	1.049	0.01	11.61	23734	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(398)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.374	1.996	5.018	11.62	N	~N(427)	B1(037)	1.049	0.01	11.61	23731	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(399)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.374	1.997	5.018	11.62	N	~N(428)	B1(038)	1.049	0.01	11.61	23731	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(400)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.373	1.996	5.017	11.61	N	~N(429)	B1(039)	1.049	0.01	11.6	23729	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(401)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.373	1.996	5.017	11.61	N	~N(430)	B1(040)	1.049	0.01	11.6	23729	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(402)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.373	1.996	5.016	11.61	N	~N(431)	B1(041)	1.049	0.01	11.6	23726	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(403)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.373	1.996	5.016	11.61	N	~N(432)	B1(042)	1.049	0.01	11.6	23726	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(404)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.372	1.996	5.015	11.61	N	~N(433)	B1(043)	1.049	0.01	11.6	23724	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(405)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.372	1.996	5.015	11.61	N	~N(434)	B1(044)	1.049	0.01	11.6	23724	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(406)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.372	1.996	5.014	11.61	N	~N(435)	B1(045)	1.049	0.01	11.6	23722	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(407)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.372	1.996	5.014	11.61	N	~N(436)	B1(046)	1.049	0.01	11.6	23722	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(408)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.371	1.996	5.013	11.61	N	~N(437)	B1(047)	1.049	0.02	11.59	23720	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(409)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.371	1.995	5.013	11.61	N	~N(438)	B1(048)	1.049	0.02	11.59	23720	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(410)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.371	1.995	5.013	11.6	N	~N(439)	B1(049)	1.049	0.01	11.59	23718	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(411)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.37	1.995	5.012	11.6	N	~N(440)	B1(050)	1.049	0.01	11.59	23718	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(412)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.37	1.995	5.012	11.6	N	~N(441)	B1(051)	1.049	0.01	11.59	23716	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(413)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.37	1.995	5.012	11.6	N	~N(442)	B1(052)	1.049	0.01	11.59	23716	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(414)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.37	1.995	5.011	11.6	N	~N(443)	B1(053)	1.049	0.01	11.59	23714	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(415)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.37	1.995	5.011	11.6	N	~N(444)	B1(054)	1.049	0.01	11.59	23714	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(416)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.369	1.995	5.01	11.6	N	~N(445)	B1(055)	1.049	0.01	11.59	23712	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(417)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.369	1.995	5.01	11.6	N	~N(446)	B1(056)	1.049	0.01	11.59	23712	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(418)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.369	1.995	5.01	11.6	N	~N(447)	B1(057)	1.049	0.01	11.59	23711	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(419)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.369	1.995	5.01	11.6	N	~N(448)	B1(058)	1.049	0.01	11.59	23711	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(420)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.369	1.995	5.009	11.59	N	~N(449)	B1(059)	1.049	0.01	11.58	23709	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(421)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.369	1.995	5.009	11.59	N	~N(450)	B1(060)	1.049	0.01	11.58	23709	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(422)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.368	1.995	5.009	11.59	N	~N(451)	B1(061)	1.049	0.01	11.58	23708	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(423)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.368	1.995	5.009	11.59	N	~N(452)	B1(062)	1.049	0.01	11.58	23708	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(424)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.368	1.994	5.008	11.59	N	~N(453)	B1(063)	1.049	0.01	11.58	23707	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(425)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.368	1.994	5.008	11.59	N	~N(454)	B1(064)	1.049	0.01	11.58	23707	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(426)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.368	1.994	5.007	11.59	N	~N(455)	B1(065)	1.049	0.01	11.58	23706	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(427)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.368	1.994	5.007	11.59	N	~N(456)	B1(066)	1.049	0.01	11.58	23706	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(428)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.368	1.994	5.007	11.59	N	~N(457)	B1(067)	1.049	0.01	11.58	23704	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(429)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.368	1.994	5.007	11.59	N	~N(458)	B1(068)	1.049	0.01	11.58	23704	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(430)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.367	1.994	5.007	11.59	N	~N(459)	B1(069)	1.049	0.01	11.58	23703	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(431)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.367	1.994	5.007	11.59	N	~N(460)	B1(070)	1.049	0.01	11.58	23703	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(432)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.367	1.994	5.006	11.59	N	~N(461)	B1(071)	1.049	0.01	11.58	23703	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(433)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.367	1.994	5.006	11.59	N	~N(462)	B1(072)	1.049	0.01	11.58	23703	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(434)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.367	1.994	5.006	11.59	N	~N(463)	B1(073)	1.049	0.01	11.58	23702	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(435)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.367	1.994	5.006	11.59	N	~N(464)	B1(074)	1.049	0.01	11.58	23702	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(436)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.367	1.994	5.006	11.59	N	~N(465)	B1(075)	1.049	0.01	11.58	23701	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(437)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.367	1.994	5.006	11.59	N	~N(466)	B1(076)	1.049	0.01	11.58	23701	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(438)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.367	1.994	5.005	11.59	N	~N(467)	B1(077)	1.049	0.01	11.58	23700	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(439)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.367	1.994	5.005	11.59	N	~N(468)	B1(078)	1.049	0.01	11.58	23700	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(440)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.367	1.994	5.005	11.59	N	~N(469)	B1(079)	1.049	0.01	11.58	23700	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(441)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.367	1.994	5.005	11.59	N	~N(470)	B1(080)	1.049	0.01	11.58	23700	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(442)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.005	11.58	N	~N(471)	B1(081)	1.049	0.01	11.57	23699	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(443)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.005	11.58	N	~N(472)	B1(082)	1.049	0.01	11.57	23699	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(444)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.005	11.58	N	~N(473)	B1(083)	1.049	0.01	11.57	23699	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(445)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.005	11.58	N	~N(474)	B1(084)	1.049	0.01	11.57	23699	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(446)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.004	11.58	N	~N(475)	B1(085)	1.049	0.01	11.57	23698	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(447)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.004	11.58	N	~N(476)	B1(086)	1.049	0.01	11.57	23698	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(448)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.004	11.58	N	~N(477)	B1(087)	1.049	0.01	11.57	23698	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(449)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.004	11.58	N	~N(478)	B1(088)	1.049	0.01	11.57	23698	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(450)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.004	11.58	N	~N(479)	B1(089)	1.049	0.01	11.57	23697	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(451)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.004	11.58	N	~N(480)	B1(090)	1.049	0.01	11.57	23697	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(452)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.004	11.58	N	~N(481)	B1(091)	1.049	0.01	11.57	23697	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(453)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.004	11.58	N	~N(482)	B1(092)	1.049	0.01	11.57	23697	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(454)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.004	11.58	N	~N(483)	B1(093)	1.049	0.01	11.57	23697	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(455)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.004	11.58	N	~N(484)	B1(094)	1.049	0.01	11.57	23697	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(456)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.004	11.58	N	~N(485)	B1(095)	1.049	0.01	11.57	23697	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(457)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.004	11.58	N	~N(486)	B1(096)	1.049	0.01	11.57	23696	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(458)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.004	11.58	N	~N(487)	B1(097)	1.049	0.01	11.57	23696	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(459)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.004	11.58	N	~N(488)	B1(098)	1.049	0.01	11.57	23696	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(460)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.004	11.58	N	~N(489)	B1(099)	1.049	0.01	11.57	23696	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(461)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.004	11.58	N	~N(490)	B1(100)	1.049	0.01	11.57	23696	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(462)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.004	11.58	N	~N(491)	B1(101)	1.049	0.01	11.57	23696	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(463)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.004	11.58	N	~N(492)	B1(102)	1.049	0.01	11.57	23696	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(464)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.004	11.58	N	~N(493)	B1(103)	1.049	0.01	11.57	23696	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(465)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.004	11.58	N	~N(494)	B1(104)	1.049	0.01	11.57	23696	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(466)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.003	11.58	N	~N(495)	B1(105)	1.049	0.01	11.57	23696	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(467)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.003	11.58	N	~N(496)	B1(106)	1.049	0.01	11.57	23696	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(468)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.003	11.58	N	~N(497)	B1(107)	1.049	0.01	11.57	23696	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(469)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.003	11.58	N	~N(498)	B1(108)	1.049	0.01	11.57	23696	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(470)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.003	11.58	N	~N(499)	B1(109)	1.049	0.01	11.57	23696	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(471)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.003	11.58	N	~N(500)	B1(110)	1.049	0.01	11.57	23696	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(472)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.003	11.58	N	~N(501)	B1(111)	1.049	0.01	11.57	23696	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(473)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.366	1.994	5.003	11.58	N	~N(502)	B1(112)	1.049	0.01	11.57	23696	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(474)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.863	1.435	2.42	6.002	N	~N(113)	A1(001)	1.049	0.006	5.996	17058	0.03034	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
RC04AA	Steel Sch 140 (clean)	Water After RHR HX	12	10.3	6.316	XXX	—	—	—	—	N	~N(545)	Hot Leg A(002)	10.5	—	—	—	—	1 x Pipe Bend - r/d 1.5 (90°)	0.1862	1 x Pipe Bend - r/d 1.5 (45°)	0.1318	1 x Diverging Tee (Through)	1.00E-05				
RC04AA/RH01AA	Steel Sch 140 (clean)	Water After RHR HX	12	149.6	2.723	XXX	—	—	—	—	N	~N(548)	~N(546)	10.5	—	—	—	—	13 x Pipe Bend - r/d 1.5 (90°)	0.1862	1 x Pipe Bend - r/d 1.5 (45°)	0.1318	1 x RH8701B-2	0.17				
RC04AB	Steel Sch 140 (clean)	Water After RHR HX	12	9.7	1.118	XXX	—	—	—	—	N	~N(542)	Hot Leg C(002)	10.5	—	—	—	—	1 x Pipe Bend - r/d 1.5 (90°)	0.1862	1 x Pipe Bend - r/d 1.5 (45°)	0.1318	1 x Diverging* Tee (Branch)	0.8				
RC04AB/RH01AB	Steel Sch 140 (clean)	Water After RHR HX	12	148.4	3.227	XXX	—	—	—	—	N	~N(551)	~N(542)	10.5	—	—	—	—	15 x Pipe Bend - r/d 1.5 (90°)	0.1862	2 x Pipe Bend - r/d 1.5 (45°)	0.1318	1 x RH8702B-2	0.17	1 x Diverging* Tee (Branch)	1.00E-05		
RC05AA	Steel Sch 160 (clean)	Water After RHR HX	6	7	2.841		0	0	-1.296	0	N	~N(610)	Hot Leg B(002)	5.187	0	0	0	0	1 x Pipe Bend - r/d 1.5 (90°)	0.2156	1 x SI8949B	2.625						
RC05AB	Steel Sch 160 (clean)	Water After RHR HX	6	12.8	3.556		0	0	1.08	0	N	~N(541)	~N(542)	5.187	0	0	0	0	2 x Pipe Bend - r/d 1.5 (90°)	0.2156	1 x SI8949C (Check Valve)	2.625	1 x Converging Tee (Branch)	0.8				
RC35AA	Steel Sch 160 (clean)	Water After RHR HX	6	7.8	4.056		0	0	0.907	0	N	~N(545)	~N(546)	5.187	0	0	0	0	2 x Pipe Bend - r/d 1.5 (90°)	0.2156	1 x SI8949A (Check Valve)	2.625	1 x Diverging Tee (Branch)	1				
RC35AD	Steel Sch 160 (clean)	Water After RHR HX	6	7	2.841		0	0	-1.296	0	N	~N(603)	Hot Leg D(002)	5.187	0	0	0	0	1 x Pipe Bend - r/d 1.5 (90°)	0.2156	1 x SI8949D	2.625						
RC45AA	Steel Sch 160 (clean)	Water After RHR HX	3	0.6	3.805		137.9	8.189	1.734	4.015	N	~N(656)	Cold Leg A(001)	2.624	0.056	3.959	243488	0.01957	1 x Reducer - Enlargement (3 x 1.5 - 3.5)	3.805								
RC45AB	Steel Sch 160 (clean)	Water After RHR HX	3	0.6	3.805		137.5	8.163	1.723	3.989	N	~N(666)	Cold Leg B(001)	2.624	0.055	3.934	242719	0.01957	1 x Reducer - Enlargement (3 x 1.5 - 3.5)	3.805								
RC45AC	Steel Sch 160 (clean)	Water After RHR HX	3	0.6	3.805		136.4	8.098	1.690	3.926	N	~N(652)	Cold Leg C(001)	2.624	0.055	3.871	240785	0.01958	1 x Reducer - Enlargement (3 x 1.5 - 3.5)	3.805								
RC45AD	Steel Sch 160 (clean)	Water After RHR HX	3	0.6	3.805		136.3	8.092	1.694	3.92	N	~N(661)	Cold Leg D(001)	2.624	0.054	3.866	240608	0.01958	1 x Reducer - Enlargement (3 x 1.5 - 3.5)	3.805								
RH01BA(001)	Steel Sch 40S (clean)	Containment Sump Water	12	81	1.439		0	0	-12.57	0	N	~N(548)	~N(549)	12	0	0	0	0	7 x Pipe Bend - r/d 1.5 (90°)	0.1813	1 x RH8701A-1	0.17	1 x Converging Tee (Through)	1.00E-05				
RH01BA(002)	Steel Sch 40S (clean)	Containment Sump Water	12	1.8	1.00E-05		4480	12.72	0.027	0.062	N	~N(549)	~N(004)	12	0.062	0	0	1.73E+06	0.01376	1 x Converging Tee (Branch)	1.00E-05								
RH01BB(001)	Steel Sch 40S (clean)	Containment Sump Water	12	78.5	1.077		0	0	-12.68	0	N	~N(552)	~N(551)	12	0	0	0	0	5 x Pipe Bend - r/d 1.5 (90°)	0.1813	1 x RH8701A-1	0.17	1 x Converging Tee (Through)	1.00E-05				
RH01BB(002)	Steel Sch 40S (clean)	Containment Sump Water	12	4.5	0.0704		4741	13.46	0.16	0.371	N	~N(553)	~N(552)	12	0.173	0.198	1.83E+06	0.01371	1 x Reducer - Enlargement (16 x 12 - 14)	0.07038	1 x Converging Tee (Branch)	1.00E-05						
RH01BB(003)	Steel Sch 40 (clean)	Containment Sump Water	16	1	0.335		4741	8.814	0.172	0.388	N	~N(553)	~N(235)	15	0.012	0.386	1.46E+06	0.01343	1 x Reducer - Enlargement (12 x 16 - 0)	0.335	1 x Converging Tee (Branch)	1.00E-05						
RH01CA(001)	Steel Sch 40 (clean)	Containment Sump Water	16	8.4	3.623	<--->	4480	8.14	3.886	3.795	N	~N(004)	~N(902)	15	0.071	3.724	1.38E+06	0.01348	1 x Pipe Bend - r/d 1.5 (45°)	0.1229	1 x Diverging* Tee (Branch)	3.5	1 x Converging Tee (Through)	1.00E-05				
RH01CA(002)	Steel Sch 40 (clean)	Containment Sump Water	16	16.2	0.1736		0	0	-2.419	0	N	~N(512)	~N(004)	15	0	0	0	0	1 x Pipe Bend - r/d 1.5 (90°)	0.1736	1 x Converging Tee (Through)	1.00E-05	1 x Diverging* Tee (Branch)	1.00E-05				
RH01CA(003)	Steel Sch 40 (clean)	Containment Sump Water	16	13.2	0.1736		0	0	0	0	N	~N(535)	~N(512)	15	0	0	0	0	1 x Pipe Bend - r/d 1.5 (90°)	0.1736								
RH01CA(004)	Steel Sch 40 (clean)	Containment Sump Water	14	6.8	0.1907		0	0	0.734	0	N	~N(535)	Residual Heat Removal Pump A	13.124	0	0	0	0	1 x Pipe Bend - r/d 1.5 (90°)	0.1782	1 x Reducer - Contraction (16 x 14 - 14)	0.01254						
RH01CB(001)	Steel Sch 40 (clean)	Containment Sump Water	16	6.3	0.9229	<--->	4741	8.814	2.653	1.14	N	~N(235)	~N(234)	15	0.076	1.062	1.46E+06	0.01343	1 x Pipe Bend - r/d 1.5 (45°)	0.1229	1 x Converging Tee (Branch)	1.00E-05	1 x Diverging Tee (Branch)	1.00E-05	1 x Diverging* Tee (Branch)	0.8		
RH01CB(002)	Steel Sch 40 (clean)	Containment Sump Water	16	19.1	0.3472		0	0	-2.419	0	N	~N(236)	~N(235)	15	0	0	0	0	2 x Pipe Bend - r/d 1.5 (90°)	0.1736	1 x Converging Tee (Through)	1.00E-05	1 x Diverging* Tee (Branch)	1.00E-05				
RH01CB(003)	Steel Sch 40 (clean)	Containment Sump Water	16	9.1	0		0	0	0	0	N	~N(536)	~N(236)	15	0	0	0	0										
RH01CB(004)	Steel Sch 40 (clean)	Containment Sump Water	14	5.4	0.1907		0	0	0.734	0	N	~N(536)	Residual Heat Removal Pump B	13.124	0	0	0	0	1 x Pipe Bend - r/d 1.5 (90°)	0.1782	1 x Reducer - Contraction (16 x 14 - 14)	0.01254						
RH02AA(001)	Steel Sch 40 (clean)	Containment Sump Water	8	67.2	5.15	XXX	—	—	—	—	N	Residual Heat Removal Pump A	~N(513)	7.981	—	—	—	—	1 x FE610	1.7	1 x RH8724A (Gate Valve)	0.182	1 x RH8730A (Check Valve)	1.89	7 x Pipe Bend - r/d 1.5 (90°)	0.1969		
RH02AA(002)	Steel Sch 40 (clean)	Containment Sump Water	8	27.2	0.8094		0	0	-3.283	0	N	~N(513)	~N(514)	7.981	0	0	0	0	3 x Pipe Bend - r/d 1.5 (90°)	0.1969	1 x Diverging Tee (Through)	1.00E-05	2 x Pipe Bend - r/d 1.5 (45°)	0.1394				
RH02AA(003)	Steel Sch 40 (clean)	Containment Sump Water	14	1	1.465		0	0	0	0	N	~N(514)	Residual HX A	13.124	0	0	0	0	1 x Reducer - Enlargement (14 x 8 - 13)	1.465								
RH02AB(001)	Steel Sch 40 (clean)	Containment Sump Water	8	129.8	6.02		0	0	8.813	0	N	Residual Heat Removal Pump B	~N(525)	7.981	0	0	0	0	1 x FE611	1.7	1 x RH8724B (Gate Valve)	0.182	1 x RH8730B (Check Valve)	1.89	10 x Pipe Bend - r/d 1.5 (90°)	0.1969	2 x Pipe Bend - r/d 1.5 (45°)	0.1394
RH02AB(002)	Steel Sch 40 (clean)	Containment Sump Water	8	25.8	0.8694		0	0	-3.326	0	N	~N(525)	~N(526)	7.981	0	0	0	0	3 x Pipe Bend - r/d 1.5 (90°)	0.1969	1 x Diverging Tee (Through)	1.00E-05	2 x Pipe Bend - r/d 1.5 (45°)	0.1394				
RH02AB(003)	Steel Sch 40 (clean)	Containment Sump Water	14	1	1.465		0	0	0	0	N	~N(526)	Residual HX B	13.124	0	0	0	0	1 x Reducer - Enlargement (14 x 8 - 13)	1.465								
RH03AA(001)	Steel Sch 40 (clean)	Water After RHR HX	14	1	0.7153		0	0	0	0	N	Residual HX A	~N(515)	13.124	0	0	0	0	1 x Reducer - Contraction (14 x 8 - 13)	0.7153								
RH03AA(002)	Steel Sch 40 (clean)	Water After RHR HX	8	22.4	0.8694		0	0	2.419	0	N	~N(515)	~N(516)	7.981	0	0	0	0	3 x Pipe Bend - r/d 1.5 (90°)	0.1969	2 x Pipe Bend - r/d 1.5 (45°)	0.1394						
RH03AA(003)	Steel Sch 40 (clean)	Water After RHR HX	8	8.1	3.846		0	0	0.864	0	N	~N(516)	~N(517)	7.981	0	0	0	0	2 x Pipe Bend - r/d 1.5 (90°)	0.1969	1 x RH606 (Butterfly Valve)	2.252	1 x Diverging Tee (Through)	1.00E-05	1 x Converging* Tee (Branch)	1.2		
RH03AA(004)	Steel Sch 40 (clean)	Water After RHR HX	8	64.8	2.781		0	0	3.326	0	N	~N(517)	~N(518)	7.981	0	0	0	0	8 x Pipe Bend - r/d 1.5 (90°)	0.1969	1 x FE618	1.9						
RH03AA(005)	Steel Sch 40 (clean)	Water After RHR HX	8	11.3	1.397		0	0	0	0	N	~N(518)	~N(519)	7.981	0	0	0	0	1 x Pipe Bend - r/d 1.5 (90°)	0.1969	1 x Diverging Tee (Through)	1.00E-05	1 x Converging* Tee (Branch)	1.2				
RH03AA(006)	Steel Sch 40 (clean)	Water After RHR HX	8	9.5	11000		0	0	0	0	N	~N(519)	~N(520)	7.981	0	0	0	0	1 x RH8716A-1(Gate Valve)	0.182	1 x Diverging Tee (Through)	1.00E-05	1 x Converging* Tee (Branch)	11000				
RH03AA(007)	Steel Sch 40 (clean)	Water After RHR HX	8	1	0.1909		0	0	0	0	N	~N(521)	~N(520)	7.981	0	0	0	0	1 x Reducer - Enlargement (12 x 8 - 8)	0.1909	1 x Diverging Tee (Through)	1.00E-05						
RH03AA(008)	Steel Sch 40S (clean)	Water After RHR HX	12	1.1	2.00E-05		0	0	0	0	N	~N(522)	~N(521)	12	0	0	0	0	1 x Converging* Tee (Branch)	1.00E-05	1 x Diverging Tee (Through)	1.00E-05						
RH03AB(001)	Steel Sch 40 (clean)	Water After RHR HX	14	1	0.7153		0	0	0	0	N	Residual HX B	~N(527)	13.124	0	0	0	0	1 x Reducer - Contraction (14 x 8 - 13)	0.7153								
RH03AB(002)	Steel Sch 40 (clean)	Water After RHR HX	8	22.9	0.8694		0	0	3.283	0	N	~N(527)	~N(528)	7.981	0	0	0	0	3 x Pipe Bend - r/d 1.5 (90°)	0.1909	2 x Pipe Bend - r/d 1.5 (45°)	0.1394						
RH03AB(003)	Steel Sch 40 (clean)	Water After RHR HX	8	2	3.452		0	0	0	0	N	~N(528)	~N(529)	7.981	0	0	0	0	1 x RH607(Butterfly Valve)	2.252	1 x Diverging Tee (Through)	1.00E-05	1 x Converging* Tee (Branch)	1.2				

RH03AB(004)	Steel Sch 40 (clean)	Water After RHR HX	8	28.9	2.472		0	0	3.283	0	N	~N(529)
RH03AB(005)	Steel Sch 40 (clean)	Water After RHR HX	8	36.3	14000		0	0	0	0	N	~N(530)
RH03AB(006)	Steel Sch 40S (clean)	Water After RHR HX	12	1.5	1.00E-05		0	0	0	0	N	~N(531)
RH09AA(001)	Steel Sch 40 (clean)	Containment Sump Water	8	1	1.00E-05	XXX	—	—	—	—	N	~N(513)
RH09AA(002)	Steel Sch 40 (clean)	Containment Sump Water	8	1	1.00E-05	XXX	—	—	—	—	N	~N(568)
RH09AB(001)	Steel Sch 40 (clean)	Containment Sump Water	8	1	1.00E-05	XXX	—	—	—	—	N	~N(525)
RH09AB(002)	Steel Sch 40 (clean)	Containment Sump Water	8	1	1.00E-05	XXX	—	—	—	—	N	~N(560)
RH10AA(001)	Steel Sch 40 (clean)	Water After RHR HX	3	1	1.00E-05	XXX	—	—	—	—	N	~N(516)
RH10AA(002)	Steel Sch 40 (clean)	Water After RHR HX	3	1	1.00E-05		0	0	0	0	N	~N(559)
RH10AB(001)	Steel Sch 40 (clean)	Water After RHR HX	3	1	1.00E-05	XXX	—	—	—	—	N	~N(526)
RH10AB(002)	Steel Sch 40 (clean)	Water After RHR HX	3	1	1.00E-05		0	0	-9.979	0	N	~N(561)
RH12A/CV89A	Steel Sch 40 (clean)	Water After RHR HX	8	28.6	5.573	XXX	—	—	—	—	N	~N(518)
RH14A	Steel Sch 40 (clean)	Water After RHR HX	8	4.4	1.979	XXX	—	—	—	—	N	~N(520)
SI01A	Steel Sch 40 (clean)	Water After RHR HX	8	28.4	0.9644		0	0	3.450	0	N	~N(530)
SI01B(001)	Steel Sch 20 (clean)	Water After RHR HX	24	113.2	0.3195		10511	7.949	-4.828	1.025	N	Refueling Water Storage Tank
SI01B(002)	Steel Sch 20 (clean)	Water After RHR HX	24	58	0.3195		9849	7.449	0.778	0.596	N	~N(503)
SI01B(003)	Steel Sch 20 (clean)	Water After RHR HX	24	4.6	0.3		5108	3.863	0.033	0.077	N	~N(504)
SI01B(004)	Steel Sch 20 (clean)	Water After RHR HX	24	60.3	0.4524		5108	3.863	0.080	0.199	N	~N(505)
SI01B(005)	Steel Sch 20 (clean)	Water After RHR HX	24	7	2.00E-05		5108	3.863	0.005	0.011	N	~N(506)
SI01B(006)	Steel Sch 20 (clean)	Water After RHR HX	24	2	20.3		628.1	0.475	0.031	0.071	N	~N(507)
SI01B(007)	Steel Sch 20 (clean)	Water After RHR HX	24	1	29.43		628.1	0.475	0.045	0.103	N	~N(509)
SI02A/SIF9A	Steel Sch 40 (clean)	Water After RHR HX	8	26.3	6.968		881.8	4.248	-1.451	2.142	N	~N(503)
SI02BA(001)	Steel Sch 40 (clean)	Water After RHR HX	8	1.7	0.1598		347.8	2.232	0.007	0.016	N	~N(590)

SI82AB/BB	Steel Sch 40 (clean)	Water After RHR HX	12	57.1	4.915	4741	13.6	-7.232	15.36	N	~N(504)	~N(552)	11.938	2.26	14.1	1.84E+06	0.01372	3 x Pipe Bend - r/d 1.5 (90°)	0.1815	1 x BIBS/MS(Check Valve)	1.6	1 x BAM 120(Gate Valve)	0.17	1 x Diverging Tee (Branch)	1.3	1 x Converging Tee (Branch)	1.1
SIA4A	Steel Sch 160 (clean)	Water After RHR HX	8	15.1	1.847	0	0	2.592	0	N	~N(537)	~N(544)	8.613	0	0	0	0	2 x Pipe Bend - r/d 1.5 (90°)	0.2035	1 x SI8841A (Check Valve)	8.84	1 x Diverging Tee (Branch)	1.06E-05	1 x Converging Tee (Through)	0.6		
SIA4B	Steel Sch 160 (clean)	Water After RHR HX	8	65.1	2.11	0	0	-0.259	0	N	~N(544)	~N(545)	8.613	0	0	0	0	8 x Pipe Bend - r/d 1.5 (90°)	0.2035	1 x Pipe Bend - r/d 1.5 (45°)	0.144	1 x Reducer - Contraction (8 x 6 - 8)	0.1344				

Node List	Status	Pressure	Grade	Elev
~N(001)		121.8	675.5	428
~N(001A)		58.42	675.5	574.3
~N(002)		37.37	407.8	355.1
~N(003)		40.31	407.8	348.3
~N(004)		41.26	411.4	349.9
~N(005)		157.8	675.5	344.3
~N(006)		157.8	675.5	344.3
~N(007)		156.1	675.5	348.3
~N(008)		151	675.5	360
~N(009)		136	675.5	394.8
~N(010)		52.85	675.5	587.2
~N(011)		50.19	675.6	593.5
~N(012)		50.2	675.7	593.5
~N(013)		50.2	675.7	593.5
~N(014)		50.2	675.7	593.5
~N(015)		50.21	675.7	593.5
~N(016)		50.22	675.7	593.5
~N(017)		50.22	675.7	593.5
~N(018)		50.23	675.7	593.5
~N(019)		50.23	675.7	593.5
~N(020)		50.24	675.8	593.5
~N(021)		50.24	675.8	593.5
~N(022)		50.25	675.8	593.5
~N(023)		50.24	675.8	593.5
~N(024)		50.24	675.8	593.5
~N(025)		50.25	675.8	593.5
~N(026)		50.25	675.8	593.5
~N(027)		50.25	675.8	593.5
~N(028)		50.25	675.8	593.5
~N(029)		50.25	675.8	593.5
~N(030)		50.25	675.8	593.5
~N(031)		50.25	675.8	593.5
~N(032)		50.25	675.8	593.5
~N(033)		50.2	675.7	593.5
~N(034)		50.21	675.7	593.5
~N(035)		50.22	675.7	593.5
~N(036)		50.23	675.7	593.5
~N(037)		50.23	675.7	593.5
~N(038)		50.22	675.7	593.5
~N(039)		50.24	675.8	593.5
~N(040)		50.25	675.8	593.5
~N(041)		50.25	675.8	593.5
~N(042)		50.24	675.8	593.5
~N(043)		50.24	675.8	593.5
~N(044)		50.24	675.8	593.5
~N(045)		50.25	675.8	593.5
~N(046)		50.25	675.8	593.5
~N(047)		50.25	675.8	593.5
~N(048)		50.25	675.8	593.5
~N(049)		50.25	675.8	593.5
~N(050)		50.25	675.8	593.5
~N(051)		52.18	675.7	589
~N(052)		52.21	675.8	589
~N(053)		52.21	675.8	589
~N(054)		52.21	675.8	589
~N(055)		52.21	675.8	589
~N(056)		52.21	675.8	589
~N(057)		52.21	675.8	589
~N(058)		52.21	675.8	589
~N(059)		52.21	675.8	589
~N(060)		52.21	675.8	589
~N(061)		52.21	675.8	589
~N(062)		52.21	675.8	589
~N(063)		52.21	675.8	589
~N(064)		52.21	675.8	589
~N(065)		52.2	675.8	589
~N(066)		52.2	675.8	589
~N(067)		52.2	675.8	589
~N(068)		52.2	675.8	589
~N(069)		52.2	675.8	589
~N(070)		52.2	675.8	589
~N(071)		52.2	675.8	589
~N(072)		52.2	675.8	589
~N(073)		52.18	675.7	589
~N(074)		52.2	675.8	589
~N(075)		52.2	675.8	589
~N(076)		52.2	675.8	589
~N(077)		52.21	675.8	589
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~N(646)		1785	4494	396.5
~N(647)		1745	4401	395
~N(648)		1691	4301	420.1
~N(649)		1741	4380	385
~N(650)		1698	4279	382.4
~N(651)		1179	3077	382.4
~N(652)		212.7	851.3	393
~N(654)		1678	4268	423.2
~N(655)		1147	3043	423.2
~N(656)		212.7	851.4	393
~N(659)		1706	4297	385.8
~N(660)		1189	3104	385.8
~N(661)		212.7	851.3	393
~N(664)		1825	4142	413
~N(665)		1096	2917	413
~N(666)		212.7	851.4	393
~N(667)		1827	4573	378.4
~N(669)		1825	4573	382.9
~N(670)		1824	4573	383.6
~N(671)		1823	4573	386.4
~N(672)		27.47	408.5	379
~N(673)		24.01	408.5	387
~N(674)		24.01	408.5	387
~N(675)		1339	3449	383
~N(676)	Isolated	—	—	379
~N(677)		1330	3428	383
~N(678)		1829	4571	370.8
~N(680)		1096	2915	412.9
~N(682)		350.3	1174	397
~N(683)		350.3	1174	397
~N(684)		1132	2999	413
~N(686)		370.5	1237	413
~N(687)		370.4	1236	413
~N(688)		1179	3077	382.4
~N(690)		397.5	1289	382.9
~N(691)		396.5	1288	384.9
~N(692)		1188	3102	385.6
~N(694)		357.3	1181	387.5
~N(695)		357.2	1180	387.5
~N(696)		1250	3274	414.5
~N(697)		905	2475	414.5
~N(698)		904.3	2474	414.5
~N(700)		221.5	893.3	414.5
~N(701)		1293	3341	381.4
~N(702)		951.1	2549	381.4
~N(703)		950.4	2547	381.4
~N(705)		233	886.6	381.4
~N(706)		232.9	886.5	381.4
~N(707)		221.5	893.3	414.5
~N(708)		1286	3311	414.9
~N(709)		919.7	2510	414.9
~N(710)		917.2	2504	414.9
~N(712)		218.2	886	414.9
~N(713)		218.2	885.9	414.9
~N(714)		1292	3344	387
~N(715)		948.4	2548	387
~N(716)		947.8	2547	387
~N(718)		233.2	892.7	387
~N(719)		233.1	892.6	387
~N(720)		26.73	408.5	380.7
~N(721)		26.73	408.5	380.7
~N(722)		26.73	408.5	380.7
~N(724)		26.73	408.5	380.7
~N(725)		26.73	408.6	380.7
~N(726)		27.9	408.5	378
~N(727)		27.9	408.5	378
~N(728)		27.9	408.5	378
~N(730)		217.5	847.4	378
~N(731)		217.5	847.4	378
~N(732)		27.85	408.5	378.1
~N(733)		27.85	408.5	378.1
~N(734)		27.85	408.5	378.1
~N(736)		27.85	408.5	378.1
~N(737)		27.85	408.6	378.1
~N(738)		26.56	408.5	381.1
~N(739)		26.56	408.5	381.1
~N(740)		26.56	408.5	381.1
~N(742)		216.1	847.4	381.1
~N(743)		218.1	847.4	381.1

Tank List	Surface Pressure	Level	Status	Flow	Pressure	Grade	Elev
Accumulator Tank A	1000	0		0	1950	2709	429.7
Accumulator Tank B	1000	0		0	1950	2709	429.8
Accumulator Tank C	1000	0		0	1950	2709	429.8
Accumulator Tank D	1000	0		0	1950	2709	429.5
Cont. Recirc. Sump A	25.7	18.8		4490	30.37	404.3	366.2
Cont. Recirc. Sump B	25.7	18.8		4741	30.37	404.5	366.2
Refueling Water Storage Tank	14.7	33.3		10511	28.89	427.3	394

Demand List	Demand Type	Flow	Pressure	Status	Grade	Elev
~N(546)	Flow in	0	152.4		675.3	368.6
~N(547)	Flow in	0	155.2		674.5	349.3
~N(548)	Flow out	30	1304		3466	368.6
~N(604)	Flow out	30	1304		3467	368.6
~N(623)	Flow in	0	36.86		424.5	370.5
~N(633)	Flow in	130	37.16		424.5	372.5
~N(634)	Flow out	65	1836		4566	369.6
~N(637)	Flow out	65	1838		4590	369.6
~N(641)	Flow out	0	1833		4577	367.9
~N(668)	Flow out	0	1827		4573	378.4
~N(678)	Flow out	80	1829		4571	370.8
A1(001)	Spray	3.883	55		866.7	574.4
A1(002)	Spray	3.861	55		856.6	576.2
A1(003)	Spray	3.731	55		866.1	575.8
A1(004)	Spray	3.731	56		866.1	575.8
A1(005)	Spray	3.558	55		866.5	576.3
A1(006)	Spray	3.861	55		866.7	575.4
A1(007)	Spray	2.95	56		866.7	575.4
A1(008)	Spray	3.559	56		866.6	576.3
A1(009)	Spray	3.729	55		866.1	575.9
A1(010)	Spray	3.729	55		866.1	575.8

A1(011)	Spray	3.557	55	669.6	576.3
A1(012)	Spray	3.859	55	668.7	575.4
A1(013)	Spray	3.858	55	668.7	575.4
A1(014)	Spray	3.556	55	669.6	576.3
A1(015)	Spray	3.726	55	669.1	575.8
A1(016)	Spray	3.726	55	669.1	575.8
A1(017)	Spray	3.556	55	669.6	576.3
A1(018)	Spray	3.857	55	668.7	575.4
A1(019)	Spray	3.856	55	668.7	575.4
A1(020)	Spray	3.554	55	669.6	576.3
A1(021)	Spray	3.724	55	669.1	575.8
A1(022)	Spray	3.724	55	669.1	575.8
A1(023)	Spray	3.553	55	669.6	576.3
A1(024)	Spray	3.855	55	668.7	575.4
A1(025)	Spray	3.854	55	668.7	575.4
A1(026)	Spray	3.552	55	669.6	576.3
A1(027)	Spray	3.723	55	669.1	575.8
A1(028)	Spray	3.723	55	669.1	575.8
A1(029)	Spray	3.551	55	669.6	576.3
A1(030)	Spray	3.853	55	668.7	575.4
A1(031)	Spray	3.853	55	668.7	575.4
A1(032)	Spray	3.551	55	669.6	576.3
A1(033)	Spray	3.721	55	669.1	575.8
A1(034)	Spray	3.721	55	669.1	575.8
A1(035)	Spray	3.55	55	669.6	576.3
A1(036)	Spray	3.852	55	668.7	575.4
A1(037)	Spray	3.851	55	668.7	575.4
A1(038)	Spray	3.549	55	669.6	576.3
A1(039)	Spray	3.72	55	669.1	575.8
A1(040)	Spray	3.72	55	669.1	575.8
A1(041)	Spray	3.548	55	669.6	576.3
A1(042)	Spray	3.851	55	668.7	575.4
A1(043)	Spray	3.85	55	668.7	575.4
A1(044)	Spray	3.548	55	669.6	576.3
A1(045)	Spray	3.718	55	669.1	575.8
A1(046)	Spray	3.718	55	669.1	575.8
A1(047)	Spray	3.547	55	669.6	576.3
A1(048)	Spray	3.85	55	668.7	575.4
A1(049)	Spray	3.849	55	668.7	575.4
A1(050)	Spray	3.547	55	669.6	576.3
A1(051)	Spray	3.717	55	669.1	575.8
A1(052)	Spray	3.717	55	669.1	575.8
A1(053)	Spray	3.546	55	669.6	576.3
A1(054)	Spray	3.849	55	668.7	575.4
A1(055)	Spray	3.848	55	668.7	575.4
A1(056)	Spray	3.546	55	669.6	576.3
A1(057)	Spray	3.717	55	669.1	575.8
A1(058)	Spray	3.717	55	669.1	575.8
A1(059)	Spray	3.545	55	669.6	576.3
A1(060)	Spray	3.848	55	668.7	575.4
A1(061)	Spray	3.848	55	668.7	575.4
A1(062)	Spray	3.545	55	669.6	576.3
A1(063)	Spray	3.716	55	669.1	575.8
A1(064)	Spray	3.716	55	669.1	575.8
A1(065)	Spray	3.544	55	669.6	576.3
A1(066)	Spray	3.847	55	668.7	575.4
A1(067)	Spray	3.847	55	668.7	575.4
A1(068)	Spray	3.544	55	669.6	576.3
A1(069)	Spray	3.715	55	669.1	575.8
A1(070)	Spray	3.715	55	669.1	575.8
A1(071)	Spray	3.544	55	669.6	576.3
A1(072)	Spray	3.847	55	668.7	575.4
A1(073)	Spray	3.846	55	668.7	575.4
A1(074)	Spray	3.544	55	669.6	576.3
A1(075)	Spray	3.715	55	669.1	575.8
A1(076)	Spray	3.715	55	669.1	575.8
A1(077)	Spray	3.543	55	669.6	576.3
A1(078)	Spray	3.846	55	668.7	575.4
A1(079)	Spray	3.846	55	668.7	575.4
A1(080)	Spray	3.543	55	669.6	576.3
A1(081)	Spray	3.714	55	669.1	575.8
A1(082)	Spray	3.714	55	669.1	575.8
A1(083)	Spray	3.543	55	669.6	576.3
A1(084)	Spray	3.846	55	668.7	575.4
A1(085)	Spray	3.846	55	668.7	575.4
A1(086)	Spray	3.543	55	669.6	576.3
A1(087)	Spray	3.714	55	669.1	575.8
A1(088)	Spray	3.714	55	669.1	575.8
A1(089)	Spray	3.543	55	669.6	576.3
A1(090)	Spray	3.846	55	668.7	575.4
A1(091)	Spray	3.845	55	668.7	575.4
A1(092)	Spray	3.543	55	669.6	576.3
A1(093)	Spray	3.714	55	669.1	575.8
A1(094)	Spray	3.714	55	669.1	575.8
A1(095)	Spray	3.542	55	669.6	576.3
A1(096)	Spray	3.845	55	668.7	575.4
A1(097)	Spray	3.845	55	668.7	575.4
A1(098)	Spray	3.542	55	669.6	576.3
A1(099)	Spray	3.714	55	669.1	575.8
A1(100)	Spray	3.714	55	669.1	575.8
A1(101)	Spray	3.542	55	669.6	576.3
A1(102)	Spray	3.845	55	668.7	575.4
A1(103)	Spray	3.845	55	668.7	575.4
A1(104)	Spray	3.542	55	669.6	576.3
A1(105)	Spray	3.714	55	669.1	575.8
A1(106)	Spray	3.714	55	669.1	575.8
A1(107)	Spray	3.542	55	669.6	576.3
A1(108)	Spray	3.845	55	668.7	575.4
A1(109)	Spray	3.845	55	668.7	575.4
A1(110)	Spray	3.542	55	669.6	576.3
A1(111)	Spray	3.714	55	669.1	575.8
A1(112)	Spray	3.714	55	669.1	575.8
A1(113)	Spray	3.542	55	669.6	576.3
A1(114)	Spray	3.845	55	668.7	575.4
A1(115)	Spray	3.845	55	668.7	575.4
A1(116)	Spray	3.542	55	669.6	576.3
A1(117)	Spray	3.714	55	669.1	575.8
A1(118)	Spray	3.714	55	669.1	575.8
A1(119)	Spray	3.542	55	669.6	576.3
A1(120)	Spray	3.845	55	668.7	575.4
A2(001)	Spray	4.19	55	682.8	589.5
A2(002)	Spray	3.922	55	682	588.7
A2(003)	Spray	4.015	55	682.3	589
A2(004)	Spray	4.015	55	682.3	589
A2(005)	Spray	3.92	55	682	588.7
A2(006)	Spray	4.166	55	682.8	589.5
A2(007)	Spray	4.165	55	682.8	589.5
A2(008)	Spray	3.919	55	682	588.7
A2(009)	Spray	4.012	55	682.3	589
A2(010)	Spray	4.012	55	682.3	589
A2(011)	Spray	3.917	55	682	588.7
A2(012)	Spray	4.163	55	682.8	589.5
A2(013)	Spray	4.162	55	682.8	589.5
A2(014)	Spray	3.916	55	682	588.7
A2(015)	Spray	4.01	55	682.3	589
A2(016)	Spray	4.01	55	682.3	589
A2(017)	Spray	3.915	55	682	588.7
A2(018)	Spray	4.161	55	682.8	589.5
A2(019)	Spray	4.161	55	682.8	589.5
A2(020)	Spray	3.914	55	682	588.7
A2(021)	Spray	4.008	55	682.3	589
A2(022)	Spray	4.008	55	682.3	589
A2(023)	Spray	3.913	55	682	588.7
A2(024)	Spray	4.159	55	682.8	589.5
A2(025)	Spray	4.159	55	682.8	589.5
A2(026)	Spray	3.912	55	682	588.7
A2(027)	Spray	4.006	55	682.3	589
A2(028)	Spray	4.006	55	682.3	589
A2(029)	Spray	3.912	55	682	588.7
A2(030)	Spray	4.158	55	682.8	589.5
A2(031)	Spray	4.158	55	682.8	589.5
A2(032)	Spray	3.911	55	682	588.7
A2(033)	Spray	4.005	55	682.3	589
A2(034)	Spray	4.005	55	682.3	589
A2(035)	Spray	3.911	55	682	588.7
A2(036)	Spray	4.157	55	682.8	589.5
A2(037)	Spray	4.157	55	682.8	589.5
A2(038)	Spray	3.91	55	682	588.7
A2(039)	Spray	4.005	55	682.3	589
A2(040)	Spray	4.004	55	682.3	589
A2(041)	Spray	3.91	55	682	588.7
A2(042)	Spray	4.157	55	682.8	589.5
A2(043)	Spray	4.156	55	682.8	589.5
A2(044)	Spray	3.91	55	682	588.7
A2(045)	Spray	4.004	55	682.3	589
A2(046)	Spray	4.004	55	682.3	589
A2(047)	Spray	3.91	55	682	588.7
A2(048)	Spray	4.156	55	682.8	589.5
A2(049)	Spray	4.156	55	682.8	589.5
A2(050)	Spray	3.91	55	682	588.7
A2(051)	Spray	4.004	55	682.3	589
A2(052)	Spray	4.004	55	682.3	589
A2(053)	Spray	3.909	55	682	588.7
A2(054)	Spray	4.156	55	682.8	589.5
A2(055)	Spray	4.156	55	682.8	589.5
A2(056)	Spray	3.909	55	682	588.7
A2(057)	Spray	4.004	55	682.3	589
A2(058)	Spray	4.004	55	682.3	589
A2(059)	Spray	3.909	55	682	588.7
A2(060)	Spray	4.179	55	682.8	589.5
A3(001)	Spray	5.211	55	686.6	593.3
A3(002)	Spray	5.259	55	686.8	593.5
A3(003)	Spray	5.207	55	686.6	593.3
A3(004)	Spray	5.207	55	686.6	593.3
A3(005)	Spray	5.25	55	686.8	593.5
A3(006)	Spray	5.203	55	686.6	593.3
A3(007)	Spray	5.199	55	686.6	593.3
A3(008)	Spray	5.247	55	686.8	593.5
A3(009)	Spray	5.196	55	686.6	593.3
A3(010)	Spray	5.196	55	686.6	593.3
A3(011)	Spray	5.241	55	686.8	593.5

A3(012)	Spray	5.193	55	686.6	593.3
A3(013)	Spray	5.191	55	686.6	593.3
A3(014)	Spray	5.238	55	686.8	593.5
A3(015)	Spray	5.188	55	686.6	593.3
A3(016)	Spray	5.188	55	686.6	593.3
A3(017)	Spray	5.234	55	686.8	593.5
A3(018)	Spray	5.187	55	686.6	593.3
A3(019)	Spray	5.185	55	686.6	593.3
A3(020)	Spray	5.233	55	686.8	593.5
A3(021)	Spray	5.184	55	686.6	593.3
A3(022)	Spray	5.184	55	686.6	593.3
A3(023)	Spray	5.231	55	686.8	593.5
A3(024)	Spray	5.183	55	686.6	593.3
A3(025)	Spray	5.182	55	686.6	593.3
A3(026)	Spray	5.23	55	686.8	593.5
A3(027)	Spray	5.181	55	686.6	593.3
A3(028)	Spray	5.181	55	686.6	593.3
A3(029)	Spray	5.229	55	686.8	593.5
A3(030)	Spray	5.181	55	686.6	593.3
A3(031)	Spray	5.181	55	686.6	593.3
A3(032)	Spray	5.228	55	686.8	593.5
A3(033)	Spray	5.18	55	686.6	593.3
A3(034)	Spray	5.18	55	686.6	593.3
A3(035)	Spray	5.228	55	686.8	593.5
A3(036)	Spray	5.18	55	686.6	593.3
A3(037)	Spray	5.18	55	686.6	593.3
A3(038)	Spray	5.228	55	686.8	593.5
A3(039)	Spray	5.18	55	686.6	593.3
B1(001)	Spray	5.39	55	660.3	567
B1(002)	Spray	5.39	55	660.3	567
B1(003)	Spray	5.389	55	660.3	567
B1(004)	Spray	5.389	55	660.3	567
B1(005)	Spray	5.388	55	660.3	567
B1(006)	Spray	5.388	55	660.3	567
B1(007)	Spray	5.387	55	660.3	567
B1(008)	Spray	5.387	55	660.3	567
B1(009)	Spray	5.386	55	660.3	567
B1(010)	Spray	5.386	55	660.3	567
B1(011)	Spray	5.384	55	660.3	567
B1(012)	Spray	5.384	55	660.3	567
B1(013)	Spray	5.383	55	660.3	567
B1(014)	Spray	5.383	55	660.3	567
B1(015)	Spray	5.382	55	660.3	567
B1(016)	Spray	5.382	55	660.3	567
B1(017)	Spray	5.381	55	660.3	567
B1(018)	Spray	5.381	55	660.3	567
B1(019)	Spray	5.381	55	660.3	567
B1(020)	Spray	5.381	55	660.3	567
B1(021)	Spray	5.38	55	660.3	567
B1(022)	Spray	5.38	55	660.3	567
B1(023)	Spray	5.379	55	660.3	567
B1(024)	Spray	5.379	55	660.3	567
B1(025)	Spray	5.378	55	660.3	567
B1(026)	Spray	5.378	55	660.3	567
B1(027)	Spray	5.377	55	660.3	567
B1(028)	Spray	5.377	55	660.3	567
B1(029)	Spray	5.376	55	660.3	567
B1(030)	Spray	5.376	55	660.3	567
B1(031)	Spray	5.376	55	660.3	567
B1(032)	Spray	5.376	55	660.3	567
B1(033)	Spray	5.375	55	660.3	567
B1(034)	Spray	5.375	55	660.3	567
B1(035)	Spray	5.374	55	660.3	567
B1(036)	Spray	5.374	55	660.3	567
B1(037)	Spray	5.374	55	660.3	567
B1(038)	Spray	5.374	55	660.3	567
B1(039)	Spray	5.373	55	660.3	567
B1(040)	Spray	5.373	55	660.3	567
B1(041)	Spray	5.373	55	660.3	567
B1(042)	Spray	5.373	55	660.3	567
B1(043)	Spray	5.372	55	660.3	567
B1(044)	Spray	5.372	55	660.3	567
B1(045)	Spray	5.372	55	660.3	567
B1(046)	Spray	5.372	55	660.3	567
B1(047)	Spray	5.371	55	660.3	567
B1(048)	Spray	5.371	55	660.3	567
B1(049)	Spray	5.371	55	660.3	567
B1(050)	Spray	5.371	55	660.3	567
B1(051)	Spray	5.37	55	660.3	567
B1(052)	Spray	5.37	55	660.3	567
B1(053)	Spray	5.37	55	660.3	567
B1(054)	Spray	5.37	55	660.3	567
B1(055)	Spray	5.369	55	660.3	567
B1(056)	Spray	5.369	55	660.3	567
B1(057)	Spray	5.369	55	660.3	567
B1(058)	Spray	5.369	55	660.3	567
B1(059)	Spray	5.369	55	660.3	567
B1(060)	Spray	5.369	55	660.3	567
B1(061)	Spray	5.368	55	660.3	567
B1(062)	Spray	5.368	55	660.3	567
B1(063)	Spray	5.368	55	660.3	567
B1(064)	Spray	5.368	55	660.3	567
B1(065)	Spray	5.368	55	660.3	567
B1(066)	Spray	5.368	55	660.3	567
B1(067)	Spray	5.368	55	660.3	567
B1(068)	Spray	5.368	55	660.3	567
B1(069)	Spray	5.367	55	660.3	567
B1(070)	Spray	5.367	55	660.3	567
B1(071)	Spray	5.367	55	660.3	567
B1(072)	Spray	5.367	55	660.3	567
B1(073)	Spray	5.367	55	660.3	567
B1(074)	Spray	5.367	55	660.3	567
B1(075)	Spray	5.367	55	660.3	567
B1(076)	Spray	5.367	55	660.3	567
B1(077)	Spray	5.367	55	660.3	567
B1(078)	Spray	5.367	55	660.3	567
B1(079)	Spray	5.367	55	660.3	567
B1(080)	Spray	5.367	55	660.3	567
B1(081)	Spray	5.366	55	660.3	567
B1(082)	Spray	5.366	55	660.3	567
B1(083)	Spray	5.366	55	660.3	567
B1(084)	Spray	5.366	55	660.3	567
B1(085)	Spray	5.366	55	660.3	567
B1(086)	Spray	5.366	55	660.3	567
B1(087)	Spray	5.366	55	660.3	567
B1(088)	Spray	5.366	55	660.3	567
B1(089)	Spray	5.366	55	660.3	567
B1(090)	Spray	5.366	55	660.3	567
B1(091)	Spray	5.366	55	660.3	567
B1(092)	Spray	5.366	55	660.3	567
B1(093)	Spray	5.366	55	660.3	567
B1(094)	Spray	5.366	55	660.3	567
B1(095)	Spray	5.366	55	660.3	567
B1(096)	Spray	5.366	55	660.3	567
B1(097)	Spray	5.366	55	660.3	567
B1(098)	Spray	5.366	55	660.3	567
B1(099)	Spray	5.366	55	660.3	567
B1(100)	Spray	5.366	55	660.3	567
B1(101)	Spray	5.366	55	660.3	567
B1(102)	Spray	5.366	55	660.3	567
B1(103)	Spray	5.366	55	660.3	567
B1(104)	Spray	5.366	55	660.3	567
B1(105)	Spray	5.366	55	660.3	567
B1(106)	Spray	5.366	55	660.3	567
B1(107)	Spray	5.366	55	660.3	567
B1(108)	Spray	5.366	55	660.3	567
B1(109)	Spray	5.366	55	660.3	567
B1(110)	Spray	5.366	55	660.3	567
B1(111)	Spray	5.366	55	660.3	567
B1(112)	Spray	5.366	55	660.3	567
B2(001)	Spray	4.262	55	682.3	589
B2(002)	Spray	4.262	55	682.3	589
B2(003)	Spray	4.259	55	682.3	589
B2(004)	Spray	4.259	55	682.3	589
B2(005)	Spray	4.257	55	682.3	589
B2(006)	Spray	4.257	55	682.3	589
B2(007)	Spray	4.255	55	682.3	589
B2(008)	Spray	4.255	55	682.3	589
B2(009)	Spray	4.253	55	682.3	589
B2(010)	Spray	4.253	55	682.3	589
B2(011)	Spray	4.251	55	682.3	589
B2(012)	Spray	4.251	55	682.3	589
B2(013)	Spray	4.249	55	682.3	589
B2(014)	Spray	4.249	55	682.3	589
B2(015)	Spray	4.248	55	682.3	589
B2(016)	Spray	4.248	55	682.3	589
B2(017)	Spray	4.246	55	682.3	589
B2(018)	Spray	4.246	55	682.3	589
B2(019)	Spray	4.244	55	682.3	589
B2(020)	Spray	4.244	55	682.3	589
B2(021)	Spray	4.243	55	682.3	589
B2(022)	Spray	4.243	55	682.3	589
B2(023)	Spray	4.241	55	682.3	589
B2(024)	Spray	4.241	55	682.3	589
B2(025)	Spray	4.24	55	682.3	589
B2(026)	Spray	4.24	55	682.3	589
B2(027)	Spray	4.239	55	682.3	589
B2(028)	Spray	4.239	55	682.3	589
B2(029)	Spray	4.238	55	682.3	589
B2(030)	Spray	4.238	55	682.3	589
B2(031)	Spray	4.237	55	682.3	589
B2(032)	Spray	4.237	55	682.3	589
B2(033)	Spray	4.236	55	682.3	589
B2(034)	Spray	4.235	55	682.3	589
B2(035)	Spray	4.234	55	682.3	589
B2(036)	Spray	4.234	55	682.3	589
B2(037)	Spray	4.234	55	682.3	589
B2(038)	Spray	4.234	55	682.3	589
B2(039)	Spray	4.233	55	682.3	589
B2(040)	Spray	4.233	55	682.3	589
B2(041)	Spray	4.232	55	682.3	589

B2(042)	Spray	4.232	55		682.3	589
B2(043)	Spray	4.231	55		682.3	589
B2(044)	Spray	4.231	55		682.3	589
B2(045)	Spray	4.23	55		682.3	589
B2(046)	Spray	4.23	55		682.3	589
B2(047)	Spray	4.23	55		682.3	589
B2(048)	Spray	4.23	55		682.3	589
B2(049)	Spray	4.229	55		682.3	589
B2(050)	Spray	4.229	55		682.3	589
B2(051)	Spray	4.229	55		682.3	589
B2(052)	Spray	4.229	55		682.3	589
B2(053)	Spray	4.228	55		682.3	589
B2(054)	Spray	4.228	55		682.3	589
B2(055)	Spray	4.228	55		682.3	589
B2(056)	Spray	4.228	55		682.3	589
B2(057)	Spray	4.227	55		682.3	589
B2(058)	Spray	4.227	55		682.3	589
B2(059)	Spray	4.227	55		682.3	589
B2(060)	Spray	4.227	55		682.3	589
B2(061)	Spray	4.227	55		682.3	589
B2(062)	Spray	4.227	55		682.3	589
B2(063)	Spray	4.226	55		682.3	589
B2(064)	Spray	4.226	55		682.3	589
B2(065)	Spray	4.226	55		682.3	589
B2(066)	Spray	4.226	55		682.3	589
B2(067)	Spray	4.226	55		682.3	589
B2(068)	Spray	4.226	55		682.3	589
B2(069)	Spray	4.226	55		682.3	589
B2(070)	Spray	4.226	55		682.3	589
B2(071)	Spray	4.226	55		682.3	589
B2(072)	Spray	4.226	55		682.3	589
B2(073)	Spray	4.226	55		682.3	589
B2(074)	Spray	4.226	55		682.3	589
B2(075)	Spray	4.225	55		682.3	589
B2(076)	Spray	4.225	55		682.3	589
B2(077)	Spray	4.225	55		682.3	589
B2(078)	Spray	4.225	55		682.3	589
B2(079)	Spray	4.225	55		682.3	589
B2(080)	Spray	4.225	55		682.3	589
B2(081)	Spray	4.225	55		682.3	589
B2(082)	Spray	4.225	55		682.3	589
B2(083)	Spray	4.225	55		682.3	589
B2(084)	Spray	4.225	55		682.3	589
B2(085)	Spray	4.225	55		682.3	589
B2(086)	Spray	4.225	55		682.3	589
B2(087)	Spray	4.225	55		682.3	589
B2(088)	Spray	4.225	55		682.3	589
B2(089)	Spray	4.225	55		682.3	589
B2(090)	Spray	4.225	55		682.3	589
B3(001)	Spray	4.325	55		682.3	589
B3(002)	Spray	4.325	55		682.3	589
B3(003)	Spray	4.533	55		682.3	589
B3(004)	Spray	4.324	55		682.3	589
B3(005)	Spray	4.324	55		682.3	589
B3(006)	Spray	4.324	55		682.3	589
B3(007)	Spray	4.323	55		682.3	589
B3(008)	Spray	4.323	55		682.3	589
B3(009)	Spray	4.323	55		682.3	589
B3(010)	Spray	4.323	55		682.3	589
B3(011)	Spray	4.322	55		682.3	589
B3(012)	Spray	4.322	55		682.3	589
B3(013)	Spray	4.322	55		682.3	589
B3(014)	Spray	4.322	55		682.3	589
B3(015)	Spray	4.321	55		682.3	589
B3(016)	Spray	4.321	55		682.3	589
B3(017)	Spray	4.321	55		682.3	589
B3(018)	Spray	4.321	55		682.3	589
B3(019)	Spray	4.321	55		682.3	589
B3(020)	Spray	4.321	55		682.3	589
B3(021)	Spray	4.32	55		682.3	589
B3(022)	Spray	4.32	55		682.3	589
B3(023)	Spray	4.32	55		682.3	589
B3(024)	Spray	4.32	55		682.3	589
B3(025)	Spray	4.32	55		682.3	589
B3(026)	Spray	4.32	55		682.3	589
B3(027)	Spray	4.319	55		682.3	589
B3(028)	Spray	4.319	55		682.3	589
B3(029)	Spray	4.319	55		682.3	589
B3(030)	Spray	4.319	55		682.3	589
B3(031)	Spray	4.319	55		682.3	589
B3(032)	Spray	4.319	55		682.3	589
B3(033)	Spray	4.319	55		682.3	589
B3(034)	Spray	4.319	55		682.3	589
B3(035)	Spray	4.319	55		682.3	589
B3(036)	Spray	4.319	55		682.3	589
B3(037)	Spray	4.319	55		682.3	589
B3(038)	Spray	4.319	55		682.3	589
B3(039)	Spray	4.319	55		682.3	589
B3(040)	Spray	4.319	55		682.3	589
B3(041)	Spray	4.319	55		682.3	589
B3(042)	Spray	4.319	55		682.3	589
B3(043)	Spray	4.319	55		682.3	589
B3(044)	Spray	4.319	55		682.3	589
B3(045)	Spray	4.319	55		682.3	589
B3(046)	Spray	4.319	55		682.3	589
B3(047)	Spray	4.319	55		682.3	589
B3(048)	Spray	4.319	55		682.3	589
B3(049)	Spray	4.319	55		682.3	589
B3(050)	Spray	4.319	55		682.3	589
B3(051)	Spray	4.319	55		682.3	589
Cold Leg A(001)	Boundary pressure	137.9	211		847.4	393
Cold Leg A(002)	Boundary pressure	150.8	211		847.4	393
Cold Leg B(001)	Boundary pressure	137.5	211		847.4	393
Cold Leg B(002)	Boundary pressure	150.6	211		847.4	393
Cold Leg C(001)	Boundary pressure	136.4	211		847.4	393
Cold Leg C(002)	Boundary pressure	150	211		847.4	393
Cold Leg D(001)	Boundary pressure	136.3	211		847.4	393
Cold Leg D(002)	Boundary pressure	150.3	211		847.4	393
Hot Leg A(001)	Boundary pressure	—	211	Isolated	—	382.7
Hot Leg A(002)	Boundary pressure	—	211	Isolated	—	393
Hot Leg B(001)	Boundary pressure	—	211	Isolated	—	382.7
Hot Leg B(002)	Boundary pressure	0	211		847.4	393
Hot Leg C(001)	Boundary pressure	—	211	Isolated	—	382.7
Hot Leg C(002)	Boundary pressure	—	211	Isolated	—	393
Hot Leg D(001)	Boundary pressure	—	211	Isolated	—	382.7
Hot Leg D(002)	Boundary pressure	0	211		847.4	393

Pump List	Operation	Flow	Status	TDH	dP	NPSHa	Suction Pressure	Discharge Pressure	Suction Elev	Discharge Elev
Centrifugal Charging Pump A	Curve	387		-4169	-1801	86.04	38.12	1639	366.6	368.7
Centrifugal Charging Pump B	Curve	371.1		-4168	-1801	85.5	37.69	1639	366.6	368.7
Containment Spray Pump A	Curve	—	Off	—	—	—	—	—	346.5	347.3
Containment Spray Pump B	Curve	—	Off	—	—	—	—	—	346.5	347.3
Positive Dis. Charging Pump	Fixed Flow	1.00E-05	Off	—	—	—	—	—	366.7	367.9
Residual Heat Removal Pump A	Curve	—	Off	—	—	—	—	—	346	347.1
Residual Heat Removal Pump B	Curve	—	Off	—	—	—	—	—	346	347.1
Safety Injection Pump A	Curve	347.8		-3044	-1315	87.19	38.62	1354	366.5	366.6
Safety Injection Pump B	Curve	314		-3045	-1315	88.22	39.06	1354	366.5	366.6

Component List	Flow	Status	HL	dP	Inlet Pressure	Outlet Pressure	Inlet Elev	Outlet Elev
Residual HX A	—	Off	—	—	—	—	359.7	359.7
Residual HX B	—	Off	—	—	—	—	358.8	358.8

Control List	Type	Set Value	Status	Flow	dP	HL	Inlet Pressure	Outlet Pressure	Elev	Cv	f p	Cvmax
~N(562)	FCV	0		0	—	—	150.3	150.3	346.8	—	—	—
~N(563)	FCV	0		0	—	—	151	151	360	—	—	—
~N(581)	FCV	Fully open		137.5	0	0	445.6	445.6	412.9	—	—	—
~N(582)	FCV	Fully open		137.9	0	0	374.9	374.9	413	—	—	—
~N(583)	FCV	Fully open		136.1	0	0	418.1	418.1	382.4	—	—	—
~N(663)	FCV	Fully open		136.3	0	0	367.2	367.2	389.6	—	—	—
~N(696)	FCV	Fully open		150.6	0	0	221.7	221.7	414.5	—	—	—
~N(704)	FCV	Fully open		150	0	0	233.1	233.1	381.4	—	—	—
~N(711)	FCV	Fully open		150.8	0	0	218.4	218.4	414.9	—	—	—
~N(717)	FCV	Fully open		150.3	0	0	233.3	233.3	387	—	—	—
~N(723)	FCV	Fully open		0	—	—	26.73	26.73	390.7	—	—	—
~N(729)	FCV	Fully open	Closed	—	—	—	—	—	378	—	—	—
~N(730)	FCV	Fully open		0	—	—	27.85	27.85	378.1	—	—	—
~N(741)	FCV	Fully open	Closed	—	—	—	—	—	381.1	—	—	—
CS0078-1	FCV	Fully open		0	—	—	130.7	130.7	402	—	—	—
CS0078-2	FCV	Fully open		0	—	—	133.7	133.7	399	—	—	—

Pipe Specification	Material	Schedule	Roughness	Sizing	Vel Limits	Press Limits	Valve Table
Steel Sch.40 (clean)	Steel	40	0.0018	not specified	—	—	standard
Steel Sch.80 (clean)	Steel	80	0.0018	not specified	—	—	standard
Steel Sch.140 (clean)	Steel	140	0.0018	not specified	—	—	standard
Steel Sch.40S (clean)	Stainless Pipe IPS	40S	0.0018	not specified	—	—	standard
Steel Sch.160 (clean)	Steel	160	0.0018	not specified	—	—	standard
Steel Sch.30 (clean)	Steel	30	0.0018	not specified	—	—	standard
Steel Sch.20 (clean)	Steel	20	0.0018	not specified	—	—	standard

Fluid Zone	Fluid	Temperature	Pressure	Density	Viscosity	k	Pv	Pc
Containment Sump Water	Water	100	14.7	62.24	0.6812	—	0.9496	3198
Water After RHR HX	Water	100	14.7	62.24	0.6812	—	0.9496	3198

PIPE-FLO
System:
Lineup:

Company:
Project: 11329-147 Rev. 0
by: Sargent & Lundy L.L.C.
Footer:

UNITS					CALCULATION:
Flow Rate	US gpm				Iteration: 15
Pressure	psi a	Atm:	14.7	psi a	Deviation percent: 0.008161
Temperature	°F				
Viscosity	cP				
Density	lb/ft³				
Grade.	ft				
Length.	ft				
Size	in				

Pipe List	Specification	Fluid Zone	Size	Length	K	Status	Flow	Velocity	dP	HL	Tagged	From	To	Inside Dia	Pipe HL	Minor HL	Re	fp	Valves/Fittings					
CS01AA(001)	Steel Sch.30 (clean)	Containment Sump Water	16	12.3	0.445	XXX	—	—	—	—	N	~N(003)	~N(005)	15.25	—	—	—	—	2 x Pipe Bend - r/d 1.5 (90°)	0.173	1 x CS009A-1 (Gate Valve)	0.09888	1 x Converging Tee (Through)	1.00E-05
CS01AA(002)	Steel Sch.30 (clean)	Containment Sump Water	16	10.6	0.2964		0	0	0	0	N	~N(005)	~N(006)	15.25	0	0	0	0	1 x Reducer - Contraction (16 x 14 - 14)	0.02451	1 x Pipe Bend - r/d 1.5 (90°)	0.173	1 x CS002A	0.09888
CS01AA(003)	Steel Sch.30 (clean)	Containment Sump Water	14	2	0		0	0	0.864	0	N	~N(006)	Containment Spray Pump A	13.25	0	0	0	0						
CS01AB(001)	Steel Sch.30 (clean)	Containment Sump Water	16	4.3	0.1978	XXX	—	—	—	—	N	~N(236)	~N(237)	15.25	—	—	—	—	1 x Gate - Double Disc	0.09888	1 x CS009B-2 (Gate Valve)	0.09888	1 x Converging Tee (Through)	1.00E-05
CS01AB(002)	Steel Sch.30 (clean)	Containment Sump Water	16	19.3	1.236		0	0	0	0	N	~N(237)	~N(238)	15.25	0	0	0	0	3 x Elbow - Standard 90°	0.3708	1 x Reducer - Contraction (16 x 14 - 14)	0.02451	1 x CS002B(Gate Valve)	0.09888
CS01AB(003)	Steel Sch.30 (clean)	Containment Sump Water	14	2	0		0	0	0.821	0	N	~N(238)	Containment Spray Pump B	13.25	0	0	0	0						
CS02AA(001)	Steel Sch.40 (clean)	Containment Sump Water	8	2	0.05006		0	0	0.432	0	N	Containment Spray Pump A	~N(007)	7.981	0	0	0	0	1 x Reducer - Enlargement (10 x 8 - 7)	0.05006				
CS02AA(002)	Steel Sch.40 (clean)	Containment Sump Water	10	25.5	2.148		0	0	5.054	0	N	~N(007)	~N(008)	10.02	0	0	0	0	4 x Pipe Bend - r/d 1.5 (90°)	0.188	1 x CS003A (Check Valve)	1.289	1 x CV004A (Gate Valve)	0.1074
CS02AA(003)	Steel Sch.40 (clean)	Containment Sump Water	10	101.3	5.852		0	0	15.03	0	N	~N(008)	~N(009)	10.02	0	0	0	0	1 x FE-CS011	4.9	4 x Pipe Bend - r/d 1.5 (90°)	0.188	1 x Diverging Tee (Through)	1.00E-05
CS02AA(004)	Steel Sch.40 (clean)	Containment Sump Water	10	34.8	0.8713		0	0	6.27	0	N	~N(009)	CS007A-1	10.02	0	0	0	0	3 x Pipe Bend - r/d 1.5 (90°)	0.188	1 x CS007A-1 (Gate Valve)	0.1074	1 x Diverging Tee (Through)	1.00E-05
CS02AA(005)	Steel Sch.40 (clean)	Containment Sump Water	10	63.7	2.55		0	0	9.072	0	N	CS007A-1	~N(001)	10.02	0	0	0	0	8 x Pipe Bend - r/d 1.5 (90°)	0.188	1 x Pipe Bend - r/d 1.5 (45°)	0.1331	1 x CS008A (Check Valve)	1.289
CS02AA(006)	Steel Sch.40 (clean)	Containment Sump Water	10	165.7	1.261		0	0	63.2	0	N	~N(001)	~N(001A)	10.02	0	0	0	0	6 x Pipe Bend - r/d 1.5 (90°)	0.188	1 x Pipe Bend - r/d 1.5 (45°)	0.1331		
CS02AB(001)	Steel Sch.40 (clean)	Containment Sump Water	8	2	0.472		0	0	-0.432	0	N	Containment Spray Pump B	~N(239)	7.981	0	0	0	0	1 x Elbow - Standard 90°	0.4719	1 x Reducer - Enlargement (10 x 8 - 7)	0.05006		
CS02AB(002)	Steel Sch.40 (clean)	Containment Sump Water	10	9.9	2.202		0	0	0.216	0	N	~N(239)	~N(240)	10.02	0	0	0	0	2 x Elbow - Standard 90°	0.4028	1 x CV004B (Gate Valve)	0.1074	1 x CV003B (Check Valve)	1.289
CS02AB(003)	Steel Sch.40 (clean)	Containment Sump Water	10	69.1	6.511		0	0	14.9	0	N	~N(240)	~N(241)	10.02	0	0	0	0	4 x Elbow - Standard 90°	0.4028	1 x FE-CS012	4.9	1 x Diverging Tee (Through)	1.00E-05
CS02AB(004)	Steel Sch.40 (clean)	Containment Sump Water	10	33.8	1.316		0	0	7.646	0	N	~N(241)	CS007B-2	10.02	0	0	0	0	3 x Elbow - Standard 90°	0.4028	1 x CV007B-2 (Gate Valve)	0.1074	1 x Diverging Tee (Through)	1.00E-05
CS02AB(005)	Steel Sch.40 (clean)	Containment Sump Water	10	75.4	3.92		0	0	12.53	0	N	CS007B-2	~N(242)	10.02	0	0	0	0	1 x Elbow - Standard 45°	0.2148	6 x Elbow - Standard 90°	0.4028	1 x CS008B (Check Valve)	1.289
CS02AB(006)	Steel Sch.40 (clean)	Containment Sump Water	10	144.2	1		0	0	59.18	0	N	~N(242)	~N(243)	10.02	0	0	0	0	1 x CS008B (Check Valve)	1	1 x Diverging Tee (Through)	1.00E-05		
CS02AB(007)	Steel Sch.40 (clean)	Containment Sump Water	10	30.8	2.00E-05	<-->	601.7	2.45	-7.636	0.056	N	~N(244)	~N(243)	10.02	0.056	0	278182	0.01628	1 x Diverging Tee (Branch)	1.00E-05	1 x Diverging Tee (Through)	1.00E-05		
CS02B	Steel Sch.40 (clean)	Containment Sump Water	8	25.6	0.04218	<-->	444.8	2.854	-6.535	0.087	N	~N(010)	~N(001A)	7.981	0.082	0.005	258078	0.01678	1 x Reducer - Contraction (10 x 8 - 7)	0.04215	1 x Diverging Tee (Through)	1.00E-05		
CS02C	Steel Sch.40 (clean)	Containment Sump Water	6	21.5	0.0633	<-->	203	2.256	-2.883	0.068	N	~N(011)	~N(010)	6.065	0.062	0.004	155042	0.01832	1 x Reducer - Contraction (8 x 6 - 6)	0.06329	1 x Diverging Tee (Through)	1.00E-05		
CS02D(001)	Steel Sch.40 (clean)	Containment Sump Water	4	1.1	0.08157	<-->	101.5	2.56	0.006	0.015	N	~N(012)	~N(011)	4.026	0.007	0.008	118764	0.01978	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156	1 x Diverging* Tee (Branch)	1.00E-05		
CS02D(002)	Steel Sch.40 (clean)	Containment Sump Water	4	1.1	0.08157	<-->	101.5	2.56	0.006	0.015	N	~N(014)	~N(011)	4.026	0.007	0.008	118800	0.01978	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156	1 x Diverging* Tee (Branch)	1.00E-05		
CS02D(003)	Steel Sch.40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	96.27	2.428	0.008	0.019	N	~N(013)	~N(012)	4.026	0.012	0.007	110768	0.01991	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
CS02D(004)	Steel Sch.40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	96.25	2.428	0.008	0.019	N	~N(033)	~N(014)	4.026	0.012	0.007	110749	0.01991	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
CS02D(005)	Steel Sch.40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	91.06	2.297	0.007	0.017	N	~N(015)	~N(013)	4.026	0.01	0.007	104777	0.02005	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
CS02D(006)	Steel Sch.40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	91.04	2.296	0.007	0.017	N	~N(034)	~N(033)	4.026	0.01	0.007	104758	0.02005	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
CS02D(007)	Steel Sch.40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	85.81	2.164	0.007	0.015	N	~N(016)	~N(015)	4.026	0.009	0.006	98736	0.02021	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
CS02D(008)	Steel Sch.40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	85.84	2.165	0.007	0.015	N	~N(035)	~N(034)	4.026	0.009	0.006	98771	0.02021	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
CS02D(009)	Steel Sch.40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	80.61	2.033	0.006	0.013	N	~N(017)	~N(016)	4.026	0.008	0.005	92753	0.02038	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
CS02D(010)	Steel Sch.40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	80.59	2.033	0.006	0.013	N	~N(036)	~N(035)	4.026	0.008	0.005	92734	0.02038	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				
CS02D(011)	Steel Sch.40 (clean)	Containment Sump Water	4	2.1	0.08156	<-->	75.41	1.902	0.005	0.012	N	~N(018)	~N(017)	4.026	0.007	0.005	86775	0.02067	1 x Reducer - Contraction (6 x 4 - 5.5)	0.08156				

CS02H(044)	Steel Sch 40 (clean)	Containment Sump Water	6	3.8	0	<-->	36.66	0.407	0	0	N	-N(102)	-N(103)	6.065	0	0	28000	0.02481				
CS02H(045)	Steel Sch 40 (clean)	Containment Sump Water	6	3.8	0	<-->	31.63	0.351	0	0	N	-N(099)	-N(098)	6.065	0	0	24156	0.02542				
CS02H(046)	Steel Sch 40 (clean)	Containment Sump Water	6	3.8	0	<-->	32.75	0.364	0	0	N	-N(101)	-N(102)	6.065	0	0	25014	0.02523				
CS02H(047)	Steel Sch 40 (clean)	Containment Sump Water	6	3.8	0	<-->	27.62	0.307	0	0	N	-N(092)	-N(099)	6.065	0	0	21098	0.02621				
CS02H(048)	Steel Sch 40 (clean)	Containment Sump Water	6	3.8	0	<-->	28.74	0.319	0	0	N	-N(107)	-N(101)	6.065	0	0	21955	0.02597				
CS02H(049)	Steel Sch 40 (clean)	Containment Sump Water	6	3.8	0	<-->	23.71	0.264	0	0	N	-N(093)	-N(092)	6.065	0	0	18111	0.02716				
CS02H(050)	Steel Sch 40 (clean)	Containment Sump Water	6	3.8	0	<-->	24.59	0.273	0	0	N	-N(106)	-N(107)	6.065	0	0	18781	0.02692				
CS02H(051)	Steel Sch 40 (clean)	Containment Sump Water	6	3.8	0	<-->	19.56	0.217	0	0	N	-N(094)	-N(093)	6.065	0	0	14937	0.02844				
CS02H(052)	Steel Sch 40 (clean)	Containment Sump Water	6	3.8	0	<-->	20.68	0.23	0	0	N	-N(105)	-N(106)	6.065	0	0	15795	0.02805				
CS02H(053)	Steel Sch 40 (clean)	Containment Sump Water	6	3.8	0	<-->	15.55	0.173	0	0	N	-N(091)	-N(094)	6.065	0	0	11879	0.03011				
CS02H(054)	Steel Sch 40 (clean)	Containment Sump Water	6	3.8	0	<-->	16.68	0.185	0	0	N	-N(108)	-N(105)	6.065	0	0	12737	0.02958				
CS02H(055)	Steel Sch 40 (clean)	Containment Sump Water	6	3.8	0	<-->	11.64	0.129	0	0	N	-N(090)	-N(091)	6.065	0	0	8893	0.03248				
CS02H(056)	Steel Sch 40 (clean)	Containment Sump Water	6	3.8	0	<-->	12.52	0.139	0	0	N	-N(109)	-N(108)	6.065	0	0	9562	0.03185				
CS02H(057)	Steel Sch 40 (clean)	Containment Sump Water	6	3.8	0	<-->	7.487	0.083	0	0	N	-N(089)	-N(090)	6.065	0	0	5718	0.03674				
CS02H(058)	Steel Sch 40 (clean)	Containment Sump Water	6	3.8	0	<-->	8.61	0.096	0	0	N	-N(110)	-N(109)	6.065	0	0	6576	0.03529				
CS02H(059)	Steel Sch 40 (clean)	Containment Sump Water	6	3.8	0	<-->	3.483	0.039	0	0	N	-N(100)	-N(089)	6.065	0	0	2660	0.04658				
CS02H(060)	Steel Sch 40 (clean)	Containment Sump Water	6	3.8	0	<-->	4.606	0.051	0	0	N	-N(111)	-N(110)	6.065	0	0	3518	0.04255				
CS02H(061)	Steel Sch 40 (clean)	Containment Sump Water	6	3.8	0	<-->	0.427	0.005	0	0	N	-N(100)	-N(111)	6.065	0	0	325.8	0.1964				
CS02J(001)	Steel Sch 40 (clean)	Containment Sump Water	6	1.8	0.0533	<-->	190.6	2.118	0.003	0.008	N	-N(298)	-N(297)	6.065	0.004	0.004	145663	0.01847	1 x Reducer - Contraction (8 x 6 - 6)	0.05329	1 x Diverging* Tee (Branch)	1.00E-06
CS02J(002)	Steel Sch 40 (clean)	Containment Sump Water	6	1.8	0.0533	<-->	190.6	2.118	0.003	0.008	N	-N(300)	-N(297)	6.065	0.004	0.004	145663	0.01847	1 x Reducer - Contraction (8 x 6 - 6)	0.05329	1 x Diverging* Tee (Branch)	1.00E-06
CS02J(003)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	186.3	2.071	0.003	0.008	N	-N(301)	-N(298)	6.065	0.008	0	142308	0.01852				
CS02J(004)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	186.3	2.071	0.003	0.008	N	-N(302)	-N(300)	6.065	0.008	0	142308	0.01852				
CS02J(005)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	182.1	2.023	0.003	0.007	N	-N(303)	-N(301)	6.065	0.007	0	139054	0.01858				
CS02J(006)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	182.1	2.023	0.003	0.007	N	-N(304)	-N(302)	6.065	0.007	0	139054	0.01858				
CS02J(007)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	177.8	1.976	0.003	0.007	N	-N(305)	-N(303)	6.065	0.007	0	135803	0.01864				
CS02J(008)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	177.8	1.976	0.003	0.007	N	-N(306)	-N(304)	6.065	0.007	0	135803	0.01864				
CS02J(009)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	173.5	1.929	0.003	0.007	N	-N(307)	-N(305)	6.065	0.007	0	132553	0.0187				
CS02J(010)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	173.5	1.929	0.003	0.007	N	-N(308)	-N(306)	6.065	0.007	0	132553	0.0187				
CS02J(011)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	169.3	1.881	0.003	0.007	N	-N(310)	-N(307)	6.065	0.007	0	129304	0.01877				
CS02J(012)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	169.3	1.881	0.003	0.007	N	-N(309)	-N(308)	6.065	0.007	0	129304	0.01877				
CS02J(013)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	165	1.834	0.003	0.006	N	-N(311)	-N(310)	6.065	0.006	0	126057	0.01883				
CS02J(014)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	165	1.834	0.003	0.006	N	-N(312)	-N(309)	6.065	0.006	0	126057	0.01883				
CS02J(015)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	160.8	1.787	0.003	0.006	N	-N(314)	-N(311)	6.065	0.006	0	122811	0.0189				
CS02J(016)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	160.8	1.787	0.003	0.006	N	-N(313)	-N(312)	6.065	0.006	0	122811	0.0189				
CS02J(017)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	156.5	1.74	0.002	0.006	N	-N(318)	-N(314)	6.065	0.006	0	119567	0.01897				
CS02J(018)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	156.5	1.74	0.002	0.006	N	-N(317)	-N(313)	6.065	0.006	0	119567	0.01897				
CS02J(019)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	152.3	1.693	0.002	0.005	N	-N(315)	-N(318)	6.065	0.005	0	116324	0.01905				
CS02J(020)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	152.3	1.693	0.002	0.005	N	-N(316)	-N(317)	6.065	0.005	0	116324	0.01905				
CS02J(021)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	148	1.645	0.002	0.005	N	-N(320)	-N(315)	6.065	0.005	0	113082	0.01912				
CS02J(022)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	148	1.645	0.002	0.005	N	-N(319)	-N(316)	6.065	0.005	0	113082	0.01912				
CS02J(023)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	143.8	1.598	0.002	0.005	N	-N(321)	-N(320)	6.065	0.005	0	109841	0.01921				
CS02J(024)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	143.8	1.598	0.002	0.005	N	-N(322)	-N(319)	6.065	0.005	0	109841	0.01921				
CS02J(025)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	139.6	1.551	0.002	0.005	N	-N(323)	-N(321)	6.065	0.005	0	106602	0.01929				
CS02J(026)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	139.6	1.551	0.002	0.005	N	-N(324)	-N(322)	6.065	0.005	0	106602	0.01929				
CS02J(027)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	135.3	1.504	0.002	0.004	N	-N(325)	-N(323)	6.065	0.004	0	103363	0.01938				
CS02J(028)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	135.3	1.504	0.002	0.004	N	-N(326)	-N(324)	6.065	0.004	0	103363	0.01938				
CS02J(029)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	131.1	1.457	0.002	0.004	N	-N(327)	-N(325)	6.065	0.004	0	100125	0.01947				
CS02J(030)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	131.1	1.457	0.002	0.004	N	-N(328)	-N(326)	6.065	0.004	0	100125	0.01947				
CS02J(031)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	126.8	1.41	0.002	0.004	N	-N(329)	-N(327)	6.065	0.004	0	96889	0.01957				
CS02J(032)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	126.8	1.41	0.002	0.004	N	-N(330)	-N(328)	6.065	0.004	0	96889	0.01957				
CS02J(033)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	122.6	1.363	0.002	0.004	N	-N(331)	-N(329)	6.065	0.004	0	93653	0.01967				
CS02J(034)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	122.6	1.363	0.002	0.004	N	-N(332)	-N(330)	6.065	0.004	0	93653	0.01967				
CS02J(035)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	118.4	1.316	0.001	0.003	N	-N(333)	-N(331)	6.065	0.003	0	90418	0.01978				
CS02J(036)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	118.4	1.316	0.001	0.003	N	-N(334)	-N(332)	6.065	0.003	0	90418	0.01978				
CS02J(037)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	114.1	1.269	0.001	0.003	N	-N(335)	-N(333)	6.065	0.003	0	87183	0.01989				
CS02J(038)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	114.1	1.269	0.001	0.003	N	-N(336)	-N(334)	6.065	0.003	0	87183	0.01989				
CS02J(039)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	109.9	1.222	0.001	0.003	N	-N(337)	-N(335)	6.065	0.003	0	83950	0.02001				
CS02J(040)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	109.9	1.222	0.001	0.003	N	-N(338)	-N(336)	6.065	0.003	0	83950	0.02001				
CS02J(041)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	105.7	1.174	0.001	0.003	N	-N(339)	-N(337)	6.065	0.003	0	80717	0.02014				
CS02J(042)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	105.7	1.174	0.001	0.003	N	-N(340)	-N(338)	6.065	0.003	0	80717	0.02014				
CS02J(043)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	101.4	1.127	0.001	0.003	N	-N(341)	-N(339)	6.065	0.003	0	77484	0.02028				
CS02J(044)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	101.4	1.127	0.001	0.003	N	-N(342)	-N(340)	6.065	0.003	0	77484	0.02028				
CS02J(045)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	97.21	1.08	0.001	0.002	N	-N(343)	-N(341)	6.065	0.002	0	74253	0.02042				
CS02J(046)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	97.21	1.08	0.001	0.002	N	-N(344)	-N(342)	6.065	0.002	0	74253	0.02042				
CS02J(047)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	92.98	1.033	0	0.002	N	-N(345)	-N(343)	6.065	0.002	0	71021	0.02057				
CS02J(048)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	92.98	1.033	0	0.002	N	-N(346)	-N(344)	6.065	0.002	0	71021	0.02057				
CS02J(049)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	88.75	0.986	0	0.002	N	-N(347)	-N(345)	6.065	0.002	0	67790	0.02074				
CS02J(050)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	88.75	0.986	0	0.002	N	-N(348)	-N(346)	6.065	0.002	0	67790	0.02074				
CS02J(051)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	84.52	0.939	0	0.002	N	-N(349)	-N(347)	6.065	0.002	0	64560	0.02091				
CS02J(052)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	84.52	0.939	0	0.002	N	-N(350)	-N(348)	6.065	0.002	0	64560	0.02091				
CS02J(053)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	80.29	0.892	0	0.002	N	-N(351)	-N(349)	6.065	0.002	0	61330	0.0211				
CS02J(054)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	80.29	0.892	0	0.002	N	-N(352)	-N(350)	6.065	0.002	0	61330	0.0211				
CS02J(055)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	76.07	0.845	0	0.001	N	-N(353)	-N(351)	6.065	0.001	0	58101	0.02131				
CS02J(056)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	76.07	0.845	0	0.001	N	-N(354)	-N(352)	6.065	0.001	0	58101	0.02131				
CS02J(057)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	71.84	0.798	0	0.001	N	-N(355)	-N(353)	6.065	0.001	0	54871	0.02153				
CS02J(058)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	71.84	0.798	0	0.001	N	-N(356)	-N(354)	6.065	0.001	0	54871	0.02153				
CS02J(059)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	67.61	0.751	0	0.001	N	-N(357)	-N(355)	6.065	0.001	0	51642	0.02177				
CS02J(060)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	67.61	0.751	0	0.001	N	-N(358)	-N(356)	6.065	0.001	0	51642	0.02177				
CS02J(061)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	63.38	0.704	0	0.001	N	-N(359)	-N(357)	6.065	0.001	0	48414	0.02204				
CS02J(062)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	63.38	0.704	0	0.001	N	-N(360)	-N(358)	6.065	0.001	0	48414	0.02204				
CS02J(063)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	59.16	0.657	0	0	N	-N(361)	-N(359)	6.065	0	0	45185	0.02233				
CS02J(064)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	59.16	0.657	0	0	N	-N(362)	-N(360)	6.065	0	0	45185	0.02233				
CS02J(065)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	54.93	0.611	0	0	N	-N(363)	-N(361)	6.065	0	0	41957	0.02265				
CS02J(066)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	54.93	0.611	0	0	N	-N(364)	-N(362)	6.065	0	0	41957	0.02265				
CS02J(067)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	50.7	0.564	0	0	N	-N(365)	-N(363)	6.065	0	0	38729	0.02301				
CS02J(068)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	50.7	0.564	0	0	N	-N(366)	-N(364)	6.065	0	0	38729	0.02301				
CS02J(069)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	46.48	0.517	0	0	N	-N(367)	-N(365)	6.065	0	0	35501	0.02342				
CS02J(070)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	46.48	0.517	0	0	N	-N(368)	-N(366)	6.065	0	0	35501	0.02342				
CS02J(071)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	42.25	0.47	0	0	N	-N(369)	-N(367)	6.065	0	0	32274	0.02388				
CS02J(072)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	42.25	0.47	0	0	N	-N(370)	-N(368)	6.065	0	0	32274	0.02388				
CS02J(073)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	38.03	0.423	0	0	N	-N(371)	-N(369)	6.065	0	0	29046	0.02442				
CS02J(074)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	38.03	0.423	0	0	N	-N(372)	-N(370)	6.065	0	0	29046	0.02442				
CS02J(075)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	33.8	0.376	0	0	N	-N(373)	-N(371)	6.065	0	0	25818	0.02505				
CS02J(076)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	33.8	0.376	0	0	N	-N(374)	-N(372)	6.065	0	0	25818	0.02505				
CS02J(077)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	29.58	0.329	0	0	N	-N(375)	-N(373)	6.065	0	0	22591	0.0258				
CS02J(078)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	29.58	0.329	0	0	N	-N(376)	-N(374)	6.065	0	0	22591	0.0258				
CS02J(079)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	25.35	0.282	0	0	N	-N(377)	-N(375)	6.065	0	0	19364	0.02673				
CS02J(080)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	25.35	0.282	0	0	N	-N(378)	-N(376)	6.065	0	0	19364	0.02673				
CS02J(081)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	21.13	0.235	0	0	N	-N(379)	-N(377)	6.065	0	0	16136	0.02791				
CS02J(082)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	21.13	0.235	0	0	N	-N(380)	-N(378)	6.065	0	0	16136	0.02791				
CS02J(083)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	16.9	0.188	0	0	N	-N(381)	-N(379)	6.065	0	0	12909	0.02948				
CS02J(084)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	16.9	0.188	0	0	N	-N(382)	-N(380)	6.065	0	0	12909	0.02948				
CS02J(085)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	12.68	0.141	0	0	N	-N(383)	-N(381)	6.065	0	0	9682	0.03175				
CS02J(086)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	12.68	0.141	0	0	N	-N(384)	-N(382)	6.065	0	0	9682	0.03175				
CS02J(087)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	8.45	0.094	0	0	N	-N(385)	-N(383)	6.065	0	0	6454	0.03548				
CS02J(088)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	8.45	0.094	0	0	N	-N(387)	-N(384)	6.065	0	0	6454	0.03548				
CS02J(089)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	4.225	0.047	0	0	N	-N(388)	-N(385)	6.065	0	0	3227	0.04374				
CS02J(090)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0	<-->	4.225	0.047	0	0	N	-N(389)	-N(387)	6.065	0	0	3227	0.04374				
CS02J(091)	Steel Sch 40 (clean)	Containment Sump Water	6	3.2	0		0	0	0	0	N	-N(389)	-N(386)	6.065	0	0	0.001151	0				
CS02KA	Steel Sch 40 (clean)	Containment Sump Water	10	2	15.8		444.8	1.81	0.996	0.805	N	-N(001A)	-N(112)	10.02	0.002	0.803	205561	0.01882	1 x FX-C8036 (Flow Element)	15.8	1 x Diverging Tee (Branch)	1.00E-06
CS02KB	Steel Sch 40 (clean)	Containment Sump Water	10	2.7	26.1		601.7	2.45	1.816	2.435	N	-N(243)	-N(390)	10.02	0.004	2.431	278182	0.01829	1 x FX-C8036 (Flow Element)	26.1	1 x Diverging Tee (Branch)	1.00E-06
CS02L001	Steel Sch 40 (clean)	Containment Sump Water	8	1.5	0.04216		222.4	1.428	0.001	0.003	N	-N(112)	-N(113)	7.981	0.002	0.001	129096	0.01838	1 x Reducer - Contraction (10 x 8 - 7)	0.04216	1 x Diverging Tee (Branch)	1.00E-06
CS02L002	Steel Sch 40 (clean)	Containment Sump Water	8	1.5	0.04216		222.2	1.426	0.001	0.003	N	-N(112)	-N(114)	7.981	0.002	0.001	128982	0.01838	1 x Reducer - Contraction (10 x 8 - 7)	0.04216	1 x Diverging Tee (Branch)	1.00E-06
CS02L003	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		218.5	1.403	0.001	0.003	N	-N(113)	-N(115)	7.981	0.003	0	126854	0.01842				
CS02L004	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		218.7	1.403	0.001	0.003	N	-N(114)	-N(203)	7.981	0.003	0	126915	0.01842				
CS02L005	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		214.8	1.379	0.001	0.002	N	-N(115)	-N(116)	7.981	0.002	0	124689	0.01847				
CS02L006	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		214.8	1.379	0.001	0.002	N	-N(203)	-N(204)	7.981	0.002	0	124749	0.01847				
CS02L007	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		211.3	1.356	0.001	0.002	N	-N(116)	-N(117)	7.981	0.002	0	122623	0.01852				
CS02L008	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		211.1	1.355	0.001	0.002	N	-N(204)	-N(206)	7.981	0.002	0	122508	0.01852				
CS02L009	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		207.4	1.331	0	0.002	N	-N(117)	-N(118)	7.981	0.002	0	120382	0.01857				
CS02L010	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		207.5	1.332	0	0.002	N	-N(206)	-N(205)	7.981	0.002	0	120442	0.01857				
CS02L011	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		203.7	1.307	0	0.002	N	-N(118)	-N(119)	7.981	0.002	0	118218	0.01862				
CS02L012	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		203.8	1.308	0	0.002	N	-N(205)	-N(210)	7.981	0.002	0	118278	0.01862				
CS02L013	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		200.1	1.284	0	0.002	N	-N(119)	-N(120)	7.981	0.002	0	116153	0.01867				
CS02L014	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		199.9	1.283	0	0.002	N	-N(210)	-N(209)	7.981	0.002	0	116039	0.01868				
CS02L015	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		196.3	1.26	0	0.002	N	-N(120)	-N(122)	7.981	0.002	0	113914	0.01873				
CS02L016	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		196.4	1.26	0	0.002	N	-N(209)	-N(207)	7.981	0.002	0	113974	0.01873				
CS02L017	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		192.5	1.236	0	0.002	N	-N(122)	-N(121)	7.981	0.002	0	111751	0.01878				
CS02L018	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		192.6	1.236	0	0.002	N	-N(207)	-N(208)	7.981	0.002	0	111811	0.01878				
CS02L019	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		189	1.213	0	0.002	N	-N(121)	-N(123)	7.981	0.002	0	109688	0.01884				
CS02L020	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		188.8	1.212	0	0.002	N	-N(208)	-N(218)	7.981	0.002	0	109573	0.01884				
CS02L021	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		185.1	1.188	0	0.002	N	-N(123)	-N(124)	7.981	0.002	0	107449	0.0189				
CS02L022	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		185.2	1.189	0	0.002	N	-N(218)	-N(217)	7.981	0.002	0	107510	0.0189				
CS02L023	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		181.4	1.164	0	0.002	N	-N(124)	-N(126)	7.981	0.002	0	105288	0.01896				
CS02L024	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		181.5	1.165	0	0.002	N	-N(217)	-N(215)	7.981	0.002	0	105348	0.01896				
CS02L025	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		177.8	1.141	0	0.002	N	-N(126)	-N(125)	7.981	0.002	0	103225	0.01902				
CS02L026	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		177.6	1.14	0	0.002	N	-N(215)	-N(216)	7.981	0.002	0	103111	0.01903				
CS02L027	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		174	1.117	0	0.002	N	-N(125)	-N(130)	7.981	0.002	0	100988	0.01909				
CS02L028	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		174.1	1.117	0	0.002	N	-N(216)	-N(211)	7.981	0.002	0	101049	0.01909				
CS02L029	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		170.3	1.093	0	0.002	N	-N(130)	-N(129)	7.981	0.002	0	98827	0.01915				
CS02L030	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		170.4	1.093	0	0.002	N	-N(211)	-N(212)	7.981	0.002	0	98888	0.01915				
CS02L031	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		166.7	1.07	0	0.002	N	-N(129)	-N(127)	7.981	0.002	0	96766	0.01922				
CS02L032	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		166.5	1.069	0	0.002	N	-N(212)	-N(214)	7.981	0.002	0	96651	0.01923				
CS02L033	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		162.9	1.045	0	0.001	N	-N(127)	-N(128)	7.981	0.001	0	94530	0.0193				
CS02L034	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		163	1.046	0	0.001	N	-N(214)	-N(213)	7.981	0.001	0	94590	0.01929				
CS02L035	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		159.1	1.021	0	0.001	N	-N(128)	-N(132)	7.981	0.001	0	92370	0.01937				
CS02L036	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		159.2	1.022	0	0.001	N	-N(213)	-N(231)	7.981	0.001	0	92430	0.01937				
CS02L037	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		155.6	0.999	0	0.001	N	-N(132)	-N(131)	7.981	0.001	0	90310	0.01944				
CS02L038	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		155.4	0.997	0	0.001	N	-N(231)	-N(232)	7.981	0.001	0	90195	0.01945				
CS02L039	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		151.7	0.974	0	0.001	N	-N(131)	-N(136)	7.981	0.001	0	88074	0.01952				
CS02L040	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		151.8	0.975	0	0.001	N	-N(232)	-N(227)	7.981	0.001	0	88135	0.01952				
CS02L041	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		148	0.95	0	0.001	N	-N(136)	-N(135)	7.981	0.001	0	85915	0.01961				
CS02L042	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		148.1	0.951	0	0.001	N	-N(227)	-N(228)	7.981	0.001	0	85978	0.0196				
CS02L043	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		144.5	0.927	0	0.001	N	-N(135)	-N(133)	7.981	0.001	0	83856	0.01969				
CS02L044	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		144.3	0.926	0	0.001	N	-N(228)	-N(230)	7.981	0.001	0	83741	0.01969				
CS02L045	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		140.6	0.903	0	0.001	N	-N(133)	-N(134)	7.981	0.001	0	81621	0.01978				
CS02L046	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		140.7	0.903	0	0.001	N	-N(230)	-N(229)	7.981	0.001	0	81681	0.01978				
CS02L047	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		136.9	0.879	0	0.001	N	-N(134)	-N(144)	7.981	0.001	0	79462	0.01987				
CS02L048	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		137	0.879	0	0.001	N	-N(229)	-N(219)	7.981	0.001	0	79523	0.01987				
CS02L049	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		133.4	0.856	0	0.001	N	-N(144)	-N(143)	7.981	0.001	0	77404	0.01996				
CS02L050	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		133.2	0.855	0	0.001	N	-N(219)	-N(220)	7.981	0.001	0	77288	0.01997				
CS02L051	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		129.5	0.831	0	0	N	-N(143)	-N(141)	7.981	0	0	75169	0.02006				
CS02L052	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		129.6	0.832	0	0	N	-N(220)	-N(222)	7.981	0	0	75230	0.02006				
CS02L053	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		125.8	0.807	0	0	N	-N(141)	-N(142)	7.981	0	0	73012	0.02017				
CS02L054	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		125.9	0.808	0	0	N	-N(222)	-N(221)	7.981	0	0	73072	0.02016				
CS02L055	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		122.2	0.785	0	0	N	-N(142)	-N(137)	7.981	0	0	70953	0.02027				
CS02L056	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		122	0.783	0	0	N	-N(221)	-N(226)	7.981	0	0	70838	0.02028				
CS02L057	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		118.4	0.76	0	0	N	-N(137)	-N(138)	7.981	0	0	68720	0.02038				
CS02L058	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		118.5	0.761	0	0	N	-N(226)	-N(225)	7.981	0	0	68780	0.02038				
CS02L059	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		114.7	0.736	0	0	N	-N(138)	-N(140)	7.981	0	0	66562	0.02051				
CS02L060	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		114.8	0.737	0	0	N	-N(225)	-N(223)	7.981	0	0	66623	0.0205				
CS02L061	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		111.1	0.713	0	0	N	-N(140)	-N(139)	7.981	0	0	64505	0.02062				
CS02L062	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		110.9	0.712	0	0	N	-N(223)	-N(224)	7.981	0	0	64369	0.02063				
CS02L063	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		107.3	0.689	0	0	N	-N(139)	-N(145)	7.981	0	0	62271	0.02076				
CS02L064	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		107.4	0.689	0	0	N	-N(224)	-N(175)	7.981	0	0	62332	0.02075				
CS02L065	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		103.5	0.665	0	0	N	-N(145)	-N(146)	7.981	0	0	60114	0.02089				
CS02L066	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		103.7	0.665	0	0	N	-N(175)	-N(176)	7.981	0	0	60175	0.02089				
CS02L067	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		100	0.642	0	0	N	-N(146)	-N(147)	7.981	0	0	58057	0.02103				
CS02L068	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		99.82	0.641	0	0	N	-N(176)	-N(177)	7.981	0	0	57942	0.02104				
CS02L069	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		96.17	0.617	0	0	N	-N(147)	-N(148)	7.981	0	0	55824	0.02119				
CS02L070	Steel Sch 40 (clean)	Containment Sump Water	8	3	0		96.28	0.618	0	0	N	-N(177)	-N(179)	7.981	0	0	55885	0.02118				

CS02L071	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	92.46	0.593	0	0	N	~N(148)
CS02L072	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	92.56	0.594	0	0	N	~N(179)
CS02L073	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	88.92	0.571	0	0	N	~N(149)
CS02L074	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	88.72	0.569	0	0	N	~N(178)
CS02L075	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	85.07	0.546	0	0	N	~N(150)
CS02L076	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	85.17	0.547	0	0	N	~N(183)
CS02L077	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	81.35	0.522	0	0	N	~N(151)
CS02L078	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	81.46	0.523	0	0	N	~N(182)
CS02L079	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	77.81	0.499	0	0	N	~N(153)
CS02L080	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	77.81	0.498	0	0	N	~N(180)
CS02L081	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	73.97	0.475	0	0	N	~N(152)
CS02L082	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	74.07	0.475	0	0	N	~N(181)
CS02L083	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	70.25	0.451	0	0	N	~N(154)
CS02L084	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	70.36	0.452	0	0	N	~N(191)
CS02L085	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	66.71	0.428	0	0	N	~N(155)
CS02L086	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	66.51	0.427	0	0	N	~N(190)
CS02L087	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	62.86	0.403	0	0	N	~N(157)
CS02L088	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	62.97	0.404	0	0	N	~N(188)
CS02L089	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	59.15	0.38	0	0	N	~N(156)
CS02L090	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	59.25	0.38	0	0	N	~N(189)
CS02L091	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	55.61	0.357	0	0	N	~N(161)
CS02L092	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	55.41	0.356	0	0	N	~N(184)
CS02L093	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	51.76	0.332	0	0	N	~N(160)
CS02L094	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	51.86	0.333	0	0	N	~N(185)
CS02L095	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	48.05	0.308	0	0	N	~N(158)
CS02L096	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	48.15	0.309	0	0	N	~N(187)
CS02L097	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	44.5	0.286	0	0	N	~N(159)
CS02L098	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	44.31	0.284	0	0	N	~N(186)
CS02L099	Steel Sch 40 (clean)	Containment Sump Water	8	3	0	40.66	0.261	0	0	N	~N(162)

CV08AA(001)	Steel Sch.160 (clean)	Water After RHR HX	4	2.8	0.4721		386.9	13.38	1.165	1.797	N	Centrifugal Charging Pump A	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]erging Tee (Through)	1.00E-05										
CV08AA(002)	Steel Sch.160 (clean)	Water After RHR HX	4	4.8	2.975		321.9	11.13	2.722	6.301	N	~N(537)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]8485A	0.221	1 x Diverging Tee (Through)	1.00E-05	1 x Converging Tee (Branch)	1.00E-05						
CV08AA(003)	Steel Sch.40 (clean)	Water After RHR HX	4	12.8	0.9047		321.9	8.118	1.519	1.617	N	~N(538)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]												
CV08BA(001)	Steel Sch 160 (clean)	Water After RHR HX	4	1.7	0.2361		370.9	12.83	0.766	0.874	N	Centrifugal Charging Pump B	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]8481B(Check Valve)	2.975	1 x Diverging Tee (Through)	1.00E-05								
CV08BA(002)	Steel Sch.160 (clean)	Water After RHR HX	4	3.7	3.211		305.9	10.58	2.584	5.982	N	~N(634)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]8485B (Gate Valve)	0.221	1 x Diverging Tee (Through)	1.00E-05	1 x Converging' Tee (Branch)	2.2						
CV08BA(003)	Steel Sch 40 (clean)	Water After RHR HX	4	103.1	3.333		305.9	7.715	4.333	8.13	N	~N(635)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]erging' Tee (Branch)	1.9										
CV09A(001)	Steel Sch.160 (clean)	Water After RHR HX	4	13.3	5.1		241.9	8.365	2.791	6.461	N	~N(639)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]917	7.2	1 x Tee - Flow Thru Branch	1.012								
CV09A(002)	Steel Sch.160 (clean)	Water After RHR HX	4	23.3	9.156		547.7	18.95	32.73	58.96	N	~N(636)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]8483A(Gate Valve)	0.23	1 x Diverging Tee (Through)	1.00E-05								
CV09D(001)	Steel Sch 160 (clean)	Water After RHR HX	3	2.6	0.2638		80	4.75	0.077	0.177	N	~N(642)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]nverging Tee (Through)	1.00E-05	1 x Diverging' Tee (Branch)	12								
CV09D(002)	Steel Sch 160 (clean)	Water After RHR HX	3	6.6	12.23		80	4.75	1.671	4.562	N	~N(639)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]erging Tee (Branch)	2	1 x Converging Tee (Through)	1.00E-05								
CV09D(003)	Steel Sch 160 (clean)	Water After RHR HX	3	23	11.4		80	4.75	5.03	4.743	N	~N(640)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]												
CV09D(004)	Steel Sch.160 (clean)	Water After RHR HX	3	12.5	1.00E-05		0	0	0	0	N	~N(667)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]												
CV12AA	Steel Sch.160 (clean)	Water After RHR HX	3	15.8	1.74	XXX	—	—	—	—	N	~N(638)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]8387A(Globe Valve)	0.9866	1 x Diverging Tee (Branch)	1.00E-05	1 x Converging' Tee (Branch)	1.00E-05						
CV12AB	Steel Sch.160 (clean)	Water After RHR HX	3	110.7	3.247	XXX	—	—	—	—	N	~N(635)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]8387B(Globe Valve)	0.9866	1 x Diverging Tee (Branch)	1.00E-05	1 x Converging' Tee (Branch)	1.00E-05						
CV12B	Steel Sch 160 (clean)	Water After RHR HX	3	0.8	0		0	0	0	0	N	~N(578)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]												
CV13B	Steel Sch 160 (clean)	Water After RHR HX	3	13.8	2.251		80	4.75	-2.748	1.239	N	~N(667)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]nverging Tee (Branch)	1.00E-05	1 x Diverging' Tee (Branch)	1.00E-05	1 x Diverging Tee (Branch)	2						
CV43A(001)	Steel Sch 160 (clean)	Water After RHR HX	2	92	49.04		0	0	1.944	0	N	~N(668)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]e Bend - r/d 1.5 (45°)	0.1976	1 x FE139	8.8	1 x CV8345(Globe Valve)	5.891	1 x CV8346(Globe Valve)	5.891	1 x CV8348(Check Valve)	2.005	1 x CV184 (Globe Valve)	23.84
CV43A(002)	Steel Sch 160 (clean)	Water After RHR HX	2	60.5	1.118		0	0	0.302	0	N	~N(669)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]erging' Tee (Branch)	1.00E-05										
CV43A(003)	Steel Sch.160 (clean)	Water After RHR HX	2	117.8	2.151		0	0	1.21	0	N	~N(670)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]e Bend - r/d 1.5 (45°)	0.1976	1 x Diverging Tee (Through)	1.00E-05								
CV43BA/RC16AA	Steel Sch 160 (clean)	Water After RHR HX	2	134.4	15.41	XXX	—	—	—	—	N	~N(671)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]8036A (Y Globe Valve)	5.891	1 x RC8036A (Globe Valve)	5.891	1 x Diverging Tee (Through)	1.00E-05						
CV43BB/RC16AB	Steel Sch 160 (clean)	Water After RHR HX	2	18	13.29	XXX	—	—	—	—	N	~N(671)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]e Bend - r/d 1.5 (45°)	0.1976	1 x RC8036B (Y Globe Valve)	5.891	1 x RC8036B (Globe Valve)	5.891	1 x Diverging Tee (Branch)	1.00E-05				
CV43BC/RC16AC	Steel Sch 160 (clean)	Water After RHR HX	2	59.1	13.46	XXX	—	—	—	—	N	~N(670)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]8036C (Y Globe Valve)	5.891	1 x RC8036C (Globe Valve)	5.891	1 x Diverging Tee (Branch)	1.00E-05						
CV43BD/RC16AD	Steel Sch 160 (clean)	Water After RHR HX	2	51.7	12.9	XXX	—	—	—	—	N	~N(669)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]8036D (Y Globe Valve)	5.891	1 x RC8036D (Globe Valve)	5.891	1 x Diverging' Tee (Branch)	1.00E-05						
CV98A	Steel Sch 40 (clean)	Water After RHR HX	8	6.5	0		627.7	4.029	-2.361	0.034	N	~N(506)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]												
CV98BA	Steel Sch 40 (clean)	Water After RHR HX	8	6.8	0.3769		313.9	2.015	-2.143	0.038	N	~N(618)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]112D(Gate Valve)	0.18	1 x Converging Tee (Branch)	1.00E-05	1 x Diverging Tee (Branch)	1.00E-05						
CV98BB	Steel Sch 40 (clean)	Water After RHR HX	8	6.8	0.3769		313.9	2.015	-2.143	0.038	N	~N(618)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]112E(Gate Valve)	0.18	1 x Converging Tee (Through)	1.00E-05	1 x Diverging Tee (Through)	1.00E-05						
CV98C	Steel Sch 40 (clean)	Water After RHR HX	8	6.5	3.2		627.7	4.029	0.365	0.846	N	~N(621)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]nverging Tee (Branch)	1.3										
CVA1A/SI13C	Steel Sch.40 (clean)	Water After RHR HX	8	22.5	1.521	XXX	—	—	—	—	N	~N(626)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]e Bend - r/d 1.5 (90°)	0.2085	1 x Converging Tee (Branch)	0.7								
CVJ4A	Steel Sch 160 (clean)	Water After RHR HX	4	19.8	1.72		547.7	18.95	11.04	16.36	N	~N(543)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]e - Flow Thru Branch	1.012										
Pipe(002)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<—>	4.19	1.557	2.835	7.063	N	A2(001)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1										
Pipe(003)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<—>	4.015	1.492	2.802	6.485	N	A2(003)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1										
Pipe(004)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<—>	3.92	1.456	2.8	6.182	N	A2(005)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1										
Pipe(006)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<—>	3.922	1.457	2.803	6.189	N	A2(002)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1										
Pipe(007)	Steel Sch.40 (clean)	Containment Sump Water	1	0.5	187.7	<—>	4.015	1.492	2.802	6.485	N	A2(004)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1										
Pipe(008)	Steel Sch.40 (clean)	Containment Sump Water	1	0.5	187.7	<—>	4.166	1.548	2.8	6.981	N	A2(006)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1										
Pipe(009)	Steel Sch.40 (clean)	Containment Sump Water	1	0.5	187.7	<—>	4.165	1.547	2.799	6.978	N	A2(007)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1										
Pipe(010)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<—>	3.919	1.456	2.799	6.178	N	A2(008)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1										
Pipe(011)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<—>	4.012	1.491	2.797	6.475	N	A2(009)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1										
Pipe(012)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<—>	4.012	1.491	2.797	6.475	N	A2(010)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1										
Pipe(013)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<—>	3.917	1.455	2.796	6.173	N	A2(011)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1										
Pipe(014)	Steel Sch.40 (clean)	Containment Sump Water	1	0.5	187.7	<—>	4.163	1.547	2.796	6.972	N	A2(012)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1										
Pipe(015)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<—>	4.162	1.546	2.795	6.97	N	A2(013)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1										
Pipe(016)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<—>	3.916	1.455	2.795	6.17	N	A2(014)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1										
Pipe(017)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<—>	4.01	1.49	2.794	6.468	N	A2(015)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1										
Pipe(018)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<—>	4.01	1.49	2.794	6.467	N	A2(016)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1										
Pipe(019)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<—>	3.915	1.454	2.793	6.165	N	A2(017)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1										
Pipe(020)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<—>	4.161	1.546	2.793	6.965	N	A2(018)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1										
Pipe(021)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<—>	4.161	1.546	2.792	6.963	N	A2(019)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1										
Pipe(022)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<—>	3.914	1.454	2.792	6.163	N	A2(020)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1										
Pipe(023)	Steel Sch.40 (clean)	Containment Sump Water	1	0.5	187.7	<—>	4.008	1.489	2.791	6.462	N	A2(021)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1										
Pipe(024)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<—>	4.008	1.489	2.791	6.461	N	A2(022)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1										
Pipe(025)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<—>	3.913	1.454	2.791	6.16	N	A2(023)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1										
Pipe(026)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<—>	4.159	1.545	2.79	6.959	N	A2(024)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1										
Pipe(027)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<—>	4.159	1.545	2.79	6.958	N	A2(025)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1										

Pipe(155)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.542	1.316	2.397	5.048	N	~N(189)	A1(107)	1.049	0.005	5.043	15643	0.03087	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(156)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.845	1.429	2.397	5.948	N	~N(184)	A1(109)	1.049	0.006	5.942	16981	0.03041	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(157)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.714	1.38	2.397	5.548	N	~N(165)	A1(111)	1.049	0.005	5.543	16400	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(158)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.542	1.316	2.397	5.048	N	~N(167)	A1(113)	1.049	0.005	5.043	15643	0.03087	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(159)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.845	1.429	2.397	5.948	N	~N(166)	A1(116)	1.049	0.006	5.942	16981	0.03041	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(160)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.714	1.38	2.397	5.548	N	~N(172)	A1(117)	1.049	0.005	5.543	16400	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(161)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.542	1.316	2.397	5.048	N	~N(173)	A1(119)	1.049	0.005	5.043	15643	0.03087	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(162)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.845	1.429	2.397	5.948	N	~N(174)	A1(120)	1.049	0.006	5.942	16981	0.03041	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(163)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.714	1.38	2.397	5.548	N	~N(202)	A1(118)	1.049	0.005	5.543	16400	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(164)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.542	1.316	2.397	5.048	N	~N(197)	A1(116)	1.049	0.005	5.043	15643	0.03087	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(165)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.845	1.429	2.397	5.948	N	~N(196)	A1(114)	1.049	0.006	5.942	16981	0.03041	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(166)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.714	1.38	2.397	5.548	N	~N(195)	A1(112)	1.049	0.005	5.543	16400	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(167)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.542	1.316	2.397	5.048	N	~N(199)	A1(110)	1.049	0.005	5.043	15643	0.03087	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(168)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.845	1.429	2.397	5.948	N	~N(194)	A1(108)	1.049	0.006	5.942	16981	0.03041	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(169)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.714	1.38	2.397	5.548	N	~N(195)	A1(106)	1.049	0.005	5.543	16400	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(170)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.542	1.316	2.397	5.048	N	~N(193)	A1(104)	1.049	0.005	5.043	15643	0.03087	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(171)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.845	1.429	2.397	5.948	N	~N(192)	A1(102)	1.049	0.006	5.942	16981	0.03041	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(172)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.714	1.38	2.397	5.548	N	~N(200)	A1(100)	1.049	0.005	5.543	16400	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(173)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.542	1.316	2.397	5.048	N	~N(201)	A1(098)	1.049	0.004	5.044	15644	0.03087	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(174)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.845	1.429	2.397	5.949	N	~N(186)	A1(096)	1.049	0.006	5.943	16982	0.03041	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(175)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.714	1.38	2.397	5.549	N	~N(187)	A1(094)	1.049	0.005	5.544	16401	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(176)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.543	1.316	2.397	5.049	N	~N(185)	A1(092)	1.049	0.005	5.044	15645	0.03087	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(177)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.846	1.429	2.397	5.949	N	~N(184)	A1(090)	1.049	0.005	5.944	16982	0.03041	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(178)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.714	1.38	2.397	5.549	N	~N(189)	A1(088)	1.049	0.005	5.544	16402	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(179)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.543	1.316	2.397	5.05	N	~N(188)	A1(086)	1.049	0.005	5.045	15646	0.03087	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(180)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.846	1.429	2.398	5.95	N	~N(190)	A1(084)	1.049	0.006	5.944	16983	0.03041	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(181)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.714	1.38	2.398	5.55	N	~N(191)	A1(082)	1.049	0.005	5.545	16403	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(182)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.543	1.316	2.398	5.051	N	~N(181)	A1(080)	1.049	0.005	5.046	15647	0.03087	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(183)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.846	1.429	2.398	5.951	N	~N(180)	A1(078)	1.049	0.006	5.945	16985	0.03041	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(184)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.715	1.38	2.398	5.551	N	~N(182)	A1(076)	1.049	0.005	5.546	16405	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(185)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.544	1.317	2.398	5.052	N	~N(183)	A1(074)	1.049	0.005	5.047	15649	0.03087	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(186)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.847	1.429	2.399	5.952	N	~N(178)	A1(072)	1.049	0.005	5.947	16987	0.03041	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(187)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.715	1.38	2.399	5.553	N	~N(179)	A1(070)	1.049	0.005	5.548	16407	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(188)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.544	1.317	2.399	5.053	N	~N(177)	A1(068)	1.049	0.004	5.049	15652	0.03086	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(189)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.847	1.429	2.399	5.954	N	~N(176)	A1(066)	1.049	0.006	5.948	16989	0.03041	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(190)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.716	1.381	2.4	5.555	N	~N(175)	A1(064)	1.049	0.006	5.549	16410	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(191)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.731	1.386	2.419	5.509	N	~N(203)	A1(004)	1.049	0.005	5.504	16476	0.03058	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(192)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.861	1.434	2.418	5.997	N	~N(204)	A1(006)	1.049	0.006	5.991	17050	0.03039	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(193)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.559	1.322	2.417	5.095	N	~N(205)	A1(008)	1.049	0.005	5.09	15715	0.03084	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(194)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.726	1.385	2.416	5.592	N	~N(205)	A1(010)	1.049	0.005	5.587	16465	0.03058	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(195)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.859	1.434	2.415	5.99	N	~N(210)	A1(012)	1.049	0.006	5.984	17041	0.03039	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(196)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.556	1.321	2.414	5.088	N	~N(209)	A1(014)	1.049	0.005	5.083	15705	0.03085	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(197)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.726	1.384	2.413	5.586	N	~N(207)	A1(016)	1.049	0.006	5.581	16456	0.03058	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(198)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.857	1.433	2.412	5.984	N	~N(208)	A1(018)	1.049	0.006	5.978	17032	0.03039	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(199)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.554	1.32	2.411	5.082	N	~N(218)	A1(020)	1.049	0.005	5.077	15696	0.03085	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(200)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.724	1.384	2.411	5.58	N	~N(217)	A1(022)	1.049	0.005	5.575	16447	0.03058	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(201)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.855	1.432	2.41	5.978	N	~N(215)	A1(024)	1.049	0.005	5.973	17024	0.03039	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(202)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.552	1.32	2.409	5.076	N	~N(216)	A1(026)	1.049	0.004	5.072	15687	0.03085	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(203)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.723	1.383	2.408	5.575	N	~N(211)	A1(028)	1.049	0.005	5.57	16439	0.03059	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(204)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.853	1.432	2.408	5.973	N	~N(212)	A1(030)	1.049	0.005	5.968	17017	0.0304	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(205)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.551	1.319	2.407	5.072	N	~N(214)	A1(032)	1.049	0.005	5.067	15680	0.03085	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(206)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.721	1.382	2.406	5.57	N	~N(213)	A1(034)	1.049	0.005	5.565	16433	0.03059	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(207)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.852	1.431	2.406	5.969	N	~N(231)	A1(036)	1.049	0.006	5.963	17010	0.0304	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(208)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.549	1.319	2.405	5.067	N	~N(232)	A1(038)	1.049	0.004	5.063	15673	0.03086	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(209)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.72	1.382	2.405	5.566	N	~N(227)	A1(040)	1.049	0.005	5.561	16427	0.03059	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(210)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.851	1.431	2.404	5.965	N	~N(228)	A1(042)	1.049	0.006	5.959	17005	0.0304	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(211)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.548	1.318	2.404	5.064	N	~N(230)	A1(044)	1.049	0.005	5.059	15668	0.03086	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(212)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.718	1.382	2.403	5.563	N	~N(229)	A1(046)	1.049	0.006	5.557	16421	0.03059	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(213)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.85	1.43	2.403	5.961	N	~N(219)	A1(048)	1.049	0.006	5.956	17000	0.0304	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(214)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.547	1.318	2.402	5.06	N	~N(220)	A1(050)	1.049	0.004	5.056	15663	0.03086	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(215)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.717	1.381	2.402	5.559	N	~N(222)	A1(052)	1.049	0.005	5.554	16417	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(216)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.849	1.43	2.401	5.959	N	~N(221)	A1(054)	1.049	0.006	5.953	16996	0.0304	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(217)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.546	1.317	2.401	5.058	N	~N(226)	A1(056)	1.049	0.005	5.053	15658	0.03086	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(218)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.717	1.381	2.401	5.557	N	~N(225)	A1(058)	1.049	0.005	5.552	16413	0.0306	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(219)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.848	1.43	2.4	5.958	N	~N(223)	A1(060)	1.049	0.006	5.951	16992	0.0304	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(220)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		3.545	1.317	2.4	5.055	N	~N(224)	A1(062)	1.049	0.004	5.051	15655	0.03086	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(221)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.325	1.607	4.481	7.526	N	B3(001)	~N(246)	1.049	0.007	7.519	19101	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(222)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.533	1.684	4.78	8.265	N	B3(003)	~N(248)	1.049	0.007	8.258	20018	0.02955	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(223)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.325	1.607	4.481	7.526	N	B3(002)	~N(247)	1.049	0.007	7.519	19101	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(224)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.324	1.607	4.46	7.523	N	B3(004)	~N(249)	1.049	0.007	7.516	19098	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(225)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.324	1.606	4.459	7.521	N	B3(005)	~N(250)	1.049	0.007	7.514	19095	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(226)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.324	1.606	4.459	7.521	N	B3(006)	~N(251)	1.049	0.007	7.514	19095	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(227)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.323	1.606	4.458	7.519	N	B3(007)	~N(252)	1.049	0.007	7.512	19092	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(228)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.323	1.606	4.458	7.519	N	B3(008)	~N(253)	1.049	0.007	7.512	19092	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(229)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.323	1.606	4.457	7.517	N	B3(009)	~N(254)	1.049	0.007	7.51	19089	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(230)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.323	1.606	4.457	7.517	N	B3(010)	~N(255)	1.049	0.007	7.51	19089	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(231)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.322	1.606	4.456	7.515	N	B3(011)	~N(256)	1.049	0.007	7.508	19087	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(232)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.322	1.606	4.456	7.515	N	B3(012)	~N(257)	1.049	0.007	7.508	19087	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(233)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.322	1.606	4.455	7.513	N	B3(013)	~N(258)	1.049	0.007	7.506	19085	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(234)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.322	1.606	4.455	7.513	N	B3(014)	~N(259)	1.049	0.006	7.507	19085	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(235)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.321	1.605	4.455	7.512	N	B3(015)	~N(260)	1.049	0.007	7.505	19083	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(236)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.321	1.605	4.455	7.512	N	B3(016)	~N(261)	1.049	0.007	7.505	19083	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(237)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.321	1.605	4.454	7.51	N	B3(017)	~N(262)	1.049	0.006	7.504	19081	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(238)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.321	1.605	4.454	7.511	N	B3(018)	~N(263)	1.049	0.007	7.504	19081	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(239)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.321	1.605	4.454	7.509	N	B3(019)	~N(264)	1.049	0.007	7.502	19080	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(240)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.321	1.605	4.454	7.509	N	B3(020)	~N(265)	1.049	0.007	7.502	19080	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(241)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.32	1.605	4.453	7.508	N	B3(021)	~N(266)	1.049	0.007	7.501	19079	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(242)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.32	1.605	4.453	7.508	N	B3(022)	~N(267)	1.049	0.007	7.501	19079	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(243)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.32	1.605	4.453	7.507	N	B3(023)	~N(268)	1.049	0.007	7.5	19077	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(244)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.32	1.605	4.453	7.507	N	B3(024)	~N(269)	1.049	0.007	7.5	19077	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(245)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.32	1.605	4.452	7.506	N	B3(025)	~N(270)	1.049	0.006	7.5	19076	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(246)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.32	1.605	4.452	7.506	N	B3(026)	~N(271)	1.049	0.006	7.5	19076	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(247)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.605	4.452	7.506	N	B3(027)	~N(272)	1.049	0.007	7.499	19075	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(248)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.605	4.452	7.506	N	B3(028)	~N(273)	1.049	0.007	7.499	19075	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(249)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.605	4.452	7.505	N	B3(029)	~N(274)	1.049	0.007	7.498	19075	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(250)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.605	4.452	7.505	N	B3(030)	~N(275)	1.049	0.007	7.498	19075	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(251)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.605	4.452	7.505	N	B3(031)	~N(276)	1.049	0.007	7.498	19074	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(252)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.605	4.452	7.505	N	B3(032)	~N(277)	1.049	0.007	7.498	19074	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(253)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.605	4.451	7.504	N	B3(033)	~N(278)	1.049	0.007	7.497	19073	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(254)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.605	4.451	7.504	N	B3(034)	~N(279)	1.049	0.007	7.497	19073	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(255)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.605	4.451	7.504	N	B3(035)	~N(280)	1.049	0.007	7.497	19073	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(256)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.605	4.451	7.504	N	B3(036)	~N(281)	1.049	0.007	7.497	19073	0.02979	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(257)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.605	4.451	7.503	N	B3(037)	~N(282)	1.049	0.006	7.497	19073	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(258)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.318	1.605	4.451	7.503	N	B3(038)	~N(283)	1.049	0.006	7.497	19073	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(259)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.605	4.451	7.503	N	B3(039)	~N(284)	1.049	0.007	7.496	19072	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(260)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.318	1.605	4.451	7.503	N	B3(040)	~N(285)	1.049	0.007	7.496	19072	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(261)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.318	1.605	4.451	7.503	N	B3(041)	~N(286)	1.049	0.007	7.496	19072	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(262)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.604	4.451	7.503	N	B3(042)	~N(287)	1.049	0.007	7.496	19072	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(263)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.604	4.451	7.503	N	B3(043)	~N(288)	1.049	0.007	7.496	19072	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(264)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.604	4.451	7.503	N	B3(044)	~N(289)	1.049	0.007	7.496	19072	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(265)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.604	4.451	7.503	N	B3(045)	~N(290)	1.049	0.007	7.496	19072	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(266)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.604	4.451	7.503	N	B3(046)	~N(291)	1.049	0.007	7.496	19072	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(267)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.604	4.451	7.503	N	B3(047)	~N(292)	1.049	0.007	7.496	19072	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(268)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.604	4.451	7.503	N	B3(048)	~N(293)	1.049	0.007	7.496	19072	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(269)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.604	4.451	7.503	N	B3(049)	~N(294)	1.049	0.007	7.496	19072	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(270)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.604	4.451	7.503	N	B3(050)	~N(295)	1.049	0.007	7.496	19072	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(271)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.319	1.604	4.451	7.503	N	B3(051)	~N(296)	1.049	0.007	7.496	19072	0.0298	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(272)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.262	1.583	1.212	7.306	N	B2(001)	~N(298)	1.049	0.007	7.299	18820	0.02986	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(273)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.262	1.583	1.212	7.306	N	B2(002)	~N(300)	1.049	0.007	7.299	18820	0.02986	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(274)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.259	1.582	1.209	7.298	N	B2(003)	~N(301)	1.049	0.007	7.291	18810	0.02987	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(275)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.259	1.582	1.209	7.298	N	B2(004)	~N(302)	1.049	0.007	7.291	18810	0.02987	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(276)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.257	1.582	1.206	7.291	N	B2(005)	~N(303)	1.049	0.007	7.284	18800	0.02987	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(277)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.257	1.582	1.206	7.291	N	B2(006)	~N(304)	1.049	0.007	7.284	18800	0.02987	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(278)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.255	1.581	1.202	7.283	N	B2(007)	~N(305)	1.049	0.006	7.277	18791	0.02987	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(279)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.255	1.581	1.202	7.283	N	B2(008)	~N(306)	1.049	0.006	7.277	18791	0.02987	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(280)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.253	1.58	1.199	7.277	N	B2(009)	~N(307)	1.049	0.007	7.27	18782	0.02987	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(281)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.253	1.58	1.199	7.277	N	B2(010)	~N(308)	1.049	0.007	7.27	18782	0.02987	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(282)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.251	1.579	1.197	7.27	N	B2(011)	~N(310)	1.049	0.007	7.263	18773	0.02988	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(283)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.251	1.579	1.197	7.27	N	B2(012)	~N(309)	1.049	0.007	7.263	18773	0.02988	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(284)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.249	1.579	1.194	7.264	N	B2(013)	~N(311)	1.049	0.007	7.257	18765	0.02988	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(285)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.249	1.579	1.194	7.264	N	B2(014)	~N(312)	1.049	0.007	7.257	18765	0.02988	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(286)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.248	1.578	1.191	7.258	N	B2(015)	~N(314)	1.049	0.007	7.251	18758	0.02988	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(287)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.248	1.578	1.191	7.258	N	B2(016)	~N(313)	1.049	0.007	7.251	18758	0.02988	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(288)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.246	1.577	1.189	7.252	N	B2(017)	~N(318)	1.049	0.006	7.246	18750	0.02988	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(289)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.246	1.577	1.189	7.252	N	B2(018)	~N(317)	1.049	0.006	7.246	18750	0.02988	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(290)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.244	1.577	1.187	7.247	N	B2(019)	~N(315)	1.049	0.007	7.24	18744	0.02988	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(291)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.244	1.577	1.187	7.247	N	B2(020)	~N(316)	1.049	0.007	7.24	18744	0.02988	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(292)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.243	1.576	1.184	7.242	N	B2(021)	~N(320)	1.049	0.007	7.235	18737	0.02989	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(293)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.243	1.576	1.184	7.242	N	B2(022)	~N(319)	1.049	0.007	7.235	18737	0.02989	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(294)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.241	1.576	1.182	7.237	N	B2(023)	~N(321)	1.049	0.007	7.23	18731	0.02989	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(295)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.241	1.576	1.182	7.237	N	B2(024)	~N(322)	1.049	0.007	7.23	18731	0.02989	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(296)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.24	1.575	1.18	7.232	N	B2(025)	~N(323)	1.049	0.006	7.226	18725	0.02989	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(297)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.24	1.575	1.18	7.232	N	B2(026)	~N(324)	1.049	0.006	7.226	18725	0.02989	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(298)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.239	1.575	1.179	7.228	N	B2(027)	~N(325)	1.049	0.007	7.221	18719	0.02989	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(299)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.239	1.575	1.179	7.228	N	B2(028)	~N(326)	1.049	0.007	7.221	18719	0.02989	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(300)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.238	1.574	1.177	7.224	N	B2(029)	~N(327)	1.049	0.007	7.217	18714	0.02989	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(301)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.238	1.574	1.177	7.224	N	B2(030)	~N(328)	1.049	0.007	7.217	18714	0.02989	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(302)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.237	1.574	1.175	7.22	N	B2(031)	~N(329)	1.049	0.006	7.214	18709	0.02989	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(303)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.237	1.574	1.175	7.22	N	B2(032)	~N(330)	1.049	0.006	7.214	18709	0.02989	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(304)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.235	1.574	1.174	7.217	N	B2(033)	~N(331)	1.049	0.007	7.21	18704	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(305)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.235	1.574	1.174	7.217	N	B2(034)	~N(332)	1.049	0.007	7.21	18704	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(306)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.234	1.573	1.172	7.213	N	B2(035)	~N(333)	1.049	0.006	7.207	18700	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(307)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.234	1.573	1.172	7.213	N	B2(036)	~N(334)	1.049	0.006	7.207	18700	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(308)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.234	1.573	1.171	7.21	N	B2(037)	~N(335)	1.049	0.006	7.204	18696	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(309)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.234	1.573	1.171	7.21	N	B2(038)	~N(336)	1.049	0.006	7.204	18696	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(310)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.233	1.573	1.17	7.207	N	B2(039)	~N(337)	1.049	0.006	7.201	18692	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(311)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.233	1.573	1.17	7.207	N	B2(040)	~N(338)	1.049	0.006	7.201	18692	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(312)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.232	1.572	1.168	7.204	N	B2(041)	~N(339)	1.049	0.006	7.198	18689	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(313)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.232	1.572	1.168	7.204	N	B2(042)	~N(340)	1.049	0.006	7.198	18689	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(314)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.231	1.572	1.167	7.202	N	B2(043)	~N(341)	1.049	0.007	7.195	18685	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(315)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.231	1.572	1.167	7.202	N	B2(044)	~N(342)	1.049	0.007	7.195	18685	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(316)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.23	1.572	1.166	7.2	N	B2(045)	~N(343)	1.049	0.007	7.193	18682	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(317)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.23	1.572	1.166	7.2	N	B2(046)	~N(344)	1.049	0.007	7.193	18682	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(318)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.23	1.571	1.165	7.197	N	B2(047)	~N(345)	1.049	0.006	7.191	18679	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(319)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.23	1.571	1.165	7.197	N	B2(048)	~N(346)	1.049	0.006	7.191	18679	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(320)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.229	1.571	1.164	7.195	N	B2(049)	~N(347)	1.049	0.006	7.189	18677	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(321)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.229	1.571	1.164	7.195	N	B2(050)	~N(348)	1.049	0.006	7.189	18677	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(322)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.229	1.571	1.164	7.194	N	B2(051)	~N(349)	1.049	0.007	7.187	18675	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(323)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.229	1.571	1.164	7.194	N	B2(052)	~N(350)	1.049	0.007	7.187	18675	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(324)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.228	1.571	1.163	7.192	N	B2(053)	~N(351)	1.049	0.007	7.185	18672	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(325)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.228	1.571	1.163	7.192	N	B2(054)	~N(352)	1.049	0.007	7.185	18672	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(326)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.228	1.571	1.162	7.19	N	B2(055)	~N(353)	1.049	0.006	7.184	18670	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(327)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.228	1.571	1.162	7.19	N	B2(056)	~N(354)	1.049	0.006	7.184	18670	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(328)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.227	1.571	1.162	7.189	N	B2(057)	~N(355)	1.049	0.006	7.183	18669	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(329)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.227	1.571	1.162	7.189	N	B2(058)	~N(356)	1.049	0.006	7.183	18669	0.0299	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(330)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.227	1.57	1.161	7.188	N	B2(059)	~N(357)	1.049	0.007	7.181	18667	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(331)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.227	1.57	1.161	7.188	N	B2(060)	~N(358)	1.049	0.007	7.181	18667	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(332)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.227	1.57	1.161	7.187	N	B2(061)	~N(359)	1.049	0.007	7.18	18666	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(333)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.227	1.57	1.161	7.187	N	B2(062)	~N(360)	1.049	0.007	7.18	18666	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(334)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.226	1.57	1.16	7.186	N	B2(063)	~N(361)	1.049	0.007	7.179	18665	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1
Pipe(335)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.226	1.57	1.16	7.186	N	B2(064)	~N(362)	1.049	0.007	7.179	18665	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1

Pipe(336)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.226	1.57	1.16	7.165	N	B2(065)	~N(363)	1.049	0.006	7.179	18663	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(337)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.226	1.57	1.16	7.165	N	B2(066)	~N(364)	1.049	0.006	7.179	18663	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(338)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.226	1.57	1.16	7.164	N	B2(067)	~N(365)	1.049	0.006	7.178	18663	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(339)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.226	1.57	1.16	7.164	N	B2(068)	~N(366)	1.049	0.006	7.178	18663	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(340)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.226	1.57	1.159	7.164	N	B2(069)	~N(367)	1.049	0.007	7.177	18662	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(341)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.226	1.57	1.159	7.164	N	B2(070)	~N(368)	1.049	0.007	7.177	18662	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(342)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.226	1.57	1.159	7.163	N	B2(071)	~N(369)	1.049	0.006	7.177	18661	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(343)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.226	1.57	1.159	7.163	N	B2(072)	~N(370)	1.049	0.006	7.177	18661	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(344)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.226	1.57	1.159	7.163	N	B2(073)	~N(371)	1.049	0.007	7.176	18660	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(345)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.226	1.57	1.159	7.163	N	B2(074)	~N(372)	1.049	0.007	7.176	18660	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(346)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.225	1.57	1.159	7.162	N	B2(075)	~N(373)	1.049	0.006	7.176	18660	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(347)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.225	1.57	1.159	7.162	N	B2(076)	~N(374)	1.049	0.006	7.176	18660	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(348)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.225	1.57	1.159	7.162	N	B2(077)	~N(375)	1.049	0.006	7.176	18660	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(349)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.225	1.57	1.159	7.162	N	B2(078)	~N(376)	1.049	0.006	7.176	18660	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(350)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.225	1.57	1.159	7.162	N	B2(079)	~N(377)	1.049	0.007	7.175	18659	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(351)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.225	1.57	1.159	7.162	N	B2(080)	~N(378)	1.049	0.007	7.175	18659	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(352)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.225	1.57	1.159	7.162	N	B2(081)	~N(379)	1.049	0.007	7.175	18659	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(353)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.225	1.57	1.159	7.162	N	B2(082)	~N(380)	1.049	0.007	7.175	18659	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(354)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.225	1.57	1.159	7.162	N	B2(083)	~N(381)	1.049	0.007	7.175	18659	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(355)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.225	1.57	1.159	7.162	N	B2(084)	~N(382)	1.049	0.007	7.175	18659	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(356)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.225	1.57	1.158	7.182	N	B2(085)	~N(383)	1.049	0.007	7.175	18659	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(357)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.225	1.57	1.158	7.182	N	B2(086)	~N(384)	1.049	0.007	7.175	18659	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(358)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.225	1.57	1.158	7.182	N	B2(087)	~N(385)	1.049	0.007	7.175	18659	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(359)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.225	1.57	1.158	7.182	N	B2(088)	~N(387)	1.049	0.007	7.175	18659	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(360)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.225	1.57	1.158	7.182	N	B2(089)	~N(388)	1.049	0.007	7.175	18659	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(361)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7	<-->	4.225	1.57	1.158	7.182	N	B2(090)	~N(389)	1.049	0.007	7.175	18659	0.02991	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(362)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.39	2.003	5.049	11.69	N	~N(391)	B1(001)	1.049	0.01	11.68	23804	0.02873	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(363)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.39	2.003	5.049	11.69	N	~N(392)	B1(002)	1.049	0.01	11.68	23804	0.02873	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(364)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.389	2.002	5.047	11.68	N	~N(393)	B1(003)	1.049	0.01	11.67	23798	0.02874	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(365)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.389	2.002	5.047	11.68	N	~N(394)	B1(004)	1.049	0.01	11.67	23798	0.02874	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(366)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.388	2.002	5.045	11.68	N	~N(395)	B1(005)	1.049	0.01	11.67	23793	0.02874	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(367)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.388	2.002	5.045	11.68	N	~N(396)	B1(006)	1.049	0.01	11.67	23793	0.02874	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(368)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.387	2.001	5.042	11.67	N	~N(397)	B1(007)	1.049	0.01	11.66	23788	0.02874	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(369)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.387	2.001	5.042	11.67	N	~N(398)	B1(008)	1.049	0.01	11.66	23788	0.02874	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(370)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.385	2.001	5.04	11.67	N	~N(399)	B1(009)	1.049	0.01	11.66	23783	0.02874	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(371)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.386	2.001	5.04	11.67	N	~N(400)	B1(010)	1.049	0.01	11.66	23783	0.02874	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(372)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.384	2	5.034	11.66	N	~N(401)	B1(011)	1.049	0.01	11.65	23778	0.02874	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(373)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.384	2	5.038	11.66	N	~N(402)	B1(012)	1.049	0.01	11.65	23778	0.02874	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(374)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.383	2	5.036	11.66	N	~N(403)	B1(013)	1.049	0.01	11.65	23774	0.02874	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
Pipe(375)	Steel Sch 40 (clean)	Containment Sump Water	1	0.5	187.7		5.383	2	5.036	11.66	N	~N(404)	B1(014)	1.049	0.01	11.65	23774	0.02874	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(015)	1.049	0.01	11.64	23769	0.02874	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(016)	1.049	0.01	11.64	23769	0.02874	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(017)	1.049	0.01	11.64	23765	0.02874	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(018)	1.049	0.01	11.64	23765	0.02874	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(019)	1.049	0.01	11.64	23761	0.02874	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(020)	1.049	0.01	11.64	23761	0.02874	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(021)	1.049	0.01	11.63	23757	0.02874	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(022)	1.049	0.01	11.63	23757	0.02874	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(023)	1.049	0.01	11.63	23754	0.02874	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(024)	1.049	0.01	11.63	23754	0.02874	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(025)	1.049	0.01	11.62	23750	0.02874	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(026)	1.049	0.01	11.62	23750	0.02874	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(027)	1.049	0.01	11.62	23747	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(028)	1.049	0.01	11.62	23747	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(029)	1.049	0.01	11.62	23743	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(030)	1.049	0.01	11.62	23743	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(031)	1.049	0.02	11.61	23740	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(032)	1.049	0.02	11.61	23740	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(033)	1.049	0.01	11.61	23737	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(034)	1.049	0.01	11.61	23737	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(035)	1.049	0.01	11.61	23734	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(036)	1.049	0.01	11.61	23734	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(037)	1.049	0.01	11.61	23731	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(038)	1.049	0.01	11.61	23731	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(039)	1.049	0.01	11.6	23729	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(040)	1.049	0.01	11.6	23729	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(041)	1.049	0.01	11.6	23726	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(042)	1.049	0.01	11.6	23726	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(043)	1.049	0.01	11.6	23724	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(044)	1.049	0.01	11.6	23724	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(045)	1.049	0.01	11.6	23722	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(046)	1.049	0.01	11.6	23722	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(047)	1.049	0.02	11.59	23720	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(048)	1.049	0.02	11.59	23720	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(049)	1.049	0.01	11.59	23718	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(050)	1.049	0.01	11.59	23718	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(051)	1.049	0.01	11.59	23716	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(052)	1.049	0.01	11.59	23716	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(053)	1.049	0.01	11.59	23714	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(054)	1.049	0.01	11.59	23714	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(055)	1.049	0.01	11.59	23712	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(056)	1.049	0.01	11.59	23712	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(057)	1.049	0.01	11.59	23711	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(058)	1.049	0.01	11.59	23711	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(059)	1.049	0.01	11.58	23709	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(060)	1.049	0.01	11.58	23709	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(061)	1.049	0.01	11.58	23708	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(062)	1.049	0.01	11.58	23708	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(063)	1.049	0.01	11.58	23707	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(064)	1.049	0.01	11.58	23707	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(065)	1.049	0.01	11.58	23706	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(066)	1.049	0.01	11.58	23706	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(067)	1.049	0.01	11.58	23704	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(068)	1.049	0.01	11.58	23704	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(069)	1.049	0.01	11.58	23703	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(070)	1.049	0.01	11.58	23703	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(071)	1.049	0.01	11.58	23703	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(072)	1.049	0.01	11.58	23703	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(073)	1.049	0.01	11.58	23702	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(074)	1.049	0.01	11.58	23702	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(075)	1.049	0.01	11.58	23701	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(076)	1.049	0.01	11.58	23701	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(077)	1.049	0.01	11.58	23700	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(078)	1.049	0.01	11.58	23700	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(079)	1.049	0.01	11.58	23700	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(080)	1.049	0.01	11.58	23700	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(081)	1.049	0.01	11.57	23699	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(082)	1.049	0.01	11.57	23699	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(083)	1.049	0.01	11.57	23699	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(084)	1.049	0.01	11.57	23699	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(085)	1.049	0.01	11.57	23698	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(086)	1.049	0.01	11.57	23698	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(087)	1.049	0.01	11.57	23698	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(088)	1.049	0.01	11.57	23698	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(089)	1.049	0.01	11.57	23697	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(090)	1.049	0.01	11.57	23697	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(091)	1.049	0.01	11.57	23697	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(092)	1.049	0.01	11.57	23697	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(093)	1.049	0.01	11.57	23697	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(094)	1.049	0.01	11.57	23697	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(095)	1.049	0.01	11.57	23697	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(096)	1.049	0.01	11.57	23697	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(097)	1.049	0.01	11.57	23696	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(098)	1.049	0.01	11.57	23696	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(099)	1.049	0.01	11.57	23696	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(100)	1.049	0.01	11.57	23696	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(101)	1.049	0.01	11.57	23696	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(102)	1.049	0.01	11.57	23696	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(103)	1.049	0.01	11.57	23696	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(104)	1.049	0.01	11.57	23696	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(105)	1.049	0.01	11.57	23696	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(106)	1.049	0.01	11.57	23696	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(107)	1.049	0.01	11.57	23696	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(108)	1.049	0.01	11.57	23696	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(109)	1.049	0.01	11.57	23696	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(110)	1.049	0.01	11.57	23696	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(111)	1.049	0.01	11.57	23696	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B1(112)	1.049	0.01	11.57	23696	0.02875	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	A1(001)	1.049	0.006	5.990	17058	0.03038	1 x Spray Nozzle	186.7	1 x Exit - Sharp Edged	1						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Hot Leg A(002)	10.5	—	—	—	—	1 x Pipe Bend - r/d 1.5 (90°)	0.1862	1 x Pipe Bend - r/d 1.5 (45°)	0.1318	1 x Diverging Tee (Through)	1.00E-05				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	~N(548)	10.5	—	—	—	—	13 x Pipe Bend - r/d 1.5 (90°)	0.1862	1 x Pipe Bend - r/d 1.5 (45°)	0.1318	1 x RH8701B-2	0.17				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Hot Leg C(002)	10.5	—	—	—	—	1 x Pipe Bend - r/d 1.5 (90°)	0.1862	1 x Pipe Bend - r/d 1.5 (45°)	0.1318	1 x Diverging* Tee (Branch)	0.8				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	~N(551)	10.5	—	—	—	—	15 x Pipe Bend - r/d 1.5 (90°)	0.1862	2 x Pipe Bend - r/d 1.5 (45°)	0.1318	1 x RH8702B-2	0.17	1 x Diverging* Tee (Branch)	1.00E-05		
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Hot Leg B(002)	5.187	0	0	0	0	1 x Pipe Bend - r/d 1.5 (90°)	0.2156	1 x SI8949B	2.825						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	~N(542)	5.187	0	0	0	0	2 x Pipe Bend - r/d 1.5 (90°)	0.2156	1 x SI8949C (Check Valve)	2.825	1 x Converging Tee (Branch)	0.8				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	~N(546)	5.187	0	0	0	0	2 x Pipe Bend - r/d 1.5 (90°)	0.2156	1 x SI8949A (Check Valve)	2.825	1 x Diverging Tee (Branch)	1				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Hot Leg D(002)	5.187	0	0	0	0	1 x Pipe Bend - r/d 1.5 (90°)	0.2156	1 x SI8949D	2.825						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Cold Leg A(001)	2.624	0.056	3.954	243338	0.01957	1 x Reducer - Enlargement (3 x 1.5 - 3.5)	3.805								
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Cold Leg B(001)	2.624	0.055	3.929	242570	0.01957	1 x Reducer - Enlargement (3 x 1.5 - 3.5)	3.805								
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Cold Leg C(001)	2.624	0.054	3.867	240637	0.01958	1 x Reducer - Enlargement (3 x 1.5 - 3.5)	3.805								
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Cold Leg D(001)	2.624	0.054	3.861	240461	0.01958	1 x Reducer - Enlargement (3 x 1.5 - 3.5)	3.805								
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	~N(549)	12	0	0	0	0	7 x Pipe Bend - r/d 1.5 (90°)	0.1813	1 x RH8701A-1	0.17	1 x Converging Tee (Through)	1.00E-05				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	~N(004)	12	0.042	0	1.42E+06	0.01388	1 x Converging Tee (Branch)	1.00E-05								
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	~N(552)	12	0	0	0	0	5 x Pipe Bend - r/d 1.5 (90°)	0.1813	1 x RH8701A-1	0.17	1 x Converging Tee (Through)	1.00E-05				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	~N(553)	12	0.118	0.133	1.50E+06	0.01384	1 x Reducer - Enlargement (16 x 12 - 14)	0.07036	1 x Converging Tee (Branch)	1.00E-05	1 x Converging Tee (Through)	1.00E-05				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	~N(235)	15	0.008	0.26	1.20E+06	0.01361	1 x Reducer - Enlargement (12 x 16 - 0)	0.335	1 x Converging Tee (Branch)	1.00E-05						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	~N(002)	15	0.048	2.509	1.14E+06	0.01366	1 x Pipe Bend - r/d 1.5 (45°)	0.1229	1 x Diverging* Tee (Branch)	3.5	1 x Converging Tee (Through)	1.00E-05				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	~N(512)	15	0	0	0	0	1 x Pipe Bend - r/d 1.5 (90°)	0.1736	1 x Converging Tee (Through)	1.00E-05	1 x Diverging* Tee (Branch)	1.00E-05				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	~N(535)	15	0	0	0	0	1 x Pipe Bend - r/d 1.5 (90°)	0.1736								
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Residual Heat Removal Pump A	13.124	0	0	0	0	1 x Pipe Bend - r/d 1.5 (90°)	0.1782	1 x Reducer - Contraction (16 x 14 - 14)	0.01254						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	~N(234)	15	0.053	0.716	1.20E+06	0.01361	1 x Pipe Bend - r/d 1.5 (45°)	0.1229	1 x Converging Tee (Through)	1.00E-05	1 x Diverging Tee (Branch)	1.00E-05	1 x Diverging* Tee (Branch)	0.8		
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	~N(524)	15	0	0	0	0	2 x Pipe Bend - r/d 1.5 (90°)	0.1736	1 x Converging Tee (Through)	1.00E-05	1 x Diverging* Tee (Branch)	1.00E-05				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	~N(536)	15	0	0	0	0										
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Residual Heat Removal Pump B	13.124	0	0	0	0	1 x Pipe Bend - r/d 1.5 (90°)	0.1782	1 x Reducer - Contraction (16 x 14 - 14)	0.01254						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Residual Heat Removal Pump A	~N(513)	7.981	—	—	—	—	1 x FE610	1.7	1 x RH8724A (Gate Valve)	0.182	1 x RH8730A (Check Valve)	1.89	7 x Pipe Bend - r/d 1.5 (90°)	0.1969		
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	~N(514)	7.981	0	0	0	0	3 x Pipe Bend - r/d 1.5 (90°)	0.1969	1 x Diverging Tee (Through)	1.00E-05	2 x Pipe Bend - r/d 1.5 (45°)	0.1394				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Residual HX A	13.124	0	0	0	0	1 x Reducer - Enlargement (14 x 8 - 13)	1.465								
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Residual Heat Removal Pump B	~N(525)	7.981	0	0	0	0	1 x FE611	1.7	1 x RH8724B (Gate Valve)	0.182	1 x RH8730B (Check Valve)	1.89	10 x Pipe Bend - r/d 1.5 (90°)	0.1969	2 x Pipe Bend - r/d 1.5 (45°)	0.1394
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	~N(526)	7.981	0	0	0	0	3 x Pipe Bend - r/d 1.5 (90°)	0.1969	1 x Diverging Tee (Through)	1.00E-05	2 x Pipe Bend - r/d 1.5 (45°)	0.1394				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Residual HX B	13.124	0	0	0	0	1 x Reducer - Enlargement (14 x 8 - 13)	1.465								
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	~N(515)	13.124	0	0	0	0	1 x Reducer - Contraction (14 x 8 - 13)	0.7153								
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	~N(516)	7.981	0	0	0	0	3 x Pipe Bend - r/d 1.5 (90°)	0.1969	2 x Pipe Bend - r/d 1.5 (45°)	0.1394						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	~N(517)	7.981	0	0	0	0	2 x Pipe Bend - r/d 1.5 (90°)	0.1969	1 x RH8606 (Butterfly Valve)	2.252	1 x Diverging Tee (Through)	1.00E-05	1 x Converging* Tee (Branch)	1.2		
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	~N(518)	7.981	0	0	0	0	8 x Pipe Bend - r/d 1.5 (90°)	0.1969	1 x FE618	1.6						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	~N(519)	7.981	0	0	0	0	1 x Pipe Bend - r/d 1.5 (90°)	0.1969	1 x Diverging Tee (Through)	1.00E-05	1 x Converging* Tee (Branch)	1.2				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	~N(519)	7.981	0	0	0	0	1 x RH8716A-1(Gate Valve)	0.182	1 x Diverging Tee (Through)	1.00E-05	1 x Converging* Tee (Branch)	11000				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	~N(520)	7.981	0	0	0	0	1 x Reducer - Enlargement (12 x 8 - 8)	0.1909	1 x Diverging Tee (Through)	1.00E-05						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	~N(521)	12	0	0	0	0	1 x Converging* Tee (Branch)	1.00E-05	1 x Diverging Tee (Through)	1.00E-05						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	~N(527)	13.124	0	0	0	0	1 x Reducer - Contraction (14 x 8 - 13)	0.7153								
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	~N(528)	7.981	0	0	0	0	3 x Pipe Bend - r/d 1.5 (90°)	0.1969	2 x Pipe Bend - r/d 1.5 (45°)	0.1394						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	~N(529)	7.981	0	0	0	0	1 x RH607(Butterfly Valve)	2.252	1 x Diverging Tee (Through)	1.00E-05	1 x Converging* Tee (Branch)	1.2				

RH03AB(004)	Steel Sch 40 (clean)	Water After RHR HX	8	28.9	2.472	
RH03AB(005)	Steel Sch 40 (clean)	Water After RHR HX	6	36.3	14000	
RH03AB(006)	Steel Sch 40S (clean)	Water After RHR HX	12	1.5	1.00E-05	
RH09AA(001)	Steel Sch 40 (clean)	Containment Sump Water	8	1	1.00E-05	XXX
RH09AA(002)	Steel Sch 40 (clean)	Containment Sump Water	8	1	1.00E-05	XXX
RH09AB(001)	Steel Sch 40 (clean)	Containment Sump Water	8	1	1.00E-05	XXX
RH09AB(002)	Steel Sch 40 (clean)	Containment Sump Water	8	1	1.00E-05	XXX
RH10AA(001)	Steel Sch 40 (clean)	Water After RHR HX	3	1	1.00E-05	XXX
RH10AA(002)	Steel Sch 40 (clean)	Water After RHR HX	3	1	1.00E-05	
RH10AB(001)	Steel Sch 40 (clean)	Water After RHR HX	3	1	1.00E-05	XXX
RH10AB(002)	Steel Sch 40 (clean)	Water After RHR HX	3	1	1.00E-05	
RH12A/CV99A	Steel Sch 40 (clean)	Water After RHR HX	6	28.6	5.573	XXX
RH14A	Steel Sch 40 (clean)	Water After RHR HX	8	4.4	1.979	XXX
SI01A	Steel Sch 40 (clean)	Water After RHR HX	6	26.4	0.9844	
SI01B(001)	Steel Sch 20 (clean)	Water After RHR HX	24	113.2	0.3195	
SI01B(002)	Steel Sch 20 (clean)	Water After RHR HX	24	58	0.3195	
SI01B(003)	Steel Sch 20 (clean)	Water After RHR HX	24	4.6	0.3	
SI01B(004)	Steel Sch 20 (clean)	Water After RHR HX	24	60.3	0.4524	
SI01B(005)	Steel Sch 20 (clean)	Water After RHR HX	24	7	2.00E-05	
SI01B(006)	Steel Sch 20 (clean)	Water After RHR HX	24	2	13.7	
SI01B(007)	Steel Sch 20 (clean)	Water After RHR HX	24	1	29.43	

SI82AB/BB	Steel Sch 40 (clean)	Water After RHR HX	12	57.1	4.915	3692	11.17	-9.529	11.04	N	~N(504)	~N(552)	11.938	1.535	9.506	1.51E+06	0.01385	3 x Pipe Bend - r/d 1.5 (90°)	0.1815	1 x SI8956B(Check Valve)	1.8	1 x SI8812B(Gate Valve)	0.17	1 x Diverging Tee (Branch)	1.3	1 x Converging Tee (Branch)	1.:
SI44A	Steel Sch.160 (clean)	Water After RHR HX	8	15.1	1.847	0	0	2.592	0	N	~N(537)	~N(544)	6.813	0	0	0	0	2 x Pipe Bend - r/d 1.5 (90°)	0.2035	1 x SI8841A (Check Valve)	0.84	1 x Diverging Tee (Branch)	1.00E-05	1 x Converging Tee (Through)	0.8		
SI44B	Steel Sch.160 (clean)	Water After RHR HX	8	85.1	2.11	0	0	-0.259	0	N	~N(544)	~N(545)	6.813	0	0	0	0	9 x Pipe Bend - r/d 1.5 (90°)	0.2035	1 x Pipe Bend - r/d 1.5 (45°)	0.144	1 x Reducer - Contraction (8 x 6 - 6)	0.1344				

Node List	Status	Pressure	Grade	Elev
~N(001)		121.6	675.5	428
~N(001A)		56.42	675.5	574.3
~N(002)		37.09	406.9	356.1
~N(003)		40.03	406.9	348.3
~N(004)		40.44	409.5	349.9
~N(005)		157.8	675.5	344.3
~N(006)		157.8	675.5	344.3
~N(007)		156.1	675.5	348.3
~N(008)		151	675.5	360
~N(009)		136	675.5	394.8
~N(010)		52.85	675.5	587.2
~N(011)		50.19	675.6	593.5
~N(012)		50.2	675.7	593.5
~N(013)		50.2	675.7	593.5
~N(014)		50.2	675.7	593.5
~N(015)		50.21	675.7	593.5
~N(016)		50.22	675.7	593.5
~N(017)		50.22	675.7	593.5
~N(018)		50.23	675.7	593.5
~N(019)		50.23	675.7	593.5
~N(020)		50.24	675.8	593.5
~N(021)		50.24	675.8	593.5
~N(022)		50.25	675.8	593.5
~N(023)		50.24	675.8	593.5
~N(024)		50.24	675.8	593.5
~N(025)		50.25	675.8	593.5
~N(026)		50.25	675.8	593.5
~N(027)		50.25	675.8	593.5
~N(028)		50.25	675.8	593.5
~N(029)		50.25	675.8	593.5
~N(030)		50.25	675.8	593.5
~N(031)		50.25	675.8	593.5
~N(032)		50.25	675.8	593.5
~N(033)		50.2	675.7	593.5
~N(034)		50.21	675.7	593.5
~N(035)		50.22	675.7	593.5
~N(036)		50.23	675.7	593.5
~N(037)		50.23	675.7	593.5
~N(038)		50.22	675.7	593.5
~N(039)		50.24	675.8	593.5
~N(040)		50.25	675.8	593.5
~N(041)		50.25	675.8	593.5
~N(042)		50.24	675.8	593.5
~N(043)		50.24	675.8	593.5
~N(044)		50.24	675.8	593.5
~N(045)		50.25	675.8	593.5
~N(046)		50.25	675.8	593.5
~N(047)		50.25	675.8	593.5
~N(048)		50.25	675.8	593.5
~N(049)		50.25	675.8	593.5
~N(050)		50.25	675.8	593.5
~N(051)		52.16	675.7	589
~N(052)		52.21	675.8	589
~N(053)		52.21	675.8	589
~N(054)		52.21	675.8	589
~N(055)		52.21	675.8	589
~N(056)		52.21	675.8	589
~N(057)		52.21	675.8	589
~N(058)		52.21	675.8	589
~N(059)		52.21	675.8	589
~N(060)		52.21	675.8	589
~N(061)		52.21	675.8	589
~N(062)		52.21	675.8	589
~N(063)		52.21	675.8	589
~N(064)		52.21	675.8	589
~N(065)		52.2	675.8	589
~N(066)		52.2	675.8	589
~N(067)		52.2	675.8	589
~N(068)		52.2	675.8	589
~N(069)		52.2	675.8	589
~N(070)		52.2	675.8	589
~N(071)		52.2	675.8	589
~N(072)		52.2	675.8	589
~N(073)		52.16	675.7	589
~N(074)		52.2	675.8	589
~N(075)		52.2	675.8	589
~N(076)		52.2	675.8	589
~N(077)		52.21	675.8	589
~N(078)		52.21	675.8	589
~N(079)		52.21	675.8	589
~N(080)		52.2	675.8	589
~N(081)		52.21	675.8	589
~N(082)		52.21	675.8	589
~N(083)		52.21	675.8	589
~N(084)		52.21	675.8	589
~N(085)		52.21	675.8	589
~N(086)		52.21	675.8	589
~N(087)		52.21	675.8	589
~N(088)		52.21	675.8	589
~N(089)		52.21	675.8	589
~N(090)		52.21	675.8	589
~N(091)		52.21	675.8	589
~N(092)		52.21	675.8	589
~N(093)		52.21	675.8	589
~N(094)		52.21	675.8	589
~N(095)		52.21	675.8	589
~N(096)		52.21	675.8	589
~N(097)		52.21	675.8	589
~N(098)		52.21	675.8	589
~N(099)		52.21	675.8	589
~N(100)		52.21	675.8	589
~N(101)		52.21	675.8	589
~N(102)		52.21	675.8	589
~N(103)		52.21	675.8	589
~N(104)		52.21	675.8	589
~N(105)		52.21	675.8	589
~N(106)		52.21	675.8	589
~N(107)		52.21	675.8	589
~N(108)		52.21	675.8	589
~N(109)		52.21	675.8	589
~N(110)		52.21	675.8	589
~N(111)		52.18	675.8	589
~N(112)		57.42	674.7	575.9
~N(113)		57.42	674.7	575.9
~N(114)		57.42	674.7	575.9
~N(115)		57.42	674.7	575.9
~N(116)		57.42	674.7	575.9
~N(117)		57.42	674.7	575.9
~N(118)		57.42	674.7	575.9
~N(119)		57.42	674.7	575.9
~N(120)		57.41	674.7	575.9
~N(121)		57.41	674.7	575.9
~N(122)		57.41	674.7	575.9
~N(123)		57.41	674.7	575.9
~N(124)		57.41	674.7	575.9
~N(125)		57.41	674.7	575.9
~N(126)		57.41	674.7	575.9
~N(127)		57.41	674.7	575.9
~N(128)		57.41	674.7	575.9
~N(129)		57.41	674.7	575.9
~N(130)		57.41	674.7	575.9
~N(131)		57.41	674.7	575.9
~N(132)		57.4	674.6	575.9
~N(133)		57.4	674.6	575.9
~N(134)		57.4	674.6	575.9
~N(135)		57.4	674.6	575.9
~N(136)		57.4	674.7	575.9
~N(137)		57.4	674.6	575.9
~N(138)		57.4	674.6	575.9
~N(139)		57.4	674.6	575.9
~N(140)		57.4	674.6	575.9
~N(141)		57.4	674.6	575.9
~N(142)		57.4	674.6	575.9
~N(143)		57.4	674.6	575.9
~N(144)		57.4	674.6	575.9
~N(145)		57.4	674.6	575.9
~N(146)		57.4	674.6	575.9
~N(147)		57.4	674.6	575.9
~N(148)		57.4	674.6	575.9
~N(149)		57.4	674.6	575.9
~N(150)		57.4	674.6	575.9
~N(151)		57.4	674.6	575.9
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~N(540)	27.05	407.6	379
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~N(545)	24.72	407.6	384.4

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-N(548)		27.89	409.5	379
-N(549)		40.46	409.5	349.9
-N(551)		27.19	408.1	379.2
-N(552)		39.85	408.1	349.9
-N(553)		39.74	407.9	349.9
-N(558)	Isolated	—	—	367.3
-N(559)		42.86	409.5	344.3
-N(560)	Isolated	—	—	367.4
-N(561)		32.06	407.6	367.4
-N(564)		22.51	407.6	389.5
-N(565)		8.69	407.6	421.5
-N(566)		200.7	848	417.5
-N(569)		22.51	407.6	389.5
-N(570)		212.7	847.9	389.5
-N(571)		211.6	847.4	391.7
-N(572)		28.78	407.6	375
-N(573)		23.56	407.6	387
-N(574)		10.63	407.6	417
-N(575)		200.9	847.9	417
-N(576)		213	847.4	388.4
-N(577)		24.67	407.6	384.5
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-N(579)		214.9	847.6	384.5
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-N(581)		212.4	847.4	389.8
-N(583)		1007	2709	413.3
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-N(590)		32.58	417.7	376.3
-N(591)		32.57	417.7	376.3
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-N(598)		32.33	417.1	376.3
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-N(602)		27.48	407.6	378
-N(603)		209.7	847.4	396
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-N(606)		27.48	407.6	378
-N(607)		27.48	407.6	378
-N(610)		209.7	847.4	396
-N(613)		1338	3440	377.5
-N(614)		1324	3414	383
-N(615)		1320	3401	380
-N(616)		1295	3384	420.2
-N(618)		32.52	416.8	377.5
-N(619)		35.98	415.6	366.4
-N(621)		34.67	416.7	372.5
-N(622)		34.3	417.8	372.5
-N(624)		35.27	418.1	370.5
-N(625)		34.41	418.1	372.5
-N(626)	Isolated	—	—	366.4
-N(627)		34.11	417.4	372.5
-N(631)		34.41	418.1	372.5
-N(635)		1833	4579	369.6
-N(636)		1829	4571	371.6
-N(638)		1833	4579	369.6
-N(639)		1832	4578	371.5
-N(640)		1830	4573	371.5
-N(642)		1830	4573	371.5
-N(643)		1796	4512	388.3
-N(644)		1785	4498	397.5
-N(645)		1783	4491	396.5
-N(646)		1783	4489	396.5
-N(647)		1744	4397	396
-N(648)		1690	4297	420.1
-N(649)		1739	4378	385
-N(650)		1696	4275	382.4
-N(651)		1178	3075	382.4
-N(652)		212.7	851.3	393
-N(654)		1674	4254	423.2
-N(655)		1145	3040	423.2
-N(656)		212.7	851.4	393
-N(659)		1703	4293	385.6
-N(660)		1189	3101	385.6
-N(661)		212.7	851.3	393
-N(664)		1634	4137	413
-N(665)		1095	2914	413
-N(666)		212.7	851.4	393
-N(667)		1825	4568	378.4
-N(669)		1823	4568	382.9
-N(670)		1822	4568	383.6
-N(671)		1821	4568	386.4
-N(672)		27.05	407.6	379
-N(673)		23.59	407.6	387
-N(674)		23.59	407.6	387
-N(675)		1337	3443	383
-N(676)	Isolated	—	—	379
-N(677)		1328	3422	383
-N(678)		1827	4567	370.8
-N(680)		1095	2913	412.9
-N(682)		350.2	1174	397
-N(683)		350.1	1173	397
-N(684)		1131	2997	413
-N(686)		370.3	1236	413
-N(687)		370.2	1236	413
-N(688)		1177	3074	382.4
-N(690)		387.2	1268	382.9
-N(691)		386.2	1268	384.9
-N(692)		1187	3100	385.6
-N(694)		357.1	1180	387.5
-N(695)		357	1180	387.5
-N(696)		1248	3269	414.5
-N(697)		903.4	2472	414.5
-N(698)		902.8	2470	414.5
-N(700)		221.5	893.2	414.5
-N(701)		1291	3336	381.4
-N(702)		949.5	2545	381.4
-N(703)		948.8	2544	381.4
-N(705)		232.9	886.5	381.4
-N(706)		232.9	886.4	381.4
-N(707)		221.5	893.2	414.5
-N(708)		1263	3306	414.9
-N(709)		918.1	2506	414.9
-N(710)		915.6	2500	414.9
-N(712)		218.2	885.9	414.9
-N(713)		218.1	885.8	414.9
-N(714)		1290	3339	387
-N(715)		946.7	2544	387
-N(716)		946.2	2543	387
-N(718)		233.1	892.6	387
-N(719)		233.1	892.5	387
-N(720)		26.32	407.6	380.7
-N(721)		26.32	407.6	380.7
-N(722)		26.32	407.6	380.7
-N(724)		26.32	407.6	380.7
-N(725)		26.32	407.6	380.7
-N(726)		27.48	407.6	378
-N(727)		27.48	407.6	378
-N(728)		27.48	407.6	378
-N(730)		217.5	847.4	378
-N(731)		217.5	847.4	378
-N(732)		27.44	407.6	378.1
-N(733)		27.44	407.6	378.1
-N(734)		27.44	407.6	378.1
-N(736)		27.44	407.6	378.1
-N(737)		27.44	407.6	378.1
-N(738)		26.14	407.6	381.1
-N(739)		26.14	407.6	381.1
-N(740)		26.14	407.6	381.1
-N(742)		216.1	847.4	381.1
-N(743)		216.1	847.4	381.1

Tank List	Surface Pressure	Level	Status	Flow	Pressure	Grade	Elev
Accumulator Tank A	1000	0		0	1000	2709	428.7
Accumulator Tank B	1000	0		0	1000	2709	428.6
Accumulator Tank C	1000	0		0	1000	2709	428.6
Accumulator Tank D	1000	0		0	1000	2709	428.5
Cont. Recirc. Sump A	25.6	11.4		3677	30.52	404.6	368.2
Cont. Recirc. Sump B	25.6	11.4		3692	30.52	404.6	368.2
Refueling Water Storage Tank	14.7	20.3		8858	26.06	420.3	394

Demand List	Demand Type	Flow	Pressure	Status	Grade	Elev
-N(556)	Flow in	0	152.4		675.5	356.8
-N(557)	Flow in	0	155.2		674.5	349.3
-N(599)	Flow out	30	1351		3460	366.6
-N(604)	Flow out	30	1352		3462	366.6
-N(623)	Flow in	0	35.27		418.1	370.5
-N(633)	Flow in	130	34.41		418.1	372.5
-N(634)	Flow out	65	1836		4585	369.6
-N(637)	Flow out	65	1836		4586	369.6
-N(641)	Flow out	0	1831		4573	367.9
-N(668)	Flow out	0	1825		4568	378.4
-N(679)	Flow out	80	1827		4567	370.8
A1(001)	Spray	3.863	65		868.7	575.4
A1(002)	Spray	3.561	65		869.6	576.3
A1(003)	Spray	3.731	65		869.1	575.8
A1(004)	Spray	3.731	65		869.1	575.8
A1(005)	Spray	3.559	65		869.6	576.3
A1(006)	Spray	3.861	65		868.7	575.4
A1(007)	Spray	3.86	65		868.7	575.4
A1(008)	Spray	3.559	65		869.6	576.3
A1(009)	Spray	3.728	65		869.1	575.8
A1(010)	Spray	3.728	65		869.1	575.8

A1(011)	Spray	3.557	55	669.6	576.3
A1(012)	Spray	3.859	55	668.7	575.4
A1(013)	Spray	3.858	55	668.7	575.4
A1(014)	Spray	3.556	55	669.6	576.3
A1(015)	Spray	3.726	55	669.1	575.8
A1(016)	Spray	3.726	55	669.1	575.8
A1(017)	Spray	3.555	55	669.6	576.3
A1(018)	Spray	3.857	55	668.7	575.4
A1(019)	Spray	3.856	55	668.7	575.4
A1(020)	Spray	3.554	55	669.6	576.3
A1(021)	Spray	3.724	55	669.1	575.8
A1(022)	Spray	3.724	55	669.1	575.8
A1(023)	Spray	3.553	55	669.6	576.3
A1(024)	Spray	3.855	55	668.7	575.4
A1(025)	Spray	3.854	55	668.7	575.4
A1(026)	Spray	3.552	55	669.6	576.3
A1(027)	Spray	3.723	55	669.1	575.8
A1(028)	Spray	3.723	55	669.1	575.8
A1(029)	Spray	3.551	55	669.6	576.3
A1(030)	Spray	3.853	55	668.7	575.4
A1(031)	Spray	3.853	55	668.7	575.4
A1(032)	Spray	3.551	55	669.6	576.3
A1(033)	Spray	3.721	55	669.1	575.8
A1(034)	Spray	3.721	55	669.1	575.8
A1(035)	Spray	3.55	55	669.6	576.3
A1(036)	Spray	3.852	55	668.7	575.4
A1(037)	Spray	3.851	55	668.7	575.4
A1(038)	Spray	3.549	55	669.6	576.3
A1(039)	Spray	3.72	55	669.1	575.8
A1(040)	Spray	3.72	55	669.1	575.8
A1(041)	Spray	3.548	55	669.6	576.3
A1(042)	Spray	3.851	55	668.7	575.4
A1(043)	Spray	3.85	55	668.7	575.4
A1(044)	Spray	3.548	55	669.6	576.3
A1(045)	Spray	3.718	55	669.1	575.8
A1(046)	Spray	3.718	55	669.1	575.8
A1(047)	Spray	3.547	55	669.6	576.3
A1(048)	Spray	3.85	55	668.7	575.4
A1(049)	Spray	3.849	55	668.7	575.4
A1(050)	Spray	3.547	55	669.6	576.3
A1(051)	Spray	3.717	55	669.1	575.8
A1(052)	Spray	3.717	55	669.1	575.8
A1(053)	Spray	3.546	55	669.6	576.3
A1(054)	Spray	3.849	55	668.7	575.4
A1(055)	Spray	3.848	55	668.7	575.4
A1(056)	Spray	3.546	55	669.6	576.3
A1(057)	Spray	3.717	55	669.1	575.8
A1(058)	Spray	3.717	55	669.1	575.8
A1(059)	Spray	3.545	55	669.6	576.3
A1(060)	Spray	3.848	55	668.7	575.4
A1(061)	Spray	3.848	55	668.7	575.4
A1(062)	Spray	3.545	55	669.6	576.3
A1(063)	Spray	3.718	55	669.1	575.8
A1(064)	Spray	3.718	55	669.1	575.8
A1(065)	Spray	3.544	55	669.6	576.3
A1(066)	Spray	3.847	55	668.7	575.4
A1(067)	Spray	3.847	55	668.7	575.4
A1(068)	Spray	3.544	55	669.6	576.3
A1(069)	Spray	3.715	55	669.1	575.8
A1(070)	Spray	3.715	55	669.1	575.8
A1(071)	Spray	3.544	55	669.6	576.3
A1(072)	Spray	3.847	55	668.7	575.4
A1(073)	Spray	3.846	55	668.7	575.4
A1(074)	Spray	3.544	55	669.6	576.3
A1(075)	Spray	3.715	55	669.1	575.8
A1(076)	Spray	3.715	55	669.1	575.8
A1(077)	Spray	3.543	55	669.6	576.3
A1(078)	Spray	3.846	55	668.7	575.4
A1(079)	Spray	3.846	55	668.7	575.4
A1(080)	Spray	3.543	55	669.6	576.3
A1(081)	Spray	3.714	55	669.1	575.8
A1(082)	Spray	3.714	55	669.1	575.8
A1(083)	Spray	3.543	55	669.6	576.3
A1(084)	Spray	3.846	55	668.7	575.4
A1(085)	Spray	3.846	55	668.7	575.4
A1(086)	Spray	3.543	55	669.6	576.3
A1(087)	Spray	3.714	55	669.1	575.8
A1(088)	Spray	3.714	55	669.1	575.8
A1(089)	Spray	3.543	55	669.6	576.3
A1(090)	Spray	3.846	55	668.7	575.4
A1(091)	Spray	3.845	55	668.7	575.4
A1(092)	Spray	3.543	55	669.6	576.3
A1(093)	Spray	3.714	55	669.1	575.8
A1(094)	Spray	3.714	55	669.1	575.8
A1(095)	Spray	3.542	55	669.6	576.3
A1(096)	Spray	3.845	55	668.7	575.4
A1(097)	Spray	3.845	55	668.7	575.4
A1(098)	Spray	3.542	55	669.6	576.3
A1(099)	Spray	3.714	55	669.1	575.8
A1(100)	Spray	3.714	55	669.1	575.8
A1(101)	Spray	3.542	55	669.6	576.3
A1(102)	Spray	3.845	55	668.7	575.4
A1(103)	Spray	3.845	55	668.7	575.4
A1(104)	Spray	3.542	55	669.6	576.3
A1(105)	Spray	3.714	55	669.1	575.8
A1(106)	Spray	3.714	55	669.1	575.8
A1(107)	Spray	3.542	55	669.6	576.3
A1(108)	Spray	3.845	55	668.7	575.4
A1(109)	Spray	3.845	55	668.7	575.4
A1(110)	Spray	3.542	55	669.6	576.3
A1(111)	Spray	3.714	55	669.1	575.8
A1(112)	Spray	3.714	55	669.1	575.8
A1(113)	Spray	3.542	55	669.6	576.3
A1(114)	Spray	3.845	55	668.7	575.4
A1(115)	Spray	3.845	55	668.7	575.4
A1(116)	Spray	3.542	55	669.6	576.3
A1(117)	Spray	3.714	55	669.1	575.8
A1(118)	Spray	3.714	55	669.1	575.8
A1(119)	Spray	3.542	55	669.6	576.3
A1(120)	Spray	3.845	55	668.7	575.4
A2(001)	Spray	4.19	55	682.8	589.5
A2(002)	Spray	3.922	55	682	588.7
A2(003)	Spray	4.015	55	682.3	589
A2(004)	Spray	4.015	55	682.3	589
A2(005)	Spray	3.92	55	682	588.7
A2(006)	Spray	4.166	55	682.8	589.5
A2(007)	Spray	4.165	55	682.8	589.5
A2(008)	Spray	3.919	55	682	588.7
A2(009)	Spray	4.012	55	682.3	589
A2(010)	Spray	4.012	55	682.3	589
A2(011)	Spray	3.917	55	682	588.7
A2(012)	Spray	4.163	55	682.8	589.5
A2(013)	Spray	4.162	55	682.8	589.5
A2(014)	Spray	3.916	55	682	588.7
A2(015)	Spray	4.01	55	682.3	589
A2(016)	Spray	4.01	55	682.3	589
A2(017)	Spray	3.915	55	682	588.7
A2(018)	Spray	4.161	55	682.8	589.5
A2(019)	Spray	4.161	55	682.8	589.5
A2(020)	Spray	3.914	55	682	588.7
A2(021)	Spray	4.008	55	682.3	589
A2(022)	Spray	4.008	55	682.3	589
A2(023)	Spray	3.913	55	682	588.7
A2(024)	Spray	[illegible]	55	[illegible]	[illegible]
A2(025)	Spray	[illegible]	55	[illegible]	[illegible]
A2(026)	Spray	[illegible]	55	[illegible]	[illegible]
A2(027)	Spray	[illegible]	55	[illegible]	[illegible]
A2(028)	Spray	[illegible]	55	[illegible]	[illegible]
A2(029)	Spray	[illegible]	55	[illegible]	[illegible]
A2(030)	Spray	[illegible]	55	[illegible]	[illegible]
A2(031)	Spray	[illegible]	55	[illegible]	[illegible]
A2(032)	Spray	[illegible]	55	[illegible]	[illegible]
A2(033)	Spray	[illegible]	55	[illegible]	[illegible]
A2(034)	Spray	[illegible]	55	[illegible]	[illegible]
A2(035)	Spray	[illegible]	55	[illegible]	[illegible]
A2(036)	Spray	[illegible]	55	[illegible]	[illegible]
A2(037)	Spray	[illegible]	55	[illegible]	[illegible]
A2(038)	Spray	[illegible]	55	[illegible]	[illegible]
A2(039)	Spray	[illegible]	55	[illegible]	[illegible]
A2(040)	Spray	[illegible]	55	[illegible]	[illegible]
A2(041)	Spray	[illegible]	55	[illegible]	[illegible]
A2(042)	Spray	[illegible]	55	[illegible]	[illegible]
A2(043)	Spray	[illegible]	55	[illegible]	[illegible]
A2(044)	Spray	[illegible]	55	[illegible]	[illegible]
A2(045)	Spray	[illegible]	55	[illegible]	[illegible]
A2(046)	Spray	[illegible]	55	[illegible]	[illegible]
A2(047)	Spray	[illegible]	55	[illegible]	[illegible]
A2(048)	Spray	[illegible]	55	[illegible]	[illegible]
A2(049)	Spray	[illegible]	55	[illegible]	[illegible]
A2(050)	Spray	[illegible]	55	[illegible]	[illegible]
A2(051)	Spray	[illegible]	55	[illegible]	[illegible]
A2(052)	Spray	[illegible]	55	[illegible]	[illegible]
A2(053)	Spray	[illegible]	55	[illegible]	[illegible]
A2(054)	Spray	[illegible]	55	[illegible]	[illegible]
A2(055)	Spray	[illegible]	55	[illegible]	[illegible]
A2(056)	Spray	[illegible]	55	[illegible]	[illegible]
A2(057)	Spray	[illegible]	55	[illegible]	[illegible]
A2(058)	Spray	[illegible]	55	[illegible]	[illegible]
A2(059)	Spray	[illegible]	55	[illegible]	[illegible]
A2(060)	Spray	[illegible]	55	[illegible]	[illegible]
A3(001)	Spray	[illegible]	55	[illegible]	[illegible]
A3(002)	Spray	[illegible]	55	[illegible]	[illegible]
A3(003)	Spray	[illegible]	55	[illegible]	[illegible]
A3(004)	Spray	[illegible]	55	[illegible]	[illegible]
A3(005)	Spray	[illegible]	55	[illegible]	[illegible]
A3(006)	Spray	[illegible]	55	[illegible]	[illegible]
A3(007)	Spray	[illegible]	55	[illegible]	[illegible]
A3(008)	Spray	[illegible]	55	[illegible]	[illegible]
A3(009)	Spray	[illegible]	55	[illegible]	[illegible]
A3(010)	Spray	[illegible]	55	[illegible]	[illegible]
A3(011)	Spray	[illegible]	55	[illegible]	[illegible]

A3(012)	Spray	5.183	55	686.6	593.3
A3(013)	Spray	5.191	55	686.6	593.3
A3(014)	Spray	5.238	55	686.6	593.5
A3(015)	Spray	5.188	55	686.6	593.3
A3(016)	Spray	5.188	55	686.6	593.3
A3(017)	Spray	5.234	55	686.6	593.5
A3(018)	Spray	5.187	55	686.6	593.3
A3(019)	Spray	5.185	55	686.6	593.3
A3(020)	Spray	5.233	55	686.6	593.5
A3(021)	Spray	5.184	55	686.6	593.3
A3(022)	Spray	5.184	55	686.6	593.3
A3(023)	Spray	5.231	55	686.6	593.5
A3(024)	Spray	5.183	55	686.6	593.3
A3(025)	Spray	5.182	55	686.6	593.3
A3(026)	Spray	5.23	55	686.6	593.5
A3(027)	Spray	5.181	55	686.6	593.3
A3(028)	Spray	5.181	55	686.6	593.3
A3(029)	Spray	5.229	55	686.6	593.5
A3(030)	Spray	5.181	55	686.6	593.3
A3(031)	Spray	5.181	55	686.6	593.3
A3(032)	Spray	5.228	55	686.6	593.5
A3(033)	Spray	5.18	55	686.6	593.3
A3(034)	Spray	5.18	55	686.6	593.3
A3(035)	Spray	5.229	55	686.6	593.5
A3(036)	Spray	5.18	55	686.6	593.3
A3(037)	Spray	5.18	55	686.6	593.3
A3(038)	Spray	5.228	55	686.6	593.5
A3(039)	Spray	5.18	55	686.6	593.3
B1(001)	Spray	5.39	55	660.3	567
B1(002)	Spray	5.39	55	660.3	567
B1(003)	Spray	5.389	55	660.3	567
B1(004)	Spray	5.389	55	660.3	567
B1(005)	Spray	5.388	55	660.3	567
B1(006)	Spray	5.388	55	660.3	567
B1(007)	Spray	5.387	55	660.3	567
B1(008)	Spray	5.387	55	660.3	567
B1(009)	Spray	5.385	55	660.3	567
B1(010)	Spray	5.385	55	660.3	567
B1(011)	Spray	5.384	55	660.3	567
B1(012)	Spray	5.384	55	660.3	567
B1(013)	Spray	5.383	55	660.3	567
B1(014)	Spray	5.383	55	660.3	567
B1(015)	Spray	5.382	55	660.3	567
B1(016)	Spray	5.382	55	660.3	567
B1(017)	Spray	5.381	55	660.3	567
B1(018)	Spray	5.381	55	660.3	567
B1(019)	Spray	5.381	55	660.3	567
B1(020)	Spray	5.381	55	660.3	567
B1(021)	Spray	5.38	55	660.3	567
B1(022)	Spray	5.38	55	660.3	567
B1(023)	Spray	5.379	55	660.3	567
B1(024)	Spray	5.379	55	660.3	567
B1(025)	Spray	5.378	55	660.3	567
B1(026)	Spray	5.378	55	660.3	567
B1(027)	Spray	5.377	55	660.3	567
B1(028)	Spray	5.377	55	660.3	567
B1(029)	Spray	5.376	55	660.3	567
B1(030)	Spray	5.376	55	660.3	567
B1(031)	Spray	5.376	55	660.3	567
B1(032)	Spray	5.376	55	660.3	567
B1(033)	Spray	5.375	55	660.3	567
B1(034)	Spray	5.375	55	660.3	567
B1(035)	Spray	5.374	55	660.3	567
B1(036)	Spray	5.374	55	660.3	567
B1(037)	Spray	5.374	55	660.3	567
B1(038)	Spray	5.374	55	660.3	567
B1(039)	Spray	5.373	55	660.3	567
B1(040)	Spray	5.373	55	660.3	567
B1(041)	Spray	5.373	55	660.3	567
B1(042)	Spray	5.373	55	660.3	567
B1(043)	Spray	5.372	55	660.3	567
B1(044)	Spray	5.372	55	660.3	567
B1(045)	Spray	5.372	55	660.3	567
B1(046)	Spray	5.372	55	660.3	567
B1(047)	Spray	5.371	55	660.3	567
B1(048)	Spray	5.371	55	660.3	567
B1(049)	Spray	5.371	55	660.3	567
B1(050)	Spray	5.371	55	660.3	567
B1(051)	Spray	5.37	55	660.3	567
B1(052)	Spray	5.37	55	660.3	567
B1(053)	Spray	5.37	55	660.3	567
B1(054)	Spray	5.37	55	660.3	567
B1(055)	Spray	5.369	55	660.3	567
B1(056)	Spray	5.369	55	660.3	567
B1(057)	Spray	5.369	55	660.3	567
B1(058)	Spray	5.369	55	660.3	567
B1(059)	Spray	5.369	55	660.3	567
B1(060)	Spray	5.369	55	660.3	567
B1(061)	Spray	5.368	55	660.3	567
B1(062)	Spray	5.368	55	660.3	567
B1(063)	Spray	5.368	55	660.3	567
B1(064)	Spray	5.368	55	660.3	567
B1(065)	Spray	5.368	55	660.3	567
B1(066)	Spray	5.368	55	660.3	567
B1(067)	Spray	5.368	55	660.3	567
B1(068)	Spray	5.368	55	660.3	567
B1(069)	Spray	5.367	55	660.3	567
B1(070)	Spray	5.367	55	660.3	567
B1(071)	Spray	5.367	55	660.3	567
B1(072)	Spray	5.367	55	660.3	567
B1(073)	Spray	5.367	55	660.3	567
B1(074)	Spray	5.367	55	660.3	567
B1(075)	Spray	5.367	55	660.3	567
B1(076)	Spray	5.367	55	660.3	567
B1(077)	Spray	5.367	55	660.3	567
B1(078)	Spray	5.367	55	660.3	567
B1(079)	Spray	5.367	55	660.3	567
B1(080)	Spray	5.367	55	660.3	567
B1(081)	Spray	5.366	55	660.3	567
B1(082)	Spray	5.366	55	660.3	567
B1(083)	Spray	5.366	55	660.3	567
B1(084)	Spray	5.366	55	660.3	567
B1(085)	Spray	5.366	55	660.3	567
B1(086)	Spray	5.366	55	660.3	567
B1(087)	Spray	5.366	55	660.3	567
B1(088)	Spray	5.366	55	660.3	567
B1(089)	Spray	5.366	55	660.3	567
B1(090)	Spray	5.366	55	660.3	567
B1(091)	Spray	5.366	55	660.3	567
B1(092)	Spray	5.366	55	660.3	567
B1(093)	Spray	5.366	55	660.3	567
B1(094)	Spray	5.366	55	660.3	567
B1(095)	Spray	5.366	55	660.3	567
B1(096)	Spray	5.366	55	660.3	567
B1(097)	Spray	5.366	55	660.3	567
B1(098)	Spray	5.366	55	660.3	567
B1(099)	Spray	5.366	55	660.3	567
B1(100)	Spray	5.366	55	660.3	567
B1(101)	Spray	5.366	55	660.3	567
B1(102)	Spray	5.366	55	660.3	567
B1(103)	Spray	5.366	55	660.3	567
B1(104)	Spray	5.366	55	660.3	567
B1(105)	Spray	5.366	55	660.3	567
B1(106)	Spray	5.366	55	660.3	567
B1(107)	Spray	5.366	55	660.3	567
B1(108)	Spray	5.366	55	660.3	567
B1(109)	Spray	5.366	55	660.3	567
B1(110)	Spray	5.366	55	660.3	567
B1(111)	Spray	5.366	55	660.3	567
B1(112)	Spray	5.366	55	660.3	567
B2(001)	Spray	4.262	55	682.3	589
B2(002)	Spray	4.262	55	682.3	589
B2(003)	Spray	4.259	55	682.3	589
B2(004)	Spray	4.259	55	682.3	589
B2(005)	Spray	4.257	55	682.3	589
B2(006)	Spray	4.257	55	682.3	589
B2(007)	Spray	4.255	55	682.3	589
B2(008)	Spray	4.255	55	682.3	589
B2(009)	Spray	4.253	55	682.3	589
B2(010)	Spray	4.253	55	682.3	589
B2(011)	Spray	4.251	55	682.3	589
B2(012)	Spray	4.251	55	682.3	589
B2(013)	Spray	4.249	55	682.3	589
B2(014)	Spray	4.249	55	682.3	589
B2(015)	Spray	4.248	55	682.3	589
B2(016)	Spray	4.248	55	682.3	589
B2(017)	Spray	4.246	55	682.3	589
B2(018)	Spray	4.246	55	682.3	589
B2(019)	Spray	4.244	55	682.3	589
B2(020)	Spray	4.244	55	682.3	589
B2(021)	Spray	4.243	55	682.3	589
B2(022)	Spray	4.243	55	682.3	589
B2(023)	Spray	4.241	55	682.3	589
B2(024)	Spray	4.241	55	682.3	589
B2(025)	Spray	4.24	55	682.3	589
B2(026)	Spray	4.24	55	682.3	589
B2(027)	Spray	4.239	55	682.3	589
B2(028)	Spray	4.239	55	682.3	589
B2(029)	Spray	4.238	55	682.3	589
B2(030)	Spray	4.238	55	682.3	589
B2(031)	Spray	4.237	55	682.3	589
B2(032)	Spray	4.237	55	682.3	589
B2(033)	Spray	4.235	55	682.3	589
B2(034)	Spray	4.235	55	682.3	589
B2(035)	Spray	4.234	55	682.3	589
B2(036)	Spray	4.234	55	682.3	589
B2(037)	Spray	4.234	55	682.3	589
B2(038)	Spray	4.234	55	682.3	589
B2(039)	Spray	4.233	55	682.3	589
B2(040)	Spray	4.233	55	682.3	589
B2(041)	Spray	4.232	55	682.3	589

B2(042)	Spray	4.232	55		682.3	589
B2(043)	Spray	4.231	55		682.3	589
B2(044)	Spray	4.231	55		682.3	589
B2(045)	Spray	4.23	55		682.3	589
B2(046)	Spray	4.23	55		682.3	589
B2(047)	Spray	4.23	55		682.3	589
B2(048)	Spray	4.23	55		682.3	589
B2(049)	Spray	4.229	55		682.3	589
B2(050)	Spray	4.229	55		682.3	589
B2(051)	Spray	4.229	55		682.3	589
B2(052)	Spray	4.229	55		682.3	589
B2(053)	Spray	4.228	55		682.3	589
B2(054)	Spray	4.228	55		682.3	589
B2(055)	Spray	4.227	55		682.3	589
B2(056)	Spray	4.227	55		682.3	589
B2(057)	Spray	4.227	55		682.3	589
B2(058)	Spray	4.227	55		682.3	589
B2(059)	Spray	4.227	55		682.3	589
B2(060)	Spray	4.227	55		682.3	589
B2(061)	Spray	4.226	55		682.3	589
B2(062)	Spray	4.226	55		682.3	589
B2(063)	Spray	4.226	55		682.3	589
B2(064)	Spray	4.226	55		682.3	589
B2(065)	Spray	4.226	55		682.3	589
B2(066)	Spray	4.226	55		682.3	589
B2(067)	Spray	4.225	55		682.3	589
B2(068)	Spray	4.225	55		682.3	589
B2(069)	Spray	4.225	55		682.3	589
B2(070)	Spray	4.225	55		682.3	589
B2(071)	Spray	4.225	55		682.3	589
B2(072)	Spray	4.225	55		682.3	589
B2(073)	Spray	4.225	55		682.3	589
B2(074)	Spray	4.225	55		682.3	589
B2(075)	Spray	4.225	55		682.3	589
B2(076)	Spray	4.225	55		682.3	589
B2(077)	Spray	4.225	55		682.3	589
B2(078)	Spray	4.225	55		682.3	589
B2(079)	Spray	4.225	55		682.3	589
B2(080)	Spray	4.225	55		682.3	589
B2(081)	Spray	4.225	55		682.3	589
B2(082)	Spray	4.225	55		682.3	589
B2(083)	Spray	4.225	55		682.3	589
B2(084)	Spray	4.225	55		682.3	589
B2(085)	Spray	4.225	55		682.3	589
B2(086)	Spray	4.225	55		682.3	589
B2(087)	Spray	4.225	55		682.3	589
B2(088)	Spray	4.225	55		682.3	589
B2(089)	Spray	4.225	55		682.3	589
B2(090)	Spray	4.225	55		682.3	589
B3(001)	Spray	4.325	55		682.3	589
B3(002)	Spray	4.325	55		682.3	589
B3(003)	Spray	4.523	55		682.3	589
B3(004)	Spray	4.324	55		682.3	589
B3(005)	Spray	4.324	55		682.3	589
B3(006)	Spray	4.324	55		682.3	589
B3(007)	Spray	4.323	55		682.3	589
B3(008)	Spray	4.323	55		682.3	589
B3(009)	Spray	4.323	55		682.3	589
B3(010)	Spray	4.322	55		682.3	589
B3(011)	Spray	4.322	55		682.3	589
B3(012)	Spray	4.322	55		682.3	589
B3(013)	Spray	4.322	55		682.3	589
B3(014)	Spray	4.322	55		682.3	589
B3(015)	Spray	4.321	55		682.3	589
B3(016)	Spray	4.321	55		682.3	589
B3(017)	Spray	4.321	55		682.3	589
B3(018)	Spray	4.321	55		682.3	589
B3(019)	Spray	4.321	55		682.3	589
B3(020)	Spray	4.321	55		682.3	589
B3(021)	Spray	4.32	55		682.3	589
B3(022)	Spray	4.32	55		682.3	589
B3(023)	Spray	4.32	55		682.3	589
B3(024)	Spray	4.32	55		682.3	589
B3(025)	Spray	4.32	55		682.3	589
B3(026)	Spray	4.32	55		682.3	589
B3(027)	Spray	4.319	55		682.3	589
B3(028)	Spray	4.319	55		682.3	589
B3(029)	Spray	4.319	55		682.3	589
B3(030)	Spray	4.319	55		682.3	589
B3(031)	Spray	4.319	55		682.3	589
B3(032)	Spray	4.319	55		682.3	589
B3(033)	Spray	4.319	55		682.3	589
B3(034)	Spray	4.319	55		682.3	589
B3(035)	Spray	4.319	55		682.3	589
B3(036)	Spray	4.319	55		682.3	589
B3(037)	Spray	4.319	55		682.3	589
B3(038)	Spray	4.319	55		682.3	589
B3(039)	Spray	4.319	55		682.3	589
B3(040)	Spray	4.319	55		682.3	589
B3(041)	Spray	4.319	55		682.3	589
B3(042)	Spray	4.319	55		682.3	589
B3(043)	Spray	4.319	55		682.3	589
B3(044)	Spray	4.319	55		682.3	589
B3(045)	Spray	4.319	55		682.3	589
B3(046)	Spray	4.319	55		682.3	589
B3(047)	Spray	4.319	55		682.3	589
B3(048)	Spray	4.319	55		682.3	589
B3(049)	Spray	4.319	55		682.3	589
B3(050)	Spray	4.319	55		682.3	589
B3(051)	Spray	4.319	55		682.3	589
Cold Leg A(001)	Boundary pressure	137.6	211		847.4	393
Cold Leg A(002)	Boundary pressure	150.7	211		847.4	393
Cold Leg B(001)	Boundary pressure	137.4	211		847.4	393
Cold Leg B(002)	Boundary pressure	150.5	211		847.4	393
Cold Leg C(001)	Boundary pressure	136.3	211		847.4	393
Cold Leg C(002)	Boundary pressure	149.9	211		847.4	393
Cold Leg D(001)	Boundary pressure	136.2	211		847.4	393
Cold Leg D(002)	Boundary pressure	150.2	211		847.4	393
Hot Leg A(001)	Boundary pressure	—	211	Isolated	—	382.7
Hot Leg A(002)	Boundary pressure	—	211	Isolated	—	393
Hot Leg B(001)	Boundary pressure	—	211	Isolated	—	382.7
Hot Leg B(002)	Boundary pressure	0	211		847.4	393
Hot Leg C(001)	Boundary pressure	—	211	Isolated	—	382.7
Hot Leg C(002)	Boundary pressure	—	211	Isolated	—	393
Hot Leg D(001)	Boundary pressure	—	211	Isolated	—	382.7
Hot Leg D(002)	Boundary pressure	0	211		847.4	393

Pump List	Operation	Flow	Status	TDH	dP	NPSHa	Suction Pressure	Discharge Pressure	Suction Elev	Discharge Elev
Centrifugal Charging Pump A	Curve	386.9		-4171	-1802	79.61	35.34	1837	368.6	368.7
Centrifugal Charging Pump B	Curve	370.9		-4170	-1802	79.08	35.11	1837	368.6	368.7
Containment Spray Pump A	Curve	—	Off	—	—	—	—	—	346.3	347.3
Containment Spray Pump B	Curve	—	Off	—	—	—	—	—	346.3	347.3
Positive Dis. Charging Pump	Fixed Flow	1.00E-05	Off	—	—	—	—	—	366.7	367.9
Residual Heat Removal Pump A	Curve	—	Off	—	—	—	—	—	345	347.1
Residual Heat Removal Pump B	Curve	—	Off	—	—	—	—	—	345	347.1
Safety Injection Pump A	Curve	347.5		-3045	-1316	80.74	35.83	1351	365.5	366.6
Safety Injection Pump B	Curve	313.7		-3048	-1316	81.77	36.27	1352	365.5	366.6

Component List	Flow	Status	HL	dP	Inlet Pressure	Outlet Pressure	Inlet Elev	Outlet Elev
Residual HX A	—	Off	—	—	—	—	359.7	359.7
Residual HX B	—	Off	—	—	—	—	359.8	359.8

Control List	Type	Set Value	Status	Flow	dP	HL	Inlet Pressure	Outlet Pressure	Elev	Cv	Fp	CMax
~N(562)	FCV	0		0	—	—	156.3	156.3	346.8	—	—	—
~N(563)	FCV	0		0	—	—	151	151	360	—	—	—
~N(681)	FCV	Fully open		137.4	0	0	446.4	446.4	412.9	—	—	—
~N(685)	FCV	Fully open		137.8	0	0	374.7	374.7	413	—	—	—
~N(689)	FCV	Fully open		136.3	0	0	417.9	417.9	382.4	—	—	—
~N(693)	FCV	Fully open		136.2	0	0	367	367	385.8	—	—	—
~N(699)	FCV	Fully open		150.5	0	0	221.7	221.7	414.5	—	—	—
~N(704)	FCV	Fully open		149.9	0	0	233.1	233.1	381.4	—	—	—
~N(711)	FCV	Fully open		150.7	0	0	218.4	218.4	414.9	—	—	—
~N(717)	FCV	Fully open		150.2	0	0	233.3	233.3	387	—	—	—
~N(723)	FCV	Fully open		0	—	—	26.32	26.32	380.7	—	—	—
~N(729)	FCV	Fully open	Closed	—	—	—	—	—	378	—	—	—
~N(735)	FCV	Fully open		0	—	—	27.44	27.44	378.1	—	—	—
~N(741)	FCV	Fully open	Closed	—	—	—	—	—	381.1	—	—	—
CS007A-1	FCV	Fully open		0	—	—	130.7	130.7	407	—	—	—
CS007B-2	FCV	Fully open		0	—	—	133.7	133.7	399	—	—	—

Pipe Specification	Material	Schedule	Roughness	Sizing	Vel Limits	Press Limits	Valve Table
Steel Sch.40 (clean)	Steel	40	0.0018	not specified	—	—	standard
Steel Sch.80 (clean)	Steel	80	0.0018	not specified	—	—	standard
Steel Sch.140 (clean)	Steel	140	0.0018	not specified	—	—	standard
Steel Sch 40S (clean)	Stainless Pipe IPS	40S	0.0018	not specified	—	—	standard
Steel Sch.160 (clean)	Steel	160	0.0018	not specified	—	—	standard
Steel Sch.30 (clean)	Steel	30	0.0018	not specified	—	—	standard
Steel Sch.20 (clean)	Steel	20	0.0018	not specified	—	—	standard

Fluid Zone	Fluid	Temperature	Pressure	Density	Viscosity	k	Pv	Pc
Containment Sump Water	Water	100	14.7	62.24	0.6812	—	0.9496	3198
Water After RHR HX	Water	100	14.7	62.24	0.6812	—	0.9496	3198

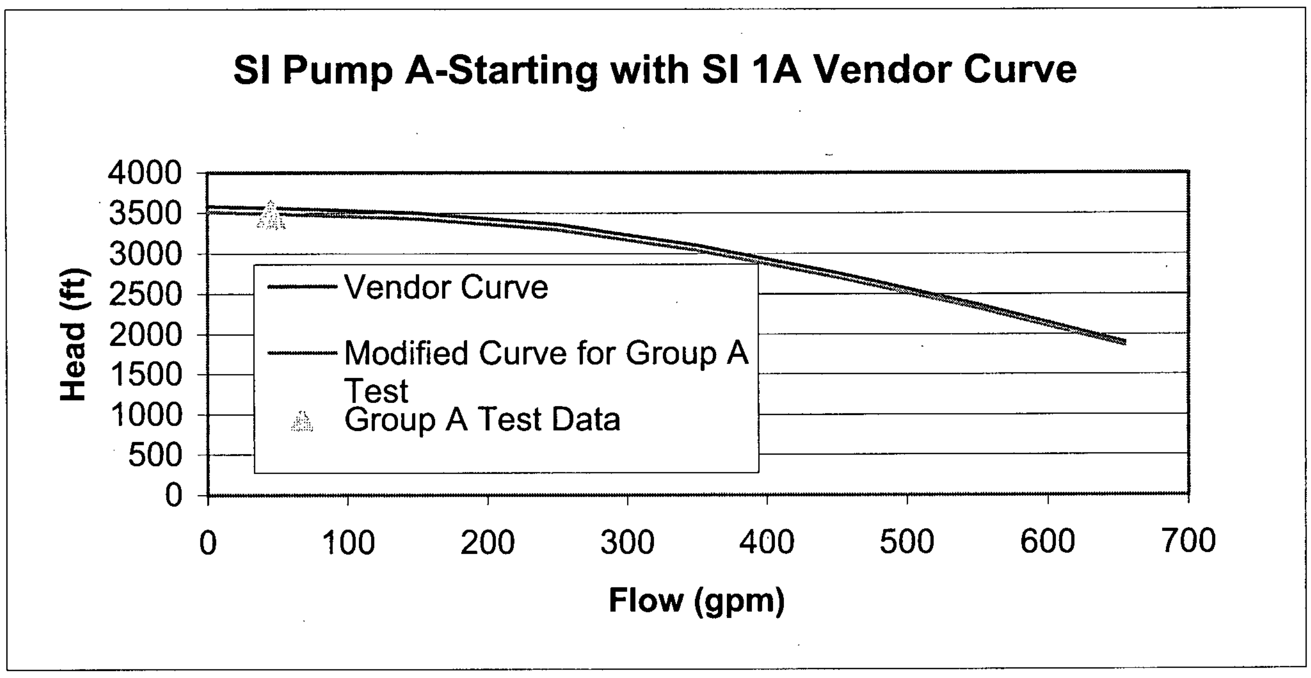
SI A

	Work Order	Flow (gpm)	dP (psi)	head (ft)
Braidwood U1	1234771	45	1513	3491.54

Braidwood SI 1A Vendor Curve

flow (gpm)	head (ft)	modified curve
0	3580	3509.2
50	3560	3489.6
150	3500	3430.8
250	3360	3293.5
350	3100	3038.7
450	2760	2705.4
550	2370	2323.1
655	1900	1862.4

Group A		45	3491.54
	x		0.9
			3491.538
			0.00
			0.980219



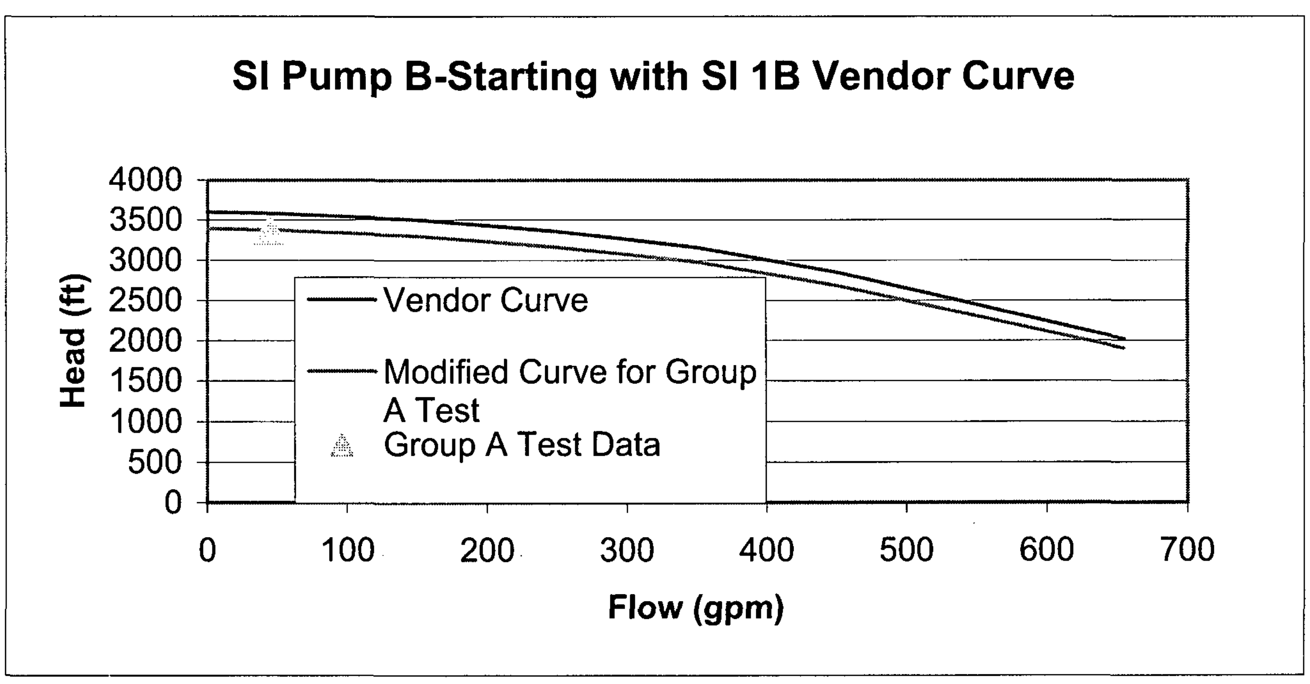
SI B

	Work Order	Flow (gpm)	dP (psi)	head (ft)
Braidwood U1	1244058	44.5	1462.5	3375.00

Braidwood SI 1B Vendor Curve

flow (gpm)	head (ft)	modified curve
0	3600	3391.8
50	3580	3372.9
150	3500	3297.6
250	3360	3165.7
350	3160	2977.2
450	2850	2685.2
550	2450	2308.3
655	2020	1903.2

Group A		44.5	3375
	x		0.89
			3375
			0
			0.942158



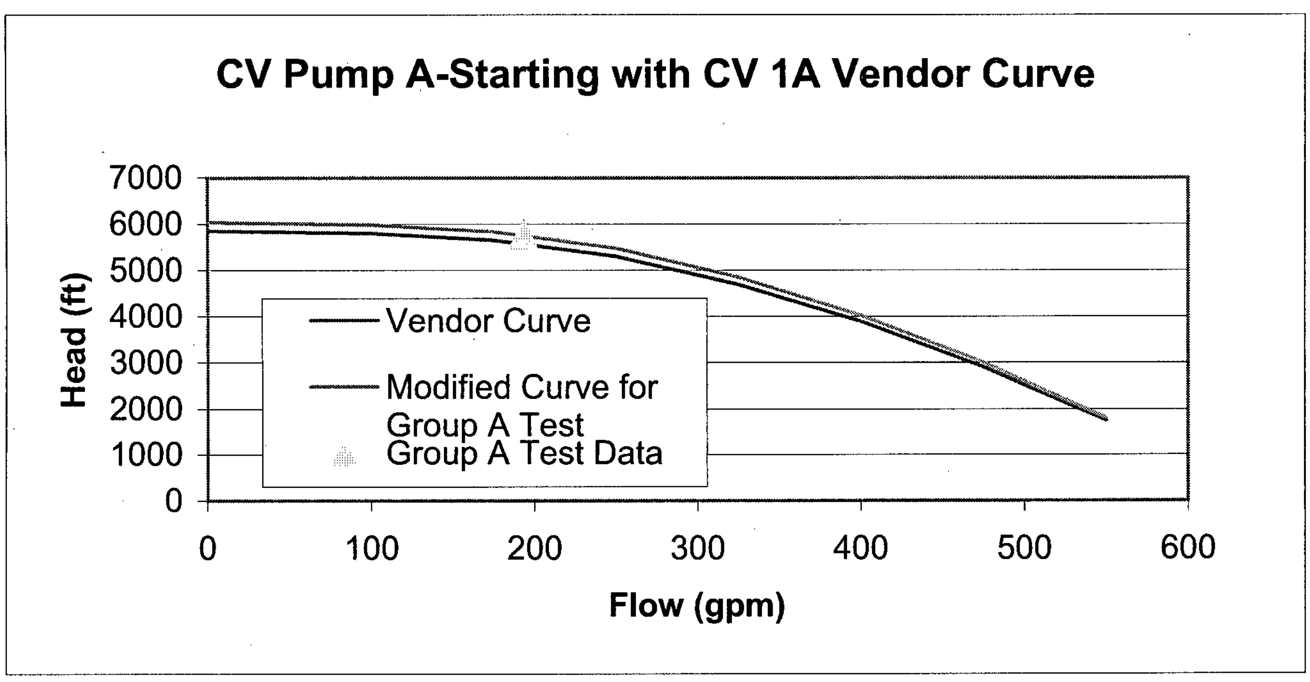
CV A

	Work Order	Flow (gpm)	dP (psi)	head (ft)
Braidwood U1	1233429	193	2490	5746.15

Braidwood Cv 1A Vendor Curve

flow (gpm)	head (ft)	modified curve
0	5850	6039.3
100	5800	5987.7
175	5650	5832.9
250	5300	5471.5
325	4700	4852.1
400	3900	4026.2
475	2900	2993.9
550	1750	1806.6

Group A		193	5746.15
	x		0.24
			5746.154
			0
			1.032367



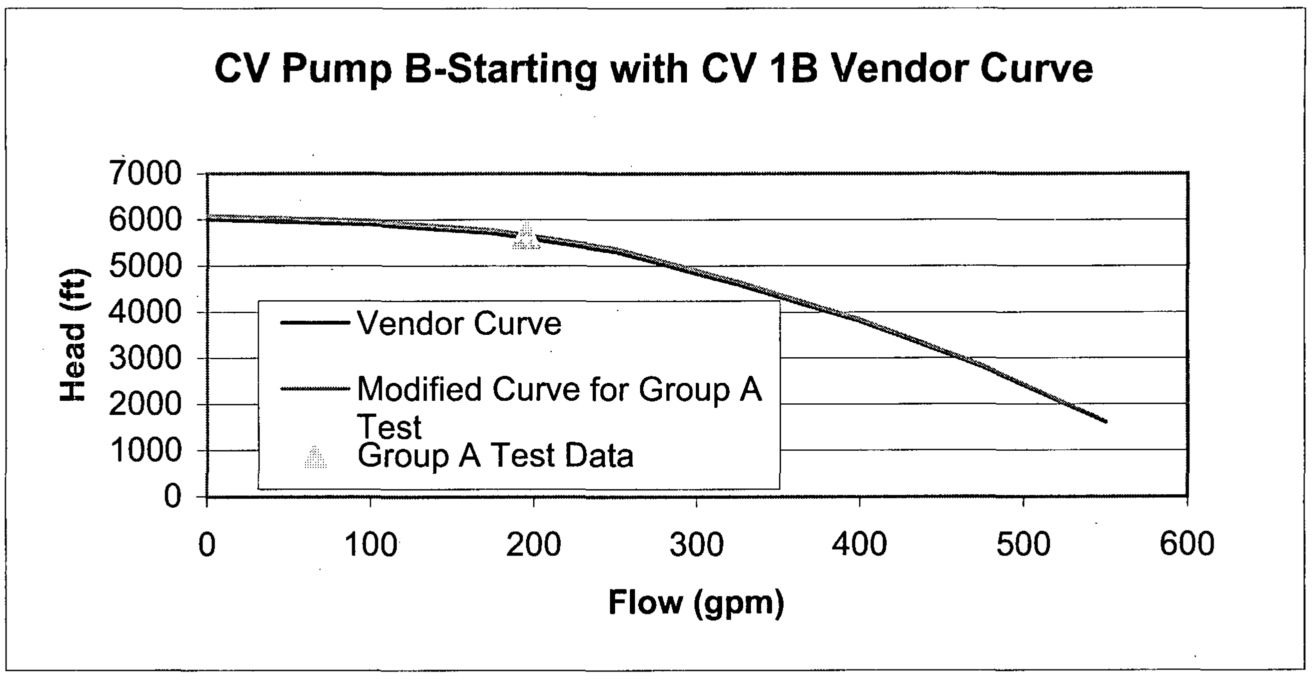
CV B

	Work Order	Flow (gpm)	dP (psi)	head (ft)
Braidwood U1	1247868	195	2459	5674.62

Braidwood CV 1B Vendor Curve

flow (gpm)	head (ft)	modified curve
0	6000	6087.2
100	5900	5985.7
175	5700	5782.8
250	5300	5377.0
325	4600	4666.8
400	3800	3855.2
475	2800	2840.7
550	1600	1623.3

Group A		195	5674.615
	x		0.266667
			5674.615
			0
			1.014532



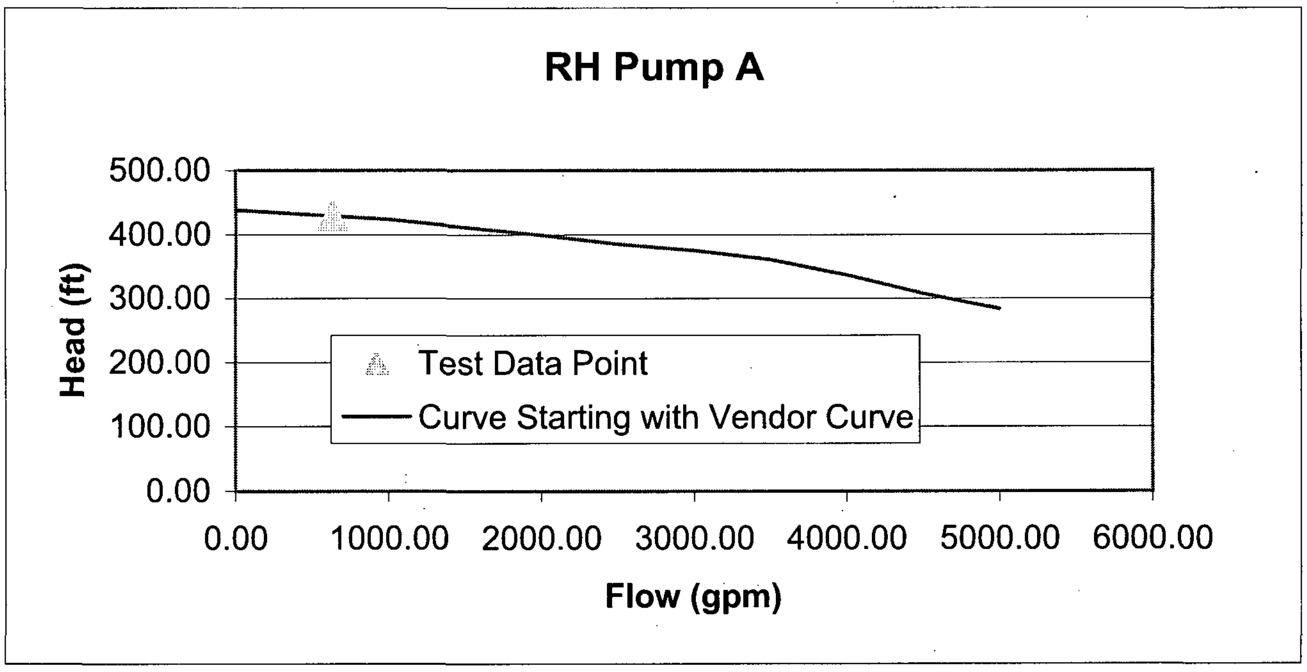
RHR 1A

	Work Order	Flow (gpm)	dP (psi)	head (ft)
Braidwood U1	1243061	633.80	185.80	428.77

Braidwood RH 1A Vendor Curve

flow (gpm)	head (ft)	modified curve
0	455	437.9
1000	440	423.5
2000	415	399.4
2500	400	385.0
3000	390	375.4
3500	375	360.9
4000	350	336.9
4500	320	308.0
5000	295	283.9

Group A		633.8	428.7692
	x		0.6338
			428.7692
			0
			0.96246



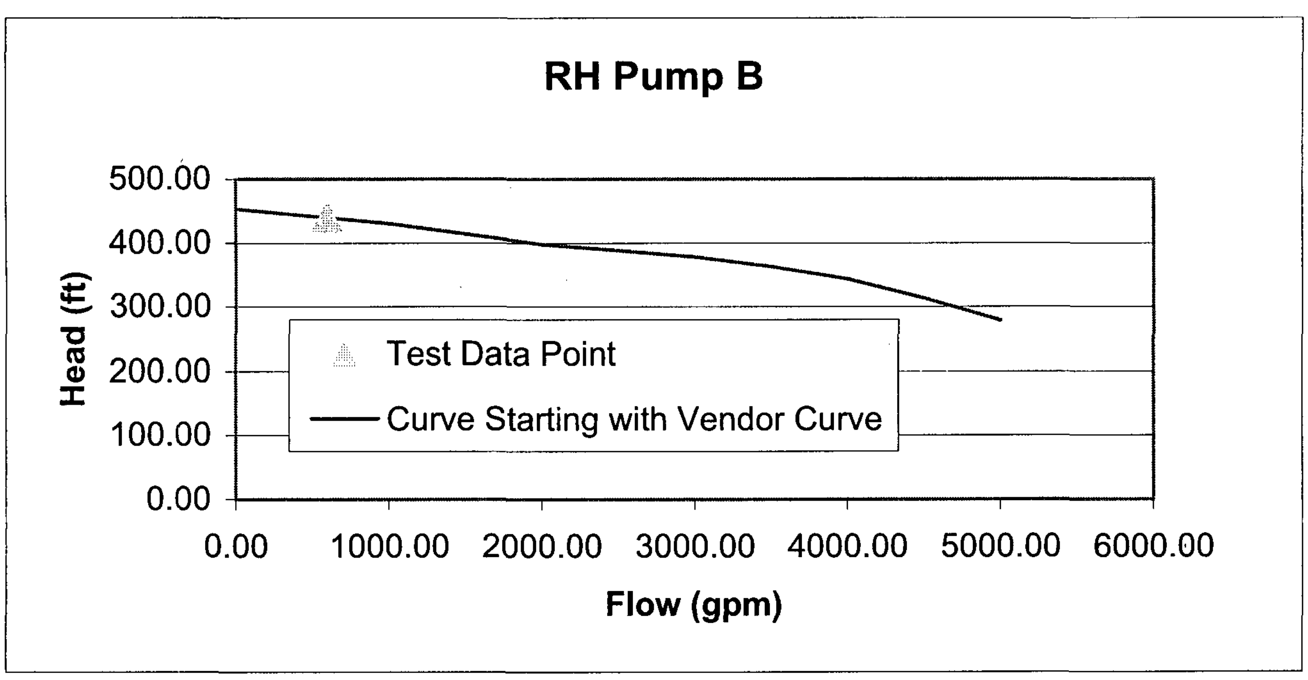
RHR 1B

	Work Order	Flow (gpm)	dP (psi)	head (ft)
Braidwood U1	1234770	596.00	190.30	439.15

Braidwood RH 1B Vendor Curve

flow (gpm)	head (ft)	modified curve
0	455	452.8
1000	432	429.9
2000	400	398.1
2500	390	388.1
3000	380	378.2
3500	365	363.2
4000	345	343.3
4500	315	313.5
5000	280	278.6

Group A		596.00	439.1538
	x		0.596
			439.1538
			0
			0.995155



[illegible]

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[illegible]	[illegible]	[illegible]	[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

Company: Exelon
Project: 11329-147 Rev 0
By: Bergen [illegible] L.L.O.

UNITS: CALCULATION
Flow: Rate US gpm
Pressure: psi
Temperature: °F
Velocity: ft/s
Density: lb/ft³
Length: ft
Size: in

Pipe	Lat.	Specification	Fluid	Zone	Size	Length	N	Status	Flow	Velocity	dP	H.	Tagged	From	To
CS01AA(001)	Steel	Sch 30	(clean)	Containment	Sump	Water	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CS01AA(002)	Steel	Sch 30	(clean)	Containment	Sump	Water	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CS01AA(003)	Steel	Sch 30	(clean)	Containment	Sump	Water	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CS01AB(001)	Steel	Sch 30	(clean)	Containment	Sump	Water	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CS01AB(002)	Steel	Sch 30	(clean)	Containment	Sump	Water	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CS01AB(003)	Steel	Sch 30	(clean)	Containment	Sump	Water	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CS02AA(001)	Steel	Sch 40	(clean)	Containment	Sump	Water	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CS02AA(002)	Steel	Sch 40	(clean)	Containment	Sump	Water	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CS02AA(003)	Steel	Sch 40	(clean)	Containment	Sump	Water	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CS02AA(004)	Steel	Sch 40	(clean)	Containment	Sump	Water	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CS02AA(005)	Steel	Sch 40	(clean)	Containment	Sump	Water	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CS02AA(006)	Steel	Sch 40	(clean)	Containment	Sump	Water	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CS02AB(001)	Steel	Sch 40	(clean)	Containment	Sump	Water	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CS02AB(002)	Steel	Sch 40	(clean)	Containment	Sump	Water	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CS02AB(003)	Steel	Sch 40	(clean)	Containment	Sump	Water	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CS02AB(004)	Steel	Sch 40	(clean)	Containment	Sump	Water	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CS02AB(005)	Steel	Sch 40	(clean)	Containment	Sump	Water	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CS02AB(006)	Steel	Sch 40	(clean)	Containment	Sump	Water	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CS02AB(007)	Steel	Sch 40	(clean)	Containment	Sump	Water	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CS02B	Steel	Sch 40	(clean)	Containment	Sump	Water	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CS02C	Steel	Sch 40	(clean)	Containment	Sump	Water	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]

Braidwood SI 1A Vendor Curve

flow (gpm)	modified curve	-3%
0	3509.2	3403.9
50	3489.6	3384.9
150	3430.8	3327.8
250	3293.5	3194.7
350	3038.7	2947.5
450	2705.4	2624.2
550	2323.1	2253.4
655	1862.4	1806.5

Braidwood SI 1B Vendor Curve

flow (gpm)	modified curve	-3%
0.0	3391.8	3290.0
50.0	3372.9	3271.7
150.0	3297.6	3198.6
250.0	3165.7	3070.7
350.0	2977.2	2887.9
450.0	2685.2	2604.6
550.0	2308.3	2239.0
655.0	1903.2	1846.1

Braidwood Cv 1A Vendor Curve

flow (gpm)	modified curve	-3%
0	6039.3	5858.2
100	5987.7	5808.1
175	5832.9	5657.9
250	5471.5	5307.4
325	4852.1	4706.6
400	4026.2	3905.4
475	2993.9	2904.0
550	1806.6	1752.4

Braidwood CV 1B Vendor Curve

flow (gpm)	modified curve	-3%
0.0	6087.2	5904.6
100.0	5985.7	5806.2
175.0	5782.8	5609.3
250.0	5377.0	5215.7
325.0	4666.8	4526.8
400.0	3855.2	3739.6
475.0	2840.7	2755.5
550.0	1623.3	1574.6

Braidwood RH 1A Vendor Curve

flow (gpm)	modified curve	-3%
0	437.9	424.8
1000	423.5	410.8
2000	399.4	387.4
2500	385.0	373.4
3000	375.4	364.1
3500	360.9	350.1
4000	336.9	326.8
4500	308.0	298.7
5000	283.9	275.4

Braidwood RH 1B Vendor Curve

flow (gpm)	modified curve	-3%
0.0	452.8	439.2
1000.0	429.9	417.0
2000.0	398.1	386.1
2500.0	388.1	376.5
3000.0	378.2	366.8
3500.0	363.2	352.3
4000.0	343.3	333.0
4500.0	313.5	304.1
5000.0	278.6	270.3

Braidwood SI 1A Vendor Curve

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0	3509.2	3403.9
50	3489.6	3384.9
150	3430.8	3327.8
250	3293.5	3194.7
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3000.0	378.2	366.8
3500.0	363.2	352.3
4000.0	343.3	333.0
4500.0	313.5	304.1
5000.0	278.6	270.3

See embedded documents for ITPR reviewer comments and resolution:

RE Evaluation 2009-13491.msg

RE RWST Back Flow.msg

RE Evaluation 2009-13491 - unsigne

Tamayo-Santolin, Tina M.:(GenCo-Nuc)

From: Baran, David A.:(GenCo-Nuc)
Sent: Wednesday, December 23, 2009 10:53 AM
To: Gosnell, James S.:(GenCo-Nuc); Rommel, John C.:(GenCo-Nuc)
Subject: RE: Evaluation 2009-13491

Jim,

The S&L document is good.

Based on my conversations with John Rommel (as recently as yesterday) he would be expecting a statement in either EC 378180, or in Roy's SDP documentation, to the effect:

A sensitivity analysis was performed for critical input parameters and assumptions used in S&L Evaluation 2009-13491. Conservative variations in the critical parameters were applied for the 5.2 inch LOCA scenario with the RWST at the Lo-2 level and the results can be applied to the other accident scenarios investigated. This analysis determined that back flows to the containment sump and overall RWST outflow increased by less than 500 gpm for the combined additive effects of conservative increases in RWST level, primary system pressure, and Cv for the 1SI8811 valves and conservative reductions in ECCS pump performance and back flow path pipe resistance. A reduction in containment pressure from 19.2 psia to 17.28 psia (10%) resulted in a 720 gpm increase in back flow to the sump. It should be noted that this represents a significant variation in the parameter on a gauge pressure basis and much smaller variations in containment pressure around the 4.5 psig value in the SDP analysis is more realistic.

On a square root sum of the squares basis, the resulting increase in sump back flow would be 759 gpm for conservative variations in all critical parameters. This result would be much less for more realistic variations in containment pressure around the 4.5 psig value assumed in the analysis. An increase in sump back flow in excess of 1000 gpm would potentially impact the conclusions of the Significance Determination Process. Therefore, the combined effects in variations of all the critical parameters in the sump back flow analysis would not change the conclusions reached in the Significance Determination Process performed under AR XXXXXX.

You will need Roy's input on this and you don't have to use my wording. John is looking for a statement that the assumptions and variations are realistic and that the results support the conclusions of the SDP.

Dave

From: Gosnell, James S.:(GenCo-Nuc)
Sent: Wednesday, December 23, 2009 9:16 AM
To: Baran, David A.:(GenCo-Nuc); Rommel, John C.:(GenCo-Nuc)
Subject: FW: Evaluation 2009-13491

The sensitivity analysis is included. Need comments by 1100.

From: ANTHONY.M.RYAN@sargentlundy.com [mailto:ANTHONY.M.RYAN@sargentlundy.com]
Sent: Tuesday, December 22, 2009 1:14 PM
To: Gosnell, James S.:(GenCo-Nuc)
Cc: ROBERT.J.PETERSON@sargentlundy.com
Subject: Evaluation 2009-13491

Jim,

Here is a pdf of the main body of the evaluation including the results of the sensitivity runs. Our review is complete and we are ready to sign. Do you want us to put signatures on the cover sheet or should we expect more comments?

Tony

Tamayo-Santolin, Tina M.:(GenCo-Nuc)

From: Rommel, John C.:(GenCo-Nuc)
Sent: Thursday, December 17, 2009 3:17 PM
To: Gosnell, James S.:(GenCo-Nuc); Baran, David A.:(GenCo-Nuc)
Cc: Gustafson, David L.:(GenCo-Nuc); Smith, Michael J.:(GenCo-Nuc)
Subject: RE: RWST Back Flow

My comment still remains the same, what is the impact of reasonable changes in your critical parameter inputs on the final conclusions of the PRA analysis. I believe this needs to be addressed somewhere.

From: Gosnell, James S.:(GenCo-Nuc)
Sent: Thursday, December 17, 2009 3:04 PM
To: Baran, David A.:(GenCo-Nuc); Rommel, John C.:(GenCo-Nuc)
Cc: Gustafson, David L.:(GenCo-Nuc); Smith, Michael J.:(GenCo-Nuc)
Subject: RE: RWST Back Flow

There is no way we can make such statements for each assumption without sensitivity runs. Either withdraw the comment or we will have to pay for more analysis.

From: Baran, David A.:(GenCo-Nuc)
Sent: Thursday, December 17, 2009 12:24 PM
To: Gosnell, James S.:(GenCo-Nuc)
Cc: Rommel, John C.:(GenCo-Nuc); Gustafson, David L.:(GenCo-Nuc)
Subject: FW: RWST Back Flow

Jim,

Here are my recommendation to address the sensitivity comment from John Rommel:

1. Accept the S&L document as is with no further case runs or calculations.
2. Have Giovanni Panici document in the EC 378180 EVAL DETAILS that this is a "best estimate" evaluation that is sensitive to RWST level, SI8811 valve position, RCS pressure, Containment Sump level, etc. Qualitatively make a conclusion (for each assumption) based on the input from Erin below that any small variations in the S&L evaluation due to these assumptions have been bounded by conservative assumptions in the SDP. For example, we can probably say that for a 10% variation in SI8811 valve position that the Cv and corresponding K value changed insignificantly, or RWST level uncertainties applied in the same direction over the 6 minute interval will have little impact on the calculated average flows, etc.

I discussed this with John Rommel and he is agreement with this. This will permit finishing up with S&L and allow you to control the approval of the EC with your guys.

Dave

From: Mark T. Cursey [mailto:MTCursey@erineng.com]
Sent: Thursday, December 17, 2009 8:50 AM
To: Linthicum, Roy R.:(GenCo-Nuc); Baran, David A.:(GenCo-Nuc)
Cc: Jeff R. Gabor; Don E. Macleod
Subject: RE: RWST Back Flow

I believe that the results from the S&L calc will have little impact if the output was to change by a "few" percent. We used a flow that was conservative for most cases due to the slight variation in the final cases we ran from the base cases we gave to S&L. In the TH Appendix this is documented and should account for any under-predicting of flow if there was any. We also extended the draindown timing from 6 to 7 minutes which used the average flow from the S&L calc for the 6 minute period. The flow would actually reduce over that last minute due to reduced RWST level. I believe that the sum of the conservative inputs is greater than any "small" change from the S&L calc.

Mark

From: roy.linthicum@exeloncorp.com [mailto:roy.linthicum@exeloncorp.com]
Sent: Thursday, December 17, 2009 9:14 AM
To: david.baran@exeloncorp.com
Cc: Mark T. Cursey; Jeff R. Gabor; Don E. Macleod
Subject: RE: RWST Back Flow

Dave,

I believe the answer is a small change (a few percent) won't have any impact, but it depends on what you mean by small

Roy

From: Baran, David A.:(GenCo-Nuc)
Sent: Wednesday, December 16, 2009 4:08 PM
To: Linthicum, Roy R.:(GenCo-Nuc)
Subject: RWST Back Flow

Roy,

An item I was asked to follow-up on is the sensitivity of the results of the SDP to the output of the evaluation performed by S&L. For example, will a small variation in the output of the S&L calc impact the results of the SDP??

Thanks,

Dave

Tamayo-Santolin, Tina M.:(GenCo-Nuc)

From: Rommel, John C.:(GenCo-Nuc)
Sent: Wednesday, December 16, 2009 10:14 AM
To: ANTHONY.M.RYAN@sargentlundy.com; Gosnell, James S.:(GenCo-Nuc)
Cc: Baran, David A.:(GenCo-Nuc); ROBERT.J.PETERSON@sargentlundy.com; Panici, Giovanni:(GenCo-Nuc)
Subject: RE: Evaluation 2009-13491 - unsigned

I understand the RWST level issue, still unclear on the sensitivities. I have no feel how minor changes in critical input assumptions influence Roy's final conclusion. This may require input from Roy to help make this clear and what needs to be included.

For example:

What if the stuck valves were 5% further open, would it make a difference in Roy's answer. What if RCS pressure is 10 psi lower, what if level is off by 3 inches, what if the frictional losses in piping to sump were really 10% lower.. If plenty of margin to concern in Roy's analysis, then likely not an issue, but it Roy's analysis is close to acceptance criteria needs to be looked at more closely.

From: ANTHONY.M.RYAN@sargentlundy.com [mailto:ANTHONY.M.RYAN@sargentlundy.com]
Sent: Tuesday, December 15, 2009 3:52 PM
To: Gosnell, James S.:(GenCo-Nuc)
Cc: Baran, David A.:(GenCo-Nuc); Rommel, John C.:(GenCo-Nuc); ROBERT.J.PETERSON@sargentlundy.com; Panici, Giovanni:(GenCo-Nuc)
Subject: RE: Evaluation 2009-13491 - unsigned

Jim,

I have added to pages 8 and 10 to address the two comments below. After I have heard that these incorporations are satisfactory, I will get signatures for the cover page.

Tony

From: <james.gosnell@exeloncorp.com>
To: <ANTHONY.M.RYAN@sargentlundy.com>, <ROBERT.J.PETERSON@sargentlundy.com>
Cc: <david.gustafson@exeloncorp.com>, <michael.smith@exeloncorp.com>, <roy.linthicum@exeloncorp.com>, <john.rommel@exeloncorp.com>, <david.baran@exeloncorp.com>
Date: 12/14/2009 01:09 PM
Subject: RE: Evaluation 2009-13491 - unsigned

John Rommel, Dave Baran and I met today to discuss the remaining comments. There are only 2 that need to be incorporated into the S&L product. None of the comments require re-analysis or revision to the math. The numbers stay the same.

- Add some discussion about the sensitivity of the results to the various inputs. How sensitive is sump flow to RWST level for example. (pipe config, containment pressure etc are some others)
- Add some explanation of how RWST level is calculated at t=6. Some discussion of the methodology of the calc. so the reader knows the approach.

This should be the last of it. Jim

From: Baran, David A.:(GenCo-Nuc)
Sent: Saturday, December 12, 2009 7:15 AM
To: Linthicum, Roy R.:(GenCo-Nuc); Gosnell, James S.:(GenCo-Nuc); Rommel, John C.:(GenCo-Nuc)
Cc: Gustafson, David L.:(GenCo-Nuc); Smith, Michael J.:(GenCo-Nuc); 'ANTHONY.M.RYAN@sargentlundy.com'; 'ROBERT.J.PETERSON@sargentlundy.com'
Subject: RE: Evaluation 2009-13491 - unsigned

All,

I inputted all the data from the evaluation into the Mathcad file I created over Thanksgiving. This file assumes that RWST outflow versus level is linear over two data points and is the same methodology I used in BRW-97-0337-M ten years ago. All of Tony's data agrees to the decimal point that at 6 minutes, the level is where he says it is for each event. I attached the 5.2 inch LOCA file in text format as an example.

This proves that his numbers are correct. I think to satisfy the comments from the reviewers, the discussion on methodology needs to be clearer and no additional analytical effort is necessary.

Dave

From: Linthicum, Roy R.:(GenCo-Nuc)
Sent: Fri 12/11/2009 6:53 PM
To: Gosnell, James S.:(GenCo-Nuc); Baran, David A.:(GenCo-Nuc); Rommel, John C.:(GenCo-Nuc)
Cc: Gustafson, David L.:(GenCo-Nuc); Smith, Michael J.:(GenCo-Nuc); 'ANTHONY.M.RYAN@sargentlundy.com'; 'ROBERT.J.PETERSON@sargentlundy.com'
Subject: RE: Evaluation 2009-13491 - unsigned
Jim is correct. We want real levels so we can understand what is happening and take it into account. The flow rates are the real outputs from S&L that we are using as inputs.

From: Gosnell, James S.:(GenCo-Nuc)
Sent: Friday, December 11, 2009 4:07 PM
To: Baran, David A.:(GenCo-Nuc); Rommel, John C.:(GenCo-Nuc)
Cc: Gustafson, David L.:(GenCo-Nuc); Smith, Michael J.:(GenCo-Nuc); 'ANTHONY.M.RYAN@sargentlundy.com'; 'ROBERT.J.PETERSON@sargentlundy.com'; Linthicum, Roy R.:(GenCo-Nuc)
Subject: RE: Evaluation 2009-13491 - unsigned
RWST level is an absolutely critical input since it determines driving head but it is not the output of the S&L analysis. John's comment was related to measurement uncertainty and as I explained, this was not a design basis type calc. Roy specifically asked that we not use uncertainty and use realistic inputs. The purpose of the analysis it to determine flow to the sump which in turn can be used to determine lost inventory and reduction in RWST level. The determination of the remaining time is made <u>outside</u> the S&L analysis. The S&L methodology of iterating the calc once seems to provide realistic numbers since the flow calculated at the 3 minute mark were only 9 gpm different from the average.

I'm not sure what changes are being advocated by the comment other than to call the RWST level a critical input parameter.

Due to the ongoing discussion here, I have directed S&L to hold final approval signatures to at least Monday.

From: Baran, David A.:(GenCo-Nuc)
Sent: Friday, December 11, 2009 3:49 PM
To: Gosnell, James S.:(GenCo-Nuc); Rommel, John C.:(GenCo-Nuc)
Cc: Gustafson, David L.:(GenCo-Nuc); Smith, Michael J.:(GenCo-Nuc); 'ANTHONY.M.RYAN@sargentlundy.com'; 'ROBERT.J.PETERSON@sargentlundy.com'; Linthicum, Roy R.:(GenCo-Nuc)
Subject: RE: Evaluation 2009-13491 - unsigned

Jim,

I agree with John. I think the critical parameter is RWST level at the end of 6 minutes to ensure that there is sufficient time for operators to complete the actions in 1BwEP ES-1.3 prior to reaching the RWST Empty limit of 9%. I assumed that flow was calculated at 427.3', then there was a projected level in which flows were calculated, then the average RWST outflow was used to determine a level at 6 minutes. The flows for validation run at the mid point level after 3 minutes should be close to the average.

Dave

From: Gosnell, James S.:(GenCo-Nuc)
Sent: Friday, December 11, 2009 3:09 PM
To: Rommel, John C.:(GenCo-Nuc)
Cc: Gustafson, David L.:(GenCo-Nuc); Baran, David A.:(GenCo-Nuc); Smith, Michael J.:(GenCo-Nuc); ANTHONY.M.RYAN@sargentlundy.com; ROBERT.J.PETERSON@sargentlundy.com; Linthicum, Roy R.:(GenCo-Nuc)
Subject: RE: Evaluation 2009-13491 - unsigned

See below

From: Rommel, John C.:(GenCo-Nuc)
Sent: Friday, December 11, 2009 1:54 PM
To: Gosnell, James S.:(GenCo-Nuc)
Cc: Gustafson, David L.:(GenCo-Nuc); Baran, David A.:(GenCo-Nuc); Smith, Michael J.:(GenCo-Nuc)
Subject: RE: Evaluation 2009-13491 - unsigned

1. I thought the purpose of the calculation was to calculate the new level in the RWST after 6 minutes, not to determine how much flow to the containment sumps Roy is using one to determine the other. If we subtract the water that went to the sump we can determine how much RWST level is lost to the sump. The purpose is to quantify the flow to the sump.

2. Critical parameters for this analysis appear to be:

Note: I recognize that there are no acceptance criteria to this document, so it makes it hard to understand available margin questions. When I speak of conclusions below, I refer to the final overall conclusions of the combined analyses and not the effect on this particular EC.

- starting RWST level

  i. you used a low level alarm which seems reasonable, but nothing is discussed regarding uncertainty or tolerances – will that impact conclusions – why or why not Good question, this analysis was specifically requested to be a realistic estimate of flow, not a design basis calculation. This is what the PRA folks requested for input. Therefore, some reasonable conservatisms were kept but minimized. We purposely did not include measurement uncertainty.

- piping resistances

  i. you make a big point to have model match plant data for CV and SI lines with injections valves Cv adjustment, but nothing seems to be done to match the RH line or the lines to the containment sumps. Is there a reason? Does it make any difference in your conclusions? S&L looked at the critical line between the RWST and the ECCS sump and validated its configuration closely matched the plant. The 12 inch line in the path was the part that contained most of the head loss.

- pump performance

  i. you used a reasonable approach to model these – no comments other than impact of measurement uncertainty on your conclusions Correct, as stated above, this analysis was a realistic estimate of actual system performance.

- Boundary conditions

  i. You have references that transmit the RCS pressure, Containment pressure and sump levels. It is not clear to me where these came from and why they are the right ones for this analysis. My read on the results is that it did not matter much as the level changes in the RWST are about the same for each case. My comment would be to ensure that these conditions are the right ones. What if they are change slightly, how sensitive are the conclusions to these assumptions? The inputs came from PRA thermal hydraulic modeling for each specific accident case. They came from the PRA folks and they are the end user of the output. We did perform some sensitivity analysis but not on all the inputs.

- CVs of partial open valves

  i. This seems to be a very key assumption. How sensitive are the conclusions to this input? What happens if the valves are really 5 or 10% further open? Will your conclusions change? Actually, the Cv of the 8811s has a very small impact on the overall system resistance, about 2%. If the valve is open a bit more there will be very little change in flow. The dominant resistance comes from the tees and 12" line in the system therefore changes in valve position or Cv are not going to have a great effect on the results.

3. Not sure on the timing and which outage is which at Braidwood, so for the Cv for the injection valves, does it need to include any degrading impacts due to the problems we have had with these valves? I think you are referring to the throttle valves. The 8811B failed to stroke open in June of 2009 and previously stroked successfully on 9-20-07. During the Unit 1 outage in the spring of 2009, we replaced one of the throttle valve cages and biased all the throttle valves low in the flow range. The degradation mechanisms; corrosion and loss of brazing material should have made most of their impact during the first cycle that they were installed. There is therefore, some overlay in the conditions. Higher pump flows have the effect of lowering flow to the sumps but obviously there is more overall flow out of the RWST. The CV pumps were about 30-40 gpm higher overall and the SI pumps were in the same range. Admittedly we did not consider this to be a big effect and it partially offset by the 30 gpm per SI pump that is recirculated back to the RWST through the pump miniflow lines. The analysis considers to be lost inventory. The flow to the sump analysis is still valid because as I stated above, lower pump flows will result in higher sump flows and since Roy (PRA) is taking the sump flow as their input to determine lost inventory, the calculation is still conservative. This was a conscience decision.

4. There needs to be some discussion/math to show how you determined that RWST level after 3 or 6 minutes. Is not that the key out put of the analysis? The key output is the inventory lost to the ECCS sump. The average flow was used to calculate the actual t=6 RWST level and the calc was iterated once. Inputs 2.7 provides gallons per foot of RWST.

5. Is there a simple way to show the results are reasonable - can we compare against some plant measured data? What about a previous analysis? Simple hand calculations? What gives me confidence that the added piping model and its implementation is appropriate? Seems to me that a simple hand calculation with no flows to pumps can be compared against a PIPE FLO run with no pumps flows that would give me confidence that the modeling is correct. We did perform one run with no pump on, S&L performed model testing and verification before running the individual cases. They also did perform one hand calc to validate reasonableness.

Please comment on the answers provided here. I can capture your comments and these answers in the reviewer comments panel of the EC.

Any questions or further clarification let me know

From: Gosnell, James S.:(GenCo-Nuc)
Sent: Friday, December 11, 2009 12:12 PM
To: Rommel, John C.:(GenCo-Nuc)
Cc: Gustafson, David L.:(GenCo-Nuc)
Subject: FW: Evaluation 2009-13491 - unsigned

This just came in, John, any ETA?

From: ANTHONY.M.RYAN@sargentlundy.com [mailto:ANTHONY.M.RYAN@sargentlundy.com]
Sent: Friday, December 11, 2009 11:43 AM
To: Gosnell, James S.:(GenCo-Nuc)
Cc: Baran, David A.:(GenCo-Nuc); DINESH.C.PATEL@sargentlundy.com; ROBERT.J.PETERSON@sargentlundy.com; Panici, Giovanni:(GenCo-Nuc); Linthicum, Roy R.:(GenCo-Nuc); Behringer, Thomas J.
Subject: Evaluation 2009-13491 - unsigned

Jim,

Attached is a pdf of the unsigned copy of evaluation 2009-13491, Analysis of RWST Back Flow to the Containment Sumps. The entire evaluation including all PIPEFLO models can be found on the S&L ftp server at the following address.

ftp://slftp1.sargentlundy.com/pub/anyone/AMR/

This copy incorporates all of the Exelon comments. If you agree that all comments have been incorporated, we will sign and send you the approved evaluation.

Tony

Attributes

Attribute Sub-category: DAR

Attribute Name	Value	PassPort	Date
CC-AA-102 ATT 1,7,8	COMPLETE	BRZYP	12/11/2009

ATTACHMENT 1
Design Attribute Review (DAR)

Engineering Change Number: EC 378180 Revision 0

IDENTIFY THE APPLICABILITY OF THE FOLLOWING TO THE DESIGN CHANGE. **WHEN** A TOPIC IS DETERMINED TO BE APPLICABLE, **THEN PLACE** THE APPLICABLE TOPIC INFORMATION IN THE DESIGN CHANGE. **IF** THE INFORMATION IS INSTALLATION-RELATED, **THEN PLACE** THIS INFORMATION IN THE INSTALLER INSTRUCTIONS (ATTACHMENT C IN CC-AA-103). **IF NOT** INSTALLATION-RELATED, **THEN PLACE** THE TOPIC INFORMATION IN A SEGREGATED DESIGN CONSIDERATION SECTION, OR WITHIN THE DOCUMENTATION REQUIRED BY THE PROCEDURES GOVERNING A PARTICULAR ATTRIBUTE. OPTIONAL FIELDS "TRACKING OF ACTION" AND "REFERENCES" ARE AVAILABLE FOR NOTATION BY THE PREPARER IF DESIRED TO ASSIST THE PREPARER IN MANAGING THE ACTIVITY.

Section	Design Change Attribute	Applicable	Tracking of Action	References
4.1.4.1.	IDENTIFY Basic SSC Functions	☒		See Design Considerations Summary (DCS)
4.1.4.2.	IDENTIFY Configuration Change safety classification.	☒		See DCS
4.1.4.3.	IDENTIFY Seismic Classification of the SSC.	☐		
4.1.5.	PROVIDE the performance requirements and design conditions (including margin) of the SSC needed to evaluate the change from the existing to the modified systems, structures, or components.	☐		
4.1.6.	DETERMINE the design requirements necessary to facilitate periodic surveillance testing and acceptance testing that is necessary for the Configuration Change being considered.	☐		
4.1.7.	DETERMINE the Codes, Standards, and Regulatory Requirements applicable to the Configuration Change.	☐		
4.1.8.	IDENTIFY PWR Sump GL 2004-02 Program impacts Braidwood, Byron, and TMI only	☐		
4.1.9.	DETERMINE changes required to existing Design Analysis or new parameters that require new calculations or calculation revisions that are used to assess the acceptability of a system or a component function in meeting various physical requirements.	☐		
4.1.10.	If Redundancy, Diversity and Separation requirements are identified or affected, then REVIEW the original design basis as well as any subsequent modifications.	☐		
4.1.11.	IDENTIFY any Failure Effects requirements. (See Attachment 12)	☐		

ATTACHMENT 1
Design Attribute Review (DAR)

Section	Design Change Attribute	Applic able	Tracking of action	References
4.1.12.	IDENTIFY Fire Protection and Appendix R Safe Shutdown requirements, by using the "Screening for Approved Fire Protection Program (AFPP) Impact", Attachment 2.	☐		
4.1.13.	DETERMINE any Material requirements, such as material grade, product form, compatibility with existing or other new materials, galvanic interaction between dissimilar metals, special welding material requirements, critical properties, performance characteristics, alternative materials as well as any Material Suitability requirements such as compatibility, electrical insulation properties, protective coating, corrosion resistance, mechanical insulation etc. necessary for the Configuration Change.	☐		
4.1.14.	Determine environmental conditions and impacts.	☐		
4.1.15.	DETERMINE if Environmental Qualification (EQ) of equipment is affected. (see Attachment 3)	☐		
4.1.16.	REVIEW the Operating Experience databases through the INPO Internet Site or equivalent in accordance with LS-AA-115:	☐		
4.1.17.	DETERMINE if the configuration change may affect the existing Equipment Performance Information Exchange (EPIX) database.	☐		
4.1.18.	DETERMINE if the Configuration Change may affect the existing Probabilistic Risk Assessment (PRA), Mitigating System Performance Index (MSPI) Basis Document PRA content, and shutdown risk models by using the screening checklist in Attachment 4.	☐		

ATTACHMENT 1
Design Attribute Review (DAR)

Section	Design Change Attribute	Applicable	Tracking of action	References
4.1.19.	EVALUATE if System Operational Requirements have changed.	☐		
4.1.20.	IDENTIFY any Human Factors requirements.	☐		
4.1.21.	IDENTIFY procedure changes per direction in Attachment 9.	☐		
4.1.22.	IDENTIFY any changes or additional training requirements for various departments, per direction in Attachment 9.	☐		
4.1.23.	CONSIDER the functional and physical system interface requirements, including the affect of cumulative tolerances between the subject system or component and adjacent or related support systems, structures, and components that may have been affected by the Configuration Change.	☐		
4.1.24.	DETERMINE specialized layout and arrangement requirements, such as protection from normal vehicle traffic flow, or physical location preferences that minimize plant operating requirements for both the structures and systems being modified, and adjacent equipment and that avoid susceptibility for water hammer and gas accumulation.	☐		
4.1.25.	DETERMINE if the Radiation Protection/ALARA programs are affected by review of changes that affect any of the following during normal or post accident conditions: Radiation sources; changes affecting controlled radiation areas; primary coolant fluid systems (Cobalt Materials); contaminated systems; radiation monitoring systems; HVAC Systems which could transport airborne contaminants; change or alter shielding. (see Attachment 5)	☐		

ATTACHMENT 1
Design Attribute Review (DAR)

Section	Design Change Attribute	Applic able	Tracking of action	References
4.1.26.	DETERMINE the need for walkdowns to look at accessibility to the work area(s) and any special installation considerations that need to be addressed during design development.	☐		
4.1.27.	DETERMINE Accessibility for maintenance, repair and In-Service Inspection (ISI) and In-Service Testing (IST), and the conditions under which these activities will be performed.	☐		
4.1.28.	DETERMINE handling, storage, cleaning, and shipping requirements, as well as transportability requirements for items which require special handling during transit from supplier to site, from site to vendor (for repair), or from site receiving to final placement in the plant.	☐		
4.1.29.	DETERMINE the effect of the Configuration Change on existing Emergency Plan or environmental and discharge monitoring that are used to prevent undue risk to public health and safety.	☐		
4.1.30.	DETERMINE Industrial Safety requirements such as restricting the use of dangerous materials, hazardous chemicals, escape provisions from enclosures, pertinent OSHA requirements, and grounding of electrical systems.	☐		
4.1.31.	DETERMINE impact on nuclear fuel, core components, core design, reactivity management, criticality control and accountability of nuclear materials as well as transient and / or accident analysis, by using Attachment 6.	☐		
4.1.32.	DETERMINE Load Path requirements for installation, removal, and repair of equipment and replacement of major components.	☐		

ATTACHMENT 1
Design Attribute Review (DAR)

Section	Design Change Attribute	Applicable	Tracking of action	References
4.1.33.	IDENTIFY Mechanical System Characteristics where design limits are placed on the mechanical properties of a system or components.	☐		
4.1.34.	IDENTIFY Chemistry requirements where limits are placed on the chemical properties of a system or component based upon safety, reliability, ALARA, economics, or other considerations.	☐		
4.1.35.	IDENTIFY Electrical requirements where limits are placed on the electrical properties of a system or component.	☐		
4.1.36.	IDENTIFY Instrument and Control requirements, including digital technology requirements.	☐		
4.1.37.	IDENTIFY Security requirements such as site monitoring, alarm systems, vehicle barrier systems, security and security lighting.	☐		
4.1.38.	IDENTIFY Civil/Structural requirements where design limits are placed on the structural properties of a SSC such as equipment foundations and component supports.	☐		
4.1.39.	If the Configuration Change adds, relocates, or alters Seismic Category I mechanical and/or electrical components then ENSURE that the Seismic Dynamic Qualification (SD/Q) of the components has been addressed per CC-AA-320-001.	☐		

ATTACHMENT 1
Design Attribute Review (DAR)

Section	Design Change Attribute	Applic able	Tracking of action	References
4.1.40.	DETERMINE Personnel Requirements and Limitations such as the need for trade specialists and engineering experts as well as support personnel, such as Radiation Chemistry technicians, welding technicians with special expertise, use of specific contractor or station procedures for installation or the need for mock-ups for training, installation, or operation.	☐		
4.1.41.	LIST special procedures and installation specifications that apply, but are not part of the normal installation procedural direction.	☐		
4.1.42.	DETERMINE Interfacing Department impact of the Configuration Change, such as Operations, Plant Engineering, Training (including Plant Simulator), Maintenance, Reactor Engineering, Radiation Protection and others. (see Attachments 10A through 10H)	☐		
4.1.43.	CONSIDER impact on active License Renewal Projects.	☐		
4.1.44.	REVIEW the proposed changes for conformance with requirements of any applicable Nuclear Electric Insurance Limited (NEIL) Insurance Standard, or other appropriate insurance standards.	☐		
4.1.45.	A comprehensive single point vulnerability (SPV) review of the configuration change shall be performed to ensure the configuration change does not add the potential to cause an unplanned reactor SCRAM.	☐		
4.1.46.	Impact on Steam Generator Replacement Projects (PWR only, see Attachment 13)	☐		
4.1.47.	IDENTIFY changes to the plant, both permanent and temporary, that potentially impact the switchyard or the interconnected transmission system. Communication and coordination of these plant changes with the applicable transmission entities is a requirement of the mandatory NERC Reliability Standards.	☐		

ATTACHMENT 1
Design Attribute Review (DAR)

Section	Design Change Attribute	Applicable	Tracking of action	References
4.4.	Configuration Control Activities- Use of Attachment 7	☐		
4.5.	Determination of Program Impact - Use of Attachment 8	☐		

CC-AA-102 Attachment 7 - Checklist of Configuration Activities			
Engineering Change Number: ____		**Rev:** ____	
Req'd	**Prior To Operation**	**Configuration Activity**	
	Procedure	**Related Tracking info**	**EC Install Attribute**
	*	Update Tech Spec or license (if affected, DBdb applies)	
	LS-AA-101	Amendment No:	CONF: TECH SPEC
		Update Tech Spec Bases	
	LS-AA-101-1000		
	As Required by LS-AA-107	UFSAR Change Notice (if affected, DBdb applies)	
	LS-AA-107	Change Request No:	CONF: UFSAR CHANGE NOTICE
		Technical Requirement Manual	
	Plant Specific	List on ADL	CONF: TECH REQMT MANUAL
		Design Bases Database Requirements	
	CC-AA-207	DBdb Input Form	CONF: DB DATABASE INPUT
		Update Design Bases Topical Reports and System Documents	
	CC-AA-207	List on ADL	
	*	Update of Critical Control Room Drawings	
	CC-AA-103, -104, -112,NF-AA-101	List on ADL	CONF: CCRD HUNG
		Additional Walkdown (s)	
	CC-AA-106-1001	Place walkdown form in package	CONF: DESIGNERS WALKDOWN
		Affected Equipment List (AEL) or Component Record List (PIMs) (CM-6)	
	Plant Specific		CONF: EQUIP DATA (NON RTC UPD)
		Update set point and calibration database (IISCP in MAROG)	
	Plant Specific		
		Electrical Load Monitoring (ELMS)	
	Plant Specific	ADL & ELMS Input form	CONF: ELMS INPUT

CC-AA-102 Attachment 7 - Checklist of Configuration Activities			
		Cable Management Database (raceway and conduit) program (SLICE)	
Plant Specific		ADL & Slice Input form	CONF: SLICE INPUT
	*	Update of Nuclear Fuels/Corporate Engineering Safety Analysis Accident Analysis (See Attachment 10G)	
Attachment 10G			CONF: NUCLEAR FUELS ACC ANLS
		Plant Barriers Affected	
Plant Specific			CONF: BARRIER PROGRAM
	*	Offsite Dose Calc Manual	
CY-AA-170-300			CONF: ODCM
		Update VETIP Manuals	
CC-AA-204			CONF: VETIP MANUALS
		Update Fire Protection Documentation Package and Appendix R	
CC-AA-209		Change Request No:	CONF: FPR CHANGE REQUEST
	*	Update Use of Locks on Valves	
OP-AA-108-103		Proc on ADL; Equip Data AEL	
	*	Equipment Tagging & Labeling (CM-6)	
OP-AA-116-101		Label Request	CONF: EQUIP TAGS/LABELS
		Address Open Operability Determinations	
OP-AA-108-115			CONF: OPEN OPERABILITY DETERMINATION
		Update or Create Equipment Bill of Material	
SM-AA-300		BOM End Use Analysis	CONF: EQUIP BOM
		Plant Simulator Change Required?	
Contact Site Simulator Coordinator			CONF: SIMULATOR CHANGES

CC-AA-102 Attachment 7 - Checklist of Configuration Activities			
		Functional Equipment Group (FEG) Update	
MA-AA-716-210			CONF: FEG UPDATE (D046)
		Clearance and Tagging Program (C/O Models Updated)	
Operations			CONF: TAG OUT C/O MODEL CHANGE
		Equipment PMT Requirements (D041)	
Plant Specific			CONF: EQUIP PMT CHANGES (D041)
		Other items	
			CONF: MISC
		Emergency Response Data System Data Point Library Update (ERDS)	
EP-AA-123 or EP-OC-123 for Oyster Creek		Notify NRC within 30 days of change to library files	CONF: ERDS
		Update Cyber Security Assessment Database	
CC-AA-215			CONF: CYBER SECURITY
		List of equipment being replaced to Site Supply Chain Manager	
SM-AC-4006			

Notes:
"*" Indicates that it must be completed prior to operation if the activity is required.
Track completion via EC ADL/AEL (if ADL/AEL is applicable) or EC INSTALL Attribute.

CC-AA-102 Attachment 8 - Checklist for Programs Impact		CC-AA-102 Rev 18	
Engineering Change Number: _____			**Rev: _____**
Req'd	**Prior to Operation**	**Program Activities**	
	Procedure	**Related Tracking info**	**EC Install Attribute**
	* If Tech Spec	Predefine Surveillance Program	
	Plant Specific		PROG: PREDEFINES (SURV, PM)
		Performance Centered Maintenance (PCM) Program	
	MA-AA-716-210		PROG: PREDEFINES (SURV, PM)
		Create or Revise PCM Template	
	MA-AA-716-210-1001		PROG: PCM TEMPLATE
		Maintenance Rule Program	
	ER-AA-310		PROG: M/R PROGRAM
		Instrument Calibration as part of Predefine Surveillance Program	
	Plant Specific		PROG: INSTR SURVEILLANCE
		Check Valve PM Program	
	ER-AA-400-1001		PROG: CHECK VALVE PM
		MOV Program	
	ER-AA-302		PROG: MOV
		AOV Program	
	ER-AA-410		PROG: AOV
		EQ Program	
	CC-AA-203		PROG: EQ
		ASME Section XI or O&M IST Program	
	ER-AA-321		PROG: IST
		ASME Section XI or O&M ISI Program	
	ER-AA-330		PROG: ISI (ASME XI)
		Boric Acid Corrosion Control (BACC) Program (PWR only)	
	ER-AP-331		
		BWR Reactor Internals/IVVI (BWR only)	
	ER-AB-331		
		ASME III Code and Auth. Nuclear Inspector/In-service Inspector Review	
	Plant Specific		PROG: ASME CODE / ANII REVIEW

CC-AA-102 Attachment 8 - Checklist for Programs Impact			CC-AA-102 Rev 18
		B&PV Inspection Program (including State Boiler Inspector Notification) (IDNS)	
Plant Specific			PROG: IDNS VESSEL/RV TEST
		ASME VIII Relief Valve Testing (part of IDNS Requirements)	
Plant Specific			PROG: IDNS VESSEL/RV TEST
		Non ASME Piping & Comp Support Inservice Inspection Program	
Plant Specific			PROG:ISI (NON ASME)
		Other Programs that may be Tech Spec required but plant specific	
Plant Specific			PROG:MISC
		Flow Accelerated Corrosion Program	
ER-AA-430			PROG: FAC (FLOW ACC CORROSION)
		Fatigue and Transient Monitoring Program	
ER-AA-470			PROG: FATIG & TRANS MON
		Lead Shielding Program	
Plant Specific			PROG: LEAD SHIELDING
		Update & Maintenance of EPIX (formerly NPRDS)	
ER-AA-2020			PROG: EPIX
	*	Emergency Operating Procedures (EOP)/Severe Accident Management (SAM) Program	
Plant Specific			PROG: EOP/SAM
		GL-89-13 Program for Heat Exchangers and Piping	
ER-AA-340			PROG: GL 89-13 HX
		Environmental Review	
EN-AA-103			PROG: ENVIRON SERV NOTIFIED
		Steam Generator Program	
ER-AP-420			PROG: STEAM GENERATOR

CC-AA-102 Attachment 8 - Checklist for Programs Impact CC-AA-102 Rev 18		
	PRA URE Completion, MSPI Basis Document and PRA Model Update	
Section 4.1.18of CC-AA--102		PROG: PRA MODEL
	Containment Coatings Program	
CC-AA-205 and ER-AA-330-008		PROG: CONTAINMENT COATINGS
	Appendix J of 10CFR50	
ER-AA-380		
	Thermal Performance	
ER-AA-510		PROG: THERMAL PERFORMANCE
	Emergency Preparedness (EP) Programs	
EP-AA-120		
	Buried Piping and Raw Water Corrosion Program	
ER-AA-5400		
	Cyber Security Program	
CC-AA-213		PROG: CYBER SECURITY
	BOP HX Program	
ER-AA-340-2000		
	Control Room Envelope (CRE) Habitability Program	
ER-AA-390		
	Lubricants Program	
MA-AA-716-006		

Notes:
"*" indicates that it must be completed prior to operation if the activity is required.
Track completion via EC ADL (if ADL is applicable) or EC INSTALL Attribute.