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United States Nuclear Regulatory Commission
Attn: Document Control Desk
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H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2
DOCKET NO. 50-261/LICENSE NO. DPR-23

INSERVICE TESTING PROGRAM PLAN FOR THE FOURTH TEN-YEAR INTERVAL

Ladies and Gentlemen:

Pursuant to 10 CFR 50.55a(f)(5)(i), Carolina Power and Light (CP&L) Company is submitting the "Inservice Testing Program Plan – Fourth Interval" for the H. B. Robinson Steam Electric Plant (HBRSEP), Unit No. 2. The HBRSEP, Unit No. 2, Fourth Ten-Year Interval begins on February 19, 2002.

10 CFR 50.55a(f) requires inservice testing (IST) of American Society of Mechanical Engineers (ASME) Code Class 1, 2, and 3 pumps and valves. 10 CFR 50.55a(f)(4)(ii) requires that IST programs conducted during successive ten-year inspection intervals following the initial ten-year interval comply with the requirements of the latest edition and addenda of the Code, incorporated by reference in paragraph (b) of 10 CFR 50.55a, twelve months prior to the start of the ten-year interval, subject to the limitations and modifications listed within paragraph (b) of that section. Therefore, the HBRSEP, Unit No. 2, "Inservice Testing Program Plan – Fourth Interval" is based on the requirements of the ASME Code for Operation and Maintenance of Nuclear Power Plants (OM Code), 1995 Edition with 1996 Addenda. The HBRSEP, Unit No.2, "Inservice Testing Program Plan – Fourth Interval" is provided as Attachment I.

The HBRSEP, Unit No. 2, "Inservice Testing Program Plan – Fourth Interval" includes requests for relief from ASME OM Code requirements. Attachment I to this submittal contains these relief requests. Attachment II to this submittal provides the system diagrams for the components identified in the program.

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As noted above, the HBRSEP, Unit No. 2, Fourth Ten-Year Interval begins on February 19, 2002. The first refueling outage of the Fourth Ten-Year Interval is Refueling Outage 21 (RO-21), which is currently scheduled to begin in October 2002. In order to support implementation of the Fourth Ten-Year Interval Inservice Testing Program, and to facilitate preparations for RO-21, CP&L requests NRC approval of this submittal and the associated relief requests by February 18, 2002.

If you have any questions regarding this matter, please contact Mr. H. K. Chernoff.

Sincerely,



B. L. Fletcher III
Manager - Regulatory Affairs

CAC/cac

Attachments:

- I. Inservice Testing Program Plan – Fourth Interval
- II. System Diagrams

c: Mr. L. A. Reyes, NRC, Region II
Mr. R. Subbaratnam, NRC, NRR
NRC Resident Inspectors

United States Nuclear Regulatory Commission
Attachment I to Serial: RNP-RA/01-0099
149 Pages

CAROLINA POWER AND LIGHT COMPANY

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2

INSERVICE TESTING PROGRAM PLAN – FOURTH INTERVAL

REVISION 0

REVISION SUMMARY

Page(s)	Description of Change
All	Initial issue.

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1.0 DESCRIPTION

1.1 Purpose

This document represents the H. B. Robinson Steam Electric Plant (HBRSEP), Unit No. 2 Inservice Testing (IST) Program Plan for the fourth interval. It establishes testing requirements to assess the operational readiness of Safety Class 1, 2 and 3 pumps and valves that are required to perform a specific function to:

1. Shut down the reactor to the safe shutdown condition, or
2. Maintain the reactor in the safe shutdown condition, or
3. Mitigate the consequences of an accident.

This IST Program Plan provides compliance with the regulatory requirements identified in Section 1.2 (below), UFSAR Section 3.9.6, and Technical Specification Section 5.5.8.

1.2 Regulatory Requirements

The Code of Federal Regulations, Title 10, Part 50.55a (10CFR50.55a), paragraph (f)(5)(i) requires each licensee of pressurized water-cooled nuclear reactors to revise the IST Program Plan to meet the requirements of 10CFR50.55a(f)(4)(ii). As a result, the IST Program Plan must be revised at 120-month intervals to comply with the requirements of the latest edition and addenda of the Code incorporated by reference in 10CFR50.55a(b) 12 months prior to the start of the 120-month interval.

1.3 Interval Information

The third 120-month interval commenced on February 19, 1992 and ends on February 18, 2002.

The fourth 120-month interval is applicable from February 19, 2002 through and including February 18, 2012.

1.4 Applicable Code

In accordance with the requirements stated in Sections 1.2 and 1.3, ASME Boiler and Pressure Vessel Code, Section XI, Division 1, 1995 Edition through 1996 Addenda is the Code of record for the fourth interval. For the IST Program Plan, the specific Code of record is modified by reference as follows:

1. The Code of record, Article IWP-1000 states, "Pump testing shall be performed in accordance with the requirements stated in ASME/ANSI OM, Part 6."
2. The Code of record, Article IWV-1000 states, "Valve testing shall be performed in accordance with the requirements stated in ASME/ANSI OM, Part 10."

However, ASME OM Code-1995, Code for Operation and Maintenance of Nuclear Power Plants, was reformatted such that Parts 6 and 10 no longer exist. The requirements of Part 6 were incorporated into Subsections ISTA and ISTB. The requirements of Part 10 were incorporated into Subsections ISTA and ISTC. As a result, Articles IWP-1000 and IWV-1000 are incorrect and should reference "ASME OM Code-1995."

1.4 Applicable Code (Continued)

The requirement of 10CFR50.55a(b)(3) supports this conclusion by stating, “As used in this section, references to the OM Code refer to the ASME Code for Operation and Maintenance of Nuclear Power Plants, and include the 1995 Edition and the 1996 Addenda subject to the following limitations and modifications.”

For the purposes of this IST Program Plan, the Code of record is OM Code-1995 Edition through 1996 Addenda and subject to limitations and modifications in 10CFR50.55a(b)(3).

2.0 IST PROGRAM PLAN DEVELOPMENT

2.1 IST Program Plan Content

This IST Program Plan is comprised of two subprograms: Pumps and Valves. Both programs were developed using the information described in Sections 2.2 through 2.5. Information specific to each subprogram, such as program scope and test requirements, are presented in the section for that particular program.

Administrative and implementing procedures, reference values, test results and other records required to define and execute this IST Program Plan are retained at RNP.

2.2 Selection of Components

Pumps and valves are selected for inclusion in the IST Program Plan based on a review of all plant systems. This review includes UFSAR, Technical Specifications, Plant Operating Manual procedures, design documents and Piping & Instrument Diagrams. In accordance with 10CFR50.55a(f) and NUREG-1482, paragraph 2.2, the components subject to OM Code requirements are limited to ASME Class 1, 2, and 3 pumps and valves.

Components and tests that are optionally included in this IST Program Plan are identified as follows:

1. Components optionally classified as Code Class 3 (e.g., Diesel Fuel Oil system) are identified as Augmented in the Remarks column of the Pump Table and Valve Table.
2. Components not within the Code Class 1, 2, or 3 boundaries are identified as Augmented in the Remarks column of the Pump Table and Valve Table.
3. Components not in the scope of the IST Program Plan are identified as Augmented in the Remarks column of the Pump Table and Valve Table.
4. Specific tests that are not necessary to meet OM Code requirements are identified with “Aug” next to the test in the Test Type column of the Valve Table.
5. Relief Requests and Test Deferral Justifications are not provided for components and tests identified as Augmented.

2.3 Development Test Requirements

In addition to the Code, this IST Program Plan includes, as applicable, the additional requirements and recommendations of the following documents:

1. 10CFR50.55a(b)(3)
2. Generic Letter (GL) 89-04, "Guidance on Developing Acceptable Inservice Testing Programs"
3. NUREG-1482, "Guidelines for Inservice Testing at Nuclear Power Plants"
4. NUREG/CR-6396, "Examples, Clarification, and Guidance on Preparing Requests for Relief from Pump and Valve Inservice Testing Requirements"

These documents and the Code provide the basis for component selection, test requirements, test frequency deferrals, relief requests, and program plan format. Relief requests and test frequency deferrals are discussed in Sections 4.0 and 5.0.

2.4 Code Classification

Code classification of pumps and valves at RNP is described in UFSAR Section 3.9.6 and is shown on the Piping and Instrumentation Diagrams provided in Section 2.5.

2.5 Systems and Flow Diagrams

The following list identifies systems included in the IST Program Plan along with the associated Piping and Instrumentation Diagrams (P&IDs) that identify the Code boundaries.

System	P&ID (Sheet)
Primary Sampling System	5379-353 (1)
Component Cooling Water System	5379-376 (1)
Component Cooling Water System	5379-376 (2)
Component Cooling Water System	5379-376 (3)
Component Cooling Water System	5379-376 (4)
Chemical Volume and Control System	5379-685 (1)
Chemical Volume and Control System	5379-685 (2)
Chemical Volume and Control System	5379-685 (3)
Chemical Volume and Control System	5379-686 (1)
Liquid Waste Disposal System	5379-920 (3)
Gaseous Waste Disposal System	5379-921 (2)
Safety Injection System	5379-1082 (1)
Safety Injection System	5379-1082 (2)
Safety Injection System	5379-1082 (3)
Safety Injection System	5379-1082 (4)
Safety Injection System	5379-1082 (5)

2.5 Systems and Flow Diagrams (Continued)

System	P&ID (Sheet)
Residual Heat Removal System	5379-1484 (1)
Reactor Coolant System	5379-1971 (1)
Reactor Coolant System	5379-1971 (2)
Main and Extraction Steam	G-190196 (1)
Feedwater, Condensate and Air Evacuation System	G-190197 (1)
Feedwater, Condensate and Air Evacuation System	G-190197 (4)
Service and Cooling Water System	G-190199 (1)
Service and Cooling Water System	G-190199 (2)
Service and Cooling Water System	G-190199 (4)
Service and Cooling Water System	G-190199 (5)
Service and Cooling Water System	G-190199 (6)
Service and Cooling Water System	G-190199 (7)
Service and Cooling Water System	G-190199 (9)
Service and Cooling Water System	G-190199 (10)
Instrument and Station Air System	G-190200 (2)
Instrument and Station Air System	G-190200 (3)
Instrument and Station Air System	G-190200 (5)
Instrument and Station Air System	G-190200 (7)
Instrument and Station Air System	G-190200 (9)
Primary and Makeup Water System	G-190202 (3)
Emergency Diesel Generator System	G-190204A (2)
Emergency Diesel Generator System	G-190204A (3)
Fuel Oil System	G-190204D (1)
Fuel Oil System	G-190204D (2)
Steam Generator Blowdown and Wet Lay-up System	G-190234 (1)
Penetration Pressurization System	G-190261 (2)
Isolation Valve Seal Water System	G-190262 (1)
HVAC-Turbine, Fuel, Auxiliary and Reactor Building Systems	G-190304 (1)
Containment Vapor and Pressure Sampling System	HBR2-6490 (1)
Post Accident Containment Venting System	HBR2-6933 (1)
Fire Protection System	HBR2-8255 (2)

3.0 REFERENCES

1. Code of Federal Regulations, Title 10, Part 50, Section 55a, and Appendix J.
2. ASME Boiler and Pressure Vessel Code, Section XI, 1995 Edition through 1996 Addenda.
3. ASME OM Code – 1995 Edition through 1996 Addenda.
4. HBRSEP Unit 2 Technical Specifications, Section 5.5.8.
5. HBR 2 Updated FSAR, Section 3.9.6, In-Service Inspection and Inservice Testing of Pumps and Valves.
6. NRC NUREG-1482, Guidelines for Inservice Testing at Nuclear Power Plants.
7. NRC Generic Letter (GL) 89-04, Guidance on Developing Acceptable Inservice Testing Programs.
8. NUREG/CR-6396, "Examples, Clarification, and Guidance on Preparing Requests for Relief from Pump and Valve Inservice Testing Requirements.
9. Federal Register Vol. 66, P. 40626, dated August 3, 2001.

4.0 RELIEF REQUESTS

4.1 Relief Request Format

Specific requests for relief are included in accordance with 10CFR50.55a(a)(3), (f)(5), and (f)(6). Where conformance with the requirements of the Code have been determined to be impracticable, alternate testing is proposed that would provide an acceptable level of quality and safety. Where conformance with the requirements of the Code would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety, alternate testing is proposed that would provide useful information to assess the operational readiness of the component tested.

The relief requests define the component(s) and test(s) involved, the basis for relief and the proposed alternative testing.

Relief requests are numbered in an “**IST-RR-N**” format where:

- IST** = Designates the relief request is applicable to the IST Program Plan
- RR** = Relief request
- N** = Unique sequential number

The relief requests are provided in Section 4.2.

4.2 Relief Request

IST-RR-1

Identification

General requirements for the duties, the qualifications, and access provisions for the Authorized Inspection Agency and Inspectors

OM Code Requirement

ASME OM Code 1995 Edition/1996 Addenda, ISTA 2.1, Inspection, identifies requirements for: the Duties of the Inspector, the Qualification of Authorized Inspection Agencies, Inspector's and Supervisors, and Access for the Inspectors. Paragraph ISTA 1.5, Accessibility, requires that provisions for examination shall include access for the inspector.

Relief Requested

CP&L requests the elimination of the requirements for the duties, the qualifications, and access provisions for the Authorized Inspection Agency and Inspectors identified in ISTA 2.1 and ISTA 1.5.

Basis for Relief

The requirements for the Authorized Inspection Agency and the Authorized Inspector have been eliminated in the 1998 Edition/2000 Addenda of the OM Code. It has been determined that the reviews and verifications conducted by the Inspector have not provided an increase in quality and safety commensurate with the level of effort to perform these tasks. The Inspector's level of expertise is generally relegated to inservice inspection activities. The IST program is subject to reviews and on site inspections by the NRC, internal audits and verifications by the Nuclear Assessment Section, internal self-assessments and cross-disciplinary reviews, as well as external third party audits. Many tests and IST related inspections must be temporarily stored in order to provide reasonable access to the inspector. This results in additional delays in processing and increases the risk of damage or loss of a QA record. In addition, the permanent storage of documents is extended; which reduces easy access to previous test results via plant processes by other inspection agencies or plant personnel. Based on the information above, additional requirements related to the Authorized Inspection Agency and Inspectors would constitute an additional burden without a corresponding increase in the level and safety.

Alternate Requirement

The specific requirements for the duties, the qualifications, and access provisions for the Authorized Inspection Agency and Inspectors shall be eliminated from the IST Program.

4.2 Relief Request

IST-RR-2

Identification

Non-calibrated Ultrasonic Flow Measuring Devices

OM Code Requirement

ASME Code, OM 1995 Edition/1996 Addenda, Table ISTB 4.7.1, Required Instrument Accuracy, requires digital pump flow-rate instrument accuracy to be $\pm 2\%$ over the calibrated range.

Relief Requested

Relief is requested from the $\pm 2\%$ instrument accuracy for ultrasonic flow measuring equipment that is used for pump testing in the IST Program in the unlikely event that calibrated instrumentation is rendered inoperable.

Basis for Relief

Original plant design occurred prior to the issuance of Section XI inservice testing requirements. Since most of the systems were not designed with flow measurement instrumentation, ultrasonic flow measuring equipment is installed during testing to take the flow measurements required by the IST Program. These instruments meet the Code accuracy requirements. Generally, spare instruments are maintained and certified, but may not be available, or rendered inoperable. When calibrated instruments are not available, back-up instruments can be installed and verified in accordance with a detailed test procedure in order to provide a high level of assurance relative to the proper operation of the flow rate devices.

The NRC has previously granted relief to use ultrasonic flow instruments in the third interval IST program. NRC Safety Evaluation, transmitted in NRC letter dated September 16, 1992, accepted the use of ultrasonic flow instruments that have an intrinsic accuracy of $\pm 3\%$ on a temporary basis. Final approval was dependent on the establishment of procedures and controls that ensure measurements are sufficiently repeatable to allow detection of pump degradation. Also required, was a determination of the in-situ accuracy and repeatability in each application. Subsequently CP&L transmitted, in a letter dated December 6, 1993, confirmation that ultrasonic flow instrumentation data taken during one cycle indicates the equipment has sufficient accuracy and repeatability to permit detection of hydraulic degradation, and supports the evaluation of results using Code allowable ranges. The NRC accepted this additional information in a letter dated, July 15, 1994. Past experience indicates that these flow measurements are highly accurate. In addition, these instruments are mounted externally, which avoids problems inherently associated with internally installed measuring devices, such as, increased system resistance, flow obstruction, and removing the system from service when instrument maintenance is required.

Calibration of these instruments cannot be accomplished onsite. For large bore pipes, the calibration vendor must arrange for the use of a special test facility. Experience has shown that the expected time period associated with obtaining an emergent instrument calibration is about two to six weeks and is largely dependent on events beyond the control of CP&L. All ultrasonic flow instruments required to be calibrated in accordance with ISTB 4.7.1-1 are validated to be operating properly in accordance with procedural requirements typically within a day prior to the performance of the scheduled test. The Technical Specification allotted extension of the test frequency (1.25 times the nominal test interval) would not be sufficient to facilitate diagnostics, instrument transport, repairs, calibration and re-installation and certification upon discovery that calibrated instruments are found to be deficient. Based on previous experience, there is reasonable assurance that unsatisfactory pump performance can be determined through the use of non-calibrated ultrasonic flow rate instruments when properly installed and verified in accordance with site specific procedures. An acceptable level of quality and safety is maintained and the use of this alternative would be a prudent action to take in the unlikely event of this emergent condition.

Alternate Requirement

Non-calibrated ultrasonic flow measuring instruments may be utilized to satisfy the requirements of the OM Code for pump flow rate determinations in the unlikely event that calibrated flow measuring instruments are not available.

4.2 Relief Request

IST-RR-3

Identification

Containment Spray Pumps (CS) A and B

OM Code Requirement

ASME OM Code 1995 Edition/1996 Addenda, ISTB 4.3, Reference Values, in paragraph (e)(1), requires reference values shall be established within $\pm 20\%$ (80% - 120%) of the design flow rate for the Comprehensive Test.

Relief Requested

CP&L requests relief from the requirements of ISTB 4.3(e)(1), such that the Comprehensive Test reference values may be established with the pump operating at less than 80% of the design flow rate.

Basis for Relief

OM Code, ISTB 4.3(e)(1), requires reference values to be established within $\pm 20\%$ of the pump design flow rate. The biennial Comprehensive Pump Tests for the CS pumps are conducted at flows less than 80% of pump design flow. For the CS pumps, the 80% design flow limit is 960 gpm. It is not practical to conduct the comprehensive test for the CS pumps with the reference value within 20% of the pump design flow for the following reasons:

The CS pumps are tested using a test loop that circulates back to the Refueling Water Storage Tank. This flow path produces a flow rate of approximately 20% of the actual design flow. The only other CS system flow path available that can produce the required increase in flow would spray containment with a solution of Sodium Hydroxide and borated water. This would require an extensive cleanup and would be detrimental to carbon steel material and non-qualified electrical circuits. This method is not acceptable. Therefore, the ability to test to the design flow rate would require a substantial plant modification.

Alternate Requirement

These pumps are classified as Group B pumps, and are subject to quarterly inservice tests where only differential pressure and flow rate is required to be monitored. HBRSEP, Unit No. 2 will conduct quarterly inservice tests monitoring the parameters (differential pressure, discharge pressure, flow rate and vibration) specified for a Group A Test. The additional vibration acceptance criteria will be limited as specified in Table ISTB 5.2.1-1. In addition, the Comprehensive Test will be conducted at a flow rate less than 80% of the pump design flow rate. Based on the information presented above, there is reasonable assurance that operational readiness of the CS pumps is maintained. The proposed alternative provides an acceptable level of quality and safety. Compliance with the Code requirement would result in an unusual hardship without a compensating increase in the level of quality and safety.

4.2 Relief Request

IST-RR-4

Identification

Active Manual Valves

OM Code Requirement

ASME OM Code 1995 Edition/1996 Addenda, Table ISTC 3.6.1, Inservice Test Requirements, and ISTC 4.2.1, Exercising Test Frequency, requires active Category A and B valves to be tested nominally every 3 months, except as provided by paragraphs ISTC 4.2.2, ISTC 4.2.5, and ISTC 4.2.7

Relief Requested

Relief is requested to utilize the requirements identified in the ASME OM Code 1998 Edition/2000 Addenda, ISTC 3540 as modified by proposed rule 10CFR50.55a. Full-stroke exercise testing of active manual valves will be performed at a frequency of 2 years.

Basis for Relief

The ASME OM Code 1998 Edition/2000 Addenda, ISTC 3540, Manual Valves, has been revised to relax the full-stroke exercise requirements for manual valves to at least every 5 years. Based on plant specific inservice test results, HBRSEP, Unit No. 2 supports the industry accepted concept that manual valves have proven to be reliable with acceptable full stroke exercising tests at an extended interval. At this time, sufficient information is not available to support an extension to the 5 year frequency. Based on the data available, extension of the quarterly exercise test for these valves to an interval of two years is acceptable. The interval extension will reduce overall radiation exposure consistent with ALARA and focus resources on activities that will maximize safety system train availability. Based on the information above, operational readiness of active manual valves is maintained with the modified exercise frequency. The proposed alternative provides an acceptable level of quality and safety. Compliance with the Code requirement would result in an unnecessary burden without a compensating increase in the level of quality and safety. The proposed frequency is consistent with proposed rule making to adopt ASME OM Code 1998 Edition / 2000 Addenda as published in Federal Register Vol. 66, P. 40626, dated August 3, 2001.

Alternate Requirement

Active manual valves to be full-stroke exercised at a frequency of 2 years.

4.2 Relief Request

IST-RR-5

Identification

Pressure Relief Devices

OM Code Requirement

ASME OM Code 1995 Edition/1996 Addenda, Appendix I, Inservice Testing of Pressure Relief Devices, paragraph I-8.1.1(h), requires that a minimum of 10 minutes shall elapse between successive openings.

Relief Requested

Relief is requested to utilize the requirements identified in the ASME OM Code 1998 Edition/2000 Addenda, Appendix I, Inservice Testing of Pressure Relief Devices, for elapsed time between successive openings. Paragraphs I-8110(h), I-8120(h) and I-8130(g) requires that a minimum of 5 minutes shall elapse between successive openings.

Basis for Relief

ASME OM Code 1998 Edition/2000 Addenda, Appendix I, Inservice Testing of Pressure Relief Devices, requires in paragraphs I-8110(h), I-8120(h) and I-8130(g) that a minimum of 5 minutes shall elapse between successive openings. As evidenced by the ASME Code Committee approval and NRC endorsement of the later Code edition, a reduction in the amount of time between successive openings during relief valve testing is not likely to reduce the overall accuracy, repeatability, or confidence of the set pressure test results. Relief Valve set pressure testing may be conducted during plant refueling outages or on line. By reducing the time between openings, the overall time required to perform the set pressure testing is reduced, which may help reduce the time required to conduct plant refueling outages or increase the availability of manpower to perform other activities. Adaptation of the 5 minute interval between successive tests will also facilitate a more timely return to service of equipment essential for safe operation during any mode of operation. Based on the information above, there is reasonable assurance that operational readiness of pressure relief devices is maintained, and that an acceptable level of quality and safety is maintained. Compliance with the Code requirement would result in an unnecessary burden without a compensating increase in the level of quality and safety.

Alternate Requirement

A minimum of 5 minutes shall elapse between successive openings during pressure relief device testing in accordance with ASME OM Code 1998 Edition/2000 Addenda, Appendix I, Inservice Testing of Pressure Relief Devices.

4.2 Relief Request

IST-RR-6

Identification

Power Operated Valves

OM Code Requirement

ASME OM Code 1995 Edition/1996 Addenda, ISTC 4.2.8, Stroke Time Acceptance Criteria, in subparagraph (e) states that valves that stroke in less than 2 seconds may be exempted from paragraphs ISTC 4.2.8(c) and ISTC 4.2.8(d). In such cases the maximum limiting stroke time shall be 2 seconds.

Relief Requested

Relief is requested to apply the requirements of ISTC 4.2.8, Stroke Time Acceptance Criteria, subparagraph (e), to valves that stroke in 5 seconds, or less. Also, the maximum limiting stroke time shall be equal to or less than 5 seconds, unless a more conservative design limit is applicable.

Basis for Relief

ASME OM Code 1995/1996 Addenda, ISTC 4.2.8, Stroke Time Acceptance Criteria, in subparagraph (e) states that valves that stroke in less than 2 seconds may be exempted from paragraphs ISTC 4.2.8(c) and ISTC 4.2.8(d). In such cases the maximum limiting stroke time shall be 2 seconds. Paragraph ISTC 4.2.8(c) provides acceptance criteria for motor operated valves with reference stroke times of less than or equal to 10 seconds, and ISTC 4.2.8(d) provides acceptance criteria for other power operated valves with reference stroke times of less than or equal to 10 seconds. The basis for the Code identifying different acceptance criteria for valves that have stroke times of less than 2 seconds is that the accuracy and repeatability of the stroke time measurements of such rapid acting valves preclude the reasonable application of the acceptance criteria requirements specified in ISTC 4.2.8(c) and ISTC 4.2.8(d). By limiting the maximum limiting stroke time for these rapid acting valves to 2 seconds, their operational readiness is maintained.

Generally, power operated valves with nominal stroke times of 5 seconds or less are air operated or solenoid operated valves. These components can exhibit similar characteristics with respect to accuracy, repeatability, and degree of variation as those valves with nominal stroke times of 2 seconds or less. This is more likely following maintenance in which these types of power operated valves are placed under clearance for repair and then subsequently exercised during the course of the maintenance. Subsequent routine testing in the as-found condition is likely to yield a higher test result if the valve has been passive during the time preceding the scheduled test. In addition, the relatively quick stroke times do not permit the assignment of a reasonable deviation allowance. The reduced band, coupled with human response time variations, the effects of maintenance or previous operation of the valve, etc., make application of the requirements prescribed in ISTC 4.2.8(c) and ISTC 4.2.8(d) burdensome and would likely result in the unwarranted declaration of valve inoperability. This would reduce safety system availability and may require additional tests or evaluation resulting in unwarranted component wear, increased radiation dose and reduce overall system functional availability. A limiting value of five seconds provides a substantial margin to any design limit assumed for the component in performing its specified function. Typically, valves applicable to this request would either operate quickly or fail. The five second limit reflects a reasonable stroke time variation that considers this type of expected performance.

Application of ISTC 4.2.8(e) requirements to valves that stroke in 5 seconds or less will reduce the possibility and frequency of unwarranted declarations of inoperability and still provide an acceptable level of confidence necessary to ensure that the valve can stroke within its analyzed limit. The available margin provided by a five second limit and the assumed stroke time will provide a high level of assurance relative to the timely implementation of corrective actions should degradation occur, consistent with the intent of the OM Code. The inability to apply the rapid acting designation to power operated valves based on a limiting value of 5 seconds may result in increased testing, evaluation or maintenance, specifically following routine or corrective maintenance activities conducted in order to improve component performance.

Based on the information above, there is reasonable assurance that operational readiness is maintained and valve degradation would be detected prior to its failure to accomplish a design safety function. The proposed alternative provides an acceptable level of quality and safety. Compliance with the Code requirement would result in an unusual difficulty without a compensating increase in the level of quality and safety.

4.2 Relief Request

IST-RR-6

Alternate Requirement

The requirements of ISTC 4.2.8, Stroke Time Acceptance Criteria, subparagraph (e), will be applied to power operated valves that stroke in less than 5 seconds. Also the maximum stroke time shall be limited to 5 seconds, unless the safety limit is less than five seconds, in which case, the safety limit will be utilized.

4.2 Relief Request

IST-RR-7

Identification

Isolation Valve Seal Water (IVSW) System 3/8 inch Penetration Check Valves IVSW-70 thru 72, 74 thru 98, and 100A, B, and C.

OM Code Requirement

ASME OM Code 1995 Edition/1996 Addenda, ISTC 4.5.4, Valve Obturator, requires in paragraph (a) that the necessary check valve obturator movement during exercise testing shall be demonstrated by performing both an open and closed test, and observation shall be made by observing a direct indicator (e.g., a position-indication device) or by other positive means (e.g., changes in system pressure, flow rate, level, temperature, seat leakage, testing, or non-intrusive testing results). Additional specific requirements are:

ISTC 4.5.4 (a)(2) states that check valves that have a safety function in only the open direction shall be exercised by initiating flow and observing that the obturator has traveled to either the full open position or to the position required to perform its intended function(s), and verify closure.

ISTC 4.5.4 (c) requires that if the test methods in ISTC 4.5.4 (a) are impractical for certain check valves, a sample disassembly program shall be used to verify valve obturator movement.

Relief Requested

Relief is requested from the requirements of ISTC 4.5.4(a)(2) to verify closure and from the requirements of ISTC 4.5.4(c) to verify closure by a sample disassembly program. The check valves will be forward flow tested and closure verification will not be performed.

Basis for Relief

The 3/8 inch penetration check valves in the IVSW system have no safety function in the closed direction and are required to open in order to provide seal water to selected containment penetrations during a Design Basis Accident (DBA). The IVSW system operates to limit the release of fission products should leakage occur; however, no credit is actually taken for its operation when calculating off site accident dose. The system has been formally accepted as a qualified seal water system pursuant to 10 CFR 50 Appendix J requirements. IVSW is maintained at a minimum pressure of 1.1 times the peak accident pressure related to the design basis loss of coolant accident. As such, the design and qualification of the system eliminates the need for these valves to close during a DBA in the unlikely event that closure is required.

Disassembly to verify obturator closure or modifications to facilitate inservice testing for closure are impractical based on the large number of valves requiring verification and the insignificance associated with their failure to close. Disassembly may also lead to maintenance-induced errors associated with re-assembly. The small size and construction of these valves prohibits the ability to perform partial disassembly / inspection in a manner representative of its inservice condition (e.g., valve removal and decontamination activities could alter disc position). IVSW is a standby system that is typically operated during refueling outages to facilitate testing. Based on infrequent use, the valve obturator exhibits minimal wear. Bi-directional check valve testing was adopted to counter the effects of a faulty test strategy associated with the inability to detect a detached valve disc. Specifically, a satisfactory forward flow check valve test could be completed when the valve disc is actually detached and laying in the bottom of the valve body. Based on the design and materials of construction associated with these check valves, disc failure with subsequent migration into associated systems is not likely. The size of the disc exceeds the inner diameter of the valve outlet. It is likely that failure of the valve in this manner would be detected by the current test method which, is performed at refueling outages in conjunction with required Appendix J leak rate testing of the associated containment penetration. Forward flow testing at a refueling interval is warranted since the test boundary must be depressurized to perform leak rate testing. Depressurization of the boundary is assured during the leak rate test conducted at refueling intervals. The location of these valves would make testing, inspection or examination for closure inconsistent with ALARA principles.

Based on the design and qualification of this system, compliance with the Code requirement would result in an unusual hardship without a compensating increase in the level of quality and safety. The proposed alternative provides an acceptable level of quality and safety.

4.2 Relief Request

IST-RR-7

Alternate Requirement

The 3/8-inch penetration check valves installed in the IVSW system will be tested to the open position at refueling intervals. Closure verification will not be performed.

5.0 TEST DEFERRAL JUSTIFICATIONS

5.1 Test Deferral Justification Format

In accordance with paragraphs ISTC 4.2.2 and ISTC 4.5.2 of the Code, certain valves are full stroke exercised during cold shutdown conditions when they cannot be exercised during normal operation. When a valve cannot be exercised during normal operation or cold shutdown conditions, then it is full stroke exercised during refueling outages. The technical justification for exercising a valve during cold shutdown or refueling outages rather than normal operation is provided in a Cold Shutdown Test Justification or Refueling Outage Test Justification.

Valves tested during cold shutdowns or refueling outages shall be scheduled in accordance with paragraphs ISTC 4.2.2 (g), ISTC 4.2.2 (h), ISTC 4.5.2 (e), and ISTC 4.5.2 (f) of the Code.

Cold Shutdown Test Justifications and Refueling Outage Test Justifications are numbered in a "XXX-VCS-N" or "XXX-VRS-N" format where:

XXX = System Acronym

VCS = Cold Shutdown Test Justifications

VRS = Refuel Outage Justifications

N = Unique sequential number (e.g., SI-VCS-2 would be the second Cold Shutdown Test Justification for valves in the safety injection system)

Cold Shutdown Test Justifications are provided in Section 5.2 and Refueling Outage Test Justifications are provided in Section 5.3.

5.2 Cold Shutdown Test Justification

CC-VCS-1

Valve No	Description	P&ID (Sheet)	Coord	Category	Active Passive	Normal Position	Safety Position
CC-716A	Cooling Water Inlet Valve "RCP CCW Supply Header Isolation Valve"	5379-376 (3)	D-8	B	Act	O	C
CC-716B	Cooling Water Inlet Valve "RCP CCW Supply Header Isolation Valve"	5379-376 (3)	D-8	A	Act	O	C

Function

Component Cooling Water supply to the Reactor Coolant Pumps.

Deferred Testing

Exercise and stroke time quarterly.

Cold Shutdown Test Justification

Exercising these valves during power operation would result in a temporary loss of Component Cooling Water flow to all three Reactor Coolant Pump thermal barriers and bearing coolers. This action increases the potential for RCP damage and failure of either valve in the closed position will require that the unit be shutdown and RCPs secured. The valves are not designed to facilitate a part stroke exercise. Therefore, a partial stroke exercise test will not be performed since it may result in the same condition that would be encountered during the performance of a full stroke exercise test.

Cold Shutdown Testing

Exercise and stroke time.

5.2 Cold Shutdown Test Justification

CC-VCS-2

Valve No	Description	P&ID (Sheet)	Coord	Category	Active Passive	Normal Position	Safety Position
CC-730	RCP Bearing Cooling Water Outlet Isolation Valve "CIV"	5379-376 (3)	F-1	A	Act	O	C

Function

Allows flow through the Reactor Coolant Pump upper and lower bearing coolers.

Deferred Testing

Exercise and stroke time quarterly.

Cold Shutdown Test Justification

Exercising this valve during power operation would result in a temporary loss of Component Cooling Water flow through all three Reactor Coolant Pump bearing coolers. This action increases the potential for RCP damage and valve failure in the closed position will require that the unit be shutdown and RCPs secured. The valve is not designed to facilitate a part stroke exercise. Therefore, a partial stroke exercise test will not be performed since it may result in the same condition that would be encountered during the performance of a full stroke exercise test.

Cold Shutdown Testing

Exercise and stroke time.

5.2 Cold Shutdown Test Justification

CC-VCS-3

Valve No	Description	P&ID (Sheet)	Coord	Category	Active Passive	Normal Position	Safety Position
CC-735	RCP Bearing Cooling Water Outlet Isolation Valve "CIV"	5379-376 (2)	C-5	A	Act	O	C
FCV-626	RCP Bearing Cooling Water Outlet Isolation Valve "CIV"	5379-376 (3)	D-1	A	Act	O	C

Function

Allows flow through the Reactor Coolant Pump thermal barrier coolers.

Deferred Testing

Exercise and stroke time quarterly.

Cold Shutdown Test Justification

Exercising these valves during power operation would result in a temporary loss of Component Cooling Water flow to all three Reactor Coolant Pump thermal barrier coolers. This action increases the potential for RCP damage and failure of either valve in the closed position will require that the unit be shutdown and RCPs secured. The valves are not designed to facilitate a part stroke exercise. Therefore, a partial stroke exercise test will not be performed since it may result in the same condition that would be encountered during the performance of a full stroke exercise test.

Cold Shutdown Testing

Exercise and stroke time.

5.2 Cold Shutdown Test Justification

CVC-VCS-1

Valve No	Description	P&ID (Sheet)	Coord	Category	Active Passive	Normal Position	Safety Position
CVC-204A	CVC Letdown Line CIV (P-23)	5379-685 (1)	G-4	A	Act	O	C
CVC-204B	CVC Letdown Line CIV (P-23)	5379-685 (1)	G-4	A	Act	O	C
LCV-460A	Letdown Line Stop Valve	5379-685 (1)	G-7	B	Act	O	C
LCV-460B	Letdown Line Stop Valve	5379-685 (1)	G-7	B	Act	O	C

Function

CVCS Letdown isolation valves.

Deferred Testing

Quarterly exercise, stroke time and fail safe testing.

Cold Shutdown Test Justification

Exercising these valves during power operation would isolate CVCS letdown causing pressurizer level to increase, charging flow to decrease and interrupt letdown flow to the regenerative heat exchanger. This would result in abnormal operating conditions and may result in a plant transient or unit trip due to pressurizer level variations, letdown line restoration events and uncontrolled positive reactivity addition as a result of cold water injection. Failure of any valve in the test position would isolate letdown. The valves are not designed to facilitate a part stroke exercise. Therefore, a partial stroke exercise test will not be performed since it may result in the same condition that would be encountered during the performance of a full stroke exercise test.

Cold Shutdown Testing

Exercise, stroke time and fail safe test.

5.2 Cold Shutdown Test Justification

CVC-VCS-2

Valve No	Description	P&ID (Sheet)	Coord	Category	Active Passive	Normal Position	Safety Position
CVC-266	Volume Control Tank To Charging Pumps Suction Header Check Valve	5379-685 (2)	D-5	C	Act	O	C
LCV-115C	Volume Control Tank Outlet	5379-685 (2)	D-5	B	Act	O	C

Function

LCV-115C is a normally open MOV which directs flow from the volume control tank (VCT) to the CVCS charging pump suction and automatically isolates the VCT on a low level signal. CVC-266 is a check valve that is normally open to provide a flow path from the VCT to the charging pumps suction. This component is required to close in the event that it becomes necessary to establish an alternate source from the refueling water storage tank (RWST) or boric acid transfer pumps to the charging pumps suction. Closure of this component prevents backflow into the VCT to ensure that the flow of boric acid is properly directed to the charging pumps.

Deferred Testing

Quarterly exercise and stroke time for LCV-115C. Quarterly reverse flow test and open verification for CVC-266.

Cold Shutdown Test Justification

Exercising LCV-115C and reverse flow testing of CVC-266 would interrupt the normal flowpath from the VCT to the suction of the charging pumps. A suction supply to the charging pumps is required to maintain an adequate pressurizer level and the required RCP seal injection flow. In order to perform this test, the charging pump suction would be redirected to the refueling water storage tank (RWST). The high boron concentration in the RWST would require a reduction in power to maintain core parameters within programmed bands and would deplete the available RWST inventory required for accident mitigation. Failure of either valve in the test position would result in a complete loss of the normal flow path and would result in a unit shutdown. LCV-115C is not designed to facilitate a part stroke exercise. Therefore, a partial stroke exercise test will not be performed since it may result in the same condition that would be encountered during the performance of a full stroke exercise test.

Cold Shutdown Testing

Exercise and stroke time LCV-115C. Reverse flow exercise test and open verification for CVC-266.

5.2 Cold Shutdown Test Justification

CVC-VCS-3

Valve No	Description	P&ID (Sheet)	Coord	Category	Active Passive	Normal Position	Safety Position
CVC-381	Reactor Coolant Pump Seal Water Return Isolation Valve	5379-685 (1)	E-2	A	Act	O	C

Function

Isolation valve for the cooling water return from the Reactor Coolant Pump seals.

Deferred Testing

Quarterly exercise and stroke time.

Cold Shutdown Test Justification

Exercising this valve during power operation would cause a loss of seal water return and probable damage to the Reactor Coolant Pump seals. This would require that the unit be shutdown and RCPs secured. Valve failure in the test position would result in a complete loss of the seal water return flow path and would result in a unit shutdown and potential RCP damage. The valve is not designed to facilitate a part stroke exercise. Therefore, a partial stroke exercise test will not be performed since it may result in the same condition that would be encountered during the performance of a full stroke exercise test.

Cold Shutdown Testing

Exercise and stroke time.

5.2 Cold Shutdown Test Justification

CVC-VCS-4

Valve No	Description	P&ID (Sheet)	Coord	Category	Active Passive	Normal Position	Safety Position
CVC-310A	Charging To Loop "A" Hot Leg Isolation Valve	5379-685 (1)	F-7	B	Act	C	O

Function

Air operated valve required to open and provide an alternate boration flow pathway to RCS loop "A" hot leg in the event that the normal boration pathway is not available.

Deferred Testing

Quarterly stroke time, exercise and fail safe test.

Cold Shutdown Test Justification

Exercising this normally closed valve to the required test position will result in temporary changes in flow to the RCP seals and may induce additional thermal stresses. Due to the passive status related to this section of piping, opening CVC-310A may lead to uncontrolled reactivity additions when this volume of water is injected into the RCS. When restoring the plant to the desired configuration, CVC-310B must be reopened resulting in additional RCP seal perturbation before CVC-310A can be closed. Failure of the valve in the test position would require that the alternate pathway for boron injection remain in service and is not desired. The valve is not designed to facilitate a part stroke exercise. Therefore, a partial stroke exercise test will not be performed since it may result in the same condition that would be encountered during the performance of a full stroke exercise test.

Cold Shutdown Testing

Exercise, stroke time and fail safe test.

5.2 Cold Shutdown Test Justification

CVC-VCS-5

Valve No	Description	P&ID (Sheet)	Coord	Category	Active Passive	Normal Position	Safety Position
CVC-387	Excess Letdown Line Stop Valve	5379-685 (1)	E-7	B	Act	O/C	C

Function

To isolate flow through the excess letdown heat exchanger.

Deferred Testing

Quarterly exercise, stroke time and fail safe testing.

Cold Shutdown Test Justification

Testing of this valve while in MODEs 1, 2, 3, or 4 will result in the temporary reduction to the RCS pressure barrier to systems outside of containment. Valve failure in the open position would result in a more permanent adverse condition, and is not desired. Testing in any condition other than MODE 5 or MODE 6 would create unnecessary risks associated with testing a system that is only in service when normal letdown is not available. The valve is not designed to facilitate a part stroke exercise. Therefore, a partial stroke exercise test will not be performed since it may result in the same condition that would be encountered during the performance of a full stroke exercise test.

Cold Shutdown Testing

Exercise, stroke time and fail safe test in the closed direction.

5.2 Cold Shutdown Test Justification

CVC-VCS-6

Valve No	Description	P&ID (Sheet)	Coord	Category	Active Passive	Normal Position	Safety Position
CVC-200A	CVC Letdown Orifice Isolation Valve	5379-685 (1)	F-6	B	Act	O/C	C
CVC-200B	CVC Letdown Orifice Isolation Valve	5379-685 (1)	G-6	B	Act	O/C	C
CVC-200C	CVC Letdown Orifice Isolation Valve	5379-685 (1)	G-6	B	Act	O/C	C

Function

Close on demand to provide containment isolation for letdown line (penetration 23).

Deferred Testing

Full stroke exercise, loss of power test, and stroke time measurement to the closed position.

Cold Shutdown Test Justification

Operation of these valves during power operations will create temporary disturbances to the letdown flow control system, resulting in a potential challenge to letdown line relief valves, CVC-203A or CVC-203B, in the event of orifice isolation valve problems, switch mis-position events, or controller PCV-145 response errors. These events could lead to an inadvertent relief valve lift, and possible failure to re-close, resulting in an uncontrolled loss of primary coolant. In addition, cycling of these components could lead to temporary pressurizer level perturbations which may invalidate the transient analysis assumptions of UFSAR Chapter 15. Although orifice isolation valve / relief valve discrepancies are not anticipated, the risk involved with exercising these valves is not warranted when performed with the sole purpose of satisfying IST requirements for normally scheduled on line surveillance activities. The valves are not designed to facilitate a part stroke exercise. Therefore, a partial stroke exercise test will not be performed since it may result in the same condition that would be encountered during the performance of a full stroke exercise test.

Cold Shutdown Testing

Full stroke exercise, stroke time measurement (closed), fail safe loss of power test to the closed position.

5.2 Cold Shutdown Test Justification

FW-VCS-1

Valve No	Description	P&ID (Sheet)	Coord	Category	Active Passive	Normal Position	Safety Position
FCV-478	Feedwater Regulating Valve "A"	G-190197 (4)	G-3	B	Act	O	C
FCV-479	Feedwater Regulating Bypass Valve "A"	G-190197 (4)	G-3	B	Act	O/C	C
FCV-488	Feedwater Regulating Valve "B"	G-190197 (4)	F-3	B	Act	O	C
FCV-489	Feedwater Regulating Bypass Valve "B"	G-190197 (4)	F-3	B	Act	O/C	C
FCV-498	Feedwater Regulating Valve "C"	G-190197 (4)	E-3	B	Act	O	C
FCV-499	Feedwater Regulating Bypass Valve "C"	G-190197 (4)	E-3	B	Act	O/C	C
FW-V2-6A	Feedwater Header Section Valve "A"	G-190197 (4)	G-2	B	Act	O	C
FW-V2-6B	Feedwater Header Section Valve "B"	G-190197 (4)	F-2	B	Act	O	C
FW-V2-6C	Feedwater Header Section Valve "C"	G-190197 (4)	E-2	B	Act	O	C

Function

Feedwater supply to the Steam Generators.

Deferred Testing

Exercise and stroke time.

Cold Shutdown Test Justification

Exercising the Feedwater Regulating or Feedwater Header Section valves in MODE 1 will cause a loss of feedwater and/or level transient. This action will cause a steam flow/feed flow mismatch and subsequent steam generator level transient which may result in a unit trip. Failure of these valves in the test position will result in a plant trip. The Feedwater Regulating Bypass valves are normally in the required safety position at power, except during plant start up or shutdown. Operation of the Bypass valves will induce temporary changes to the feedwater flow rate and increase the risk of a plant transient or unit trip. Operation of these valves to complete testing is not consistent with the bases of Technical Specifications as stated in ITS SR 3.7.3.1. The valves are not designed to facilitate a part stroke exercise. Therefore, a partial stroke exercise test will not be performed since it may result in the same condition that would be encountered during the performance of a full stroke exercise test.

Cold Shutdown Testing

Exercise and stroke time.

5.2 Cold Shutdown Test Justification

FW-VCS-2

Valve No	Description	P&ID (Sheet)	Coord	Category	Active Passive	Normal Position	Safety Position
AFW-105	Steam Driven Aux Feedwater Pump Suction Valve From Condensate Storage Tank	G-190197 (4)	C-3	C	Act	C	O/C

Function

Check valve AFW-105 opens to admit flow to the Steam Driven Auxiliary Feedwater pump. Valve closure is required to maintain the vertical loop of piping water solid when pump operation is terminated.

Deferred Testing

Exercise quarterly at full flow, reverse flow test.

Cold Shutdown Test Justification

A full flow exercise test of this valve may result in unwarranted cyclic stresses to the Auxiliary Feedwater nozzles, induce SG level transients, and may lead to a plant transient or unit trip. Reverse flow testing is performed each quarter; however, bi-directional testing of check valves can not be considered complete until both safety positions have been verified. The tests must be performed within the same interval. Performance of a forward flow test at a less frequent interval (e.g., cold shutdowns or reduced power proceeding to or transiting from shutdown) will not impose similar concerns and may be performed in conjunction with the associated comprehensive pump test; which, is performed bi-ennially. Therefore, the bi-directional test requirement of the Code for testing within the same interval is more appropriate at a cold shutdown frequency.

Cold Shutdown Testing

Full flow exercise, reverse flow test.

5.2 Cold Shutdown Test Justification

FW-VCS-3

Valve No	Description	P&ID (Sheet)	Coord	Category	Active Passive	Normal Position	Safety Position
AFW-40	Aux Feedwater Pump 'A' Discharge Check Valve	G-190197 (4)	C-4	C	Act	C	O/C
AFW-41	Aux Feedwater Pump 'B' Discharge Check Valve	G-190197 (4)	B-4	C	Act	C	O/C

Function

Opens to allow flow from the respective Motor Driven Auxiliary Feedwater pump and closes to prevent backflow through an inactive pump.

Deferred Testing

Quarterly full flow and reverse flow exercise.

Cold Shutdown Test Justification

A full flow exercise test of these valves may result in unwarranted cyclic stresses to the Auxiliary Feedwater nozzles, induce SG level transients, and may lead to a plant transient or unit trip. Reverse flow testing is performed each quarter; however, bi-directional testing of check valves can not be considered complete until both safety positions have been verified. The tests must be performed within the same interval. Performance of a forward flow test at a less frequent interval (e.g., cold shutdowns or reduced power proceeding to or transiting from shutdown) will not impose similar concerns and may be performed in conjunction with the associated comprehensive pump test; which, is performed bi-ennially. Therefore, the bi-directional test requirement of the Code for testing within the same interval is more appropriate at a cold shutdown frequency.

Cold Shutdown Testing

Full flow and reverse flow exercise.

5.2 Cold Shutdown Test Justification

FW-VCS-4

Valve No	Description	P&ID (Sheet)	Coord	Category	Active Passive	Normal Position	Safety Position
AFW-68	Aux Feedwater To Steam Generator 'A' Check Valve	G-190197 (4)	B-6	C	Act	C	O/C
AFW-69	Aux Feedwater To Steam Generator 'B' Check Valve	G-190197 (4)	C-6	C	Act	C	O/C
AFW-70	Aux Feedwater To Steam Generator 'C' Check Valve	G-190197 (4)	B-6	C	Act	C	O/C
AFW-84	Steam Driven Aux Feedwater Pump Discharge Check Valve	G-190197 (4)	D-4	C	Act	C	O/C

Function

Opens to admit flow to the Steam Generators. AFW-68, 69, and 70 close to prevent steam binding of the Motor Driven AFW pumps. AFW-84 inhibits back flow through an idle pump Steam Driven AFW pump.

Deferred Testing

Quarterly full flow and reverse flow exercise.

Cold Shutdown Test Justification

A full flow exercise test of these valves may result in unwarranted cyclic stresses to the Auxiliary Feedwater nozzles, induce SG level transients, and may lead to a plant transient or unit trip. Reverse flow testing is performed each quarter; however, bi-directional testing of check valves can not be considered complete until both safety positions have been verified. The tests must be performed within the same interval. Performance of a forward flow test at a less frequent interval (e.g., cold shutdowns or reduced power proceeding to or transiting from shutdown) will not impose similar concerns and may be performed in conjunction with the associated comprehensive pump test; which, is performed bi-ennially. Therefore, the bi-directional test requirement of the Code for testing within the same interval is more appropriate at a cold shutdown frequency.

Cold Shutdown Testing

Full flow and reverse flow exercise.

5.2 Cold Shutdown Test Justification

FW-VCS-5

Valve No	Description	P&ID (Sheet)	Coord	Category	Active Passive	Normal Position	Safety Position
AFW-9A	Steam Driven Aux Feedwater Pump Recirc Check Valve	G-190197 (4)	D-4	C	Act	C	O/C

Function

Closes to prevent flow from the MDAFW Pumps, the S/G Blowdown / Wet Layup Pumps, and / or the Condensate Hotwell Letdown into the discharge of the SDAFW Pump via the recirculation line, as required. Opens to provide a recirculation flow path for the SDAFW pump.

Deferred Testing

Quarterly reverse flow and forward flow exercise.

Cold Shutdown Test Justification

Due to limitations in design, quarterly reverse flow testing of this component requires the SDAFW Pump to be taken out of service, installation of test hoses, and manipulation of manual valves. Reverse flow testing cannot be performed on-line using installed plant equipment because the presence of two flow orifices reduce MDAFW pump discharge flow and pressure to values which are inadequate to properly seat the valve.

NUREG-1482, Section 4.1.4 states, "...The NRC has determined that the need to install test equipment is adequate justification to defer backflow testing until a refueling outage..."

Although NUREG-1482 allows deferral of the reverse flow test to a refueling outage frequency, this test may be performed at a cold shutdown frequency for the convenience of scheduling with other auxiliary feedwater tests that are normally performed during cold shutdown. Note: Although forward flow testing is performed at a nominal 92 day frequency, bi-directional test requirements cannot be met until both positions have been verified within the same interval.

Cold Shutdown Testing

Reverse flow and forward flow exercise.

5.2 Cold Shutdown Test Justification

HVA-VCS-1

Valve No	Description	P&ID (Sheet)	Coord	Category	Active Passive	Normal Position	Safety Position
V12-12	Containment Vacuum Relief Valve	G-190304 (1)	C-6	A	Act	O/C	C
V12-13	Containment Vacuum Relief Valve	G-190304 (1)	C-6	A	Act	O/C	C

Function

Opens to relieve vacuum inside containment.

Deferred Testing

Exercise, stroke time and fail safe test quarterly.

Cold Shutdown Test Justification

Exercising these valves during power operation would result in an unnecessary containment release since there is a positive pressure inside containment. The valves are not designed to facilitate a part stroke exercise. Therefore, a partial stroke exercise test will not be performed since it may result in the same condition that would be encountered during the performance of a full stroke exercise test.

Cold Shutdown Testing

Exercise, stroke time and fail safe test.

5.2 Cold Shutdown Test Justification

HVA-VCS-2

Valve No	Description	P&ID (Sheet)	Coord	Category	Active Passive	Normal Position	Safety Position
V12-6	Containment Purge Supply Valve	G-190304 (1)	C-6	A	Act	O/C	C
V12-7	Containment Purge Supply Valve	G-190304 (1)	C-6	A	Act	O/C	C
V12-8	Containment Purge Exhaust Valve	G-190304 (1)	E-2	A	Act	O/C	C
V12-9	Containment Purge Exhaust Valve	G-190304 (1)	D-3	A	Act	O/C	C

Function

Containment purge and supply valves. Close when required to isolate the affected penetration.

Deferred Testing

Exercise, stroke time and fail safe test quarterly.

Cold Shutdown Test Justification

These valves are normally closed to provide containment integrity. Therefore, the valves are already in the position required to mitigate the consequences of an accident. Opening of the affected component for the sole purpose of performing closure tests to satisfy quarterly testing requirements is not warranted as stated in Technical Specification Bases ITS SR 3.6.3.4. The valves are not designed to facilitate a part stroke exercise. Therefore, a partial stroke exercise test will not be performed since it may result in the same condition that would be encountered during the performance of a full stroke exercise test.

Cold Shutdown Testing

Exercise, stroke time and fail safe test. ITS SR 3.6.3.4 requires these valves to be tested prior to use if not tested in the previous 92 days.

5.2 Cold Shutdown Test Justification

MS-VCS-1

Valve No	Description	P&ID (Sheet)	Coord	Category	Active Passive	Normal Position	Safety Position
IA-3742	Instrument Air To Main Steam C Check Valve	G-190200 (5)	C-4	C	Act	O	C
IA-3743	Instrument Air To Main Steam B Check Valve	G-190200 (5)	C-4	C	Act	O	C
IA-3744	Instrument Air To Main Steam A Check Valve	G-190200 (5)	C-4	C	Act	O	C

Function

Contain air pressure within the MSIV accumulators.

Deferred Testing

Reverse flow test and open verification.

Cold Shutdown Test Justification

Reverse exercising of these valves would require isolating and venting the associated instrument air supply header and stroking the MSIV since pressure indication is not provided for the accumulators. The MSIVs cannot be exercised in MODE 1 since closure would induce a steam flow / feed flow transient and result in a plant trip.

Cold Shutdown Testing

Reverse flow test and open verification.

5.2 Cold Shutdown Test Justification

MS-VCS-2

Valve No	Description	P&ID (Sheet)	Coord	Category	Active Passive	Normal Position	Safety Position
MS-VI-3A	Main Steam Isolation Valve "A"	G-190196 (1)	C-4	B	Act	O	C
MS-VI-3B	Main Steam Isolation Valve "B"	G-190196 (1)	E-4	B	Act	O	C
MS-VI-3C	Main Steam Isolation Valve "C"	G-190196 (1)	G-4	B	Act	O	C

Function

The main steam isolation valves limit the Reactor Coolant system cooldown rate following a main steam line break.

Deferred Testing

Exercise, stroke time and fail safe test in the closed direction.

Cold Shutdown Test Justification

Closing these valves in MODE 1 will induce a Steam Generator steam flow / feed flow mismatch and result in a plant trip. A partial stroke exercise test will not be performed since it may lead to the same condition encountered during the performance of a full stroke exercise test if valve failure were to occur during the performance of the part stroke exercise.

Cold Shutdown Testing

Exercise, stroke time and fail safe test in the closed direction.

5.2 Cold Shutdown Test Justification

PAV-VCS-1

Valve No	Description	P&ID (Sheet)	Coord	Category	Active Passive	Normal Position	Safety Position
V12-14	Containment Hydrogen Exhaust "A" Valve	HBR2-6933 (1)	F-8	A	Act	C	O/C
V12-15	H2 Purge PCV "A" Inlet Valve	HBR2-6933 (1)	G-6	A	Act	C	O/C
V12-18	Containment Hydrogen Exhaust "B"	HBR2-6933 (1)	E-8	A	Act	C	O/C
V12-19	H2 Purge PCV "B" Inlet	HBR2-6933 (1)	E-7	A	Act	C	O/C

Function

Closed to provide containment isolation. Opens to vent containment or support operation of the Hydrogen Recombiner post accident.

Deferred Testing

Quarterly exercise, stroke time and fail safe position verification.

Cold Shutdown Test Justification

Exercising these valves during power operation would require defeating administrative controls put in place to prevent inadvertent operation of these components. The valves are normally closed to provide containment isolation for their respective penetrations. The components are re-positioned approximately 54 days following the onset of a DBA. In order to operate these valves, an administratively controlled key must be obtained in order to operate the control panel. In addition, cycling the inboard valves (V12-14, V12-18) requires that two locked closed manual valves in series must be opened which, effectively removes a separate containment penetration from service. The valves are not designed to facilitate a part stroke exercise. Therefore, a partial stroke exercise test will not be performed since it may result in the same condition that would be encountered during the performance of a full stroke exercise test.

Cold Shutdown Testing

Exercise, stroke time and fail safe.

5.2 Cold Shutdown Test Justification

RCS-VCS-1

Valve No	Description	P&ID (Sheet)	Coord	Category	Active Passive	Normal Position	Safety Position
PCV-455C	Pressurizer Power Operated Relief Valve	5379-1971 (2)	F-2	B	Act	C	O/C
PCV-456	Pressurizer Power Operated Relief Valve	5379-1971 (2)	F-2	B	Act	C	O/C

Function

Opens to provide overpressure protection when the RCS is at low temperature.

Deferred Testing

Quarterly exercise, stroke time and fail safe position verification.

Cold Shutdown Test Justification

These valves are not needed for overpressure protection during power operation. The safety function of these valves is to protect the reactor vessel and the Reactor Coolant System from low temperature overpressure conditions. During power operations, the valves are closed to provide an RCS barrier. Operation of these valves quarterly will reduce the RCS barrier protection when opened and may lead to a excessive RCS leakage if the upstream valve is mispositioned or leaking by. The valves are not designed to facilitate a part stroke exercise. Therefore, a partial stroke exercise test will not be performed since it may result in the same condition that would be encountered during the performance of a full stroke exercise test.

Cold Shutdown Testing

Exercise, stroke time and fail safe position verification.

5.2 Cold Shutdown Test Justification

RCS-VCS-2

Valve No	Description	P&ID (Sheet)	Coord	Category	Active Passive	Normal Position	Safety Position
RC-567	Reactor Head Vent Solenoid Isolation Valve	5379-1971 (1)	D-3	B	Act	C	O
RC-568	Reactor Head Vent Solenoid Isolation Valve	5379-1971 (1)	C-3	B	Act	C	O
RC-569	Pressurizer Vent Solenoid Isolation Valve	5379-1971 (1)	C-3	B	Act	C	O
RC-570	Pressurizer Vent Solenoid Isolation Valve	5379-1971 (1)	C-3	B	Act	C	O
RC-571	Pressurizer Solenoid Isolation Valve	5379-1971 (1)	D-2	B	Act	C	O
RC-572	CV Atmosphere Solenoid Isolation Valve	5379-1971 (1)	D-1	B	Act	C	O

Function

Opens to vent non-condensable gases from the RCS.

Deferred Testing

Quarterly exercise, loss of power and stroke time.

Cold Shutdown Test Justification

Technical Requirements Manual Specification (TRMS) 3.2 requires RC-567, RC-568, RC-569, and RC-570 be closed and power removed when above MODE 4. TRMS 3.2 requires RC-571 and RC-572 be closed unless needed to depressurize the RCS vent system in case of leakage past RC-567, RC-568, RC-569, or RC-570. During power operations, the valves are closed to provide an RCS barrier to the PRT or containment atmosphere. Opening these valves reduces RCS boundary integrity. The valves are not designed to facilitate a part stroke exercise. Therefore, a partial stroke exercise test will not be performed since it may result in the same condition that would be encountered during the performance of a full stroke exercise test.

Cold Shutdown Testing

Full stroke exercise, loss of power, and stroke time.

5.2 Cold Shutdown Test Justification

RHR-VCS-1

Valve No	Description	P&ID (Sheet)	Coord	Category	Active Passive	Normal Position	Safety Position
RHR-750	Loop "B" Hot Leg To RHR System	5379-1484 (1)	B-2	B	Act	C	O/C
RHR-751	Loop "B" Hot Leg To RHR System	5379-1484 (1)	B-2	B	Act	C	O/C

Function

RHR shutdown cooling suction line from RCS loop "B" hot leg to the RHR pumps suction and reactor coolant pressure boundary isolation.

Deferred Testing

Exercise and stroke time.

Cold Shutdown Test Justification

These valves cannot be stroked quarterly because they are interlocked to prevent operation when Reactor Coolant System pressure is greater than 474 psig. RCS pressure during plant operation is approximately 2235 psig; therefore, these valves cannot be exercised unless interlocks are defeated. Control power is removed from RHR-751 prior to entering MODE 3 to provide increased assurance related to RCS barrier integrity. The valves are not designed to facilitate a part stroke exercise. Therefore, a partial stroke exercise test will not be performed since it may result in the same condition that would be encountered during the performance of a full stroke exercise test.

Cold Shutdown Testing

Full stroke exercise and stroke time.

5.2 Cold Shutdown Test Justification

RHR-VCS-2

Valve No	Description	P&ID (Sheet)	Coord	Category	Active Passive	Normal Position	Safety Position
RHR-753A	RHR 'A' Pump Discharge Check Valve	5379-1484 (1)	D-5	C	Act	C	O/C
RHR-753B	RHR 'B' Pump Discharge Check Valve	5379-1484 (1)	F-5	C	Act	C	O/C
RHR-782	RHR Htx "A" Outlet Check Valve	5379-1484 (1)	D-7	C	Act	C	O/C
RHR-783	RHR Htx "B" Outlet Check Valve	5379-1484 (1)	F-7	C	Act	C	O/C

Function

Opens to deliver low head RHR flow to the reactor core in an accident. Closes to restrict backflow into an inactive pump and associated flow components.

Deferred Testing

Quarterly forward flow and reverse flow test.

Cold Shutdown Test Justification

In order to achieve full flow, injection into the Reactor Coolant System cold legs is required. The RHR pumps do not develop enough pressure to overcome normal Reactor Coolant System pressure while at power. The only means to obtain the required conditions for the full flow exercise would require that the plant be shutdown, cooled down and depressurized which, is impracticable. Although the valves are reverse flow tested at a quarterly interval, bi-directional testing of check valves cannot be considered complete until both safety positions have been verified. Both tests must be performed within the same interval.

Cold Shutdown Testing

Full flow and reverse flow test.

5.2 Cold Shutdown Test Justification

SI-VCS-1

Valve No	Description	P&ID (Sheet)	Coord	Category	Active Passive	Normal Position	Safety Position
SI-845A	Spray Additive Tank Discharge Valve	5379-1082 (3)	F-6	B	Act	C	O
SI-845B	Spray Additive Tank Discharge Valve	5379-1082 (3)	E-6	B	Act	C	O

Function

Opens to admit sodium hydroxide injection during containment spray system actuation.

Deferred Testing

Exercise and stroke time quarterly.

Cold Shutdown Test Justification

Exercising these valves during power Operation would introduce sodium hydroxide into the safety injection system resulting in unacceptable water chemistry. The closing of other valves in the system to allow quarterly cycling of SI-845A and SI-845B would isolate all Sodium Hydroxide injection flow paths. Therefore, a partial stroke exercise test will not be performed since it may result in the same condition that would be encountered during the performance of a full stroke exercise test.

Cold Shutdown Testing

Exercise and stroke time.

5.2 Cold Shutdown Test Justification

SI-VCS-2

Valve No	Description	P&ID (Sheet)	Coord	Category	Active Passive	Normal Position	Safety Position
SI-862A	RHR Loop RWST Isolation Valve	5379-1082 (2)	C-3	B	Act	O	O/C
SI-862B	RHR Loop RWST Isolation Valve	5379-1082 (2)	C-3	B	Act	O	O/C
SI-864A	RWST Discharg Valve	5379-1082 (2)	E-4	A	Act	O	O/C
SI-864B	RWST Discharg Valve	5379-1082 (2)	E-4	A	Act	O	O/C

Function

Opens to allow suction from the RWST to the RHR pumps. Closes to affect post-accident long-term recirculation cooling.

Deferred Testing

Exercise and stroke time quarterly.

Cold Shutdown Test Justification

Exercising these valves during power operation would result in losing suction from the RWST to both trains of residual heat removal system. The failure of one valve in the non-conservative direction would result in a total loss of system function. In addition, ITS SR 3.5.2.1 requires AC control power be removed from these valves in MODES 1, 2, and 3. The valves are not designed to facilitate a part stroke exercise. Therefore, a partial stroke exercise test will not be performed since it may result in the same condition that would be encountered during the performance of a full stroke exercise test.

Cold Shutdown Testing

Exercise and stroke time.

5.2 Cold Shutdown Test Justification

SI-VCS-3

Valve No	Description	P&ID (Sheet)	Coord	Category	Active Passive	Normal Position	Safety Position
SI-863A	RHR Loop Recirc Valve	5379-1082 (2)	C-3	B	Act	LC	O/C
SI-863B	RHR Loop Recirc Valve	5379-1082 (2)	C-3	B	Act	LC	O/C
SI-865A	SI Accumulator "A" Discharge Valve	5379-1082 (4)	F-2	B	Act	O	O/C
SI-865B	SI Accumulator "B" Discharge Valve	5379-1082 (4)	D-2	B	Act	O	O/C
SI-865C	SI Accumulator "C" Discharge Valve	5379-1082 (4)	C-2	B	Act	O	O/C
SI-866A	Loop "C" Hot Leg Injection Isolation	5379-1082 (4)	D-7	B	Act	C	O/C
SI-866B	Loop "B" Hot Leg Injection Isolation	5379-1082 (4)	D-7	B	Act	C	O/C
SI-878A	SI Pump Discharge Header Cross-Connect Isolation Valve	5379-1082 (2)	D-7	B	Act	O	C
SI-878B	SI Pump Discharge Header Cross-Connect Isolation Valve	5379-1082 (2)	E-7	B	Act	O	C

Function

Safety Injection Isolation Valves.

Deferred Testing

Exercise and stroke time quarterly.

Cold Shutdown Test Justification

ITS SR 3.5.1.5 for SI-865A, B, and C and ITS SR 3.5.2.1 for the remainder of applicable valves requires that AC control power be removed from these valves when in MODE 1, 2, or 3 with pressurizer pressure > 1000 psig (SI-865A, B, and C) or when in MODE 1, 2, or 3 (SI-863A and B, SI-866A and B, and SI-878A and B). The valves are not designed to facilitate a part stroke exercise. Therefore, a partial stroke exercise test will not be performed since it may result in the same condition that would be encountered during the performance of a full stroke exercise test.

Cold Shutdown Testing

Exercise and stroke time.

5.2 Cold Shutdown Test Justification

SI-VCS-4

Valve No	Description	P&ID (Sheet)	Coord	Category	Active Passive	Normal Position	Safety Position
SI-889A	CV Spray Eductor Feed Check Valve	5379-1082 (3)	D-3	C	Act	C	O/C
SI-889B	CV Spray Eductor Feed Check Valve	5379-1082 (3)	D-3	C	Act	C	O/C

Function

Opens to admit sodium hydroxide injection during Containment Spray system actuation. Closes to prevent flow from the Containment Spray Pump minimum flow line from entering the Spray Additive Tank.

Deferred Testing

Reverse flow and forward flow exercising quarterly.

Cold Shutdown Test Justification

Reverse flow exercising these valves during power operation would render the entire Spray Additive System inoperable. Forward flow exercising of these valves requires isolation of the Spray Additive Tank in order to perform a line flush if the desired chemistry requirements are not met, as well as imposing additional risk associated with contamination of the RWST with NaOH. The sample and flush alignment renders the Spray Additive System inoperable, and would require manual operator action involving multiple valve operations to restore this essential feature. Forward flow testing of either component renders the Spray Additive System inoperable once SI-892D (manual eductor test line isolation) is opened to facilitate the flowpath necessary to open these valves. Additional test equipment set - up is required to complete the test.

Cold Shutdown Testing

Reverse flow and forward flow exercise.

5.2 Cold Shutdown Test Justification

SI-VCS-5

Valve No	Description	P&ID (Sheet)	Coord	Category	Active Passive	Normal Position	Safety Position
SI-856A	SI Pump Recirc Valve	5379-1082 (2)	E-3	A	Act	O	O/C
SI-856B	SI Pump Recirc Valve	5379-1082 (2)	E-3	A	Act	O	O/C

Function

1) Opens to provide a mini-flow path back to RWST. 2) Closed by operator action during the transition from the injection mode of SIS operation to the recirculation mode of operation to prevent the discharge of containment sump water to the RWST and the potential release of activity through the RWST vent line when the SI Pumps are used during the recirculation mode.

Deferred Testing

Quarterly exercise, stroke time and fail safe test.

Cold Shutdown Test Justification

Exercising these valves during power operations with the SI Pumps racked in creates the potential for a pump start and run without a minimum flow path available. This condition increases the potential for possible pump damage and safety system unavailability. Failure in a non-conservative direction will result in total loss of system function. The valves are not designed to facilitate a part stroke exercise. Therefore, a partial stroke exercise test will not be performed since it may result in the same condition that would be encountered during the performance of a full stroke exercise test.

Cold Shutdown Testing

Exercise; stroke time open and closed, and fail safe to the open position.

5.2 Cold Shutdown Test Justification

SI-VCS-6

Valve No	Description	P&ID (Sheet)	Coord	Category	Active Passive	Normal Position	Safety Position
SI-851A	SI Accumulator "A" Make-Up Valve Accumulator Liquid Fill Line Isolation Valve	5379-1082 (5)	E-5	B	Act	C	C
SI-851B	SI Accumulator "B" Make-Up Valve Accumulator Liquid Fill Line Isolation Valve	5379-1082 (5)	D-5	B	Act	C	C
SI-851C	SI Accumulator "C" Make-Up Valve Accumulator Liquid Fill Line Isolation Valve	5379-1082 (5)	B-5	B	Act	C	C

Function

Closed to prevent the diversion of Safety Injection flow during hot leg injection.

Deferred Testing

Quarterly full stroke, stroke time and loss of power test.

Cold Shutdown Test Justification

Exercising these valves while at power creates the potential for valve failure in the non-conservative direction, which would cause a loss of system function during a large break loss of coolant accident as a result of the diversion of flow from the core to the affected Safety Injection accumulator. The valves are not designed to facilitate a part stroke exercise. Therefore, a partial stroke exercise test will not be performed since it may result in the same condition that would be encountered during the performance of a full stroke exercise test.

Cold Shutdown Testing

Exercise, stroke time (closed), fail safe (to the closed position).

5.2 Cold Shutdown Test Justification

SW-VCS-1

Valve No	Description	P&ID (Sheet)	Coord	Category	Active Passive	Normal Position	Safety Position
V6-16C	Service Water Isolation To Turbine Building	G-190199 (10)	B-2	B	Act	O	C

Function

Service water header to turbine building isolation valve.

Deferred Testing

Exercise and stroke time quarterly.

Cold Shutdown Test Justification

Exercising this valve during power operation would temporarily isolate service water to all components in the turbine building and may result in damage to major plant equipment and a plant trip. Valve failure in the test position would require a plant shutdown or trip and may result in damage to plant equipment. The valve is not designed to facilitate a part stroke exercise. Therefore, a partial stroke exercise test will not be performed since it may result in the same condition that would be encountered during the performance of a full stroke exercise test.

Cold Shutdown Testing

Exercise and stroke time.

5.3 Refueling Outage Test Justification

CC-VRS-1

Valve No	Description	P&ID (Sheet)	Coord	Category	Active Passive	Normal Position	Safety Position
CC-731	Reactor Coolant Pump Bearing Cooling Water Outlet Check Valve	5379-376 (2)	C-6	C	Act	O	C

Function

Required to close to prevent emptying the cooling water surge tank upon accident, coincident with failure of upstream containment isolation valve CC-730 to close automatically on phase 'B' containment isolation signal.

Deferred Testing

Reverse flow testing and open verification quarterly and at cold shutdown.

Refueling Shutdown Test Justification

Reverse flow testing of this valve is impractical at power or during cold shutdown. The valve is located in the return flow path from the reactor coolant pumps motor bearing coolers. The inspection cannot be performed unless this section of piping is depressurized and drained. CCW is not isolated to the RCPs unless maintenance is required and is normally conducted during refueling outages. The disassembly of this valve is performed in conjunction with Appendix J local leak rate testing in order to provide a required vent path for testing. The coordination of these two activities minimizes radiation dose and maximizes equipment availability and personnel efficiency. The disassembly of this check valve at a refueling interval is consistent with the requirements of ISTC 4.5.4(c)(3).

Refueling Shutdown Testing

Disassembly and examination to verify valve obturator movement in accordance with ISTC 4.5.4.

5.3 Refueling Outage Test Justification

CVC-VRS-1

Valve No	Description	P&ID (Sheet)	Coord	Category	Active Passive	Normal Position	Safety Position
CVC-298A	RCP "A" Seal Water Isolation Check Valve	5379-685 (1)	C-8	C	Act	O	O/C
CVC-298B	RCP "B" Seal Water Isolation Check Valve	5379-685 (1)	C-6	C	Act	O	O/C
CVC-298C	RCP "C" Seal Water Isolation Check Valve	5379-685 (1)	C-5	C	Act	O	O/C
CVC-298D	RCP "A" Seal Water Isolation Check Valve	5379-685 (1)	B-8	C	Act	O	O/C
CVC-298E	RCP "B" Seal Water Isolation Check Valve	5379-685 (1)	B-6	C	Act	O	O/C
CVC-298F	RCP "C" Seal Water Isolation Check Valve	5379-685 (1)	B-5	C	Act	O	O/C

Function

Close to prevent backflow from the RCP seals to the CVCS system.

Deferred Testing

Reverse flow testing and open verification quarterly and at cold shutdown.

Refueling Shutdown Test Justification

These valves are normally open to provide seal injection flow to their respective RCP seals. Reverse flow testing would require stopping seal water flow to the reactor coolant pump. The interruption of seal water flow during power operation, even for a short time, could result in extensive damage to the pump seals. Based on limitations in system design, testing these valves would require inordinate measures. Reverse flow testing can be accomplished by installing a special test rig or by examination via radiography. Installing the test rig or arranging for special processes would be impractical during cold shutdowns based on the complexity of the test, valve re-alignment, and ALARA considerations. Extension of the interval is supported by performance data.

Refueling Shutdown Testing

Reverse flow testing and open verification.

5.3 Refueling Outage Test Justification

CVC-VRS-2

Valve No	Description	P&ID (Sheet)	Coord	Category	Active Passive	Normal Position	Safety Position
CVC-351	Boric Acid To Charging Pump Suction Isolation Check Valve	5379-685 (2)	B2	C	Act	C	O
CVC-357	RWST To Charging Pumps Suction Check Valve	5379-685 (2)	C-4	C	Act	C	O

Function

The function of CVC-351 is to open and allow flow from the Boric Acid Pumps for emergency boration. CVC-357 opens to allow flow from the RWST for emergency boration.

Deferred Testing

Full flow exercise and closure verification quarterly and at cold shutdown.

Refueling Shutdown Test Justification

Exercising these valves during power operation will cause undesirable RCS temperature and/or boron concentration changes which may result in an uncontrolled reactivity excursion, plant transient or trip. Operating a charging pump at full flow during cold shutdown with the reactor vessel head in place could result in a low temperature over pressurization of the RCS.

Refueling Shutdown Testing

Full flow exercise and closure verification.

5.3 Refueling Outage Test Justification

CVC-VRS-3

Valve No	Description	P&ID (Sheet)	Coord	Category	Active Passive	Normal Position	Safety Position
CVC-312A	Charging Line To Loop "A" Check Valve	5379-685 (1)	F-8	C	Act	C	O/C
CVC-312B	Charging Line To Loop "B" Check Valve	5379-685 (1)	F-8	C	Act	O/C	O/C
CVC-312C	Regenerative Heat Exchanger Inlet Check Valve	5379-685 (1)	F-6	C	Act	O	O/C
CVC-313	Auxiliary Spray Line Check Valve	5379-685 (1)	F-8	C	Pass	C	C

Function

Closes to prevent back flow.

Deferred Testing

Testing quarterly and at cold shutdown.

Refueling Shutdown Test Justification

Due to the design of the system, the only method available to test these valves is to isolate or secure flow in the charging line. Securing charging flow during power operation would cause pressurizer level fluctuation and may result in a unit trip. Based on limitations in system design, testing these valves would require inordinate measures. Reverse flow testing can be accomplished by installing a special test rig or by examination via radiography. Installing the test rig or arranging for special processes would be impractical during cold shutdowns based on the complexity of the test, valve re-alignment, and ALARA considerations.

Refueling Shutdown Testing

Forward flow and reverse flow test for CVC-312A, CVC-312B, and CVC-312C.

Reverse flow and open verification for CVC-313.

5.3 Refueling Outage Test Justification

CVC-VRS-4

Valve No	Description	P&ID (Sheet)	Coord	Category	Active Passive	Normal Position	Safety Position
CVC-239A	Reactor Coolant Filter To Volume Control Tank Check Valve	5379-685 (2)	F-4	C	Act	O	C

Function

Closes to assure the integrity of the CVCS closed system outside of containment.

Deferred Testing

Reverse flow testing and open verification quarterly and at cold shutdown.

Refueling Shutdown Test Justification

This valve is normally open at power and cold shutdown conditions. Operation of this valve during power operations or operations requiring coolant purification would cause temporary isolation of letdown flow to the VCT, which would alter the balance of the letdown flow control system, resulting in a potential errors associated with controller PCV-145 response. The consequences may lead to an inadvertent opening of relief valves CVC-203A or B, and possible failure to re-close, resulting in an uncontrolled loss of primary coolant. In addition, the failure of this valve in the test position would result in a complete loss of normal RCS letdown capability to the VCT, and lead to an eventual unit shutdown. Cycling of this component would also induce temporary pressurizer level perturbations, which may invalidate the transient analysis assumptions of UFSAR Chapter 15. Reverse flow testing may be accomplished by examination (radiography). Arranging for special processes would be impractical during cold shutdowns based on the complexity of the test, valve re-alignment, and ALARA considerations.

Refueling Shutdown Testing

Reverse flow and open verification.

5.3 Refueling Outage Test Justification

CVC-VRS-5

Valve No	Description	P&ID (Sheet)	Coord	Category	Active Passive	Normal Position	Safety Position
CVC-263	H2 & N2 To Volume Control Tank Check Valve	5379-685 (2)	E-5	C	Act	O/C	C

Function

Closes to assure the integrity for the CVCS closed system outside of containment.

Deferred Testing

Reverse flow testing and open verification quarterly and at cold shutdown.

Refueling Shutdown Test Justification

This valve is normally open at power and cold shutdown conditions. Operation of this valve during power operations or operations requiring coolant purification will create temporary disturbances to the letdown flow control system, resulting in a potential challenge to letdown line relief valves CVC-203A or CVC-203B as a result of PCV-145 response errors. This event could lead to an inadvertent relief valve lift, and possible failure to re-close, resulting in an uncontrolled loss of primary coolant. Cycling of this valve could lead to temporary pressurizer level perturbations, which may invalidate the transient analysis assumptions of UFSAR Chapter 15. In addition, the failure of this valve in the test position would result in a total loss of system function related to the capability to maintain VCT pressure and gas concentration. The risk involved with performing this test is not warranted. Reverse flow testing may be accomplished by examination (radiography). Arranging for special processes would be impractical during cold shutdowns based on the complexity of the test, valve re-alignment, and ALARA considerations.

Refueling Shutdown Testing

Reverse flow and open verification.

5.3 Refueling Outage Test Justification

FW-VRS-1

Valve No	Description	P&ID (Sheet)	Coord	Category	Active Passive	Normal Position	Safety Position
FW-8A	Steam Generator "A" Inlet Stop Check Valve	G-190197 (4)	G-6	C	Act	O	C
FW-8B	Steam Generator "B" Inlet Stop Check Valve	G-190197 (4)	E-6	C	Act	O	C
FW-8C	Steam Generator "C" Inlet Stop Check Valve	G-190197 (4)	D-6	C	Act	O	C

Function

These valves are required to close to isolate the Main Feedwater System.

Deferred Testing

Reverse flow testing and open verification quarterly and at cold shutdown.

Refueling Shutdown Test Justification

These valves are normally open at power. The check valves cannot be exercised closed during power operation without isolating the main Feedwater flow to the Steam Generators, which would result in a plant trip. Reverse flow testing during cold shutdown is impractical. In order to performed the test, the steam generators must be filled, main feedwater system must be re-aligned and portions of the system opened and depressurized. Reverse flow testing may be accomplished by examination (radiography). Arranging for special processes would be impractical during cold shutdowns based on the complexity of the test and large size of the valves. Although these valves are open as demonstrated by routine power operations, bi-directional testing of check valves can not be considered complete until both safety positions have been verified. Boths tests must be performed within the same interval.

Refueling Shutdown Testing

Reverse flow testing and open verification.

5.3 Refueling Outage Test Justification

IA-VRS-1

Valve No	Description	P&ID (Sheet)	Coord	Category	Active Passive	Normal Position	Safety Position
IA-525	Air Dryer To Instrument Air Loop Check Valve Isolation Valve	G-190200 (2)	G-7	A/C	Act	O	C
PCV-1716	Instrument Air Isolation To CV	G-190200 (2)	G-7	A	Act	O	C

Function

Close to provide containment isolation.

Deferred Testing

PCV-1716 - Quarterly and cold shutdown exercise, stroke time, and fail closed test.

IA-525 - Quarterly and cold shutdown reverse flow test and open verification.

Refueling Shutdown Test Justification

These valves are normally open to provide instrument air to components located in containment. Exercising these valves during power operation or cold shutdown would isolate instrument air from components inside containment which could result in a plant trip or reduce the level of safety in order to maintain stable plant operation. The valves are tested closed via seat leakage measurement to meet the requirements of 10 CFR 50, Appendix J. Additionally, IA-525 must be proven to close and open in order to fulfill the bi-directional test requirements of the Code. These tests must be performed within the same interval. The leak rate test for this valve is performed at a refueling interval; therefore, the bi-directional test requirement of the Code for testing within the same interval is more appropriate at a refueling interval. Additional tests to verify closure for IA-525 quarterly or at cold shutdown intervals would involve tests that are considered to be impractical since it would involve complex test lineups or non intrusive measures. PCV-1716 is not designed to facilitate a part stroke exercise. Therefore, a partial stroke exercise test will not be performed since it may result in the same condition that would be encountered during the performance of a full stroke exercise test.

Refueling Shutdown Testing

PCV-1716 - Exercise, stroke time and fail closed.

IA-525 - Open verification and reverse flow test.

5.3 Refueling Outage Test Justification

SI-VRS-1

Valve No	Description	P&ID (Sheet)	Coord	Category	Active Passive	Normal Position	Safety Position
SI-909	SI Accumulators N2 Supply Check Valve CIV for Pen. P-65	5379-1082 (5)	F-3	A/C	Act	C	C

Function

Closes to prevent a backflow of Nitrogen from the SI Accumulators and provides isolation of the associated containment penetration.

Deferred Testing

Reverse flow and open verification quarterly and cold shutdown.

Refueling Shutdown Test Justification

Testing of this valve would require the isolation of the nitrogen supply to the Safety Injection Accumulators. This would represent a challenge to safety equipment to perform its intended function. Although this valve is an active component, it is normally closed and opened only when it is necessary to re-pressurize the SI accumulators. The valve is tested closed via seat leakage measurement to meet the requirements of 10 CFR 50, Appendix J. Additionally, the valve must be proven to close and open in order to fulfill the bi-directional test requirements of the Code. These tests must be performed within the same interval. The use of radiography to verify closure requires the use of outside services in order to complete the task. Due to the expense and limitations associated with performance of this examination, it is not warranted at a quarterly interval. In addition, system realignment to perform inservice testing or radiography is not warranted at a cold shutdown interval when a more definitive test can be performed at a refueling interval. Forward flow testing of the valve is normally completed in refueling outages when preparing to restore the SI accumulators to standby service. The leak rate test for this valve is performed at a refueling interval; therefore, the bi-directional test requirement of the Code for testing within the same interval is more appropriate at a refueling interval.

Refueling Shutdown Testing

Leak test as required by 10 CFR 50, App. J and open verification.

5.3 Refueling Outage Test Justification

SI-VRS-2

Valve No	Description	P&ID (Sheet)	Coord	Category	Active Passive	Normal Position	Safety Position
SI-879A	SI Pump A Discharge Check Valve	5379-1082 (2)	D-7	C	Act	C	O/C
SI-879B	SI Pump B Discharge Check Valve	5379-1082 (2)	E-7	C	Act	C	O/C
SI-879C	SI Pump C Discharge Check Valve	5379-1082 (2)	F-7	C	Act	C	O/C

Function

Open to permit full flow from the respective Safety Injection pump to the cold leg or hot leg injection pathways. Closed to prevent the diversion of flow from an operating pump through an idle pump.

Deferred Testing

Full flow and reverse flow exercise quarterly and cold shutdown.

Refueling Shutdown Test Justification

Quarterly testing (forward flow) is not practical since the RCS pressure exceeds the discharge pressure of the Safety Injection pumps. Full flow testing at cold shutdown conditions is not practical due to the increased probability of a low temperature over pressurization event; therefore, testing at a refueling interval with the reactor vessel head removed is appropriate. Although reverse flow testing is performed at a quarterly test interval, check valve bi-directional test requirements cannot be considered completed until both positions have been verified within the same interval.

Refueling Shutdown Testing

Full flow and reverse flow exercise.

5.3 Refueling Outage Test Justification

SI-VRS-3

Valve No	Description	P&ID (Sheet)	Coord	Category	Active Passive	Normal Position	Safety Position
SI-873A	Boron Injection To RCS Check Valve	5379-1082 (4)	C-6	A/C	Act	C	O/C
SI-873D	Boron Injection To RCS Check Valve	5379-1082 (4)	B-6	A/C	Act	C	O/C
SI-873E	Boron Injection To RCS Check Valve	5379-1082 (4)	B-6	A/C	Act	C	O/C
SI-873F	Boron Injection To RCS Check Valve	5379-1082 (4)	C-5	A/C	Act	C	O/C
SI-874A	SI To Loops 2 And 3 Check Valve	5379-1082 (4)	C-7	A/C	Act	C	O/C
SI-874B	SI To Loops 2 And 3 Check Valve	5379-1082 (4)	C-7	A/C	Act	C	O/C

Function

SI-874A, B - SI Hot Leg Injection Check Valves
 SI-873A, D, E, F - SI Cold Leg Injection Check Valves

Deferred Testing

Full flow and reverse flow exercise quarterly and cold shutdown.

Refueling Shutdown Test Justification

Forward flow testing of these valves can only be performed by injecting water into the RCS utilizing the RWST as the supply source. The SI pumps discharge pressure cannot overcome normal RCS system pressure; therefore, the forward flow testing cannot be performed unless the reactor coolant system is depressurized and vented. Injecting with the RCS depressurized and not vented may result in a low temperature over pressurization of the RCS due to the small expansion volume. For this reason, the full flow test is conducted when filling or draining the refueling canal in conjunction with refueling outages.

Reverse flow testing of these valves requires the cold leg injection flow paths to be isolated one at a time. In addition to reducing safety system availability, the closure test requires that manual valves inside the Class 1 and 2 pressure boundaries be opened in order to provide a flow path for any seat leakage. This is an undesirable practice since the RCS pressure boundary is normally maintained by closed valves or valves capable of automatic closure. This evolution requires entry into containment and into Locked High Radiation Areas, increasing personnel exposure and the potential for personnel contamination. The activity is scheduled during critical plant evolutions based on the conditions necessary to facilitate testing. Portable testing equipment (pumps, hoses, fittings, containers, etc.) is required. Staging and installation of portable test equipment (hoses, fittings, gages, containers, etc.) inside containment to perform this test increases the probability for incidents to occur due to activities performed on hot, pressurized systems.

Check valve tests must be performed by verifying the open and closed positions. The tests are to be performed at an interval when it is practicable to perform both tests. These components are required to be leak rate tested IAW ITS SR 3.4.14.1 at cold shutdowns of greater than 48 hours in duration, provided the test has not been completed in the previous 9 months (276 days). The leak test satisfies the requirement for closure verification. The forward flow test is performed at a refueling interval. The combination of these two activities satisfies the OM Code requirement for bi-directional testing and the interval extension to refueling is warranted.

Refueling Shutdown Testing

Full flow exercise at refueling intervals and reverse flow verification via seat leakage testing at cold shutdown intervals - greater than 48 hours in duration and prior to entering MODE 2 whenever the unit has been in MODE 5 for 7 days or more, if leakage testing has not been performed in the previous 9 months and within 24 hours following valve actuation due to automatic or manual action or flow through the valve.

5.3 Refueling Outage Test Justification

SI-VRS-4

Valve No	Description	P&ID (Sheet)	Coord	Category	Active Passive	Normal Position	Safety Position
SI-893A	SI Pump "A" Minimum Flow Check Valve	5379-1082 (2)	D-6	C	Act	C	O
SI-893B	SI Pump "B" Minimum Flow Check Valve	5379-1082 (2)	E-6	C	Act	C	O
SI-893C	SI Pump "C" Minimum Flow Check Valve	5379-1082 (2)	G-6	C	Act	C	O

Function

Open to provide a minimum flow path for an operating SI pump during testing.

Deferred Testing

Full flow and closure verification.

Refueling Shutdown Test Justification

Check valve tests must be performed by verifying the open and closed positions. The tests are to be performed at an interval when it is practicable to perform both tests. The forward flow test of these components is typically conducted when the respective SI pump is operated to satisfy quarterly pump test requirements. 'A' (SI-893A) and 'C' (SI-893C) SI pumps are normally in service and 'B' (SI-893B) SI pump is utilized as a maintenance spare. The valves are seal welded and are installed downstream of a strainer and orifice. The seal welded design is not conducive to disassembly for inspection and obturator verification. In addition, the system is not configured for closure verification due to the lack of test tees or drains in conjunction with a downstream check valve common to all three paths. The only practical means to verify closure is through the use of radiography. In addition to the costs and special arrangements that must be made to complete the examination utilizing this method, access to the SI pump room, which also houses the Containment Spray pumps, Refueling Water Storage Tank pump, Primary Water pumps and associated valves would be limited during the examination activity.

Refueling Shutdown Testing

Full flow and closure verification exercise.

5.3 Refueling Outage Test Justification

SI-VRS-5

Valve No	Description	P&ID (Sheet)	Coord	Category	Active Passive	Normal Position	Safety Position
SI-849	SI Line To High Head Inst Test Line Check Valve	5379-1082 (4)	F-7	C	Act	C	O

Function

Provides a flow path to relief valve SI-859. Relief valve SI-859 provides over pressure protection for the piping located between the SI-866 and SI-869 valves. This valve has no safety-related function in the closed position.

Deferred Testing

Quarterly forward flow and closure verification.

Refueling Shutdown Test Justification

A full flow exercise of this valve during power operations is not practicable. This test activity would require the repositioning of three manual valves and one failed closed motor operated valve (SI-869) to provide the required flow path. Two of these components (SI-895V and SI-898F) are locked closed to isolate containment penetration #48. These components are in remote locations which, would introduce test personnel to unnecessary radiation exposure to accomplish the task of locating, accessing, unlocking and operating both valves to the required test position. This process would then be repeated in order to restore the normal operating configuration. In addition, should a DBA occur while in the required test configuration for this component, the normal delivery of Safety Injection flow to the core would be degraded until such time that the test line could be effectively isolated by manual operator action. The required bi-directional test of check valves can not be considered complete until both positions have been verified. Boths tests must be performed within the same interval. Closure verification for this valve may be accomplished by examination (radiography). Arranging for special processes would be impractical during cold shutdowns based on the complexity of the test and size of the valve.

Refueling Shutdown Testing

Full flow exercising and closure verification will be performed during cold shutdown periods when containment integrity is not required.

5.3 Refueling Outage Test Justification

SI-VRS-6

Valve No	Description	P&ID (Sheet)	Coord	Category	Active Passive	Normal Position	Safety Position
SI-839	SI RWST Back Flow Preventer Check Valve	5379-1082 (2)	D-4	C	Act	C	O

Function

SI-839 opens to permit a recirculation flow path for the Safety Injection pumps; thereby preventing pump damage when RCS pressure is greater than the shut-off head of the SI Pumps.

Deferred Testing

Quarterly full flow and closure verification.

Refueling Shutdown Test Justification

Exposing the 3/4" test line to accommodate the full flow test for SI-839 would divert flow to the RWST such that one SI Pump would be incapable of delivering adequate flow to mitigate the consequences of a large break loss of coolant accident. As such, the SI system is inoperable when performing this test and entry into ITS LCO 3.0.3 is required. A second SI pump must be started in order to provide the required flow and constitutes additional cycling of safety-related equipment while at minimum recirculation flow conditions and is considered unnecessary. The full flow test at cold shutdown does not impose a similar reduction in the level of safety; therefore, can be performed. However, the required bi-directional test can not be considered complete until both positions have been verified. Both tests must be performed within the same interval. Closure verification for this valve may be accomplished by examination (radiography). Arranging for special processes would be impractical during cold shutdowns based on the complexity of the test.

Refueling Shutdown Testing

Full flow and closure verification.

6.0 PUMPS

6.1 Scope

Pumps included in the IST Program Plan are those Safety Class 2 and 3 centrifugal and positive displacement pumps provided with an emergency power source that are required to:

1. Shut down the reactor to the safe shutdown condition, or
2. Maintain the reactor in the safe shutdown condition, or
3. Mitigate the consequences of an accident.

Excluded from the above are:

1. Drivers, except where the pump and driver form an integral unit and the pump bearings are in the driver;
2. Pumps supplied with emergency power solely for operating convenience.
3. Skid-mounted pumps and component subassemblies that are tested as part of the major component.

6.2 Pump Table Format

A complete list of pumps in the scope of IST Program Plan is provided on the following pages in a tabular format. The Pump Table is sorted alphabetically. A description of each column in the Pump Table is shown below with applicable abbreviations.

Pump	Unique alphabetical designator assigned to each pump.
Description	Descriptive name of the pump.
P&ID (SHT)	P&ID in which the pump is located. A complete list of P&IDs is provided in Section 2.5.
Coord	Drawing coordinate of pump location on the P&ID.
Pump Group	Testing Group
	A Pumps that are operated continuously or routinely during normal operation, cold shutdown or refueling operations.
	B Pumps in standby systems that are not operated routinely except for testing.
Pump Type	Pump design.
	C-H Centrifugal pump where orientation of the pump and motor shaft is in the horizontal plane.
	C-V Centrifugal pump where orientation of the pump and motor shaft is in the vertical plane.
	PD Positive displacement pump.
	VLS Centrifugal vertically suspended pump where the pump driver and pumping element are connected by a line shaft within an enclosing column which contains the pump bearings.

6.2 Pump Table Format (Continued)

Speed	Identifies whether the pump speed is fixed or variable. All pumps in the IST Program Plan are tested at speeds greater than 600 rpm. Fixed Speed is constant and is a function of the motor design. Vari Speed is variable.
Test Type	Parameters measured and evaluated during the pump test. Comp. Test types prefixed with designator comply with the requirements for Comprehensive pump tests per OM Code. Grp. A Test types prefixed with designator comply with the requirements for Group A pump tests per OM Code. Grp. B Test types prefixed with designator comply with the requirements for Group B pump tests per OM Code. dP Pump differential pressure. Q Pump flow. N Pump speed (variable speed pumps only). P Discharge pressure. V Pump or motor bearing vibration velocity (broad band unfiltered peak in inches per second).
Test Freq	Frequency of pump testing per OM Code. Q Quarterly (once per 92 days) Bi Biennial (once per 731 days)
Relief Request	Reference to applicable relief request. Relief requests are located in Section 4.2.
Remarks	Applicable notes or other unique comments that provide clarification.

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6.3 Pump Table

Pump	Description	P&ID (SHT)	Coord	Pump Group	Pump Type	Speed	Test Type	Test Freq	Relief Request	Remarks
AFW-A	Auxiliary Feedwater	G-190197 (4)	C-3	B	C-H	Fixed	Grp. B - Q, dP Comp. - Q, dP, V	Q Bi	N/A N/A	
AFW-B	Auxiliary Feedwater	G-190197 (4)	A-3	B	C-H	Fixed	Grp. B - Q, dP Comp. - Q, dP, V	Q Bi	N/A N/A	
AFW-SD	Auxiliary Feedwater (Steam Driven)	G-190197 (4)	D-2	B	C-H	Vari	Grp. B - N, Q, dP Comp. - N, Q, dP, V	Q Bi	N/A N/A	
BA-A	Boric Acid Transfer	5379-685 (3)	B-6	A	C-H	Fixed	Grp. A - Q, dP, V Comp. - Q, dP, V	Q Bi	N/A N/A	
BA-B	Boric Acid Transfer	5379-685 (3)	B-5	A	C-H	Fixed	Grp. A - Q, dP, V Comp. - Q, dP, V	Q Bi	N/A N/A	
CCW-A	Component Cooling Water	5379-376 (1)	D-7	A	C-H	Fixed	Grp. A - Q, dP, V Comp. - Q, dP, V	Q Bi	N/A N/A	
CCW-B	Component Cooling Water	5379-376 (1)	C-7	A	C-H	Fixed	Grp. A - Q, dP, V Comp. - Q, dP, V	Q Bi	N/A N/A	
CCW-C	Component Cooling Water	5379-376 (1)	A-7	A	C-H	Fixed	Grp. A - Q, dP, V Comp. - Q, dP, V	Q Bi	N/A N/A	
CS-A	Containment Spray	5379-1082 (3)	C-3	B	C-H	Fixed	Grp. B - Q, dP, V Comp. - Q, dP, V	Q Bi	IST-RR-3 IST-RR-3	Vibration will be measured quarterly
CS-B	Containment Spray	5379-1082 (3)	E-3	B	C-H	Fixed	Grp. B - Q, dP, V Comp. - Q, dP, V	Q Bi	IST-RR-3 IST-RR-3	Vibration will be measured quarterly
CVC-A	CVCS Charging Pump	5379-685 (2)	B-7	A	PD	Vari	Grp. A - N, Q, P, V Comp. - N, Q, P, V	Q Bi	N/A N/A	
CVC-B	CVCS Charging Pump	5379-685 (2)	C-7	A	PD	Vari	Grp. A - N, Q, P, V Comp. - N, Q, P, V	Q Bi	N/A N/A	
CVC-C	CVCS Charging Pump	5379-685 (2)	C-7	A	PD	Vari	Grp. A - N, Q, P, V Comp. - N, Q, P, V	Q Bi	N/A N/A	
DF-A	Diesel Fuel Oil Transfer	G-190204D (2)	D-7	A	PD	Fixed	Aug. - Q, P, V	Q	N/A	Augmented
DF-B	Diesel Fuel Oil Transfer	G-190204D (2)	D-8	A	PD	Fixed	Aug. - Q, P, V	Q	N/A	Augmented

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6.3 Pump Table

Pump	Description	P&ID (SHT)	Coord	Pump Group	Pump Type	Speed	Test Type	Test Freq	Relief Request	Remarks
RHR-A	Residual Heat Removal	5379-1484 (1)	D-4	A	C-V	Fixed	Grp. A - Q, dP, V Comp. - Q, dP, V	Q Bi	N/A N/A	
RHR-B	Residual Heat Removal	5379-1484 (1)	F-4	A	C-V	Fixed	Grp. A - Q, dP, V Comp. - Q, dP, V	Q Bi	N/A N/A	
SI-A	Safety Injection	5379-1082 (2)	C-6	B	C-H	Fixed	Grp. B - Q, dP Comp. - Q, dP, V	Q Bi	N/A N/A	
SI-B	Safety Injection	5379-1082 (2)	E-6	B	C-H	Fixed	Grp. B - Q, dP Comp. - Q, dP, V	Q Bi	N/A N/A	Normally in standby as a maintenance pump
SI-C	Safety Injection	5379-1082 (2)	F-6	B	C-H	Fixed	Grp. B - Q, dP Comp. - Q, dP, V	Q Bi	N/A N/A	
SW-A	Service Water	G-190199 (2)	B-7	A	VLS	Fixed	Grp. A - Q, dP, V Comp. - Q, dP, V	Q Bi	N/A N/A	
SW-B	Service Water	G-190199 (2)	B-7	A	VLS	Fixed	Grp. A - Q, dP, V Comp. - Q, dP, V	Q Bi	N/A N/A	
SW-C	Service Water	G-190199 (2)	B-6	A	VLS	Fixed	Grp. A - Q, dP, V Comp. - Q, dP, V	Q Bi	N/A N/A	
SW-D	Service Water	G-190199 (2)	B-6	A	VLS	Fixed	Grp. A - Q, dP, V Comp. - Q, dP, V	Q Bi	IST-RR-3 N/A	
SWBP-A	Service Water Booster	G-190199 (7)	E-6	A	C-H	Fixed	Grp. A - Q, dP, V Comp. - Q, dP, V	Q Bi	N/A N/A	
SWBP-B	Service Water Booster	G-190199 (7)	F-6	A	C-H	Fixed	Grp. A - Q, dP, V Comp. - Q, dP, V	Q Bi	N/A N/A	

7.0 VALVES

7.1 Scope

Valves included in the IST Program Plan are those active or passive Safety Class 1, 2, and 3 valves that are required to perform a specific function in:

1. Shutting down the reactor to the safe shutdown condition, or
2. Maintaining the reactor in the safe shutdown condition, or
3. Mitigating the consequences of an accident.

Pressure relief devices included in the IST Program Plan are those Safety Class 1, 2, and 3 pressure relief devices for protecting systems or portion of systems that perform a specific function in:

1. Shutting down the reactor to the cold shutdown condition, or
2. Maintaining the reactor in the cold shutdown condition, or
3. Mitigating the consequences of an accident.

The following are excluded from above, provided that they are not required to perform a specific function as specified above:

1. Valves used only for operating convenience such as vent, drain, instrument, and test valves.
2. Valves used only for system control, such as pressure regulating valves.
3. Valves used only for system or component maintenance.
4. External control and protection systems responsible for sensing plant conditions and providing signals for valve operation.
5. Skid-mounted valves and component subassemblies that are tested as part of the major component.

Valves (except vent and drain valves) that are excluded from the IST Program Plan are listed in Section 7.4.

7.2 Valve Table Format

A complete list of valves in the scope of the IST Program Plan is provided on the following pages in a tabular format. The Valve Table is sorted alpha-numerically by valve number. A description of each column in the Valve Table is shown below with applicable abbreviations.

Valve Number	Unique alpha-numeric designator assigned to each valve. The valve number used in the Valve Table is taken from the P&IDs listed in Section 2.5.
P&ID (SHT)	P&ID in which the valve is located. A complete list of P&IDs is provided in Section 2.5.
Coord	Drawing coordinate of valve location on the P&ID.
Cat	Category as defined in OM Code, Subsection ISTC 1.4. A Valves for which seat leakage is limited to a specific amount in the closed position for fulfillment of their required function(s). A/C Valves which are both self actuating and for which seat leakage is limited to a specific amount in the closed position for fulfillment of their required function(s). B Valves for which seat leakage in the closed position is inconsequential for fulfillment of the required function(s). C Valves which are self-actuating in response to some system characteristic, such as pressure (relief valves) or flow direction (check valves) for fulfillment of the required function(s). D Valves which are actuated by an energy source capable of only one operation such as rupture disks or explosively actuated valves. (Note: There are not any Cat. D components at RNP.)
Act Pass	Identifies whether the valve performs an active or passive safety function as defined by OM Code, Subsection ISTC 1.3 Act Active valve Pass Passive valve
Size	Valve size, in inches.

7.2 Valve Table Format (Continued)

Valve Type	Valve design body style. BL Ball valve BF Butterfly valve CK Check valve DA Diaphragm valve GA Gate valve GL Globe valve ND Needle valve SCK Stop check valve RV Relief valve TW Three-way valve VB Vacuum breaker
Act Type	Actuator type used to change valve obturator position. AO Air operator HYD Hydraulic operator M Manual operator MO Motor operator SA Self actuated SO Solenoid operator
Rap Act	Identifies if the valve is rapid acting. N No Y Yes
Norm Pos	Identifies the valve position during normal plant operation as defined by plant operating procedures. C Closed LC Locked Closed LO Locked Open O Open O/C Open and Closed

7.2 Valve Table Format (Continued)

Safe Pos	Identifies the valve position required for the valve to perform its safety function. C Closed O Open O/C Open and Closed
Fail Pos	Identifies the position of the valve on loss of actuator power. AI As-Is C Closed O Open N/A Not applicable. Valve does not have a fail position
App J Type C	Identifies if the valve is included in the 10CFR50 Appendix J, Type C testing program. N No Y Yes
Pos Ind	Identifies if the valve is equipped with remote position indication N No Y Yes
Test Type	Identifies the test requirements which apply to the valve as determined by OM Code Subsection ISTC. DA Valve will be disassembled and visually inspected in accordance with OM Code Subsection ISTC 4.5.4(c) as described in the applicable Refueling Outage Test Justification. CM Testing as required by the condition monitoring program in accordance with OM Code Appendix II. CV Closure verification of a check valve to satisfy the bi-directional test requirement of OM Code Subsection ISTC 4.5.2(a). FC Fail stroke closed exercise valve with a fail-safe actuator to the closed position in accordance with OM Code Subsection ISTC 4.2.6. FF Full stroke open exercise of Category C valves in accordance with OM Code Subsection ISTC 4.5.4(a). FO Fail stroke open exercise valve with a fail-safe actuator to the open position in accordance with OM Code Subsection ISTC 4.2.6. FS Full stroke exercise Category A or B valves to the open and closed position in accordance with OM Code Subsection ISTC 4.2.2.

7.2 Valve Table Format (Continued)

- FV** Functional verification of component operation (this is an Augmented test which does not satisfy OM Code requirements).
- LJ** Leak test per 10CFR50 Appendix J, Type C, in accordance with OM Code Subsection ISTC 4.3.2 (containment isolation function only).
- LK** Leak test per OM Code Subsection ISTC 4.3.3 (leakage rate for other than containment isolation valves).
- OV** Open verification of a check valve to satisfy the bi-directional test requirement of OM Code Subsection ISTC 4.5.2(a).
- PI** Valve with remote position indication verified in accordance with OM Code Subsection ISTC 4.1.
- RF** Full stroke close exercise of Category C valves in accordance with OM Code Subsection ISTC 4.5.4(a).
- RL** Relief valve testing in accordance with OM Code Appendix I.
- TM** Stroke time valve open (O), closed (C), or open and close (O/C) in accordance with OM Code Subsection ISTC 4.2.4.

Test Freq

Identifies the frequency required for valve testing as determined by OM Code.

App. I Test frequency in accordance with OM Code Appendix I.

App. II Test frequency as required by the condition monitoring program in accordance with OM Code Appendix II.

App. J Test frequency in accordance with the 10CFR50 Appendix J program for Type C testing.

Bi Biennial, Once per 731 days (2 years).

CS Cold Shutdown, Testing performed during the cold shutdown condition (if not performed during the previous 92 days) in accordance with OM Code Subsections 4.2.2 and 4.5.2. If required, testing may be performed during the transition period between normal operation and cold shutdown.

Q Quarterly, Once per 92 days.

R Refueling Outage, Testing performed during the refueling outage condition in accordance with OM Code Subsections 4.2.2 and 4.5.2. If required, testing may be performed during the transition period between normal operation and refueling.

Test Deferral

This field identifies, by unique number, applicable relief request (RR), cold shutdown test justification (VCS) and refueling outage test justification (VRS) for the individual component or test. These documents are located in Sections 4.2, 5.2, and 5.3 respectively.

Remarks

Applicable notes or other unique comments that provide clarification.

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7.3 Valve Table

Valve Number	P&ID (SHT)	Coord	Cat	Act Pass	Size	Valve Type	Act Type	Rap Act	Norm Pos	Safe Pos	Fail Pos	App J Type	Pos C Ind	Test Type	Test Freq	Test Deferral	Remarks
A Turbo Charger Inlet	G-190204A (1)	C-6	C	Act	20	CK	SA	N/A	C	O/C	N/A	N	N	FF RF	Q Q	N/A N/A	AUG Skid mounted
AFW-1	G-190197 (1)	B-7	B	Act	6	GA	M	N/A	LO	O/C	N/A	N	N	FS	Bi	IST-RR-4	
AFW-104	G-190197 (1)	B-7	B	Act	6	GA	M	N/A	LO	O/C	N/A	N	N	FS	Bi	IST-RR-4	
AFW-105	G-190197 (4)	C-3	C	Act	6	CK	SA	N/A	C	O/C	N/A	N	N	FF RF	CS CS	FW-VCS-2 FW-VCS-2	
AFW-13	G-190197 (4)	D-2	C	Act	1	RV	SA	N/A	C	O	N/A	N	N	RL	App. I	IST-RR-5	
AFW-24	G-190197 (4)	B-2	B	Act	6	GA	M	N/A	LC	O	N/A	N	N	FS	Bi	IST-RR-4	
AFW-32	G-190197 (4)	C-3	C	Act	1	RV	SA	N/A	C	O	N/A	N	N	RL	App. I	IST-RR-5	
AFW-33	G-190197 (4)	B-3	C	Act	1	RV	SA	N/A	C	O	N/A	N	N	RL	App. I	IST-RR-5	
AFW-40	G-190197 (4)	C-4	C	Act	4	CK	SA	N/A	C	O/C	N/A	N	N	FF RF	CS CS	FW-VCS-3 FW-VCS-3	
AFW-41	G-190197 (4)	B-4	C	Act	4	CK	SA	N/A	C	O/C	N/A	N	N	FF RF	CS CS	FW-VCS-3 FW-VCS-3	
AFW-68	G-190197 (4)	B-6	C	Act	4	CK	SA	N/A	C	O/C	N/A	N	N	FF RF	CS CS	FW-VCS-4 FW-VCS-4	
AFW-69	G-190197 (4)	C-6	C	Act	4	CK	SA	N/A	C	O/C	N/A	N	N	FF RF	CS CS	FW-VCS-4 FW-VCS-4	
AFW-70	G-190197 (4)	B-6	C	Act	4	CK	SA	N/A	C	O/C	N/A	N	N	FF RF	CS CS	FW-VCS-4 FW-VCS-4	
AFW-79	G-190197 (4)	D-2	C	Act	1	RV	SA	N/A	C	O	N/A	N	N	RL	App. I	IST-RR-5	
AFW-8	G-190197 (4)	D-2	C	Act	1	RV	SA	N/A	C	O	N/A	N	N	RL	App. I	IST-RR-5	
AFW-84	G-190197 (4)	D-4	C	Act	6	CK	SA	N/A	C	O/C	N/A	N	N	FF RF	CS CS	FW-VCS-4 FW-VCS-4	
AFW-9	G-190197 (4)	C-2	C	Act	2	CK	SA	N/A	C	C	N/A	N	N	CM	App. II	N/A	

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7.3 Valve Table

Valve Number	P&ID (SHT)	Coord	Cat	Act Pass	Size	Valve Type	Act Type	Rap Act	Norm Pos	Safe Pos	Fail Pos	App J Type	Pos C Ind	Test Type	Test Freq	Test Deferral	Remarks
AFW-9A	G-190197 (4)	D-4	C	Act	2	CK	SA	N/A	C	O/C	N/A	N	N	FF RF	CS CS	FW-VCS-5 FW-VCS-5	
AFW-V2-14A	G-190197 (4)	G-4	B	Act	4	GA	MO	N	C	O/C	AI	N	Y	FS PI TM (O/C)	Q Bi Q	N/A N/A N/A	
AFW-V2-14B	G-190197 (4)	F-4	B	Act	4	GA	MO	N	C	O/C	AI	N	Y	FS PI TM (O/C)	Q Bi Q	N/A N/A N/A	
AFW-V2-14C	G-190197 (4)	E-4	B	Act	4	GA	MO	N	C	O/C	AI	N	Y	FS PI TM (O/C)	Q Bi Q	N/A N/A N/A	
AFW-V2-16A	G-190197 (4)	B-5	B	Act	4	GA	MO	N	C	O/C	AI	N	Y	FS PI TM (O/C)	Q Bi Q	N/A N/A N/A	
AFW-V2-16B	G-190197 (4)	C-5	B	Act	4	GA	MO	N	C	O/C	AI	N	Y	FS PI TM (O/C)	Q Bi Q	N/A N/A N/A	
AFW-V2-16C	G-190197 (4)	B-5	B	Act	4	GA	MO	N	C	O/C	AI	N	Y	FS PI TM (O/C)	Q Bi Q	N/A N/A N/A	
AFW-V2-20A	G-190197 (4)	C-5	B	Act	4	GA	MO	N	O	C	AI	N	Y	FS PI TM (C)	Q Bi Q	N/A N/A N/A	
AFW-V2-20B	G-190197 (4)	B-5	B	Act	4	GA	MO	N	O	C	AI	N	Y	FS PI TM (C)	Q Bi Q	N/A N/A N/A	
B Turbo Charger Inlet	G-190204A (1)	F-6	C	Act	20	CK	SA	N/A	C	O/C	N/A	N	N	FF RF	Q Q	N/A N/A	AUG Skid mounted

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7.3 Valve Table

Valve Number	P&ID (SHT)	Coord	Cat	Act Pass	Size	Valve Type	Act Type	Rap Act	Norm Pos	Safe Pos	Fail Pos	App J Type	Pos C Ind	Test Type	Test Freq	Test Deferral	Remarks
C-411	G-190197 (1)	B-7	B	Act	6	GA	M	N/A	O	C	N/A	N	N	FS	Bi	N/A	AUG
CC-702A	5379-376 (1)	D-6	C	Act	16	CK	SA	N/A	O/C	O/C	N/A	N	N	FF RF	Q Q	N/A N/A	
CC-702B	5379-376 (1)	C-6	C	Act	16	CK	SA	N/A	O/C	O/C	N/A	N	N	FF RF	Q Q	N/A N/A	
CC-702C	5379-376 (1)	B-6	C	Act	16	CK	SA	N/A	O/C	O/C	N/A	N	N	FF RF	Q Q	N/A N/A	
CC-707	5379-376 (1)	G-7	C	Act	3	RV	SA	N/A	C	O	N/A	N	N	RL	App. I	IST-RR-5	
CC-715	5379-376 (3)	B-2	C	Act	3	RV	SA	N/A	C	O/C	N/A	N	N	RL	App. I	IST-RR-5	
CC-716A	5379-376 (3)	D-8	B	Act	6	GA	MO	N	O	C	AI	N	Y	FS PI TM (C)	CS Bi CS	CC-VCS-1 N/A CC-VCS-1	
CC-716B	5379-376 (3)	D-8	A	Act	6	GA	MO	N	O	C	AI	Y	Y	FS LJ PI TM (C)	CS App. J Bi CS	CC-VCS-1 N/A N/A CC-VCS-1	
CC-721A	5379-376 (3)	C-6	C	Act	1.5	CK	SA	N/A	O	C	N/A	N	N	CM	App. II	N/A	
CC-721B	5379-376 (3)	F-6	C	Act	1.5	CK	SA	N/A	O	C	N/A	N	N	CM	App. II	N/A	
CC-721C	5379-376 (3)	D-6	C	Act	1.5	CK	SA	N/A	O	C	N/A	N	N	CM	App. II	N/A	
CC-722A	5379-376 (3)	B-5	C	Act	0.75	RV	SA	N/A	C	O/C	N/A	N	N	RL	App. I	IST-RR-5	
CC-722B	5379-376 (3)	E-5	C	Act	0.75	RV	SA	N/A	C	O/C	N/A	N	N	RL	App. I	IST-RR-5	
CC-722C	5379-376 (3)	D-5	C	Act	0.75	RV	SA	N/A	C	O/C	N/A	N	N	RL	App. I	IST-RR-5	
CC-729	5379-376 (3)	F-2	C	Act	3	RV	SA	N/A	C	O/C	N/A	N	N	RL	App. I	IST-RR-5	
CC-730	5379-376 (3)	F-1	A	Act	6	GL	MO	N	O	C	AI	Y	Y	FS LJ PI TM (C)	CS App. J Bi CS	CC-VCS-2 N/A N/A CC-VCS-2	

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7.3 Valve Table

Valve Number	P&ID (SHT)	Coord	Cat	Act Pass	Size	Valve Type	Act Type	Rap Act	Norm Pos	Safe Pos	Fail Pos	App J Type C	Pos Ind	Test Type	Test Freq	Test Deferral	Remarks
CC-731	5379-376 (2)	C-6	C	Act	6	CK	SA	N/A	O	C	N/A	N	N	DA	R	CC-VRS-1	
CC-735	5379-376 (2)	C-5	A	Act	3	GA	MO	N	O	C	AI	Y	Y	FS LJ PI TM (C)	CS App. J Bi CS	CC-VCS-3 N/A N/A CC-VCS-3	
CC-737A	5379-376 (3)	B-8	B	Act	3	GA	M	N/A	O	C	N/A	N	N	FS	Bi	IST-RR-4	
CC-738	5379-376 (3)	B-7	C	Act	3	CK	SA	N/A	O	C	N/A	N	N	CM	App. II	N/A	
CC-739	5379-376 (3)	B-1	B	Act	3	GA	AO	Y	O	C	C	N	Y	FC FS PI TM (C)	Q Q Bi Q	N/A N/A N/A IST-RR-6	
CC-749A	5379-376 (2)	E-7	B	Act	16	GA	MO	N	C	O	AI	N	Y	FS PI TM (O)	Q Bi Q	N/A N/A N/A	
CC-749B	5379-376 (2)	E-5	B	Act	16	GA	MO	N	C	O	AI	N	Y	FS PI TM (O)	Q Bi Q	N/A N/A N/A	
CC-791B	5379-376 (2)	B-3	C	Act	0.75	RV	SA	N/A	C	O	N/A	N	N	RL	App. I	IST-RR-5	
CC-791D	5379-376 (4)	B-4	C	Act	0.75	RV	SA	N/A	C	O	N/A	N	N	RL	App. I	IST-RR-5	
CC-791E	5379-376 (2)	C-3	C	Act	0.75	RV	SA	N/A	C	O	N/A	N	N	RL	App. I	IST-RR-5	
CC-791J	5379-376 (4)	G-6	C	Act	0.75	RV	SA	N/A	C	O	N/A	N	N	RL	App. I	IST-RR-5	
CC-791K	5379-376 (4)	F-6	C	Act	0.75	RV	SA	N/A	C	O	N/A	N	N	RL	App. I	IST-RR-5	
CC-791L	5379-376 (4)	C-4	C	Act	0.75	RV	SA	N/A	C	O	N/A	N	N	RL	App. I	IST-RR-5	
CC-832	5379-376 (1)	F-8	B	Pass	3	GL	MO	N	C	C	AI	N	Y	PI	Bi	N/A	
CC-926	5379-376 (4)	F-4	C	Act	0.75	CK	SA	N/A	O	O/C	N/A	N	N	CM	App. II	N/A	
CC-927	5379-376 (4)	C-2	B	Act	1	GL	M	N/A	O	O/C	N/A	N	N	FS	Bi	IST-RR-4	

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7.3 Valve Table

Valve Number	P&ID (SHT)	Coord	Cat	Act Pass	Size	Valve Type	Act Type	Rap Act	Norm Pos	Safe Pos	Fail Pos	App J Type C	Pos Ind	Test Type	Test Freq	Test Deferral	Remarks
CC-928	5379-376 (4)	C-2	B	Act	1	GL	M	N/A	O	O/C	N/A	N	N	FS	Bi	IST-RR-4	
CC-931	5379-376 (4)	E-4	C	Act	0.75	CK	SA	N/A	O	O/C	N/A	N	N	CM	App. II	N/A	
CCW Tank V.B.	5379-376 (1)	G-8	C	Act	1	VB	SA	N/A	C	O	N/A	N	N	RL	App. I	IST-RR-5	
CVC-1118A	5379-686 (1)	G-6	C	Act	2	RV	SA	N/A	C	O	N/A	N	N	RL	App. I	N/A	AUG
CVC-1118B	5379-686 (1)	E-6	C	Act	2	RV	SA	N/A	C	O	N/A	N	N	RL	App. I	N/A	AUG
CVC-1118C	5379-686 (1)	C-6	C	Act	2	RV	SA	N/A	C	O	N/A	N	N	RL	App. I	N/A	AUG
CVC-200A	5379-685 (1)	F-6	B	Act	2	GL	AO	Y	O/C	C	C	N	Y	FC FS PI TM (C)	CS CS Bi CS	CVC-VCS-6 CVC-VCS-6 N/A CVC-VCS-6 IST-RR-6	
CVC-200B	5379-685 (1)	G-6	B	Act	2	GL	AO	Y	O/C	C	C	N	Y	FC FS PI TM (C)	CS CS Bi CS	CVC-VCS-6 CVC-VCS-6 N/A CVC-VCS-6 IST-RR-6	
CVC-200C	5379-685 (1)	G-6	B	Act	2	GL	AO	Y	O/C	C	C	N	Y	FC FS PI TM (C)	CS CS Bi CS	CVC-VCS-6 CVC-VCS-6 N/A CVC-VCS-6 IST-RR-6	
CVC-202A	5379-685 (1)	F-4	A	Act	3	GA	M	N/A	O	C	N/A	Y	N	FS LJ	Bi App. J	IST-RR-4 N/A	
CVC-203A	5379-685 (1)	G-5	C	Act	1	RV	SA	N/A	C	O	N/A	N	N	RL	App. I	IST-RR-5	
CVC-203B	5379-685 (1)	G-5	C	Act	2	RV	SA	N/A	C	O	N/A	N	N	RL	App. I	IST-RR-5	

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7.3 Valve Table

Valve Number	P&ID (SHT)	Coord	Cat	Act Pass	Size	Valve Type	Act Type	Rap Act	Norm Pos	Safe Pos	Fail Pos	App J Type	Pos C Ind	Test Type	Test Freq	Test Deferral	Remarks
CVC-204A	5379-685 (1)	G-4	A	Act	2	GL	AO	N	O	C	C	Y	Y	FC	CS	CVC-VCS-1	
														FS	CS	CVC-VCS-1	
														LJ	App. J	N/A	
														PI	Bi	N/A	
														TM (C)	CS	CVC-VCS-1	
CVC-204B	5379-685 (1)	G-4	A	Act	2	GL	AO	N	O	C	C	Y	Y	FC	CS	CVC-VCS-1	
														FS	CS	CVC-VCS-1	
														LJ	App. J	N/A	
														PI	Bi	N/A	
														TM (C)	CS	CVC-VCS-1	
CVC-2080	5379-685 (2)	B-5	C	Act	0.75	RV	SA	N/A	C	O	N/A	N	N	RL	App. I	IST-RR-5	
CVC-2081	5379-685 (2)	C-5	C	Act	0.75	RV	SA	N/A	C	O	N/A	N	N	RL	App. I	IST-RR-5	
CVC-2082	5379-685 (2)	D-6	C	Act	0.75	RV	SA	N/A	C	O	N/A	N	N	RL	App. I	IST-RR-5	
CVC-209	5379-685 (2)	G-4	C	Act	2	RV	SA	N/A	C	O	N/A	N	N	RL	App. I	IST-RR-5	
CVC-239A	5379-685 (2)	F-4	C	Act	2	CK	SA	N/A	O	C	N/A	N	N	OV	R	CVC-VRS-4	
														RF	R	CVC-VRS-4	
CVC-256	5379-685 (2)	F-7	B	Act	0.375	GL	SO	N	O	C	C	N	N	FC	Q	N/A	
														FS	Q	N/A	
														TM	Q	N/A	
CVC-257	5379-685 (2)	F-5	C	Act	2	RV	SA	N/A	C	O/C	N/A	N	N	RL	App. I	IST-RR-5	
CVC-258	5379-685 (2)	F-7	B	Act	0.375	GL	SO	N	C	C	C	N	Y	FC	Q	N/A	
														FS	Q	N/A	
														PI	Bi	N/A	
														TM	Q	N/A	
CVC-263	5379-685 (2)	E-5	C	Act	1	CK	SA	N/A	O/C	C	N/A	N	N	OV	R	CVC-VRS-5	
														RF	R	CVC-VRS-5	
CVC-266	5379-685 (2)	D-5	C	Act	4	CK	SA	N/A	O	C	N/A	N	N	OV	CS	CVC-VCS-2	
														RF	CS	CVC-VCS-2	

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7.3 Valve Table

Valve Number	P&ID (SHT)	Coord	Cat	Act Pass	Size	Valve Type	Act Type	Rap Act	Norm Pos	Safe Pos	Fail Pos	App J Type	Pos C Ind	Test Type	Test Freq	Test Deferral	Remarks
CVC-282	5379-685 (1)	F-4	A	Act	3	GL	M	N/A	O	C	N/A	Y	N	FS LJ	Bi App. J	IST-RR-4 N/A	
CVC-283A	5379-685 (2)	D-7	C	Act	0.75	RV	SA	N/A	C	O	N/A	N	N	RL	App. I	IST-RR-5	
CVC-283B	5379-685 (2)	C-7	C	Act	0.75	RV	SA	N/A	C	O	N/A	N	N	RL	App. I	IST-RR-5	
CVC-283C	5379-685 (2)	B-7	C	Act	0.75	RV	SA	N/A	C	O	N/A	N	N	RL	App. I	IST-RR-5	
CVC-292A	5379-685 (1)	A-2	B	Act	0.75	GL	M	N/A	O	C	N/A	N	N	FS	Bi	IST-RR-4	
CVC-293A	5379-685 (1)	C-3	A	Act	2	GL	M	N/A	O/C	C	N/A	Y	N	FS LJ	Bi App. J	IST-RR-4 N/A	
CVC-293C	5379-685 (1)	B-3	A	Act	2	GL	M	N/A	O/C	C	N/A	Y	N	FS LJ	Bi App. J	IST-RR-4 N/A	
CVC-295	5379-685 (1)	A-2	A	Pass	3	GA	M	N/A	C	C	N/A	Y	N	LJ	App. J	N/A	
CVC-295A	5379-685 (1)	A-3	A	Pass	0.75	GL	M	N/A	LC	C	N/A	Y	N	LJ	App. J	N/A	
CVC-297A	5379-685 (1)	B-8	A	Act	1	ND	M	N/A	O	O/C	N/A	Y	N	FS LJ	Bi App. J	IST-RR-4 N/A	
CVC-297B	5379-685 (1)	B-6	A	Act	1	ND	M	N/A	O	O/C	N/A	Y	N	FS LJ	Bi App. J	IST-RR-4 N/A	
CVC-297C	5379-685 (1)	B-5	A	Act	1	ND	M	N/A	O	O/C	N/A	Y	N	FS LJ	Bi App. J	IST-RR-4 N/A	
CVC-298A	5379-685 (1)	C-8	C	Act	2	CK	SA	N/A	O	O/C	N/A	N	N	FF RF	R R	CVC-VRS-1 CVC-VRS-1	
CVC-298B	5379-685 (1)	C-6	C	Act	2	CK	SA	N/A	O	O/C	N/A	N	N	FF RF	R R	CVC-VRS-1 CVC-VRS-1	
CVC-298C	5379-685 (1)	C-5	C	Act	2	CK	SA	N/A	O	O/C	N/A	N	N	FF RF	R R	CVC-VRS-1 CVC-VRS-1	
CVC-298D	5379-685 (1)	B-8	C	Act	2	CK	SA	N/A	O	O/C	N/A	N	N	FF RF	R R	CVC-VRS-1 CVC-VRS-1	

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7.3 Valve Table

Valve Number	P&ID (SHT)	Coord	Cat	Act Pass	Size	Valve Type	Act Type	Rap Act	Norm Pos	Safe Pos	Fail Pos	App J Type	Pos C Ind	Test Type	Test Freq	Test Deferral	Remarks
CVC-298E	5379-685 (1)	B-6	C	Act	2	CK	SA	N/A	O	O/C	N/A	N	N	FF RF	R R	CVC-VRS-1 CVC-VRS-1	
CVC-298F	5379-685 (1)	B-5	C	Act	2	CK	SA	N/A	O	O/C	N/A	N	N	FF RF	R R	CVC-VRS-1 CVC-VRS-1	
CVC-309A	5379-685 (1)	F-3	A	Pass	2	GL	M	N/A	C	C	N/A	Y	N	LJ	App. J	N/A	
CVC-310A	5379-685 (1)	F-7	B	Act	3	GL	AO	Y	C	O	O	N	Y	FO FS PI TM (O)	CS CS Bi CS	CVC-VCS-4 CVC-VCS-4 N/A CVC-VCS-4 IST-RR-6	
CVC-310B	5379-685 (1)	F-7	B	Pass	3	GL	AO	N/A	O	O	O	N	Y	PI	Bi	N/A	
CVC-312A	5379-685 (1)	F-8	C	Act	3	CK	SA	N/A	C	O/C	N/A	N	N	FF RF	R R	CVC-VRS-3 CVC-VRS-3	
CVC-312B	5379-685 (1)	F-8	C	Act	3	CK	SA	N/A	O/C	O/C	N/A	N	N	FF RF	R R	CVC-VRS-3 CVC-VRS-3	
CVC-312C	5379-685 (1)	F-6	C	Act	3	CK	SA	N/A	O	O/C	N/A	N	N	FF RF	R R	CVC-VRS-3 CVC-VRS-3	
CVC-313	5379-685 (1)	F-8	C	Pass	2	CK	SA	N/A	C	C	N/A	N	N	OV RF	R R	CVC-VRS-3 CVC-VRS-3	
CVC-341	5379-685 (3)	C-5	B	Act	2	DA	M	N/A	O/C	O/C	N/A	N	N	FS	Bi	IST-RR-4	
CVC-342	5379-685 (3)	B-6	B	Act	2	DA	M	N/A	O/C	O/C	N/A	N	N	FS	Bi	IST-RR-4	
CVC-351	5379-685 (2)	B2	C	Act	2	CK	SA	N/A	C	O	N/A	N	N	CV FF	R R	CVC-VRS-2 CVC-VRS-2	
CVC-357	5379-685 (2)	C-4	C	Act	4	CK	SA	N/A	C	O	N/A	N	N	CV FF	R R	CVC-VRS-2 CVC-VRS-2	
CVC-358	5379-685 (2)	C-5	B	Act	4	BF	M	N/A	C	O	N/A	N	N	FS	Bi	IST-RR-4	

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Valve Number	P&ID (SHT)	Coord	Cat	Act Pass	Size	Valve Type	Act Type	Rap Act	Norm Pos	Safe Pos	Fail Pos	App J Type	Pos C Ind	Test Type	Test Freq	Test Deferral	Remarks
CVC-381	5379-685 (1)	E-2	A	Act	3	GA	MO	N	O	C	AI	Y	Y	FS LJ PI TM (C)	CS App. J Bi CS	CVC-VCS-3 N/A N/A CVC-VCS-3	
CVC-382	5379-685 (1)	E-3	C	Act	2	RV	SA	N/A	C	O	N/A	N	N	RL	App. I	IST-RR-5	
CVC-387	5379-685 (1)	E-7	B	Act	0.75	GL	AO	Y	O/C	C	C	N	Y	FC FS PI TM (C)	CS CS Bi CS	CVC-VCS-5 CVC-VCS-5 N/A CVC-VCS-5 IST-RR-6	
CVC-397A	5379-685 (3)	B-5	C	Act	2	CK	SA	N/A	C	O	N/A	N	N	CV FF	Q Q	N/A N/A	
CVC-397B	5379-685 (3)	B-5	C	Act	2	CK	SA	N/A	C	O	N/A	N	N	CV FF	Q Q	N/A N/A	
DA-11A	G-190204A (1)	B-4	C	Act	0.5	RV	SA	N/A	C	O	N/A	N	N	RL	App. I	N/A	AUG
DA-11B	G-190204A (1)	E-4	C	Act	0.5	RV	SA	N/A	C	O	N/A	N	N	RL	App. I	N/A	AUG
DA-19A	G-190204A (1)	B-6	B	Act	1.5	TW	SO	N/A	C	O	O	N	N	FO FS	Q Q	N/A N/A	AUG Skid mounted
DA-19B	G-190204A (1)	E-6	B	Act	1.5	TW	SO	N/A	C	O	O	N	N	FO FS	Q Q	N/A N/A	AUG Skid mounted
DA-20A	G-190204A (1)	B-6	C	Act	1.5	CK	SA	N/A	C	O	N/A	N	N	FF	Q	N/A	AUG Skid mounted
DA-20B	G-190204A (1)	E-6	C	Act	1.5	CK	SA	N/A	C	O	N/A	N	N	FF	Q	N/A	AUG Skid mounted
DA-23A	G-190204A (1)	B-6	B	Act	1.5	TW	SO	N/A	C	O	O	N	N	FO FS	Q Q	N/A N/A	AUG Skid mounted
DA-23B	G-190204A (1)	E-6	B	Act	1.5	TW	SO	N/A	C	O	O	N	N	FO FS	Q Q	N/A N/A	AUG Skid mounted

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7.3 Valve Table

Valve Number	P&ID (SHT)	Coord	Cat	Act Pass	Size	Valve Type	Act Type	Rap Act	Norm Pos	Safe Pos	Fail Pos	App J Type C	Pos Ind	Test Type	Test Freq	Test Deferral	Remarks
DA-24A	G-190204A (1)	B-6	C	Act	1.5	CK	SA	N/A	C	O	N/A	N	N	FF	Q	N/A	AUG Skid mounted
DA-24B	G-190204A (1)	E-6	C	Act	1.5	CK	SA	N/A	C	O	N/A	N	N	FF	Q	N/A	AUG Skid mounted
DA-28	G-190204A (1)	D-4	B	Act	2	GL	M	N/A	C	O/C	N/A	N	N	FS	Bi	N/A	AUG
DA-33A	G-190204A (1)	C-4	C	Act	0.75	CK	SA	N/A	O/C	C	N/A	N	N	RF	Q	N/A	AUG DA-9A and DA-33A are tested as a unit
DA-33B	G-190204A (1)	E-4	C	Act	0.75	CK	SA	N/A	O/C	C	N/A	N	N	RF	Q	N/A	AUG DA-9B and DA-33B are tested as a unit
DA-9A	G-190204A (1)	B-4	C	Act	0.75	CK	SA	N/A	O/C	C	N/A	N	N	RF	Q	N/A	AUG DA-9A and DA-33A are tested as a unit
DA-9B	G-190204A (1)	E-4	C	Act	0.75	CK	SA	N/A	O/C	C	N/A	N	N	RF	Q	N/A	AUG DA-9B and DA-33B are tested as a unit
DG-20A	G-190204A (2)	E-5	C	Act	1.5	CK	SA	N/A	C	C	N/A	N	N	RF	Q	N/A	AUG Skid mounted
DG-20B	G-190204A (3)	E-5	C	Act	1.5	CK	SA	N/A	C	C	N/A	N	N	RF	Q	N/A	AUG Skid mounted
DG-24A	G-190204A (2)	B-5	C	Act	4	CK	SA	N/A	C	O/C	N/A	N	N	FF RF	Q Q	N/A N/A	AUG Skid mounted
DG-24B	G-190204A (3)	B-5	C	Act	4	CK	SA	N/A	C	O/C	N/A	N	N	FF RF	Q Q	N/A N/A	AUG Skid mounted
DG-32A	G-190204A (2)	E-4	C	Act	1	RV	SA	N	C	O/C	N/A	N	N	FV	Q	N/A	AUG Skid mounted

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7.3 Valve Table

Valve Number	P&ID (SHT)	Coord	Cat	Act Pass	Size	Valve Type	Act Type	Rap Act	Norm Pos	Safe Pos	Fail Pos	App J Type	Pos C Ind	Test Type	Test Freq	Test Deferral	Remarks
DG-32B	G-190204A (3)	E-4	C	Act	1	RV	SA	N	C	O/C	N/A	N	N	FV	Q	N/A	AUG Skid mounted
DG-45A	G-190204A (2)	D-6	C	Act	0.75	CK	SA	N/A	C	O/C	N/A	N	N	FF RF	Q Q	N/A N/A	AUG Skid mounted
DG-45B	G-190204A (3)	D-6	C	Act	0.75	CK	SA	N/A	C	O/C	N/A	N	N	FF RF	Q Q	N/A N/A	AUG Skid mounted
DG-46A	G-190204A (2)	E-4	C	Act	0.5	RV	SA	N	C	O/C	N/A	N	N	FV	Q	N/A	AUG Skid mounted
DG-46B	G-190204A (3)	D-6	C	Act	0.5	RV	SA	N	C	O/C	N/A	N	N	FV	Q	N/A	AUG Skid mounted
DG-4A	G-190204A (2)	F-2	C	Act	5	CK	SA	N/A	C	O/C	N/A	N	N	FF RF	Q Q	N/A N/A	AUG Skid mounted
DG-4B	G-190204A (3)	F-2	C	Act	5	CK	SA	N/A	C	O/C	N/A	N	N	FF RF	Q Q	N/A N/A	AUG Skid mounted
DG-5A	G-190204A (2)	F-2	C	Act	5	CK	SA	N/A	C	O	N/A	N	N	FF	Q	N/A	AUG Skid mounted
DG-5B	G-190204A (3)	F-2	C	Act	5	CK	SA	N/A	C	O	N/A	N	N	FF	Q	N/A	AUG Skid mounted
DW-19	G-190202 (3)	H-3	B	Act	6	GA	M	N/A	LC	O	N/A	N	N	FS	Bi	N/A	AUG
DW-21	G-190202 (3)	H-3	B	Act	6	GA	M	N/A	LC	O	N/A	N	N	FS	Bi	IST-RR-4	
EV-1963A-1	G-190204D (2)	C-5	B	Act	1	GL	SO	Y	C	O	C	N	N	FC FS TM (O)	Q Q Q	N/A N/A N/A	AUG
EV-1963A-2	G-190204D (2)	C-5	B	Act	1	GL	SO	Y	C	O	C	N	N	FC FS TM (O)	Q Q Q	N/A N/A N/A	AUG

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7.3 Valve Table

Valve Number	P&ID (SHT)	Coord	Cat	Act Pass	Size	Valve Type	Act Type	Rap Act	Norm Pos	Safe Pos	Fail Pos	App J Type C	Pos Ind	Test Type	Test Freq	Test Deferral	Remarks
EV-1963B-1	G-190204D (2)	B-5	B	Act	1	GL	SO	Y	C	O	C	N	N	FC	Q	N/A	AUG
														FS	Q	N/A	
														TM (O)	Q	N/A	
EV-1963B-2	G-190204D (2)	B-5	B	Act	1	GL	SO	Y	C	O	C	N	N	FC	Q	N/A	AUG
														FS	Q	N/A	
														TM (O)	Q	N/A	
FCV-113B	5379-685 (2)	D-4	B	Act	2	DA	AO	N	O/C	C	C	N	Y	FC	Q	N/A	
														FS	Q	N/A	
														PI	Bi	N/A	
														TM (C)	Q	N/A	
FCV-1424	G-190197 (4)	C-4	B	Act	4	GA	HYD	N	C	O	C	N	Y	FC	Q	N/A	
														FS	Q	N/A	
														PI	Bi	N/A	
														TM (O)	Q	N/A	
FCV-1425	G-190197 (4)	B-4	B	Act	4	GA	HYD	N	C	O	C	N	Y	FC	Q	N/A	
														FS	Q	N/A	
														PI	Bi	N/A	
														TM (O)	Q	N/A	
FCV-1608A	G-190199 (2)	E-7	B	Act	3	BL	AO	N	O/C	C	C	N	N	FC	Q	N/A	AUG
														FS	Q	N/A	
														TM (C)	Q	N/A	
FCV-1608B	G-190199 (2)	E-6	B	Act	3	BL	AO	N	O/C	C	C	N	N	FC	Q	N/A	AUG
														FS	Q	N/A	
														TM (C)	Q	N/A	
FCV-1625A	G-190199 (1)	B-2	B	Act	3	GA	SO	N	O/C	C	C	N	N	FC	Q	N/A	AUG
														FS	Q	N/A	
														TM (C)	Q	N/A	

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7.3 Valve Table

Valve Number	P&ID (SHT)	Coord	Cat	Act Pass	Size	Valve Type	Act Type	Rap Act	Norm Pos	Safe Pos	Fail Pos	App J Type	Pos C Ind	Test Type	Test Freq	Test Deferral	Remarks
FCV-1625B	G-190199 (1)	D-2	B	Act	3	GA	SO	N	O/C	C	C	N	N	FC	Q	N/A	AUG
														FS	Q	N/A	
														TM (C)	Q	N/A	
FCV-1625C	G-190199 (1)	F-2	B	Act	3	GA	SO	N	O/C	C	C	N	N	FC	Q	N/A	AUG
														FS	Q	N/A	
														TM (C)	Q	N/A	
FCV-1930A	G-190234 (1)	F-7	A	Act	3	GA	AO	N	O	C	C	Y	Y	FC	Q	N/A	
														FS	Q	N/A	
														LJ	App. J	N/A	
														PI	Bi	N/A	
														TM (C)	Q	N/A	
FCV-1930B	G-190234 (1)	F-7	A	Act	3	GA	AO	N	O	C	C	Y	Y	FC	Q	N/A	
														FS	Q	N/A	
														LJ	App. J	N/A	
														PI	Bi	N/A	
														TM (C)	Q	N/A	
FCV-1931A	G-190234 (1)	D-7	A	Act	3	GA	AO	N	O	C	C	Y	Y	FC	Q	N/A	
														FS	Q	N/A	
														LJ	App. J	N/A	
														PI	Bi	N/A	
														TM (C)	Q	N/A	
FCV-1931B	G-190234 (1)	D-7	A	Act	3	GA	AO	N	O	C	C	Y	Y	FC	Q	N/A	
														FS	Q	N/A	
														LJ	App. J	N/A	
														PI	Bi	N/A	
														TM (C)	Q	N/A	

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7.3 Valve Table

Valve Number	P&ID (SHT)	Coord	Cat	Act Pass	Size	Valve Type	Act Type	Rap Act	Norm Pos	Safe Pos	Fail Pos	App J Type	Pos C Ind	Test Type	Test Freq	Test Deferral	Remarks
FCV-1932A	G-190234 (1)	C-7	A	Act	3	GA	AO	N	O	C	C	Y	Y	FC	Q	N/A	
														FS	Q	N/A	
														LJ	App. J	N/A	
														PI	Bi	N/A	
														TM (C)	Q	N/A	
FCV-1932B	G-190234 (1)	C-7	A	Act	3	GA	AO	N	O	C	C	Y	Y	FC	Q	N/A	
														FS	Q	N/A	
														LJ	App. J	N/A	
														PI	Bi	N/A	
														TM (C)	Q	N/A	
FCV-1933A	G-190234 (1)	F-7	A	Act	0.75	GL	AO	Y	O	C	C	Y	Y	FC	Q	N/A	
														FS	Q	N/A	
														LJ	App. J	N/A	
														PI	Bi	N/A	
														TM (C)	Q	IST-RR-6	
FCV-1933B	G-190234 (1)	F-7	A	Act	0.75	GL	AO	Y	O	C	C	Y	Y	FC	Q	N/A	
														FS	Q	N/A	
														LJ	App. J	N/A	
														PI	Bi	N/A	
														TM (C)	Q	IST-RR-6	
FCV-1934A	G-190234 (1)	D-7	A	Act	0.75	GL	AO	Y	O	C	C	Y	Y	FC	Q	N/A	
														FS	Q	N/A	
														LJ	App. J	N/A	
														PI	Bi	N/A	
														TM (C)	Q	IST-RR-6	
FCV-1934B	G-190234 (1)	D-7	A	Act	0.75	GL	AO	Y	O	C	C	Y	Y	FC	Q	N/A	
														FS	Q	N/A	
														LJ	App. J	N/A	
														PI	Bi	N/A	
														TM (C)	Q	IST-RR-6	

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7.3 Valve Table

Valve Number	P&ID (SHT)	Coord	Cat	Act Pass	Size	Valve Type	Act Type	Rap Act	Norm Pos	Safe Pos	Fail Pos	App J Type C	Pos Ind	Test Type	Test Freq	Test Deferral	Remarks
FCV-1935A	G-190234 (1)	B-7	A	Act	0.75	GL	AO	Y	O	C	C	Y	Y	FC	Q	N/A	
														FS	Q	N/A	
														LJ	App. J	N/A	
														PI	Bi	N/A	
														TM (C)	Q	IST-RR-6	
FCV-1935B	G-190234 (1)	B-7	A	Act	0.75	GL	AO	Y	O	C	C	Y	Y	FC	Q	N/A	
														FS	Q	N/A	
														LJ	App. J	N/A	
														PI	Bi	N/A	
														TM (C)	Q	IST-RR-6	
FCV-478	G-190197 (4)	G-3	B	Act	12	GL	AO	N	O	C	C	N	Y	FC	CS	FW-VCS-1	
														FS	CS	FW-VCS-1	
														PI	Bi	N/A	
														TM (C)	CS	FW-VCS-1	
FCV-479	G-190197 (4)	G-3	B	Act	4	GL	AO	Y	O/C	C	C	N	Y	FC	CS	FW-VCS-1	
														FS	CS	FW-VCS-1	
														PI	Bi	N/A	
														TM (C)	CS	FW-VCS-1 IST-RR-6	
FCV-488	G-190197 (4)	F-3	B	Act	12	GL	AO	N	O	C	C	N	Y	FC	CS	FW-VCS-1	
														FS	CS	FW-VCS-1	
														PI	Bi	N/A	
														TM (C)	CS	FW-VCS-1	
FCV-489	G-190197 (4)	F-3	B	Act	4	GL	AO	Y	O/C	C	C	N	Y	FC	CS	FW-VCS-1	
														FS	CS	FW-VCS-1	
														PI	Bi	N/A	
														TM (C)	CS	FW-VCS-1 IST-RR-6	

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7.3 Valve Table

Valve Number	P&ID (SHT)	Coord	Cat	Act Pass	Size	Valve Type	Act Type	Rap Act	Norm Pos	Safe Pos	Fail Pos	App J Type C	Pos Ind	Test Type	Test Freq	Test Deferral	Remarks
FCV-498	G-190197 (4)	E-3	B	Act	12	GL	AO	N	O	C	C	N	Y	FC	CS	FW-VCS-1	
														FS	CS	FW-VCS-1	
														PI	Bi	N/A	
														TM (C)	CS	FW-VCS-1	
FCV-499	G-190197 (4)	E-3	B	Act	4	GL	AO	Y	O/C	C	C	N	Y	FC	CS	FW-VCS-1	
														FS	CS	FW-VCS-1	
														PI	Bi	N/A	
														TM (C)	CS	FW-VCS-1 IST-RR-6	
FCV-605	5379-1484 (1)	D-7	B	Pass	12	BF	AO	N/A	C	C	C	N	Y	PI	Bi	N/A	
FCV-626	5379-376 (3)	D-1	A	Act	3	GA	MO	N	O	C	AI	Y	Y	FS	CS	CC-VCS-3	
														LJ	App. J	N/A	
														PI	Bi	N/A	
														TM (C)	CS	CC-VCS-3	
FCV-6416	G-190197 (4)	D-4	B	Pass	6	GA	HYD	N/A	O	O	O	N	Y	FO	Q	N/A	Control Valve
														FS AUG	Q	N/A	
														PI AUG	Bi	N/A	
FO-182A	G-190204D (2)	E-6	C	Act	0.625	CK	SA	N/A	C	O/C	N/A	N	N	FF	Q	N/A	AUG Skid mounted
														RF	Q	N/A	
FO-182B	G-190204D (2)	E-4	C	Act	0.625	CK	SA	N/A	C	O/C	N/A	N	N	FF	Q	N/A	AUG Skid mounted
														RF	Q	N/A	
FO-183A	G-190204D (2)	D-5	C	Act	1	CK	SA	N/A	C	O	N/A	N	N	FF	Q	N/A	AUG Skid mounted
FO-183B	G-190204D (2)	D-3	C	Act	1	CK	SA	N/A	C	O	N/A	N	N	FF	Q	N/A	AUG Skid mounted
FO-21A	G-190204D (2)	D-7	C	Act	2	CK	SA	N/A	C	O	N/A	N	N	CM	App. II	N/A	AUG
FO-21B	G-190204D (2)	D-8	C	Act	2	CK	SA	N/A	C	O	N/A	N	N	CM	App. II	N/A	AUG
FO-22A	G-190204D (2)	C-7	B	Act	2	GL	M	N/A	O	O/C	N/A	N	N	FS	Bi	N/A	AUG

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7.3 Valve Table

Valve Number	P&ID (SHT)	Coord	Cat	Act Pass	Size	Valve Type	Act Type	Rap Act	Norm Pos	Safe Pos	Fail Pos	App J Type	Pos C Ind	Test Type	Test Freq	Test Deferral	Remarks
FO-22B	G-190204D (2)	C-8	B	Act	2	GL	M	N/A	O	O/C	N/A	N	N	FS	Bi	N/A	AUG
FO-24	G-190204D (2)	C-7	B	Act	2	GA	M	N/A	C	O/C	N/A	N	N	FS	Bi	N/A	AUG
FO-32A	G-190204D (2)	E-5	C	Act	0.5	RV	SA	N	C	O/C	N/A	N	N	FV	Q	N/A	AUG Skid mounted
FO-32B	G-190204D (2)	E-3	C	Act	0.5	RV	SA	N	C	O/C	N/A	N	N	FV	Q	N/A	AUG Skid mounted
FO-33A	G-190204D (2)	E-5	C	Act	0.625	CK	SA	N/A	C	C	N/A	N	N	RF	Q	N/A	AUG Skid mounted
FO-33B	G-190204D (2)	E-4	C	Act	0.625	CK	SA	N/A	C	C	N/A	N	N	RF	Q	N/A	AUG Skid mounted
FP-248	HBR2-8255 (2)	E-7	A	Act	4	GA	MO	N	O	C	AI	Y	Y	FS LJ PI TM (C)	Q App. J Bi Q	N/A N/A N/A N/A	
FP-249	HBR2-8255 (2)	E-7	A	Act	4	GA	MO	N	O	C	AI	Y	Y	FS LJ PI TM (C)	Q App. J Bi Q	N/A N/A N/A N/A	
FP-256	HBR2-8255 (2)	F-7	A	Act	4	GA	MO	N	O	C	AI	Y	Y	FS LJ PI TM (C)	Q App. J Bi Q	N/A N/A N/A N/A	
FP-258	HBR2-8255 (2)	F-7	A	Act	4	GA	MO	N	O	C	AI	Y	Y	FS LJ PI TM (C)	Q App. J Bi Q	N/A N/A N/A N/A	
FW-8A	G-190197 (4)	G-6	C	Act	16	SCK	SA	N/A	O	C	C	N	N	OV RF	R R	FW-VRS-1 FW-VRS-1	

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7.3 Valve Table

Valve Number	P&ID (SHT)	Coord	Cat	Act Pass	Size	Valve Type	Act Type	Rap Act	Norm Pos	Safe Pos	Fail Pos	App J Type	Pos C Ind	Test Type	Test Freq	Test Deferral	Remarks
FW-8B	G-190197 (4)	E-6	C	Act	16	SCK	SA	N/A	O	C	C	N	N	OV RF	R R	FW-VRS-1 FW-VRS-1	
FW-8C	G-190197 (4)	D-6	C	Act	16	SCK	SA	N/A	O	C	C	N	N	OV RF	R R	FW-VRS-1 FW-VRS-1	
FW-V2-6A	G-190197 (4)	G-2	B	Act	16	GA	MO	N	O	C	AI	N	Y	FS PI TM (C)	CS Bi CS	FW-VCS-1 N/A FW-VCS-1	
FW-V2-6B	G-190197 (4)	F-2	B	Act	16	GA	MO	N	O	C	AI	N	Y	FS PI TM (C)	CS Bi CS	FW-VCS-1 N/A FW-VCS-1	
FW-V2-6C	G-190197 (4)	E-2	B	Act	16	GA	MO	N	O	C	AI	N	Y	FS PI TM (C)	CS Bi CS	FW-VCS-1 N/A FW-VCS-1	
HCV-105	5379-685 (3)	C-5	B	Act	2	GL	AO	N	O/C	C	C	N	N	FC	Q	N/A	Control Valve
HCV-110	5379-685 (3)	C-6	B	Act	2	GL	AO	N	O/C	C	C	N	N	FC	Q	N/A	Control Valve
HCV-758	5379-1484 (1)	E-8	B	Pass	12	BF	AO	N/A	C	C	C	N	Y	PI	Bi	N/A	
IA-3742	G-190200 (5)	C-4	C	Act	0.25	CK	SA	N/A	O	C	N/A	N	N	OV RF	CS CS	MS-VCS-1 MS-VCS-1	
IA-3743	G-190200 (5)	C-4	C	Act	0.25	CK	SA	N/A	O	C	N/A	N	N	OV RF	CS CS	MS-VCS-1 MS-VCS-1	
IA-3744	G-190200 (5)	C-4	C	Act	0.25	CK	SA	N/A	O	C	N/A	N	N	OV RF	CS CS	MS-VCS-1 MS-VCS-1	
IA-525	G-190200 (2)	G-7	A/C	Act	2	CK	SA	N/A	O	C	N/A	Y	N	LJ OV RF	App. J R R	N/A IA-VRS-1 IA-VRS-1	
IVSW-100A	G-190262 (1)	D-7	C	Act	0.375	CK	SA	N/A	C	O	N/A	N	N	FF	R	IST-RR-7	
IVSW-100B	G-190262 (1)	D-6	C	Act	0.375	CK	SA	N/A	C	O	N/A	N	N	FF	R	IST-RR-7	

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7.3 Valve Table

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IVSW-100C	G-190262 (1)	D-7	C	Act	0.375	CK	SA	N/A	C	O	N/A	N	N	FF	R	IST-RR-7	
IVSW-11	G-190262 (1)	F-4	C	Act	0.75	RV	SA	N/A	C	O	N/A	N	N	RL	App. I	N/A	AUG
IVSW-14	G-190262 (1)	B-1	C	Act	0.375	RV	SA	N/A	C	O	N/A	N	N	RL	App. I	N/A	AUG
IVSW-16	G-190262 (1)	C-2	B	Act	0.5	GL	M	N/A	C	O	N/A	N	N	FS	Bi	N/A	AUG
IVSW-16A	G-190262 (1)	C-2	B	Act	0.5	GL	M	N/A	C	O	N/A	N	N	FS	Bi	N/A	AUG
IVSW-16D	G-190262 (1)	C-2	B	Act	0.5	GL	M	N/A	C	O	N/A	N	N	FS	Bi	N/A	AUG
IVSW-16E	G-190262 (1)	B-2	B	Act	0.5	GL	M	N/A	C	O	N/A	N	N	FS	Bi	N/A	AUG
IVSW-16F	G-190262 (1)	B-2	B	Act	0.5	GL	M	N/A	C	O	N/A	N	N	FS	Bi	N/A	AUG
IVSW-16G	G-190262 (1)	D-2	B	Act	0.5	GL	M	N/A	C	O	N/A	N	N	FS	Bi	N/A	AUG
IVSW-23	G-190262 (1)	B-4	C	Act	0.375	RV	SA	N/A	C	O	N/A	N	N	RL	App. I	N/A	AUG
IVSW-27	G-190262 (1)	B-7	C	Act	0.375	RV	SA	N/A	C	O	N/A	N	N	RL	App. I	N/A	AUG
IVSW-31	G-190262 (1)	E-7	C	Act	0.375	RV	SA	N/A	C	O	N/A	N	N	RL	App. I	N/A	AUG
IVSW-66A	G-190262 (1)	F-2	C	Act	0.375	CK	SA	N/A	O	C	N/A	N	N	DA	R	N/A	AUG
IVSW-66B	G-190262 (1)	F-2	C	Act	0.375	CK	SA	N/A	O	C	N/A	N	N	RF	R	N/A	AUG
IVSW-68A	G-190262 (1)	F-2	C	Act	0.375	CK	SA	N/A	C	O	N/A	N	N	FF	R	N/A	AUG
IVSW-68B	G-190262 (1)	F-2	C	Act	0.375	CK	SA	N/A	C	O	N/A	N	N	FF	R	N/A	AUG
IVSW-68C	G-190262 (1)	F-3	C	Act	0.375	CK	SA	N/A	C	O	N/A	N	N	FF	R	N/A	AUG
IVSW-68D	G-190262 (1)	F-3	C	Act	0.375	CK	SA	N/A	C	O	N/A	N	N	FF	R	N/A	AUG
IVSW-70	G-190262 (1)	D-2	C	Act	0.375	CK	SA	N/A	C	O	N/A	N	N	FF	R	IST-RR-7	
IVSW-71	G-190262 (1)	C-2	C	Act	0.375	CK	SA	N/A	C	O	N/A	N	N	FF	R	IST-RR-7	
IVSW-72	G-190262 (1)	C-2	C	Act	0.375	CK	SA	N/A	C	O	N/A	N	N	FF	R	IST-RR-7	
IVSW-74	G-190262 (1)	B-2	C	Act	0.375	CK	SA	N/A	C	O	N/A	N	N	FF	R	IST-RR-7	
IVSW-75	G-190262 (1)	B-2	C	Act	0.375	CK	SA	N/A	C	O	N/A	N	N	FF	R	IST-RR-7	
IVSW-76	G-190262 (1)	C-4	C	Act	0.375	CK	SA	N/A	C	O	N/A	N	N	FF	R	IST-RR-7	

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7.3 Valve Table

Valve Number	P&ID (SHT)	Coord	Cat	Act Pass	Size	Valve Type	Act Type	Rap Act	Norm Pos	Safe Pos	Fail Pos	App J Type	Pos C Ind	Test Type	Test Freq	Test Deferral	Remarks
IVSW-77	G-190262 (1)	C-4	C	Act	0.375	CK	SA	N/A	C	O	N/A	N	N	FF	R	IST-RR-7	
IVSW-78	G-190262 (1)	C-4	C	Act	0.375	CK	SA	N/A	C	O	N/A	N	N	FF	R	IST-RR-7	
IVSW-79	G-190262 (1)	C-4	C	Act	0.375	CK	SA	N/A	C	O	N/A	N	N	FF	R	IST-RR-7	
IVSW-80	G-190262 (1)	B-4	C	Act	0.375	CK	SA	N/A	C	O	N/A	N	N	FF	R	IST-RR-7	
IVSW-81	G-190262 (1)	B-4	C	Act	0.375	CK	SA	N/A	C	O	N/A	N	N	FF	R	IST-RR-7	
IVSW-82	G-190262 (1)	E-7	C	Act	0.375	CK	SA	N/A	C	O	N/A	N	N	FF	R	IST-RR-7	
IVSW-83	G-190262 (1)	E-7	C	Act	0.375	CK	SA	N/A	C	O	N/A	N	N	FF	R	IST-RR-7	
IVSW-84	G-190262 (1)	D-7	C	Act	0.375	CK	SA	N/A	C	O	N/A	N	N	FF	R	IST-RR-7	
IVSW-85	G-190262 (1)	D-7	C	Act	0.375	CK	SA	N/A	C	O	N/A	N	N	FF	R	IST-RR-7	
IVSW-86	G-190262 (1)	D-7	C	Act	0.375	CK	SA	N/A	C	O	N/A	N	N	FF	R	IST-RR-7	
IVSW-87	G-190262 (1)	D-7	C	Act	0.375	CK	SA	N/A	C	O	N/A	N	N	FF	R	IST-RR-7	
IVSW-88	G-190262 (1)	C-7	C	Act	0.75	CK	SA	N/A	C	O	N/A	N	N	FF	R	IST-RR-7	
IVSW-89	G-190262 (1)	C-7	C	Act	0.375	CK	SA	N/A	C	O	N/A	N	N	FF	R	IST-RR-7	
IVSW-90	G-190262 (1)	C-7	C	Act	0.375	CK	SA	N/A	C	O	N/A	N	N	FF	R	IST-RR-7	
IVSW-91	G-190262 (1)	C-7	C	Act	0.375	CK	SA	N/A	C	O	N/A	N	N	FF	R	IST-RR-7	
IVSW-92	G-190262 (1)	B-7	C	Act	0.375	CK	SA	N/A	C	O	N/A	N	N	FF	R	IST-RR-7	
IVSW-93	G-190262 (1)	F-7	C	Act	0.375	CK	SA	N/A	C	O	N/A	N	N	FF	R	IST-RR-7	
IVSW-94	G-190262 (1)	F-7	C	Act	0.375	CK	SA	N/A	C	O	N/A	N	N	FF	R	IST-RR-7	
IVSW-95	G-190262 (1)	F-7	C	Act	0.375	CK	SA	N/A	C	O	N/A	N	N	FF	R	IST-RR-7	
IVSW-96	G-190262 (1)	G-7	C	Act	0.375	CK	SA	N/A	C	O	N/A	N	N	FF	R	IST-RR-7	
IVSW-97	G-190262 (1)	G-7	C	Act	0.375	CK	SA	N/A	C	O	N/A	N	N	FF	R	IST-RR-7	
IVSW-98	G-190262 (1)	C-2	C	Act	0.375	CK	SA	N/A	C	O	N/A	N	N	FF	R	IST-RR-7	
IVSW-99	G-190262 (1)	G-2	C	Act	0.25	RV	SA	N/A	C	O	N/A	N	N	RL	App. I	N/A	AUG

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7.3 Valve Table

Valve Number	P&ID (SHT)	Coord	Cat	Act Pass	Size	Valve Type	Act Type	Rap Act	Norm Pos	Safe Pos	Fail Pos	App J Type C	Pos Ind	Test Type	Test Freq	Test Deferral	Remarks
LCV-115B	5379-685 (2)	C-5	B	Act	4	BF	AO	N	C	O	C	N	Y	FC	Q	N/A	
														FS	Q	N/A	
														PI	Bi	N/A	
														TM (O)	Q	N/A	
LCV-115C	5379-685 (2)	D-5	B	Act	4	GA	MO	N	O	C	AI	N	Y	FS	CS	CVC-VCS-2	
														PI	Bi	N/A	
														TM (C)	CS	CVC-VCS-2	
LCV-460A	5379-685 (1)	G-7	B	Act	2	GL	AO	Y	O	C	C	N	Y	FC	CS	CVC-VCS-1	
														FS	CS	CVC-VCS-1	
														PI	Bi	N/A	
														TM (C)	CS	CVC-VCS-1 IST-RR-6	
LCV-460B	5379-685 (1)	G-7	B	Act	2	GL	AO	Y	O	C	C	N	Y	FC	CS	CVC-VCS-1	
														FS	CS	CVC-VCS-1	
														PI	Bi	N/A	
														TM (C)	CS	CVC-VCS-1 IST-RR-6	
MOV-350	5379-685 (2)	B-2	B	Act	2	GA	MO	N	C	O	AI	N	Y	FS	Q	N/A	
														PI	Bi	N/A	
														TM (O)	Q	N/A	
MS-261A	G-190196 (1)	C-4	C	Act	26	CK	SA	N/A	O	C	N/A	N	N	CM	App. II	N/A	
MS-261B	G-190196 (1)	E-4	C	Act	26	CK	SA	N/A	O	C	N/A	N	N	CM	App. II	N/A	
MS-261C	G-190196 (1)	G-4	C	Act	26	CK	SA	N/A	O	C	N/A	N	N	CM	App. II	N/A	
MS-262A	G-190196 (1)	C-5	B	Act	2	GA	M	N/A	LO	O/C	N/A	N	N	FS	Bi	IST-RR-4	
MS-262B	G-190196 (1)	E-5	B	Act	2	GA	M	N/A	LO	O/C	N/A	N	N	FS	Bi	IST-RR-4	
MS-262C	G-190196 (1)	G-5	B	Act	2	GA	M	N/A	LO	O/C	N/A	N	N	FS	Bi	IST-RR-4	
MS-263A	G-190196 (1)	C-5	C	Act	2	CK	SA	N/A	C	O/C	N/A	N	N	CM	App. II	N/A	
MS-263B	G-190196 (1)	D-5	C	Act	2	CK	SA	N/A	C	O/C	N/A	N	N	CM	App. II	N/A	

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7.3 Valve Table

Valve Number	P&ID (SHT)	Coord	Cat	Act Pass	Size	Valve Type	Act Type	Rap Act	Norm Pos	Safe Pos	Fail Pos	App J Type C	Pos Ind	Test Type	Test Freq	Test Deferral	Remarks
MS-263C	G-190196 (1)	F-5	C	Act	2	CK	SA	N/A	C	O/C	N/A	N	N	CM	App. II	N/A	
MS-353A	G-190196 (1)	C-4	B	Pass	2	GA	MO	N/A	C	C	AI	N	Y	PI	Bi	N/A	
MS-353B	G-190196 (1)	E-4	B	Pass	2	GA	MO	N/A	C	C	AI	N	Y	PI	Bi	N/A	
MS-353C	G-190196 (1)	F-4	B	Pass	2	GA	MO	N/A	C	C	AI	N	Y	PI	Bi	N/A	
MS-V1-3A	G-190196 (1)	C-4	B	Act	26	SCK	AO	N	O	C	C	N	Y	FC FS PI TM (C)	CS CS Bi CS	MS-VCS-2 MS-VCS-2 N/A MS-VCS-2	
MS-V1-3B	G-190196 (1)	E-4	B	Act	26	SCK	AO	N	O	C	C	N	Y	FC FS PI TM (C)	CS CS Bi CS	MS-VCS-2 MS-VCS-2 N/A MS-VCS-2	
MS-V1-3C	G-190196 (1)	G-4	B	Act	26	SCK	AO	N	O	C	C	N	Y	FC FS PI TM (C)	CS CS Bi CS	MS-VCS-2 MS-VCS-2 N/A MS-VCS-2	
MS-V1-8A	G-190196 (1)	B-4	B	Act	2	GA	MO	N	C	O	AI	N	Y	FS PI TM (O)	Q Bi Q	N/A N/A N/A	
MS-V1-8B	G-190196 (1)	D-4	B	Act	2	GA	MO	N	C	O	AI	N	Y	FS PI TM (O)	Q Bi Q	N/A N/A N/A	
MS-V1-8C	G-190196 (1)	F-4	B	Act	2	GA	MO	N	C	O	AI	N	Y	FS PI TM (O)	Q Bi Q	N/A N/A N/A	
OPP-10	G-190200 (9)	C-5	C	Act	0.5	CK	SA	N/A	O/C	C	N/A	N	N	RF	R	N/A	AUG
OPP-12	G-190200 (9)	C-6	C	Act	0.75	RV	SA	N/A	C	O	N/A	N	N	RL	App. I	N/A	AUG
OPP-13	G-190200 (9)	D-6	C	Act	0.75	RV	SA	N/A	C	O	N/A	N	N	RL	App. I	N/A	AUG

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7.3 Valve Table

Valve Number	P&ID (SHT)	Coord	Cat	Act Pass	Size	Valve Type	Act Type	Rap Act	Norm Pos	Safe Pos	Fail Pos	App J Type C	Pos Ind	Test Type	Test Freq	Test Deferral	Remarks
OPP-14	G-190200 (9)	C-4	C	Act	0.5	CK	SA	N/A	C	O	N/A	N	N	FF	R	N/A	AUG
OPP-15	G-190200 (7)	D-4	C	Act	0.5	CK	SA	N/A	C	O	N/A	N	N	FF	R	N/A	AUG
OPP-16	G-190200 (9)	C-4	C	Act	0.5	RV	SA	N/A	C	O	N/A	N	N	RL	App. I	N/A	AUG
OPP-17	G-190200 (9)	D-4	C	Act	0.5	RV	SA	N/A	C	O	N/A	N	N	RL	App. I	N/A	AUG
OPP-32	G-190200 (9)	D-4	C	Act	0.25	RV	SA	N/A	C	O	N/A	N	N	FV	R	N/A	AUG
OPP-33	G-190200 (9)	D-5	C	Act	0.25	RV	SA	N/A	C	O	N/A	N	N	FV	R	N/A	AUG
OPP-7	G-190200 (9)	D-4	C	Act	0.75	CK	SA	N/A	O	C	N/A	N	N	RF	R	N/A	AUG
OPP-8	G-190200 (9)	C-4	C	Act	0.75	CK	SA	N/A	O	C	N/A	N	N	RF	R	N/A	AUG
OPP-9	G-190200 (9)	D-5	C	Act	0.5	CK	SA	N/A	O/C	C	N/A	N	N	RF	R	N/A	AUG
PAS-1	HBR2-6490 (1)	C-6	A	Pass	0.375	GL	M	N/A	LC	C	N/A	Y	N	LJ	App. J	N/A	
PAS-2	HBR2-6490 (1)	B-6	A	Pass	0.375	GL	M	N/A	LC	C	N/A	Y	N	LJ	App. J	N/A	
PAS-3	HBR2-6490 (1)	D-6	A	Pass	0.375	GL	M	N/A	LC	C	N/A	Y	N	LJ	App. J	N/A	
PAS-4	HBR2-6490 (1)	C-6	A	Pass	0.375	GL	M	N/A	LC	C	N/A	Y	N	LJ	App. J	N/A	
PAS-5	HBR2-6490 (1)	E-6	A	Pass	0.375	GL	M	N/A	LC	C	N/A	Y	N	LJ	App. J	N/A	
PAS-6	HBR2-6490 (1)	D-6	A	Pass	0.375	GL	M	N/A	LC	C	N/A	Y	N	LJ	App. J	N/A	
PAV-31	HBR2-6933 (1)	D-7	B	Act	0.375	GL	M	N/A	LC	O	N/A	N	N	FS	Bi	IST-RR-4	
PAV-32	HBR2-6933 (1)	D-6	B	Act	0.375	GL	M	N/A	LC	O	N/A	N	N	FS	Bi	N/A	AUG
PAV-33	HBR2-6933 (1)	B-7	B	Act	0.375	GL	M	N/A	LC	O	N/A	N	N	FS	Bi	IST-RR-4	
PAV-34	HBR2-6933 (1)	B-6	B	Act	0.375	GL	M	N/A	LC	O	N/A	N	N	FS	Bi	N/A	AUG
PAV-35	HBR2-6933 (1)	D-7	B	Act	0.375	GL	M	N/A	LC	O	N/A	N	N	FS	Bi	IST-RR-4	
PAV-36	HBR2-6933 (1)	D-6	B	Act	0.375	GL	M	N/A	LC	O	N/A	N	N	FS	Bi	N/A	AUG
PAV-37	HBR2-6933 (1)	B-7	B	Act	0.375	GL	M	N/A	LC	O	N/A	N	N	FS	Bi	IST-RR-4	
PAV-38	HBR2-6933 (1)	B-6	B	Act	0.375	GL	M	N/A	LC	O	N/A	N	N	FS	Bi	N/A	AUG

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7.3 Valve Table

Valve Number	P&ID (SHT)	Coord	Cat	Act Pass	Size	Valve Type	Act Type	Rap Act	Norm Pos	Safe Pos	Fail Pos	App J Type C	Pos Ind	Test Type	Test Freq	Test Deferral	Remarks
PCV-1716	G-190200 (2)	G-7	A	Act	2	GL	AO	Y	O	C	C	Y	Y	FC	R	IA-VRS-1	
														FS	R	IA-VRS-1	
														LJ	App. J	N/A	
														PI	Bi	N/A	
														TM (C)	R	IA-VRS-1 IST-RR-6	
PCV-1922A	G-190262 (1)	E-5	B	Act	0.375	GA	AO	Y	C	O	O	N	Y	FO	CS	N/A	AUG
														FS	CS	N/A	
														PI	Bi	N/A	
														TM (O)	CS	N/A	
PCV-1922B	G-190262 (1)	D-5	B	Act	0.375	GA	AO	Y	C	O	O	N	Y	FO	CS	N/A	AUG
														FS	CS	N/A	
														PI	Bi	N/A	
														TM (O)	CS	N/A	
PCV-455C	5379-1971 (2)	F-2	B	Act	3	GL	AO	N	C	O/C	C	N	Y	FC	CS	RCS-VCS-1	GL-90-06
														FS	CS	RCS-VCS-1	
														PI	Bi	N/A	
														TM (O/C)	CS	RCS-VCS-1	
PCV-456	5379-1971 (2)	F-2	B	Act	3	GL	AO	N	C	O/C	C	N	Y	FC	CS	RCS-VCS-1	GL-90-06
														FS	CS	RCS-VCS-1	
														PI	Bi	N/A	
														TM (O/C)	CS	RCS-VCS-1	
PP-274D	G-190261 (2)	C-4	A	Pass	0.375	GL	M	N/A	C	C	N/A	Y	N/A	LJ	App. J	N/A	
PP-275D	G-190261 (2)	C-4	A	Pass	0.375	GL	M	N/A	C	C	N/A	Y	N/A	LJ	App. J	N/A	
PS-956A	5379-353 (1)	G-6	A	Act	0.375	GL	AO	Y	O/C	C	C	Y	Y	FC	Q	N/A	
														FS	Q	N/A	
														LJ	App. J	N/A	
														PI	Bi	N/A	
														TM (C)	Q	IST-RR-6	

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7.3 Valve Table

Valve Number	P&ID (SHT)	Coord	Cat	Act Pass	Size	Valve Type	Act Type	Rap Act	Norm Pos	Safe Pos	Fail Pos	App J Type	Pos C Ind	Test Type	Test Freq	Test Deferral	Remarks
PS-956B	5379-353 (1)	G-6	A	Act	0.375	GL	AO	Y	O/C	C	C	Y	Y	FC	Q	N/A	
														FS	Q	N/A	
														LJ	App. J	N/A	
														PI	Bi	N/A	
														TM (C)	Q	IST-RR-6	
PS-956C	5379-353 (1)	F-6	A	Act	0.375	GL	AO	Y	O/C	C	C	Y	Y	FC	Q	N/A	
														FS	Q	N/A	
														LJ	App. J	N/A	
														PI	Bi	N/A	
														TM (C)	Q	IST-RR-6	
PS-956D	5379-353 (1)	F-6	A	Act	0.375	GL	AO	Y	O/C	C	C	Y	Y	FC	Q	N/A	
														FS	Q	N/A	
														LJ	App. J	N/A	
														PI	Bi	N/A	
														TM (C)	Q	IST-RR-6	
PS-956E	5379-353 (1)	E-6	A	Act	0.375	GL	AO	Y	O/C	C	C	Y	Y	FC	Q	N/A	
														FS	Q	N/A	
														LJ	App. J	N/A	
														PI	Bi	N/A	
														TM (C)	Q	IST-RR-6	
PS-956F	5379-353 (1)	E-6	A	Act	0.375	GL	AO	Y	O/C	C	C	Y	Y	FC	Q	N/A	
														FS	Q	N/A	
														LJ	App. J	N/A	
														PI	Bi	N/A	
														TM (C)	Q	IST-RR-6	
PS-956G	5379-353 (1)	E-6	A	Act	0.375	GL	AO	Y	O/C	C	C	Y	Y	FC	Q	N/A	
														FS	Q	N/A	
														LJ	App. J	N/A	
														PI	Bi	N/A	
														TM (C)	Q	IST-RR-6	

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7.3 Valve Table

Valve Number	P&ID (SHT)	Coord	Cat	Act Pass	Size	Valve Type	Act Type	Rap Act	Norm Pos	Safe Pos	Fail Pos	App J Type C	Pos Ind	Test Type	Test Freq	Test Deferral	Remarks
PS-956H	5379-353 (1)	E-6	A	Act	0.375	GL	AO	Y	O/C	C	C	Y	Y	FC	Q	N/A	
														FS	Q	N/A	
														LJ	App. J	N/A	
														PI	Bi	N/A	
														TM (C)	Q	IST-RR-6	
PS-959	5379-353 (1)	D-7	B	Act	0.375	GL	AO	Y	O/C	C	C	N	Y	FC	Q	N/A	
														FS	Q	N/A	
														PI	Bi	N/A	
														TM (C)	Q	IST-RR-6	
RC-516	5379-1971 (2)	G-8	A	Act	0.375	GL	AO	N	O/C	C	C	Y	Y	FC	Q	N/A	
														FS	Q	N/A	
														LJ	App. J	N/A	
														PI	Bi	N/A	
														TM (C)	Q	N/A	
RC-518	5379-1971 (2)	F-7	A/C	Act	0.75	CK	SA	N/A	C	C	N/A	Y	N	CM	App. II	N/A	
														LJ	App. J	N/A	
RC-519A	5379-1971 (2)	F-8	A	Act	3	DA	AO	Y	O/C	C	C	Y	Y	FC	Q	N/A	
														FS	Q	N/A	
														LJ	App. J	N/A	
														PI	Bi	N/A	
														TM (C)	Q	IST-RR-6	
RC-519B	5379-1971 (2)	F-8	A	Act	3	DA	AO	Y	O/C	C	C	Y	Y	FC	Q	N/A	
														FS	Q	N/A	
														LJ	App. J	N/A	
														PI	Bi	N/A	
														TM (C)	Q	IST-RR-6	
RC-535	5379-1971 (2)	F-2	B	Act	3	GA	MO	N	O	C	AI	N	Y	FS	Q	N/A	
														PI	Bi	N/A	
														TM (C)	Q	N/A	

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7.3 Valve Table

Valve Number	P&ID (SHT)	Coord	Cat	Act Pass	Size	Valve Type	Act Type	Rap Act	Norm Pos	Safe Pos	Fail Pos	App J Type	Pos C Ind	Test Type	Test Freq	Test Deferral	Remarks
RC-536	5379-1971 (2)	F-2	B	Act	3	GA	MO	N	O	C	AI	N	Y	FS PI TM (C)	Q Bi Q	N/A N/A N/A	
RC-550	5379-1971 (2)	F-7	A	Act	0.75	DA	AO	N	O/C	C	C	Y	Y	FC FS LJ PI TM (C)	Q Q App. J Bi Q	N/A N/A N/A N/A N/A	
RC-551A	5379-1971 (2)	G-2	C	Act	4	RV	SA	N/A	C	O/C	N/A	N	N	RL	App. I	IST-RR-5	
RC-551B	5379-1971 (2)	G-3	C	Act	4	RV	SA	N/A	C	O/C	N/A	N	N	RL	App. I	IST-RR-5	
RC-551C	5379-1971 (2)	G-4	C	Act	4	RV	SA	N/A	C	O/C	N/A	N	N	RL	App. I	IST-RR-5	
RC-553	5379-1971 (2)	G-8	A	Act	0.375	GL	AO	Y	O/C	C	C	Y	Y	FC FS LJ PI TM (C)	Q Q App. J Bi Q	N/A N/A N/A N/A IST-RR-6	
RC-567	5379-1971 (1)	D-3	B	Act	1	GL	SO	Y	C	O	C	N	Y	FC FS PI TM (O)	CS CS Bi CS	RCS-VCS-2 RCS-VCS-2 N/A IST-RR-6 RCS-VCS-2	
RC-568	5379-1971 (1)	C-3	B	Act	1	GL	SO	Y	C	O	C	N	Y	FC FS PI TM (O)	CS CS Bi CS	RCS-VCS-2 RCS-VCS-2 N/A IST-RR-6 RCS-VCS-2	

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7.3 Valve Table

Valve Number	P&ID (SHT)	Coord	Cat	Act Pass	Size	Valve Type	Act Type	Rap Act	Norm Pos	Safe Pos	Fail Pos	App J Type	Pos C Ind	Test Type	Test Freq	Test Deferral	Remarks
RC-569	5379-1971 (1)	C-3	B	Act	1	GL	SO	Y	C	O	C	N	Y	FC	CS	RCS-VCS-2	
														FS	CS	RCS-VCS-2	
														PI	Bi	N/A	
														TM (O)	CS	IST-RR-6 RCS-VCS-2	
RC-570	5379-1971 (1)	C-3	B	Act	1	GL	SO	Y	C	O	C	N	Y	FC	CS	RCS-VCS-2	
														FS	CS	RCS-VCS-2	
														PI	Bi	N/A	
														TM (O)	CS	IST-RR-6 RCS-VCS-2	
RC-571	5379-1971 (1)	D-2	B	Act	1	GL	SO	Y	C	O	C	N	Y	FC	CS	RCS-VCS-2	
														FS	CS	RCS-VCS-2	
														PI	Bi	N/A	
														TM (O)	CS	IST-RR-6 RCS-VCS-2	
RC-572	5379-1971 (1)	D-1	B	Act	1	GL	SO	Y	C	O	C	N	Y	FC	CS	RCS-VCS-2	
														FS	CS	RCS-VCS-2	
														PI	Bi	N/A	
														TM (O)	CS	IST-RR-6 RCS-VCS-2	
RHR-706	5379-1484 (1)	B-8	C	Act	2	RV	SA	N/A	C	O/C	N/A	N	N	RL	App. I	IST-RR-5	
RHR-743	5379-1484 (1)	C-7	B	Act	2	GL	M	N/A	LC	O/C	N/A	N/A	N	FS	Bi	IST-RR-4	
RHR-744A	5379-1484 (1)	B-8	B	Act	10	GA	MO	N	C	O	AI	N	Y	FS	Q	N/A	
														PI	Bi	N/A	
														TM (O)	Q	N/A	
RHR-744B	5379-1484 (1)	B-8	B	Act	10	GA	MO	N	C	O	AI	N	Y	FS	Q	N/A	
														PI	Bi	N/A	
														TM (O)	Q	N/A	

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7.3 Valve Table

Valve Number	P&ID (SHT)	Coord	Cat	Act Pass	Size	Valve Type	Act Type	Rap Act	Norm Pos	Safe Pos	Fail Pos	App J Type	Pos C Ind	Test Type	Test Freq	Test Deferral	Remarks
RHR-750	5379-1484 (1)	B-2	B	Act	14	GA	MO	N	C	O/C	AI	N	Y	FS PI TM (O/C)	CS Bi CS	RHR-VCS-1 N/A RHR-VCS-1	
RHR-751	5379-1484 (1)	B-2	B	Act	14	GA	MO	N	C	O/C	AI	N	Y	FS PI TM (O/C)	CS Bi CS	RHR-VCS-1 N/A RHR-VCS-1	
RHR-752A	5379-1484 (1)	D-3	B	Act	14	GA	MO	N	O	O/C	AI	N	Y	FS PI TM (O/C)	Q Bi Q	N/A N/A N/A	
RHR-752B	5379-1484 (1)	F-3	B	Act	14	GA	MO	N	O	O/C	AI	N	Y	FS PI TM (O/C)	Q Bi Q	N/A N/A N/A	
RHR-753A	5379-1484 (1)	D-5	C	Act	10	CK	SA	N/A	C	O/C	N/A	N	N	FF RF	CS CS	RHR-VCS-2 RHR-VCS-2	
RHR-753B	5379-1484 (1)	F-5	C	Act	10	CK	SA	N/A	C	O/C	N/A	N	N	FF RF	CS CS	RHR-VCS-2 RHR-VCS-2	
RHR-757C	5379-1484 (1)	E-5	B	Act	10	GA	M	N/A	LC	O/C	N/A	N	N	FS	Bi	IST-RR-4	
RHR-757D	5379-1484 (1)	F-5	B	Act	10	GA	M	N/A	LC	O/C	N/A	N	N	FS	Bi	IST-RR-4	
RHR-759A	5379-1484 (1)	D-7	B	Act	10	GA	MO	N	O	O/C	AI	N	Y	FS PI TM (O/C)	Q Bi Q	N/A N/A N/A	
RHR-759B	5379-1484 (1)	F-7	B	Act	10	GA	MO	N	O	O/C	AI	N	Y	FS PI TM (O/C)	Q Bi Q	N/A N/A N/A	
RHR-760	5379-1484 (1)	E-7	B	Act	2	GL	M	N/A	LC	O/C	N/A	N	N	FS	Bi	IST-RR-4	
RHR-782	5379-1484 (1)	D-7	C	Act	10	CK	SA	N/A	C	O/C	N/A	N	N	FF RF	CS CS	RHR-VCS-2 RHR-VCS-2	

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7.3 Valve Table

Valve Number	P&ID (SHT)	Coord	Cat	Act Pass	Size	Valve Type	Act Type	Rap Act	Norm Pos	Safe Pos	Fail Pos	App J Type	Pos C Ind	Test Type	Test Freq	Test Deferral	Remarks
RHR-783	5379-1484 (1)	F-7	C	Act	10	CK	SA	N/A	C	O/C	N/A	N	N	FF RF	CS CS	RHR-VCS-2 RHR-VCS-2	
RMS-1	G-190304 (1)	C-2	A	Act	1	DA	AO	N	O	C	C	Y	Y	FC FS LJ PI TM (C)	Q Q App. J Bi Q	N/A N/A N/A N/A N/A	
RMS-2	G-190304 (1)	C-2	A	Act	1	DA	AO	N	O	C	C	Y	Y	FC FS LJ PI TM (C)	Q Q App. J Bi Q	N/A N/A N/A N/A N/A	
RMS-3	G-190304 (1)	C-2	A	Act	1	DA	AO	N	O	C	C	Y	Y	FC FS LJ PI TM (C)	Q Q App. J Bi Q	N/A N/A N/A N/A N/A	
RMS-4	G-190304 (1)	C-2	A	Act	1	DA	AO	N	O	C	C	Y	Y	FC FS LJ PI TM (C)	Q Q App. J Bi Q	N/A N/A N/A N/A N/A	
RV1-1	G-190196 (1)	C-6	B	Pass	8	GL	AO	N/A	C	C	C	N	Y	FC AUG FS AUG PI	CS CS Bi	N/A N/A N/A	
RV1-2	G-190196 (1)	E-6	B	Pass	8	GL	AO	N/A	C	C	C	N	Y	FC AUG FS AUG PI	CS CS Bi	N/A N/A N/A	

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7.3 Valve Table

Valve Number	P&ID (SHT)	Coord	Cat	Act Pass	Size	Valve Type	Act Type	Rap Act	Norm Pos	Safe Pos	Fail Pos	App J Type C	Pos Ind	Test Type	Test Freq	Test Deferral	Remarks
RV1-3	G-190196 (1)	G-6	B	Pass	8	GL	AO	N/A	C	C	C	N	Y	FC AUG FS AUG PI	CS CS Bi	N/A N/A N/A	
SA-42	G-190200 (3)	D-5	B	Act	2	DA	M	N/A	LC	O	N/A	N	N	FS	Bi	N/A	AUG
SA-43	G-190200 (3)	D-5	A	Act	2	DA	M	N/A	LC	O/C	N/A	Y	N	FS LJ	Bi App. J	IST-RR-4 N/A	
SA-44	G-190200 (3)	D-5	A	Act	2	DA	M	N/A	LC	O/C	N/A	Y	N	FS LJ	Bi App. J	IST-RR-4 N/A	
SA-80	G-190200 (3)	D-5	C	Act	2	CK	SA	N/A	C	O	N/A	N	N	FF	Bi	N/A	AUG
SI-839	5379-1082 (2)	D-4	C	Act	2	CK	SA	N/A	C	O	N/A	N	N	CV FF	R R	SI-VRS-6 SI-VRS-6	
SI-844A	5379-1082 (3)	C-2	B	Pass	8	GA	MO	N	O	O	AI	N	Y	PI	Bi	N/A	
SI-844B	5379-1082 (3)	E-2	B	Pass	8	GA	MO	N	O	O	AI	N	Y	PI	Bi	N/A	
SI-845A	5379-1082 (3)	F-6	B	Act	2	GL	MO	N	C	O	AI	N	Y	FS PI TM (O)	CS Bi CS	SI-VCS-1 N/A SI-VCS-1	
SI-845B	5379-1082 (3)	E-6	B	Act	2	GL	MO	N	C	O	AI	N	Y	FS PI TM (O)	CS Bi CS	SI-VCS-1 N/A SI-VCS-1	
SI-845C	5379-1082 (3)	F-6	B	Pass	2	GL	MO	N	O	O	AI	N	Y	PI	Bi	N/A	AUG
SI-849	5379-1082 (4)	F-7	C	Act	0.75	CK	SA	N/A	C	O	N/A	N	N	CV FF	R R	SI-VRS-5 SI-VRS-5	
SI-851A	5379-1082 (5)	E-5	B	Act	1	GL	AO	Y	C	C	C	N	Y	FC FS PI TM (C)	CS CS Bi CS	SI-VCS-6 SI-VCS-6 N/A IST-RR-6 SI-VCS-6	

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7.3 Valve Table

Valve Number	P&ID (SHT)	Coord	Cat	Act Pass	Size	Valve Type	Act Type	Rap Act	Norm Pos	Safe Pos	Fail Pos	App J Type C	Pos Ind	Test Type	Test Freq	Test Deferral	Remarks
SI-851B	5379-1082 (5)	D-5	B	Act	1	GL	AO	Y	C	C	C	N	Y	FC	CS	SI-VCS-6	
														FS	CS	SI-VCS-6	
														PI	Bi	N/A	
														TM (C)	CS	IST-RR-6 SI-VCS-6	
SI-851C	5379-1082 (5)	B-5	B	Act	1	GL	AO	Y	C	C	C	N	Y	FC	CS	SI-VCS-6	
														FS	CS	SI-VCS-6	
														PI	Bi	N/A	
														TM (C)	CS	IST-RR-6 SI-VCS-6	
SI-853A	5379-1082 (5)	G-6	B	Pass	1	GL	AO	N	C	C	C	N	Y	PI	Bi	N/A	
SI-853B	5379-1082 (5)	E-6	B	Pass	1	GL	AO	N	C	C	C	N	Y	PI	Bi	N/A	
SI-853C	5379-1082 (5)	C-6	B	Pass	1	GL	AO	N	C	C	C	N	Y	PI	Bi	N/A	
SI-855	5379-1082 (5)	F-3	A	Act	1	GL	AO	Y	O	C	C	Y	Y	FC	Q	N/A	
														FS	Q	N/A	
														LJ	App. J	N/A	
														PI	Bi	N/A	
														TM (C)	Q	IST-RR-6	
SI-856A	5379-1082 (2)	E-3	A	Act	2	GL	AO	Y (C)	O	O/C	O	N	Y	FO	CS	SI-VCS-5	IN 91-056
														FS	CS	SI-VCS-5	
														LK	Bi	N/A	
														PI	Bi	N/A	
														TM (O/C)	CS	IST-RR-6 SI-VCS-5	

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7.3 Valve Table

Valve Number	P&ID (SHT)	Coord	Cat	Act Pass	Size	Valve Type	Act Type	Rap Act	Norm Pos	Safe Pos	Fail Pos	App J Type C	Pos Ind	Test Type	Test Freq	Test Deferral	Remarks
SI-856B	5379-1082 (2)	E-3	A	Act	2	GL	AO	Y (C)	O	O/C	O	N	Y	FO FS LK PI TM (O/C)	CS CS Bi Bi CS	SI-VCS-5 SI-VCS-5 N/A N/A IST-RR-6 SI-VCS-5	IN 91-056
SI-857A	5379-1082 (1)	F-7	C	Act	0.75	RV	SA	N/A	C	O	N/A	N	N	RL	App. I	IST-RR-5	
SI-857B	5379-1082 (4)	E-6	C	Act	0.75	RV	SA	N/A	C	O	N/A	N	N	RL	App. I	IST-RR-5	
SI-858A	5379-1082 (5)	F-6	C	Act	1	RV	SA	N/A	C	O	N/A	N	N	RL	App. I	IST-RR-5	
SI-858B	5379-1082 (5)	E-6	C	Act	1	RV	SA	N/A	C	O	N/A	N	N	RL	App. I	IST-RR-5	
SI-858C	5379-1082 (5)	C-6	C	Act	1	RV	SA	N/A	C	O	N/A	N	N	RL	App. I	IST-RR-5	
SI-859	5379-1082 (4)	F-8	C	Act	0.75	RV	SA	N/A	C	O	N/A	N	N	RL	App. I	IST-RR-5	
SI-860A	5379-1082 (5)	C-2	B	Act	14	GA	MO	N	C	O	AI	N	Y	FS PI TM (O)	Q Bi Q	N/A N/A N/A	
SI-860B	5379-1082 (5)	B-2	B	Act	14	GA	MO	N	C	O	AI	N	Y	FS PI TM (O)	Q Bi Q	N/A N/A N/A	
SI-861A	5379-1082 (5)	C-2	B	Act	14	GA	MO	N	C	O	AI	N	Y	FS PI TM (O)	Q Bi Q	N/A N/A N/A	
SI-861B	5379-1082 (5)	B-2	B	Act	14	GA	MO	N	C	O	AI	N	Y	FS PI TM (O)	Q Bi Q	N/A N/A N/A	
SI-862A	5379-1082 (2)	C-3	B	Act	14	GA	MO	N	O	O/C	AI	N	Y	FS PI TM (O/C)	CS Bi CS	SI-VCS-2 N/A SI-VCS-2	

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7.3 Valve Table

Valve Number	P&ID (SHT)	Coord	Cat	Act Pass	Size	Valve Type	Act Type	Rap Act	Norm Pos	Safe Pos	Fail Pos	App J Type C	Pos Ind	Test Type	Test Freq	Test Deferral	Remarks
SI-862B	5379-1082 (2)	C-3	B	Act	14	GA	MO	N	O	O/C	AI	N	Y	FS PI TM (O/C)	CS Bi CS	SI-VCS-2 N/A SI-VCS-2	
SI-863A	5379-1082 (2)	C-3	B	Act	8	GA	MO	N	LC	O/C	AI	N	Y	FS PI TM (O/C)	CS Bi CS	SI-VCS-3 N/A SI-VCS-3	
SI-863B	5379-1082 (2)	C-3	B	Act	8	GA	MO	N	LC	O/C	AI	N	Y	FS PI TM (O/C)	CS Bi CS	SI-VCS-3 N/A SI-VCS-3	
SI-864A	5379-1082 (2)	E-4	A	Act	16	GA	MO	N	O	O/C	AI	N	Y	FS LK PI TM (O/C)	CS Bi Bi CS	SI-VCS-2 N/A N/A SI-VCS-2	IN 91-56
SI-864B	5379-1082 (2)	E-4	A	Act	16	GA	MO	N	O	O/C	AI	N	Y	FS LK PI TM (O/C)	CS Bi Bi CS	SI-VCS-2 N/A N/A SI-VCS-2	IN 91-56
SI-865A	5379-1082 (4)	F-2	B	Act	10	GA	MO	N	O	O/C	AI	N	Y	FS PI TM (O/C)	CS Bi CS	SI-VCS-3 N/A SI-VCS-3	
SI-865B	5379-1082 (4)	D-2	B	Act	10	GA	MO	N	O	O/C	AI	N	Y	FS PI TM (O/C)	CS Bi CS	SI-VCS-3 N/A SI-VCS-3	
SI-865C	5379-1082 (4)	C-2	B	Act	10	GA	MO	N	O	O/C	AI	N	Y	FS PI TM (O/C)	CS Bi CS	SI-VCS-3 N/A SI-VCS-3	
SI-866A	5379-1082 (4)	D-7	B	Act	2	GL	MO	N	C	O/C	AI	N	Y	FS PI TM (O/C)	CS Bi CS	SI-VCS-3 N/A SI-VCS-3	

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7.3 Valve Table

Valve Number	P&ID (SHT)	Coord	Cat	Act Pass	Size	Valve Type	Act Type	Rap Act	Norm Pos	Safe Pos	Fail Pos	App J Type C	Pos Ind	Test Type	Test Freq	Test Deferral	Remarks
SI-866B	5379-1082 (4)	D-7	B	Act	2	GL	MO	N	C	O/C	AI	N	Y	FS PI TM (O/C)	CS Bi CS	SI-VCS-3 N/A SI-VCS-3	
SI-867A	5379-1082 (1)	D-3	B	Pass	4	GA	MO	N	O	O	AI	N	Y	PI	Bi	N/A	
SI-867B	5379-1082 (1)	C-3	B	Pass	4	GA	MO	N	O	O	AI	N	Y	PI	Bi	N/A	
SI-868A	5379-1082 (1)	B-7	B	Pass	2	GA	M	N	O	O	AI	N	N	FS	Bi	IST-RR-4	
SI-868B	5379-1082 (1)	B-7	B	Pass	2	GA	M	N	O	O	AI	N	N	FS	Bi	IST-RR-4	
SI-868C	5379-1082 (1)	B-7	B	Pass	2	GA	M	N	O	O	AI	N	N	FS	Bi	IST-RR-4	
SI-869	5379-1082 (1)	F-8	A	Act	3	GA	MO	N	C	O	AI	Y	Y	FS LJ PI TM (O)	Q App. J Bi Q	N/A N/A N/A N/A	
SI-870A	5379-1082 (1)	D-8	A	Act	3	GA	MO	N	C	O/C	AI	Y	Y	FS LJ PI TM (O/C)	Q App. J Bi Q	N/A N/A N/A N/A	
SI-870B	5379-1082 (1)	D-7	A	Act	3	GA	MO	N	C	O/C	AI	Y	Y	FS LJ PI TM (O/C)	Q App. J Bi Q	N/A N/A N/A N/A	
SI-871	5379-1082 (3)	E-2	C	Act	0.75	RV	SA	N/A	C	O	N/A	N	N	RL	App. I	IST-RR-5	
SI-872	5379-1082 (3)	G-6	C	Act	0.75	RV	SA	N/A	C	O	N/A	N	N	RL	App. I	IST-RR-5	
SI-873A	5379-1082 (4)	C-6	A/C	Act	2	CK	SA	N/A	C	O/C	N/A	N	N	FF LK RF	R Bi R	SI-VRS-3 N/A SI-VRS-3	SI-873A and SI-873D are tested as a unit (ISTC 4.5.7)
SI-873B	5379-1082 (4)	C-6	C	Act	2	CK	SA	N/A	C	O	N/A	N	N	CM	App. II	N/A	
SI-873C	5379-1082 (4)	C-5	C	Act	2	CK	SA	N/A	C	O	N/A	N	N	CM	App. II	N/A	

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7.3 Valve Table

Valve Number	P&ID (SHT)	Coord	Cat	Act Pass	Size	Valve Type	Act Type	Rap Act	Norm Pos	Safe Pos	Fail Pos	App J Type	Pos C Ind	Test Type	Test Freq	Test Deferral	Remarks
SI-873D	5379-1082 (4)	B-6	A/C	Act	2	CK	SA	N/A	C	O/C	N/A	N	N	FF LK RF	R Bi R	SI-VRS-3 N/A SI-VRS-3	SI-873A and SI-873D are tested as a unit (ISTC 4.5.7)
SI-873E	5379-1082 (4)	B-6	A/C	Act	2	CK	SA	N/A	C	O/C	N/A	N	N	FF LK RF	R Bi R	SI-VRS-3 N/A SI-VRS-3	
SI-873F	5379-1082 (4)	C-5	A/C	Act	2	CK	SA	N/A	C	O/C	N/A	N	N	FF LK RF	R Bi R	SI-VRS-3 N/A SI-VRS-3	
SI-874A	5379-1082 (4)	C-7	A/C	Act	2	CK	SA	N/A	C	O/C	N/A	N	N	FF LK RF	R Bi R	SI-VRS-3 N/A SI-VRS-3	
SI-874B	5379-1082 (4)	C-7	A/C	Act	2	CK	SA	N/A	C	O/C	N/A	N	N	FF LK RF	R Bi R	SI-VRS-3 N/A SI-VRS-3	
SI-875A	5379-1082 (4)	B-6	A/C	Act	10	CK	SA	N/A	C	O/C	N/A	N	N	CM LK	App. II Bi	N/A N/A	
SI-875B	5379-1082 (4)	B-7	A/C	Act	10	CK	SA	N/A	C	O/C	N/A	N	N	CM LK	App. II Bi	N/A N/A	
SI-875C	5379-1082 (4)	A-7	A/C	Act	10	CK	SA	N/A	C	O/C	N/A	N	N	CM LK	App. II Bi	N/A N/A	
SI-875D	5379-1082 (4)	F-3	A/C	Act	10	CK	SA	N/A	C	O/C	N/A	N	N	CM LK	App. II Bi	N/A N/A	
SI-875E	5379-1082 (4)	D-3	A/C	Act	10	CK	SA	N/A	C	O/C	N/A	N	N	CM LK	App. II Bi	N/A N/A	
SI-875F	5379-1082 (4)	C-3	A/C	Act	10	CK	SA	N/A	C	O/C	N/A	N	N	CM LK	App. II Bi	N/A N/A	

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7.3 Valve Table

Valve Number	P&ID (SHT)	Coord	Cat	Act Pass	Size	Valve Type	Act Type	Rap Act	Norm Pos	Safe Pos	Fail Pos	App J Type	Pos C Ind	Test Type	Test Freq	Test Deferral	Remarks
SI-876A	5379-1082 (4)	F-3	A/C	Act	8	CK	SA	N/A	C	O/C	N/A	N	N	CM LK	App. II Bi	N/A N/A	
SI-876B	5379-1082 (4)	D-4	A/C	Act	8	CK	SA	N/A	C	O/C	N/A	N	N	CM LK	App. II Bi	N/A N/A	
SI-876C	5379-1082 (4)	C-3	A/C	Act	8	CK	SA	N/A	C	O/C	N/A	N	N	CM LK	App. II Bi	N/A N/A	
SI-878A	5379-1082 (2)	D-7	B	Act	4	GA	MO	N/A	O	C	AI	N	Y	FS PI TM (C)	CS Bi CS	SI-VCS-3 N/A SI-VCS-3	
SI-878B	5379-1082 (2)	E-7	B	Act	4	GA	MO	N/A	O	C	AI	N	Y	FS PI TM (C)	CS Bi CS	SI-VCS-3 N/A SI-VCS-3	
SI-879A	5379-1082 (2)	D-7	C	Act	3	CK	SA	N/A	C	O/C	N/A	N	N	FF RF	R R	SI-VRS-2 SI-VRS-2	
SI-879B	5379-1082 (2)	E-7	C	Act	3	CK	SA	N/A	C	O/C	N/A	N	N	FF RF	R R	SI-VRS-2 SI-VRS-2	
SI-879C	5379-1082 (2)	F-7	C	Act	3	CK	SA	N/A	C	O/C	N/A	N	N	FF RF	R R	SI-VRS-2 SI-VRS-2	
SI-880A	5379-1082 (3)	C-5	B	Act	6	GA	MO	N	C	O	AI	N	Y	FS PI TM (O)	Q Bi Q	N/A N/A N/A	
SI-880B	5379-1082 (3)	C-5	B	Act	6	GA	MO	N	C	O	AI	N	Y	FS PI TM (O)	Q Bi Q	N/A N/A N/A	
SI-880C	5379-1082 (3)	E-5	B	Act	6	GA	MO	N	C	O	AI	N	Y	FS PI TM (O)	Q Bi Q	N/A N/A N/A	

HBRSEP, Unit No. 2 IST Program Plan - Fourth Interval

7.3 Valve Table

Valve Number	P&ID (SHT)	Coord	Cat	Act Pass	Size	Valve Type	Act Type	Rap Act	Norm Pos	Safe Pos	Fail Pos	App J Type C	Pos Ind	Test Type	Test Freq	Test Deferral	Remarks
SI-880D	5379-1082 (3)	E-5	B	Act	6	GA	MO	N	C	O	AI	N	Y	FS PI TM (O)	Q Bi Q	N/A N/A N/A	
SI-883L	5379-1082 (1)	C-6	A	Pass	1	GL	M	N/A	LC	C	N/A	Y	N	LJ	App. J	N/A	
SI-883W	5379-1082 (1)	C-5	A	Pass	1	GL	M	N/A	C	C	N/A	Y	N	LJ	App. J	N/A	
SI-889A	5379-1082 (3)	D-3	C	Act	2	CK	SA	N/A	C	O/C	N/A	N	N	FF RF	CS CS	SI-VCS-4 SI-VCS-4	
SI-889B	5379-1082 (3)	D-3	C	Act	2	CK	SA	N/A	C	O/C	N/A	N	N	FF RF	CS CS	SI-VCS-4 SI-VCS-4	
SI-890A	5379-1082 (3)	C-5	A/C	Act	6	CK	SA	N/A	C	O/C	N/A	N	N	CM LK	App. II Bi	N/A N/A	
SI-890B	5379-1082 (3)	E-6	A/C	Act	6	CK	SA	N/A	C	O/C	N/A	N	N	CM LK	App. II Bi	N/A N/A	
SI-891A	5379-1082 (3)	C-8	A	Act	6	GA	M	N/A	LO	O/C	N/A	Y	N	FS LJ	Bi App. J	IST-RR-4 N/A	
SI-891B	5379-1082 (3)	E-8	A	Act	6	GA	M	N/A	LO	O/C	N/A	Y	N	FS LJ	Bi App. J	IST-RR-4 N/A	
SI-893A	5379-1082 (2)	D-6	C	Act	0.75	CK	SA	N/A	C	O	N/A	N	N	CV FF	R R	SI-VRS-4 SI-VRS-4	
SI-893B	5379-1082 (2)	E-6	C	Act	0.75	CK	SA	N/A	C	O	N/A	N	N	CV FF	R R	SI-VRS-4 SI-VRS-4	
SI-893C	5379-1082 (2)	G-6	C	Act	0.75	CK	SA	N/A	C	O	N/A	N	N	CV FF	R R	SI-VRS-4 SI-VRS-4	
SI-895V	5379-1082 (1)	G-7	A	Pass	0.75	GL	M	N/A	LC	C	N/A	Y	N	FS LJ	Bi App. J	IST-RR-4 N/A	
SI-898F	5379-1082 (1)	G-7	A	Pass	0.75	GL	M	N/A	LC	C	N/A	Y	N	FS LJ	Bi App. J	IST-RR-4 N/A	

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7.3 Valve Table

Valve Number	P&ID (SHT)	Coord	Cat	Act Pass	Size	Valve Type	Act Type	Rap Act	Norm Pos	Safe Pos	Fail Pos	App J Type	Pos C Ind	Test Type	Test Freq	Test Deferral	Remarks
SI-899D	5379-1082 (3)	G-7	C	Act	0.75	VB	SA	N/A	C	O	N/A	N	N	RL	App. I	IST-RR-5	
SI-899E	5379-1082 (3)	G-7	C	Act	0.75	VB	SA	N/A	C	O	N/A	N	N	RL	App. I	IST-RR-5	
SI-909	5379-1082 (5)	F-3	A/C	Act	1	CK	SA	N/A	C	C	N/A	Y	N	LJ OV RF	App. J R R	N/A SI-VRS-1 SI-VRS-1	
SV1-1A	G-190196 (1)	C-6	C	Act	6	RV	SA	N/A	C	O/C	N/A	N	N	RL	App. I	IST-RR-5	
SV1-1B	G-190196 (1)	E-6	C	Act	6	RV	SA	N/A	C	O/C	N/A	N	N	RL	App. I	IST-RR-5	
SV1-1C	G-190196 (1)	G-6	C	Act	6	RV	SA	N/A	C	O/C	N/A	N	N	RL	App. I	IST-RR-5	
SV1-2A	G-190196 (1)	C-6	C	Act	6	RV	SA	N/A	C	O/C	N/A	N	N	RL	App. I	IST-RR-5	
SV1-2B	G-190196 (1)	E-6	C	Act	6	RV	SA	N/A	C	O/C	N/A	N	N	RL	App. I	IST-RR-5	
SV1-2C	G-190196 (1)	G-6	C	Act	6	RV	SA	N/A	C	O/C	N/A	N	N	RL	App. I	IST-RR-5	
SV1-3A	G-190196 (1)	C-5	C	Act	6	RV	SA	N/A	C	O/C	N/A	N	N	RL	App. I	IST-RR-5	
SV1-3B	G-190196 (1)	E-5	C	Act	6	RV	SA	N/A	C	O/C	N/A	N	N	RL	App. I	IST-RR-5	
SV1-3C	G-190196 (1)	G-5	C	Act	6	RV	SA	N/A	C	O/C	N/A	N	N	RL	App. I	IST-RR-5	
SV1-4A	G-190196 (1)	C-5	C	Act	6	RV	SA	N/A	C	O/C	N/A	N	N	RL	App. I	IST-RR-5	
SV1-4B	G-190196 (1)	E-5	C	Act	6	RV	SA	N/A	C	O/C	N/A	N	N	RL	App. I	IST-RR-5	
SV1-4C	G-190196 (1)	G-5	C	Act	6	RV	SA	N/A	C	O/C	N/A	N	N	RL	App. I	IST-RR-5	
SW-118	G-190199 (10)	C-4	B	Act	6	GA	M	N/A	LC	O	N/A	N	N	FS	Bi	IST-RR-4	
SW-18	G-190199 (9)	D-7	B	Act	24	BF	M	N/A	O	O/C	N/A	N	N	FS	Bi	IST-RR-4	
SW-19	G-190199 (9)	E-7	B	Act	24	BF	M	N/A	O	O/C	N/A	N	N	FS	Bi	IST-RR-4	
SW-200	G-190199 (7)	D-3	B	Act	1	GL	M	N/A	LC	O	N/A	N	N	FS	Bi	N/A	AUG
SW-202	G-190199 (7)	D-3	B	Act	1	GL	M	N/A	C	O	N/A	N	N	FS	Bi	N/A	AUG
SW-261	G-190199 (10)	F-2	C	Act	1	CK	SA	N/A	C	O	N/A	N	N	CM	App. II	N/A	
SW-272	G-190199 (10)	E-1	C	Act	1	CK	SA	N/A	C	O	N/A	N	N	CM	App. II	N/A	

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7.3 Valve Table

Valve Number	P&ID (SHT)	Coord	Cat	Act Pass	Size	Valve Type	Act Type	Rap Act	Norm Pos	Safe Pos	Fail Pos	App J Type	Pos C Ind	Test Type	Test Freq	Test Deferral	Remarks
SW-374	G-190199 (2)	C-8	C	Act	18	CK	SA	N/A	O/C	O/C	N/A	N	N	FF RF	Q Q	N/A N/A	
SW-375	G-190199 (2)	C-6	C	Act	18	CK	SA	N/A	O/C	O/C	N/A	N	N	FF RF	Q Q	N/A N/A	
SW-376	G-190199 (2)	C-7	C	Act	18	CK	SA	N/A	O/C	O/C	N/A	N	N	FF RF	Q Q	N/A N/A	
SW-377	G-190199 (2)	C-6	C	Act	18	CK	SA	N/A	O/C	O/C	N/A	N	N	FF RF	Q Q	N/A N/A	
SW-541	G-190199 (9)	G-5	C	Act	30	CK	SA	N/A	O	O/C	N/A	N	N	FF RF	Q Q	N/A N/A	
SW-545	G-190199 (10)	B-3	C	Act	30	CK	SA	N/A	O	O/C	N/A	N	N	FF RF	Q Q	N/A N/A	
SW-546	G-190199 (4)	F-3	C	Act	0.75	RV	SA	N/A	C	O	N/A	N	N	RL	App. I	IST-RR-5	
SW-547	G-190199 (5)	E-6	C	Act	0.75	RV	SA	N/A	C	O	N/A	N	N	RL	App. I	IST-RR-5	
SW-548	G-190199 (5)	D-6	C	Act	0.75	RV	SA	N/A	C	O	N/A	N	N	RL	App. I	IST-RR-5	
SW-549	G-190199 (5)	C-6	C	Act	0.75	RV	SA	N/A	C	O	N/A	N	N	RL	App. I	IST-RR-5	
SW-559	G-190199 (7)	D-3	C	Act	1	CK	SA	N/A	C	O	N/A	N	N	CM	App. II	N/A	AUG
SW-560	G-190199 (7)	F-5	C	Act	12	CK	SA	N/A	O/C	O/C	N/A	N	N	FF RF	Q Q	N/A N/A	
SW-561	G-190199 (7)	E-5	C	Act	12	CK	SA	N/A	O/C	O/C	N/A	N	N	FF RF	Q Q	N/A N/A	
SW-562	G-190199 (9)	D-6	C	Act	1	CK	SA	N/A	O/C	O	N/A	N	N	FF	Q	N/A	AUG
SW-563	G-190199 (9)	E-6	C	Act	1	CK	SA	N/A	O/C	O	N/A	N	N	FF	Q	N/A	AUG
SW-83	G-190199 (6)	G-6	B	Pass	6	GA	M	N/A	C	C	N/A	N	N	FS	Bi	N/A	AUG
SW-837	G-190199 (2)	F-6	C	Act	0.5	CK	SA	N/A	C	C	N/A	N	N	CM	App. II	N/A	
SW-843	G-190199 (2)	F-6	C	Act	0.5	CK	SA	N/A	C	C	N/A	N	N	CM	App. II	N/A	

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7.3 Valve Table

Valve Number	P&ID (SHT)	Coord	Cat	Act Pass	Size	Valve Type	Act Type	Rap Act	Norm Pos	Safe Pos	Fail Pos	App J Type	Pos C Ind	Test Type	Test Freq	Test Deferral	Remarks
SW-849	G-190199 (2)	F-7	C	Act	0.5	CK	SA	N/A	C	C	N/A	N	N	CM	App. II	N/A	
SW-855	G-190199 (2)	F-7	C	Act	0.5	CK	SA	N/A	C	C	N/A	N	N	CM	App. II	N/A	
SW-906	G-190199 (5)	B-2	B	Act	3	GA	M	N/A	O	O/C	N/A	N	N	FS	BI	IST-RR-4	
SW-907	G-190199 (5)	B-4	B	Act	2	GA	M	N/A	O	O/C	N/A	N	N	FS	BI	IST-RR-4	
SW-911	G-190199 (10)	F-6	C	Act	2	CK	SA	N/A	O	C	N/A	N	N	CM	App. II	N/A	
SW-924	G-190199 (10)	F-7	C	Act	2	CK	SA	N/A	O	C	N/A	N	N	CM	App. II	N/A	
SW-931	G-190199 (7)	E-5	C	Act	0.5	CK	SA	N/A	O	C	N/A	N	N	CM	App. II	N/A	AUG
SW-932	G-190199 (7)	F-5	C	Act	0.5	CK	SA	N/A	O	C	N/A	N	N	CM	App. II	N/A	AUG
SW-933	G-190199 (7)	D-4	C	Act	1	CK	SA	N/A	C	C	N/A	N	N	CM	App. II	N/A	AUG
SW-949	G-190199 (7)	E-4	C	Act	6	CK	SA	N/A	O/C	C	N/A	N	N	OV RF	Q Q	N/A N/A	System normally out of service
SW-950	G-190199 (7)	E-4	C	Act	6	CK	SA	N/A	O/C	C	N/A	N	N	OV RF	Q Q	N/A N/A	System normally out of service
TCV-1660	G-190199 (6)	C-1	B	Act	4	GL	AO	N	C	O	O	N	N	FO FS TM (O)	Q Q Q	N/A N/A N/A	
TCV-1661	G-190199 (6)	C-5	B	Act	4	GL	AO	N	C	O	O	N	N	FO FS TM (O)	Q Q Q	N/A N/A N/A	
TCV-1903A	G-190199 (9)	C-5	B	Act	1	GL	AO	Y	C	O	O	N	Y	FO FS PI TM (O)	Q Q Bi Q	N/A N/A N/A IST-RR-6	

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7.3 Valve Table

Valve Number	P&ID (SHT)	Coord	Cat	Act Pass	Size	Valve Type	Act Type	Rap Act	Norm Pos	Safe Pos	Fail Pos	App J Type	Pos C Ind	Test Type	Test Freq	Test Deferral	Remarks
TCV-1903B	G-190199 (9)	F-5	B	Act	1	GL	AO	Y	C	O	O	N	Y	FO	Q	N/A	
														FS	Q	N/A	
														PI	Bi	N/A	
														TM (O)	Q	IST-RR-6	
V12-10	G-190304 (1)	D-2	A	Act	6	BF	AO	Y	O/C	C	C	Y	Y	FC	Q	N/A	
														FS	Q	N/A	
														LJ	App. J	N/A	
														PI	Bi	N/A	
														TM (C)	Q	IST-RR-6	
V12-11	G-190304 (1)	D-3	A	Act	6	BF	AO	Y	O/C	C	C	Y	Y	FC	Q	N/A	
														FS	Q	N/A	
														LJ	App. J	N/A	
														PI	Bi	N/A	
														TM (C)	Q	IST-RR-6	
V12-12	G-190304 (1)	C-6	A	Act	6	BF	AO	Y	O/C	C	C	Y	Y	FC	CS	HVA-VCS-1	
														FS	CS	HVA-VCS-1	
														LJ	App. J	N/A	
														PI	Bi	N/A	
														TM (C)	CS	HVA-VCS-1 IST-RR-6	
V12-13	G-190304 (1)	C-6	A	Act	6	BF	AO	Y	O/C	C	C	Y	Y	FC	CS	HVA-VCS-1	
														FS	CS	HVA-VCS-1	
														LJ	App. J	N/A	
														PI	Bi	N/A	
														TM (C)	CS	HVA-VCS-1 IST-RR-6	

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7.3 Valve Table

Valve Number	P&ID (SHT)	Coord	Cat	Act Pass	Size	Valve Type	Act Type	Rap Act	Norm Pos	Safe Pos	Fail Pos	App J Type	Pos C Ind	Test Type	Test Freq	Test Deferral	Remarks
V12-14	HBR2-6933 (1)	F-8	A	Act	3	DA	AO	N	C	O/C	C	Y	Y	FC	CS	PAV-VCS-1	
														FS	CS	PAV-VCS-1	
														LJ	App. J	N/A	
														PI	Bi	N/A	
														TM (O/C)	CS	PAV-VCS-1	
V12-15	HBR2-6933 (1)	G-6	A	Act	3	DA	AO	N	C	O/C	C	Y	Y	FC	CS	PAV-VCS-1	
														FS	CS	PAV-VCS-1	
														LJ	App. J	N/A	
														PI	Bi	N/A	
														TM (O/C)	CS	PAV-VCS-1	
V12-16	HBR2-6933 (1)	G-5	B	Act	3	DA	M	N/A	C	O	N/A	N	N	FS	Bi	N/A	AUG
V12-17	HBR2-6933 (1)	G-4	B	Act	3	DA	M	N/A	C	O	N/A	N	N	FS	Bi	N/A	AUG
V12-18	HBR2-6933 (1)	E-8	A	Act	3	DA	AO	N	C	O/C	C	Y	Y	FC	CS	PAV-VCS-1	
														FS	CS	PAV-VCS-1	
														LJ	App. J	N/A	
														PI	Bi	N/A	
														TM (O/C)	CS	PAV-VCS-1	
V12-19	HBR2-6933 (1)	E-7	A	Act	3	DA	AO	N	C	O/C	C	Y	Y	FC	CS	PAV-VCS-1	
														FS	CS	PAV-VCS-1	
														LJ	App. J	N/A	
														PI	Bi	N/A	
														TM (O/C)	CS	PAV-VCS-1	
V12-20	HBR2-6933 (1)	E-6	B	Act	3	DA	M	N/A	C	O	N/A	N	N	FS	Bi	N/A	AUG
V12-21	HBR2-6933 (1)	E-5	B	Act	3	DA	M	N/A	C	O	N/A	N	N	FS	Bi	N/A	AUG
V12-24A	G-190200 (9)	F-4	B	Act	2	DA	AO	N	C	O	C	N	Y	FC	Bi	N/A	AUG
														FS	Bi	N/A	
														PI	Bi	N/A	
														TM (O)	Bi	N/A	

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7.3 Valve Table

Valve Number	P&ID (SHT)	Coord	Cat	Act Pass	Size	Valve Type	Act Type	Rap Act	Norm Pos	Safe Pos	Fail Pos	App J Type	Pos C Ind	Test Type	Test Freq	Test Deferral	Remarks
V12-24B	G-190200 (3)	E-5	B	Act	2	DA	AO	N	C	O	C	N	Y	FC	Bi	N/A	AUG
														FS	Bi	N/A	
														PI	Bi	N/A	
														TM (O)	Bi	N/A	
V12-25	G-190200 (3)	C-5	B	Act	2	DA	AO	N	C	O	C	N	Y	FC	Bi	N/A	AUG
														FS	Bi	N/A	
														PI	Bi	N/A	
														TM (O)	Bi	N/A	
V12-6	G-190304 (1)	C-6	A	Act	42	BF	AO	Y	O/C	C	C	Y	Y	FC	CS	HVA-VCS-2	
														FS	CS	HVA-VCS-2	
														LJ	App. J	N/A	
														PI	Bi	N/A	
														TM (C)	CS	HVA-VCS-2 IST-RR-6	
V12-61	HBR2-6933 (1)	G-5	B	Act	2	GA	M	N/A	C	O	N/A	N	N	FS	Bi	N/A	AUG
V12-63	HBR2-6933 (1)	E-6	B	Act	2	GA	M	N/A	C	O	N/A	N	N	FS	Bi	N/A	AUG
V12-7	G-190304 (1)	C-6	A	Act	42	BF	AO	Y	O/C	C	C	Y	Y	FC	CS	HVA-VCS-2	
														FS	CS	HVA-VCS-2	
														LJ	App. J	N/A	
														PI	Bi	N/A	
														TM (C)	CS	HVA-VCS-2 IST-RR-6	
V12-8	G-190304 (1)	E-2	A	Act	42	BF	AO	Y	O/C	C	C	Y	Y	FC	CS	HVA-VCS-2	
														FS	CS	HVA-VCS-2	
														LJ	App. J	N/A	
														PI	Bi	N/A	
														TM (C)	CS	HVA-VCS-2 IST-RR-6	

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7.3 Valve Table

Valve Number	P&ID (SHT)	Coord	Cat	Act Pass	Size	Valve Type	Act Type	Rap Act	Norm Pos	Safe Pos	Fail Pos	App J Type	Pos C Ind	Test Type	Test Freq	Test Deferral	Remarks
V12-9	G-190304 (1)	D-3	A	Act	42	BF	AO	Y	O/C	C	C	Y	Y	FC	CS	HVA-VCS-2	
														FS	CS	HVA-VCS-2	
														LJ	App. J	N/A	
														PI	Bi	N/A	
														TM (C)	CS	HVA-VCS-2 IST-RR-6	
V6-12A	G-190199 (2)	D-7	B	Act	30	BF	MO	N	O	C	AI	N	Y	FS	Q	N/A	
														PI	Bi	N/A	
														TM (C)	Q	N/A	
V6-12B	G-190199 (2)	C-7	B	Act	30	BF	MO	N	O	C	AI	N	Y	FS	Q	N/A	
														PI	Bi	N/A	
														TM (C)	Q	N/A	
V6-12C	G-190199 (2)	C-6	B	Act	30	BF	MO	N	O	C	AI	N	Y	FS	Q	N/A	
														PI	Bi	N/A	
														TM (C)	Q	N/A	
V6-12D	G-190199 (2)	D-6	B	Act	30	BF	MO	N	O	C	AI	N	Y	FS	Q	N/A	
														PI	Bi	N/A	
														TM (C)	Q	N/A	
V6-16A	G-190199 (10)	B-3	B	Act	16	BF	MO	N	O	C	AI	N	Y	FS	Q	N/A	
														PI	Bi	N/A	
														TM (C)	Q	N/A	
V6-16B	G-190199 (10)	C-3	B	Act	16	BF	MO	N	O	C	AI	N	Y	FS	Q	N/A	
														PI	Bi	N/A	
														TM (C)	Q	N/A	
V6-16C	G-190199 (10)	B-2	B	Act	16	BF	MO	N	O	C	AI	N	Y	FS	CS	SW-VCS-1	
														PI	Bi	N/A	
														TM (C)	CS	SW-VCS-1	

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7.3 Valve Table

Valve Number	P&ID (SHT)	Coord	Cat	Act Pass	Size	Valve Type	Act Type	Rap Act	Norm Pos	Safe Pos	Fail Pos	App J Type	Pos C Ind	Test Type	Test Freq	Test Deferral	Remarks
V6-33A	G-190199 (7)	E-3	B	Act	6	BF	MO	N	O	C	AI	N	Y	FS PI TM (C)	Q Bi Q	N/A N/A N/A	
V6-33B	G-190199 (7)	E-3	B	Act	6	BF	MO	N	O	C	AI	N	Y	FS PI TM (C)	Q Bi Q	N/A N/A N/A	
V6-33C	G-190199 (7)	G-3	B	Act	6	BF	MO	N	O	C	AI	N	Y	FS PI TM (C)	Q Bi Q	N/A N/A N/A	
V6-33D	G-190199 (7)	F-3	B	Act	6	BF	MO	N	O	C	AI	N	Y	FS PI TM (C)	Q Bi Q	N/A N/A N/A	
V6-33E	G-190199 (7)	E-4	B	Act	6	BF	MO	N	O	C	AI	N	Y	FS PI TM (C)	Q Bi Q	N/A N/A N/A	
V6-33F	G-190199 (7)	F-4	B	Act	6	BF	MO	N	O	C	AI	N	Y	FS PI TM (C)	Q Bi Q	N/A N/A N/A	
V6-34A	G-190199 (5)	C-6	B	Act	6	BF	MO	N	O	C	AI	N	Y	FS PI TM (C)	Q Bi Q	N/A N/A N/A	
V6-34B	G-190199 (5)	D-6	B	Act	6	BF	MO	N	O	C	AI	N	Y	FS PI TM (C)	Q Bi Q	N/A N/A N/A	
V6-34C	G-190199 (5)	E-6	B	Act	6	BF	MO	N	O	C	AI	N	Y	FS PI TM (C)	Q Bi Q	N/A N/A N/A	

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7.3 Valve Table

Valve Number	P&ID (SHT)	Coord	Cat	Act Pass	Size	Valve Type	Act Type	Rap Act	Norm Pos	Safe Pos	Fail Pos	App J Type C	Pos Ind	Test Type	Test Freq	Test Deferral	Remarks
V6-34D	G-190199 (5)	F-6	B	Act	6	BF	MO	N	O	C	AI	N	Y	FS PI TM (C)	Q Bi Q	N/A N/A N/A	
V6-35A	G-190199 (4)	G-3	B	Act	1	GL	MO	N	O	C	AI	N	Y	FS PI TM (C)	Q Bi Q	N/A N/A N/A	
V6-35B	G-190199 (4)	G-4	B	Act	1	GL	MO	N	O	C	AI	N	Y	FS PI TM (C)	Q Bi Q	N/A N/A N/A	
V6-35C	G-190199 (4)	G-3	B	Act	1	GL	MO	N	O	C	AI	N	Y	FS PI TM (C)	Q Bi Q	N/A N/A N/A	
V6-35D	G-190199 (4)	G-3	B	Act	1	GL	MO	N	O	C	AI	N	Y	FS PI TM (C)	Q Bi Q	N/A N/A N/A	
VCT-13	HBR2-6490 (1)	C-8	A	Pass	2	GA	M	N/A	LC	C	N/A	Y	N	LJ	App. J	N/A	
VCT-18	HBR2-6490 (1)	C-7	A	Pass	0.375	GL	M	N/A	LC	C	N/A	Y	N	LJ	App. J	N/A	
VCT-19	HBR2-6490 (1)	D-7	A	Pass	0.375	GL	M	N/A	LC	C	N/A	Y	N	LJ	App. J	N/A	
VCT-20	HBR2-6490 (1)	E-8	A	Pass	0.375	GL	M	N/A	LC	C	N/A	Y	N	LJ	App. J	N/A	
WD-1621	5379-921 (2)	F-3	C	Act	1	RV	SA	N/A	C	O	N/A	N	N	RL	App. I	N/A	AUG
WD-1622	5379-921 (2)	G-3	C	Act	1	RV	SA	N/A	C	O	N/A	N	N	RL	App. I	N/A	AUG
WD-1623	5379-921 (2)	D-3	C	Act	1	RV	SA	N/A	C	O	N/A	N	N	RL	App. I	N/A	AUG
WD-1624	5379-921 (2)	E-3	C	Act	1	RV	SA	N/A	C	O	N/A	N	N	RL	App. I	N/A	AUG
WD-1713	5379-920 (3)	E-7	A/C	Pass	1	CK	SA	N/A	C	C	N/A	Y	N	LJ	App. J	N/A	

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7.3 Valve Table

Valve Number	P&ID (SHT)	Coord	Cat	Act Pass	Size	Valve Type	Act Type	Rap Act	Norm Pos	Safe Pos	Fail Pos	App J Type	Pos C Ind	Test Type	Test Freq	Test Deferral	Remarks
WD-1721	5379-920 (3)	C-6	A	Act	3	DA	AO	N	O/C	C	C	Y	Y	FC	Q	N/A	
														FS	Q	N/A	
														LJ	App. J	N/A	
														PI	Bi	N/A	
														TM (C)	Q	N/A	
WD-1722	5379-920 (3)	C-7	A	Act	3	DA	AO	Y	O/C	C	C	Y	Y	FC	Q	N/A	
														FS	Q	N/A	
														LJ	App. J	N/A	
														PI	Bi	N/A	
														TM (C)	Q	IST-RR-6	
WD-1723	5379-920 (3)	B-7	A	Act	2	DA	AO	Y	O/C	C	C	Y	Y	FC	Q	N/A	
														FS	Q	N/A	
														LJ	App. J	N/A	
														PI	Bi	N/A	
														TM (C)	Q	IST-RR-6	
WD-1728	5379-920 (3)	B-7	A	Act	2	DA	AO	Y	O/C	C	C	Y	Y	FC	Q	N/A	
														FS	Q	N/A	
														LJ	App. J	N/A	
														PI	Bi	N/A	
														TM (C)	Q	IST-RR-6	
WD-1786	5379-920 (3)	D-6	A	Act	1	DA	AO	Y	O/C	C	C	Y	Y	FC	Q	N/A	
														FS	Q	N/A	
														LJ	App. J	N/A	
														PI	Bi	N/A	
														TM (C)	Q	IST-RR-6	
WD-1787	5379-920 (3)	D-7	A	Act	1	DA	AO	Y	O/C	C	C	Y	Y	FC	Q	N/A	
														FS	Q	N/A	
														LJ	App. J	N/A	
														PI	Bi	N/A	
														TM (C)	Q	IST-RR-6	

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7.3 Valve Table

Valve Number	P&ID (SHT)	Coord	Cat	Act Pass	Size	Valve Type	Act Type	Rap Act	Norm Pos	Safe Pos	Fail Pos	App J Type	Pos C Ind	Test Type	Test Freq	Test Deferral	Remarks
WD-1789	5379-920 (3)	D-7	A	Act	0.75	DA	AO	Y	O/C	C	C	Y	Y	FC	Q	N/A	
														FS	Q	N/A	
														LJ	App. J	N/A	
														PI	Bi	N/A	
														TM (C)	Q	IST-RR-6	
WD-1793	5379-920 (3)	E-6	A	Pass	1	DA	M	N/A	LC	C	N/A	Y	N	LJ	App. J	N/A	
WD-1794	5379-920 (3)	D-6	A	Act	0.75	DA	AO	N	O/C	C	C	Y	Y	FC	Q	N/A	
														FS	Q	N/A	
														LJ	App. J	N/A	
														PI	Bi	N/A	
														TM (C)	Q	IST-RR-6	

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7.4 Excluded Valve Table

P&ID	Valve No	Reason For Exclusion
5379-1082 (1)	SI-841A	No safety function
	SI-841B	No safety function
	SI-877D	Exempt per ISTC-1.2 (a)
	SI-894	Line blocked by MOD-888
	SI-895K	Category B passive manual valve
	SI-895N	Exempt per ISTC-1.2 (a)
	SI-895P	Category B passive manual valve
	SI-895T	Category B passive manual valve
	SI-895U	Category B passive manual valve
	SI-899B	Category B passive manual valve
5379-1082 (2)	SI-878C	Exempt per ISTC-1.2 (a)
	SI-889C	Exempt per ISTC-1.2 (a)
	SI-891C	Category B passive manual valve
	SI-891D	Category B passive manual valve
	SI-897G	Category B passive manual valve
	SI-898D	Category B passive manual valve
	SI-898G	Category B passive manual valve
	SI-898H	Category B passive manual valve
	SI-898J	Category B passive manual valve
	SI-915	Category B passive manual valve
5379-1082 (3)	SI-916	Category B passive manual valve
	SI-883M	Category B passive manual valve
	SI-883N	Category B passive manual valve
	SI-889D	Category C passive check valve
	SI-889E	Category C passive manual valve
	SI-889F	Category C passive manual valve
	SI-892A	Category B passive manual valve
	SI-892C	Category B passive manual valve
	SI-892D	Category B passive manual valve
	SI-892E	Category B passive manual valve
SI-892F	Category B passive manual valve	
SI-892G	Category B passive manual valve	
SI-892H	Category B passive manual valve	
SI-896E	Category B passive manual valve	
SI-897H	Category B passive manual valve	
SI-897J	Category B passive manual valve	

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7.4 Excluded Valve Table

P&ID	Valve No	Reason For Exclusion
5379-1082 (4)	SI-850A	Exempt per ISTC-1.2 (a)
	SI-850B	Exempt per ISTC-1.2 (a)
	SI-850C	Exempt per ISTC-1.2 (a)
	SI-850D	Exempt per ISTC-1.2 (a)
	SI-850E	Exempt per ISTC-1.2 (a)
	SI-850F	Exempt per ISTC-1.2 (a)
	SI-877A	Exempt per ISTC-1.2 (a)
	SI-877B	Exempt per ISTC-1.2 (a)
	SI-877C	Exempt per ISTC-1.2 (a)
	SI-883R	Category B passive manual valve
	SI-884A	Exempt per ISTC-1.2 (a)
	SI-884B	Exempt per ISTC-1.2 (a)
	SI-884C	Exempt per ISTC-1.2 (a)
	SI-884D	Exempt per ISTC-1.2 (a)
	SI-884E	Exempt per ISTC-1.2 (a)
5379-1082 (5)	HCV-936	Exempt per ISTC-1.2 (a)
	SI-852A	Exempt per ISTC-1.2 (a)
	SI-852B	Exempt per ISTC-1.2 (a)
	SI-852C	Exempt per ISTC-1.2 (a)
	SI-882A	Exempt per ISTC-1.2 (a)
	SI-882B	Exempt per ISTC-1.2 (a)
	SI-882C	Exempt per ISTC-1.2 (a)
	SI-883B	Category B passive manual valve
	SI-883C	Category B passive manual valve
	SI-883E	Category B passive manual valve
	SI-883F	Category B passive manual valve
	SI-883H	Category B passive manual valve
	SI-883J	Category B passive manual valve
SI-912	Category B passive manual valve	
5379-1484 (1)	RHR-754A	Category B passive manual valve
	RHR-754B	Category B passive manual valve
	RHR-755A	No safety function
	RHR-755B	No safety function
	RHR-757A	Category B passive manual valve
	RHR-757B	Category B passive manual valve
	RHR-764	Category B passive manual valve

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7.4 Excluded Valve Table

P&ID	Valve No	Reason For Exclusion	
5379-1484 (1)	RHR-774	No safety function	
	RHR-775	No safety function	
5379-1485 (1)	SFPC-798A	No safety function	
	SFPC-798B	No safety function	
	SFPC-802B	No safety function	
	SFPC-802C	Category B Passive manual valve	
	SFPC-805A	No safety function	
	SFPC-805B	No safety function	
5379-1971 (1)	RC-500	Category B passive manual valve	
	RC-501	Category B passive manual valve	
	RC-502	Category B passive manual valve	
	RC-505A	Exempt per ISTC-1.2 (a)	
	RC-505B	Exempt per ISTC-1.2 (a)	
	RC-508A	Exempt per ISTC-1.2 (a)	
	RC-508B	Exempt per ISTC-1.2 (a)	
	RC-515A	Exempt per ISTC-1.2 (a)	
	RC-515B	Exempt per ISTC-1.2 (a)	
	RC-542	Category B passive manual valve	
	RC-586	Category B passive manual valve	
	RC-601	Category B passive manual valve	
	RHR-762A	Exempt per ISTC-1.2 (c)	
	RHR-762B	Exempt per ISTC-1.2 (c)	
	5379-1971 (2)	RC-524	Category B passive manual valve
		RC-525	Category B passive manual valve
RC-582		Category B passive manual valve	
RC-PCV-455A		Exempt per ISTC-1.2 (b)	
RC-PCV-455B		Exempt per ISTC-1.2 (b)	
5379-353 (1)	PS-951	Exempt per ISTC 1.2(a)	
	PS-953	Exempt per ISTC 1.2(a)	
	PS-955A	Exempt per ISTC 1.2(a)	
	PS-955B	Exempt per ISTC 1.2(a)	
	PS-955C	Exempt per ISTC 1.2(a)	
	PS-955D	Exempt per ISTC 1.2(a)	
	PS-955E	Exempt per ISTC 1.2(a)	
	PS-969B	Category B passive manual valve	
PS-974A	Exempt per ISTC 1.2(a)		

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7.4 Excluded Valve Table

P&ID	Valve No	Reason For Exclusion
5379-353 (1)	PS-974B	Exempt per ISTC 1.2(a)
	PS-975	Exempt per ISTC 1.2(a)
	PS-976	Category B passive manual valve
	PS-977	Category B passive manual valve
	PS-988	Category B passive manual valve
	PS-989D	Category B passive manual valve
5379-376 (1)	CC-701A	Category B passive manual valve
	CC-701B	Category B passive manual valve
	CC-701C	Category B passive manual valve
	CC-703A	Category B passive manual valve
	CC-703B	Category B passive manual valve
	CC-703C	Category B passive manual valve
	CC-705A	Category B passive manual valve
	CC-705B	Category B passive manual valve
	CC-705C	Category B passive manual valve
	CC-710	Category B passive manual valve
	CC-711	Category B passive manual valve
	CC-712A	Category B passive manual valve
	CC-712B	Category B passive manual valve
	CC-713A	Category B passive manual valve
	CC-713B	Category B passive manual valve
	CC-733A	Category B passive manual valve
	CC-733B	Category B passive manual valve
	CC-737C	Category B passive manual valve
	CC-737D	Category B passive manual valve
	CC-786A	Category B passive manual valve
	CC-786B	Category B passive manual valve
	CC-788A	Category B passive manual valve
	CC-788AA	Category B passive manual valve
	CC-788B	Category B passive manual valve
	CC-788BB	Category B passive manual valve
	CC-788C	Category B passive manual valve
	CC-788CC	Category B passive manual valve
CC-788D	Category B passive manual valve	
CC-788DD	Category B passive manual valve	
CC-788E	Category B passive manual valve	

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7.4 Excluded Valve Table

P&ID	Valve No	Reason For Exclusion
5379-376 (1)	CC-788EE	Category B passive manual valve
	CC-788F	Category B passive manual valve
	CC-788FF	Category B passive manual valve
	CC-788G	Category B passive manual valve
	CC-788GG	Category B passive manual valve
	CC-791G	No safety function
	CC-825A	Category B passive manual valve
	CC-825B	Category B passive manual valve
	CC-825C	Category B passive manual valve
	CC-825D	Category B passive manual valve
	CC-825E	Category B passive manual valve
	CC-825F	Category B passive manual valve
	RCV-609	Vent valve gagged open, valve excluded by ISTC 1.2 (a).
	TCV-659A	System control valve excluded per ISTC 1.2 (b)
	TCV-659B	System control valve excluded per ISTC 1.2 (b)
	TCV-659C	System control valve excluded per ISTC 1.2 (b)
	5379-376 (2)	CC-732
CC-736		Category B passive manual valve
CC-737B		Category B passive manual valve
CC-746A		Category B passive manual valve
CC-746B		Category B passive manual valve
CC-747A		No safety function
CC-747B		No safety function
CC-748A		Category B passive manual valve
CC-748B		Category B passive manual valve
CC-777		Category B passive manual valve
CC-780		Category B passive manual valve
CC-781		Category B passive manual valve
CC-784		Category B passive manual valve
CC-785		Category B passive manual valve
CC-791C		No safety function
CC-791H		No safety function
CC-792A		Category B passive manual valve
CC-792B		Category B passive manual valve
CC-830A		Category B passive manual valve
CC-833		Category B passive manual valve

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7.4 Excluded Valve Table

P&ID	Valve No	Reason For Exclusion
5379-376 (2)	CC-834	Category B passive manual valve
	TCV-144	System control valve excluded per ISTC 1.2 (b)
5379-376 (3)	CC-717	No System Safety Function
	CC-718A	Category B passive manual valve
	CC-718B	Category B passive manual valve
	CC-718C	Category B passive manual valve
	CC-719A	Category B passive manual valve
	CC-719B	Category B passive manual valve
	CC-719C	Category B passive manual valve
	CC-719D	Category B passive manual valve
	CC-719D1	Category B passive manual valve
	CC-719D2	Category B passive manual valve
	CC-719D3	Category B passive manual valve
	CC-719E	Category B passive manual valve
	CC-720A	Category B passive manual valve
	CC-720B	Category B passive manual valve
	CC-720C	Category B passive manual valve
	CC-723A	Category B passive manual valve
	CC-723B	Category B passive manual valve
	CC-723C	Category B passive manual valve
	CC-724A	Category B passive manual valve
	CC-724B	Category B passive manual valve
	CC-724C	Category B passive manual valve
	CC-724D	Category B passive manual valve
	CC-727A	Category B passive manual valve
	CC-727B	Category B passive manual valve
	CC-727C	Category B passive manual valve
	CC-728A	Category B passive manual valve
	CC-728B	Category B passive manual valve
CC-728C	Category B passive manual valve	
5379-376 (4)	CC-728D	Category B passive manual valve
	CC-769A	Category B passive manual valve
	CC-769B	Category B passive manual valve
	CC-772	Category B passive manual valve
	CC-774	No safety function ESR-98-00565
	CC-775	Category B passive manual valve

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7.4 Excluded Valve Table

P&ID	Valve No	Reason For Exclusion
5379-376 (4)	CC-776	Category B passive manual valve
	CC-791A	No safety function
	CC-792C	Category B passive manual valve
	CC-792D	Category B passive manual valve
	CC-794A	Category B passive manual valve
	CC-794B	Category B passive manual valve
	CC-795A	Category B passive manual valve
	CC-795B	Category B passive manual valve
	CC-795C	Category B passive manual valve
	CC-795D	Category B passive manual valve
	CC-795E	Category B passive manual valve
	CC-795F	Category B passive manual valve
	CC-795G	Category B passive manual valve
	CC-795H	Category B passive manual valve
	CC-795J	Category B passive manual valve
	CC-795K	Category B passive manual valve
	CC-826A	Category B passive manual valve
	CC-826B	Category B passive manual valve
	CC-826C	Category B passive manual valve
	CC-826D	Category B passive manual valve
	CC-826E	Category B passive manual valve
	CC-826F	Category B passive manual valve
	CC-827A	Category B passive manual valve
	CC-827B	Category B passive manual valve
	CC-830B	Category B passive manual valve
	5379-684 (1)	CVC-1102
CVC-1161		Category B passive valve
5379-685 (1)	CVC-202B	Category B passive manual valve
	CVC-205A	Category B passive manual valve
	CVC-205B	Category B passive manual valve
	CVC-293B	Category B passive manual valve
	CVC-293D	Category B passive manual valve
	CVC-302A	No safety function
	CVC-302B	No safety function
	CVC-302C	No safety function
CVC-303A	No safety function	

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7.4 Excluded Valve Table

P&ID	Valve No	Reason For Exclusion	
5379-685 (1)	CVC-303B	No safety function	
	CVC-303C	No safety function	
	CVC-304A	Category B passive manual valve	
	CVC-304B	Category B passive manual valve	
	CVC-304C	Category B passive manual valve	
	CVC-304D	Category B passive manual valve	
	CVC-304E	Category B passive manual valve	
	CVC-304F	Category B passive manual valve	
	CVC-304G	Category B passive manual valve	
	CVC-304H	Category B passive manual valve	
	CVC-304J	Category B passive manual valve	
	CVC-304K	Category B passive manual valve	
	CVC-304L	Category B passive manual valve	
	CVC-304M	Category B passive manual valve	
	CVC-306A	Category B passive manual valve	
	CVC-306B	Category B passive manual valve	
	CVC-306C	Category B passive manual valve	
	CVC-307	No safety function	
	CVC-308	Category B passive manual valve	
	CVC-309D	Category B passive manual valve	
	CVC-311	No safety function.	
	CVC-312	Category B passive manual valve	
	CVC-318	Category B passive manual valve	
	CVC-320	Category B passive manual valve	
	CVC-380	Category B passive manual valve	
	CVC-389	No safety function	
	CVC-454	No safety function	
	CVC-474	Category B passive manual valve	
	HCV-121	Exempt per ISTC- 1.2(b)	
	HCV-137	Exempt per ISTC- 1.2(b)	
	HCV-142	Category B passive valve with no remote position indication	
	5379-685 (2)	CVC-249	Category B passive manual valve
		CVC-250	Category B passive manual valve
CVC-253		Category B passive manual valve	
CVC-254		No safety function	
CVC-259A		No safety function	

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7.4 Excluded Valve Table

P&ID	Valve No	Reason For Exclusion
5379-685 (2)	CVC-259C	Category B passive manual valve
	CVC-264	Category B passive manual valve
	CVC-267	Category B passive manual valve
	CVC-268	Category B passive manual valve
	CVC-269	Category B passive manual valve
	CVC-270	Category B passive manual valve
	CVC-271	No safety function
	CVC-272	Category B passive manual valve
	CVC-275A	Category B passive manual valve
	CVC-275B	Category B passive manual valve
	CVC-275C	Category B passive manual valve
	CVC-277A	Category B passive manual valve
	CVC-277B	Category B passive manual valve
	CVC-277C	Category B passive manual valve
	CVC-286	Category B passive manual valve
	CVC-287	Category B passive manual valve
	CVC-288	Category B passive manual valve
	CVC-289	Category B passive manual valve
	CVC-290	Category B passive manual valve
	CVC-291	Category B passive manual valve
	CVC-309B	Category B passive manual valve
	CVC-309C	Category B passive manual valve
	CVC-309E	Category B passive manual valve
	CVC-321	Category B passive manual valve
	CVC-352	No safety function
	CVC-353	Category B passive manual valve
	CVC-354	Category B passive manual valve
	CVC-355	No safety function
	CVC-356	Category B passive manual valve
	CVC-361	Category B passive manual valve
	CVC-362	Category B passive manual valve
	CVC-364	No safety function
	CVC-365A	Category B passive manual valve
	CVC-365B	Category B passive valve
	CVC-366	No safety function
	CVC-368	Category B passive manual valve

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7.4 Excluded Valve Table

P&ID	Valve No	Reason For Exclusion	
5379-685 (2)	CVC-600	Category B passive valve	
	FCV-113A	No safety function.	
	FCV-114A	No safety function.	
	FCV-114B	No safety function.	
	LCV-115A	Exempt per ISTC 1.2(b)	
	PCV-117	Exempt per ISTC 1.2(b)	
	PCV-118	Exempt per ISTC 1.2(b)	
	PCV-119	Exempt per ISTC 1.2(b)	
	PCV-145	Exempt per ISTC 1.2(b)	
	TCV-143	No safety function.	
	5379-685 (3)	CVC-1237	No safety function.
		CVC-226B	Category B passive manual valve
		CVC-227A	Category B passive manual valve
CVC-239B		No safety function	
CVC-244		No safety function	
CVC-245		Category B passive manual valve	
CVC-247A		Category B passive manual valve	
CVC-247B		Category B passive manual valve	
CVC-284A		Category B passive manual valve	
CVC-284B		Category B passive manual valve	
CVC-328		Category B passive manual valve	
CVC-329		Category B passive manual valve	
CVC-331		Category B passive manual valve	
CVC-332		Category B passive manual valve	
CVC-334		Category B passive manual valve	
CVC-335		Category B passive manual valve	
CVC-336		Category B passive manual valve	
CVC-337		Category B passive manual valve	
CVC-338		Category B passive manual valve	
CVC-340		Category B passive manual valve	
CVC-343A	Category B passive manual valve		
CVC-344	Category B passive manual valve		
CVC-345	Category B passive manual valve		
CVC-347	Category B passive manual valve		
CVC-348	Category B passive manual valve		
CVC-375	Category B passive manual valve		

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7.4 Excluded Valve Table

P&ID	Valve No	Reason For Exclusion
5379-685 (3)	CVC-379	Category B passive manual valve
	CVC-398A	Category B passive manual valve
	CVC-398B	Category B passive manual valve
5379-686 (1)	CVC-1100	No safety Function
	CVC-1101	No safety function
	CVC-1103	No safety function
	CVC-1104	No safety function
	CVC-1105	No safety function
	CVC-1106	No safety function
	CVC-1107	Category B passive
	CVC-1108	Category B passive
	CVC-1109	Category B passive
	CVC-1111	No safety function
	CVC-1114A	No safety function
	CVC-1114B	No safety function
	CVC-1114C	No safety function
	CVC-1115	No safety function
	CVC-1116A	No safety function.
	CVC-1116B	No safety function.
	CVC-1116C	No safety function.
	CVC-1122	No safety function
	CVC-1123	No safety function
	CVC-1124	No safety function
	CVC-1125	No safety function
	CVC-1129	Category B passive valve
	CVC-1130	Category B passive valve
	CVC-1131	Category B passive valve
	CVC-1241A	Category B passive manual valve
	CVC-1241B	Category B passive manual valve
	CVC-1241C	Category B passive manual valve
5379-921 (2)	WD-1676	No safety function.
	WD-1677	No safety function.
	WD-1679	No safety function.
G-190196 (1)	MS-10A	Category B passive manual valve
	MS-11A	Category B passive manual valve
	MS-12A	Category B passive manual valve

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7.4 Excluded Valve Table

P&ID	Valve No	Reason For Exclusion	
G-190196 (1)	MS-13	Exempt per ISTC 1.2(a)	
	MS-14	Exempt per ISTC 1.2(a)	
	MS-154	Category B passive manual valve	
	MS-155	Category B passive manual valve	
	MS-156	No safety function.	
	MS-158	Category B passive manual valve	
	MS-159	Category B passive manual valve	
	MS-16	Exempt per ISTC 1.2(a)	
	MS-160	Category B passive manual valve	
	MS-161	No safety function	
	MS-17	Exempt per ISTC 1.2(a)	
	MS-19	Category B passive manual valve	
	MS-20	Category B passive manual valve	
	MS-21	Category B passive manual valve	
	MS-22	Exempt per ISTC 1.2(a)	
	MS-23	Exempt per ISTC 1.2(a)	
	MS-25	Exempt per ISTC 1.2(a)	
	MS-26	Exempt per ISTC 1.2(a)	
	MS-28	Category B passive manual valve	
	MS-29	Category B passive manual valve	
	MS-30	Category B passive manual valve	
	MS-31	Exempt per ISTC 1.2(a)	
	MS-32	Exempt per ISTC 1.2(a)	
	MS-34	Exempt per ISTC 1.2(a)	
	MS-35	Exempt per ISTC 1.2(a)	
	MS-37	Category B passive manual valve	
	MS-38	Category B passive manual valve	
	MS-39	Category B passive manual valve	
	G-190197 (4)	AFW-15	Exempt per ISTC 1.2(a)
		AFW-20	Category B passive manual valve
		AFW-22	Category B passive manual valve
		AFW-24A	Exempt per ISTC 1.2(a)
		AFW-28	Category B passive manual valve
AFW-29		Category B passive manual valve	
AFW-4		Category B passive manual valve	
AFW-42	Category B passive manual valve		

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7.4 Excluded Valve Table

P&ID	Valve No	Reason For Exclusion
G-190197 (4)	AFW-43	Category B passive manual valve
	AFW-51	Exempt per ISTC 1.2(a)
	AFW-53	Category B passive manual valve
	AFW-54	Category B passive manual valve
	AFW-55	Category B passive manual valve
	AFW-62	Category B passive manual valve
	AFW-63	Category B passive manual valve
	AFW-64	Category B passive manual valve
	FW-201	Category B passive manual valve
	FW-203	Category B passive manual valve
	FW-205	Category B passive manual valve
	FW-5A	Category B passive manual valve
	FW-5B	Category B passive manual valve
	FW-5C	Category B passive manual valve
	FW-6A	Category B passive manual valve
	FW-6B	Category B passive manual valve
	FW-6C	Category B passive manual valve
	FW-7A	Exempt per ISTC 1.2(c)
	FW-7B	Exempt per ISTC 1.2(c)
	FW-7C	Exempt per ISTC 1.2(c)
G-190199 (1)	SW-197	Exempt per ISTC 1.2(c)
	SW-198	Exempt per ISTC 1.2(c)
	SW-199	Exempt per ISTC 1.2(c)
G-190199 (10)	SW-106	Exempt per ISTC 1.2(c)
	SW-243	Exempt per ISTC 1.2(c)
	SW-246	Category B passive manual valve
	SW-252	Category B passive manual valve
	SW-253	Category B passive manual valve
	SW-259	Category B passive manual valve
	SW-542	No safety function
	SW-543	No safety function
	SW-75	Category B passive manual valve
	SW-76	No safety function
	SW-77	Category B passive manual valve
	SW-78	No safety function
SW-900	Exempt per ISTC 1.2(c)	

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7.4 Excluded Valve Table

P&ID	Valve No	Reason For Exclusion
G-190199 (10)	SW-914	Exempt per ISTC 1.2(c)
	SW-922	Category B passive manual valve
	SW-927	Category B Passive valve
	SW-V6-146A	Exempt per ISTC 1.2(a)
	SW-V6-146B	Exempt per ISTC 1.2(a)
	TCV-1902A	No safety function
G-190199 (2)	SW-187	Category B passive manual valve
	SW-188	Category B passive manual valve
	SW-190	Category B passive manual valve
	SW-203	Category B passive manual valve
	SW-204	Category B passive manual valve
	SW-205	Category B passive manual valve
	SW-206	Category B passive manual valve
	SW-5	Category B passive manual valve
	SW-6	Category B passive manual valve
	SW-7	Category B passive manual valve
	SW-8	Category B passive manual valve
	SW-839	Category B passive manual valve
	SW-845	Category B passive manual valve
	SW-851	Category B passive manual valve
SW-857	Category B passive manual valve	
G-190199 (4)	SW-630	Category B passive manual valve
	SW-632	Category B passive manual valve
	SW-634	Category B passive manual valve
	SW-636	Category B passive manual valve
G-190199 (5)	SW-79A	Category B passive manual valve
	SW-81	Category B passive manual valve
G-190199 (6)	SW-85	Category B passive manual valve
	SW-86	Category B passive manual valve
	SW-87	Category B passive manual valve
	SW-88	Category B passive manual valve
	SW-89	Category B passive manual valve
	SW-90	Category B passive manual valve
	SW-91	Category B passive manual valve
	SW-92	Category B passive manual valve
	SW-93	Category B passive manual valve

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7.4 Excluded Valve Table

P&ID	Valve No	Reason For Exclusion
G-190199 (7)	SW-24	Category B passive manual valve
	SW-25	Category B passive manual valve
	SW-26	Category B passive manual valve
	SW-27	Category B passive manual valve
	SW-28	Category B passive manual valve
	SW-284	Category B passive manual valve
	SW-29	Category B passive manual valve
	SW-307	Category B passive manual valve
	SW-311	Category B passive manual valve
	SW-32	Category B passive manual valve
	SW-33	Category B passive manual valve
	SW-503	No safety function
	SW-948	Exempt per ISTC 1.2(c)
	SW-958	Category B passive manual valve
	SW-959	Exempt per ISTC 1.2(a)
G-190199 (8)	SW-54	No safety function
	SW-61	No safety function
	SW-68	Category B passive manual valve
G-190199 (9)	FCV-4701	Exempt per ISTC 1.2(c)
	FCV-4702	Exempt per ISTC 1.2(c)
	SW-100	Category B passive manual valve
	SW-102	Category B passive manual valve
	SW-109	Category B passive manual valve
	SW-110	Category B passive manual valve
	SW-112	Category B passive manual valve
	SW-113	Category B passive manual valve
	SW-20	Category B passive manual valve
	SW-21	Category B passive manual valve
	SW-260	Exempt per ISTC 1.2(a)
	SW-270	Category B passive manual valve
	SW-52	Category B passive manual valve
	SW-53	Category B passive manual valve
	SW-739	Category B passive manual valve
SW-740	Category B passive manual valve	
SW-866	Category B passive manual valve	

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7.4 Excluded Valve Table

P&ID	Valve No	Reason For Exclusion
G-190199 (9)	SW-869	Category B passive manual valve
	SW-871	Category B passive manual valve
	SW-873	Category B passive manual valve
	SW-875	Category B passive manual valve
	SW-877	Category B passive manual valve
G-190204A (1)	DA-3A	No safety function
	DA-3B	
G-190204D (2)	FO-13	Category B passive manual valve
	FO-14	Category B passive manual valve
	FO-176A	Category B passive manual valve
	FO-176B	Category B passive manual valve
	FO-177A	Category B passive manual valve
	FO-177B	Category B passive manual valve
	FO-178A	Category B passive manual valve
	FO-178B	Category B passive manual valve
	FO-179A	Category B passive manual valve
	FO-179B	Category B passive manual valve
	FO-19A	Category B passive valve
	FO-19B	Category B passive valve
	FO-23A	Category B passive manual valve
	FO-23B	Category B passive manual valve
	FO-25A	Category B passive manual valve
	FO-25B	Category B passive manual valve
	FO-26A	Exempt per ISTC 1.2(a)
	FO-26B	Exempt per ISTC 1.2(a)
	FO-28A	Category B manual passive valve
	FO-28B	Category B manual passive valve
G-190234 (1)	SGB-30	Category B passive valve
	SGB-31	Category B passive valve
	SGB-32	Category B passive valve
G-190261 (1)	PP-100B	Category B passive manual valve
	PP-101B	Category B passive manual valve
	PP-102B	Category B passive manual valve
	PP-103B	Category B passive manual valve
	PP-104B	Category B passive manual valve
	PP-105B	Category B passive manual valve

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7.4 Excluded Valve Table

P&ID	Valve No	Reason For Exclusion
G-190261 (1)	PP-106B	Category B passive manual valve
	PP-107B	Category B passive manual valve
	PP-108B	Category B passive manual valve
	PP-109B	Category B passive manual valve
	PP-110B	Category B passive manual valve
	PP-111B	Category B passive manual valve
	PP-112B	Category B passive manual valve
	PP-113B	Category B passive manual valve
	PP-14B	Category B passive manual valve
	PP-15B	Category B passive manual valve
	PP-16A	Category B passive manual valve
	PP-16B	Category B passive manual valve
	PP-17A	Category B passive manual valve
	PP-17B	Category B passive manual valve
	PP-18A	Category B passive manual valve
	PP-18B	Category B passive manual valve
	PP-19A	Category B passive manual valve
	PP-19B	Category B passive manual valve
	PP-20A	Category B passive manual valve
	PP-20B	Category B passive manual valve
	PP-21A	Category B passive manual valve
	PP-21B	Category B passive manual valve
	PP-22B	Category B passive manual valve
	PP-23B	Category B passive manual valve
	PP-24B	Category B passive manual valve
	PP-25B	Category B passive manual valve
	PP-26B	Category B passive manual valve
	PP-27B	Category B passive manual valve
	PP-28B	Category B passive manual valve
	PP-29B	Category B passive manual valve
	PP-300B	Category B passive manual valve
	PP-301B	Category B passive manual valve
	PP-302B	Category B passive manual valve
PP-303B	Category B passive manual valve	
PP-304B	Category B passive manual valve	
PP-305B	Category B passive manual valve	

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7.4 Excluded Valve Table

P&ID	Valve No	Reason For Exclusion
G-190261 (1)	PP-306B	Category B passive manual valve
	PP-30B	Category B passive manual valve
	PP-31A	Category B passive manual valve
	PP-31B	Category B passive manual valve
	PP-32A	Category B passive manual valve
	PP-32B	Category B passive manual valve
	PP-33A	Category B passive manual valve
	PP-33B	Category B passive manual valve
	PP-34A	Category B passive manual valve
	PP-34B	Category B passive manual valve
	PP-35A	Category B passive manual valve
	PP-35B	Category B passive manual valve
	PP-36A	Category B passive manual valve
	PP-36B	Category B passive manual valve
	PP-37B	Category B passive manual valve
	PP-38B	Category B passive manual valve
	PP-39B	Category B passive manual valve
	PP-40B	Category B passive manual valve
	PP-41B	Category B passive manual valve
	PP-42B	Category B passive manual valve
	PP-43B	Category B passive manual valve
	PP-44B	Category B passive manual valve
	PP-45B	Category B passive manual valve
	PP-46B	Category B passive manual valve
	PP-47B	Category B passive manual valve
	PP-48B	Category B passive manual valve
	PP-49B	Category B passive manual valve
	PP-50B	Category B passive manual valve
	PP-51B	Category B passive manual valve
	PP-52B	Category B passive manual valve
	PP-53B	Category B passive manual valve
	PP-54B	Category B passive manual valve
PP-55B	Category B passive manual valve	
PP-56B	Category B passive manual valve	
PP-57B	Category B passive manual valve	
PP-58B	Category B passive manual valve	

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7.4 Excluded Valve Table

P&ID	Valve No	Reason For Exclusion
G-190261 (1)	PP-59B	Category B passive manual valve
	PP-60B	Category B passive manual valve
	PP-61B	Category B passive manual valve
	PP-62B	Category B passive manual valve
	PP-63B	Category B passive manual valve
	PP-64B	Category B passive manual valve
	PP-65B	Category B passive manual valve
	PP-66B	Category B passive manual valve
	PP-67B	Category B passive manual valve
	PP-68B	Category B passive manual valve
	PP-69B	Category B passive manual valve
	PP-70B	Category B passive manual valve
	PP-71B	Category B passive manual valve
	PP-72B	Category B passive manual valve
	PP-73B	Category B passive manual valve
	PP-74B	Category B passive manual valve
	PP-75B	Category B passive manual valve
	PP-76B	Category B passive manual valve
	PP-77B	Category B passive manual valve
	PP-78B	Category B passive manual valve
	PP-79B	Category B passive manual valve
	PP-80B	Category B passive manual valve
	PP-81B	Category B passive manual valve
	PP-82B	Category B passive manual valve
	PP-83B	Category B passive manual valve
	PP-84B	Category B passive manual valve
	PP-85B	Category B passive manual valve
	PP-86B	Category B passive manual valve
	PP-87B	Category B passive manual valve
	PP-88B	Category B passive manual valve
	PP-89B	Category B passive manual valve
	PP-90B	Category B passive manual valve
	PP-91B	Category B passive manual valve
	PP-92B	Category B passive manual valve
PP-93B	Category B passive manual valve	
PP-94B	Category B passive manual valve	

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7.4 Excluded Valve Table

P&ID	Valve No	Reason For Exclusion
G-190261 (1)	PP-95B	Category B passive manual valve
	PP-96B	Category B passive manual valve
	PP-97B	Category B passive manual valve
	PP-98B	Category B passive manual valve
	PP-99B	Category B passive manual valve
G-190261 (2)	PP-14C	Category B passive manual valve
	PP-15C	Category B passive manual valve
	PP-16C	Category B passive manual valve
	PP-17C	Category B passive manual valve
	PP-18C	Category B passive manual valve
	PP-19C	Category B passive manual valve
	PP-20C	Category B passive manual valve
	PP-21C	Category B passive manual valve
	PP-22C	Category B passive manual valve
	PP-23C	Category B passive manual valve
	PP-24C	Category B passive manual valve
	PP-254C	Category B passive manual valve
	PP-255C	Category B passive manual valve
	PP-256C	Category B passive manual valve
	PP-257C	Category B passive manual valve
	PP-25C	Category B passive manual valve
	PP-26C	Category B passive manual valve
	PP-276D	Category B passive manual valve
	PP-27C	Category B passive manual valve
	PP-286D	Category B passive manual valve
	PP-28C	Category B passive manual valve
	PP-29C	Category B passive manual valve
	PP-30C	Category B passive manual valve
	PP-31C	Category B passive manual valve
	PP-32C	Category B passive manual valve
	PP-33C	Category B passive manual valve
	PP-34C	Category B passive manual valve
PP-35C	Category B passive manual valve	
PP-38C	Category B passive manual valve	
PP-40C	Category B passive manual valve	
PP-41C	Category B passive manual valve	

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7.4 Excluded Valve Table

P&ID	Valve No	Reason For Exclusion
G-190261 (2)	PP-42C	Category B passive manual valve
	PP-44C	Category B passive manual valve
	PP-45C	Category B passive manual valve
	PP-46C	Category B passive manual valve
	PP-47C	Category B passive manual valve
	PP-48C	Category B passive manual valve
	PP-54C	Category B passive manual valve
	PP-55C	Category B passive manual valve
	PP-56C	Category B passive manual valve
	PP-57C	Category B passive manual valve
	PP-58C	Category B passive manual valve
	PP-59C	Category B passive manual valve
	PP-60C	Category B passive manual valve
	PP-61C	Category B passive manual valve
	PP-62C	Category B passive manual valve
	PP-63C	Category B passive manual valve
	PP-64C	Category B passive manual valve
	PP-65C	Category B passive manual valve
	PP-66C	Category B passive manual valve
	PP-67C	Category B passive manual valve
	PP-68C	Category B passive manual valve
	PP-69C	Category B passive manual valve
	PP-70C	Category B passive manual valve
	PP-71C	Category B passive manual valve
	PP-72C	Category B passive manual valve
	PP-73C	Category B passive manual valve
	PP-74C	Category B passive manual valve
	PP-75C	Category B passive manual valve
	PP-78C	Category B passive manual valve
	PP-80C	Category B passive manual valve
	PP-81C	Category B passive manual valve
	PP-82C	Category B passive manual valve
PP-84C	Category B passive manual valve	
PP-85C	Category B passive manual valve	
PP-86C	Category B passive manual valve	
PP-87C	Category B passive manual valve	

7.4 Excluded Valve Table

P&ID	Valve No	Reason For Exclusion
G-190261 (2)	PP-88C	Category B passive manual valve
G-190261 (3)	PP-100D	Category B passive manual valve
	PP-101D	Category B passive manual valve
	PP-102D	Category B passive manual valve
	PP-103D	Category B passive manual valve
	PP-104D	Category B passive manual valve
	PP-105D	Category B passive manual valve
	PP-106D	Category B passive manual valve
	PP-107D	Category B passive manual valve
	PP-114D	Category B passive manual valve
	PP-115D	Category B passive manual valve
	PP-116D	Category B passive manual valve
	PP-117D	Category B passive manual valve
	PP-118D	Category B passive manual valve
	PP-119D	Category B passive manual valve
	PP-120D	Category B passive manual valve
	PP-121D	Category B passive manual valve
	PP-122D	Category B passive manual valve
	PP-123D	Category B passive manual valve
	PP-124D	Category B passive manual valve
	PP-125D	Category B passive manual valve
	PP-126D	Category B passive manual valve
	PP-127D	Category B passive manual valve
	PP-128D	Category B passive manual valve
	PP-129D	Category B passive manual valve
	PP-130D	Category B passive manual valve
	PP-131D	Category B passive manual valve
	PP-132D	Category B passive manual valve
	PP-133D	Category B passive manual valve
	PP-134D	Category B passive manual valve
	PP-135D	Category B passive manual valve
	PP-136D	Category B passive manual valve
	PP-137D	Category B passive manual valve
	PP-138D	Category B passive manual valve
	PP-139D	Category B passive manual valve
PP-140D	Category B passive manual valve	

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7.4 Excluded Valve Table

P&ID	Valve No	Reason For Exclusion
G-190261 (3)	PP-141D	Category B passive manual valve
	PP-142D	Category B passive manual valve
	PP-143D	Category B passive manual valve
	PP-144D	Category B passive manual valve
	PP-145D	Category B passive manual valve
	PP-146D	Category B passive manual valve
	PP-147D	Category B passive manual valve
	PP-148D	Category B passive manual valve
	PP-149D	Category B passive manual valve
	PP-14D	Category B passive manual valve
	PP-150D	Category B passive manual valve
	PP-151D	Category B passive manual valve
	PP-152D	Category B passive manual valve
	PP-153D	Category B passive manual valve
	PP-154D	Category B passive manual valve
	PP-155D	Category B passive manual valve
	PP-156D	Category B passive manual valve
	PP-157D	Category B passive manual valve
	PP-158D	Category B passive manual valve
	PP-159D	Category B passive manual valve
	PP-15D	Category B passive manual valve
	PP-160D	Category B passive manual valve
	PP-161D	Category B passive manual valve
	PP-162D	Category B passive manual valve
	PP-163D	Category B passive manual valve
	PP-164D	Category B passive manual valve
	PP-165D	Category B passive manual valve
	PP-166D	Category B passive manual valve
	PP-167D	Category B passive manual valve
	PP-168D	Category B passive manual valve
	PP-169D	Category B passive manual valve
	PP-16D	Category B passive manual valve
	PP-170D	Category B passive manual valve
	PP-171D	Category B passive manual valve
	PP-172D	Category B passive manual valve
	PP-173D	Category B passive manual valve

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7.4 Excluded Valve Table

P&ID	Valve No	Reason For Exclusion
G-190261 (3)	PP-174D	Category B passive manual valve
	PP-175D	Category B passive manual valve
	PP-176D	Category B passive manual valve
	PP-177D	Category B passive manual valve
	PP-178D	Category B passive manual valve
	PP-179D	Category B passive manual valve
	PP-17D	Category B passive manual valve
	PP-180D	Category B passive manual valve
	PP-181D	Category B passive manual valve
	PP-182D	Category B passive manual valve
	PP-183D	Category B passive manual valve
	PP-184D	Category B passive manual valve
	PP-185D	Category B passive manual valve
	PP-186D	Category B passive manual valve
	PP-187D	Category B passive manual valve
	PP-188D	Category B passive manual valve
	PP-189D	Category B passive manual valve
	PP-18D	Category B passive manual valve
	PP-190D	Category B passive manual valve
	PP-191D	Category B passive manual valve
	PP-192D	Category B passive manual valve
	PP-193D	Category B passive manual valve
	PP-194D	Category B passive manual valve
	PP-195D	Category B passive manual valve
	PP-196D	Category B passive manual valve
	PP-197D	Category B passive manual valve
	PP-198D	Category B passive manual valve
	PP-199D	Category B passive manual valve
	PP-19D	Category B passive manual valve
	PP-200D	Category B passive manual valve
	PP-201D	Category B passive manual valve
	PP-202D	Category B passive manual valve
	PP-203D	Category B passive manual valve
PP-204D	Category B passive manual valve	
PP-205D	Category B passive manual valve	
PP-206D	Category B passive manual valve	

HBRSEP, Unit No. 2 IST Program Plan - Fourth Interval

7.4 Excluded Valve Table

P&ID	Valve No	Reason For Exclusion
G-190261 (3)	PP-207D	Category B passive manual valve
	PP-208D	Category B passive manual valve
	PP-20D	Category B passive manual valve
	PP-214D	Category B passive manual valve
	PP-219D	Category B passive manual valve
	PP-21D	Category B passive manual valve
	PP-221D	Category B passive manual valve
	PP-222D	Category B passive manual valve
	PP-22D	Category B passive manual valve
	PP-23D	Category B passive manual valve
	PP-24D	Category B passive manual valve
	PP-258D	Category B passive manual valve
	PP-259D	Category B passive manual valve
	PP-25D	Category B passive manual valve
	PP-26D	Category B passive manual valve
	PP-27D	Category B passive manual valve
	PP-28D	Category B passive manual valve
	PP-292	Category B passive manual valve
	PP-293	Category B passive manual valve
	PP-29D	Category B passive manual valve
	PP-30D	Category B passive manual valve
	PP-31D	Category B passive manual valve
	PP-32D	Category B passive manual valve
	PP-33D	Category B passive manual valve
	PP-34D	Category B passive manual valve
	PP-35D	Category B passive manual valve
	PP-36D	Category B passive manual valve
	PP-37D	Category B passive manual valve
	PP-38D	Category B passive manual valve
	PP-39D	Category B passive manual valve
	PP-40D	Category B passive manual valve
	PP-41D	Category B passive manual valve
	PP-42D	Category B passive manual valve
	PP-43D	Category B passive manual valve
	PP-44D	Category B passive manual valve
PP-45D	Category B passive manual valve	

HBRSEP, Unit No. 2 IST Program Plan - Fourth Interval

7.4 Excluded Valve Table

P&ID	Valve No	Reason For Exclusion
G-190261 (3)	PP-46D	Category B passive manual valve
	PP-47D	Category B passive manual valve
	PP-48D	Category B passive manual valve
	PP-49D	Category B passive manual valve
	PP-50D	Category B passive manual valve
	PP-51D	Category B passive manual valve
	PP-52D	Category B passive manual valve
	PP-53D	Category B passive manual valve
	PP-54D	Category B passive manual valve
	PP-55D	Category B passive manual valve
	PP-56D	Category B passive manual valve
	PP-57D	Category B passive manual valve
	PP-58D	Category B passive manual valve
	PP-59D	Category B passive manual valve
	PP-60D	Category B passive manual valve
	PP-61D	Category B passive manual valve
	PP-62D	Category B passive manual valve
	PP-63D	Category B passive manual valve
	PP-64D	Category B passive manual valve
	PP-65D	Category B passive manual valve
	PP-66D	Category B passive manual valve
	PP-67D	Category B passive manual valve
	PP-68D	Category B passive manual valve
	PP-69D	Category B passive manual valve
	PP-70D	Category B passive manual valve
	PP-71D	Category B passive manual valve
	PP-72D	Category B passive manual valve
	PP-73D	Category B passive manual valve
	PP-74D	Category B passive manual valve
	PP-75D	Category B passive manual valve
	PP-76D	Category B passive manual valve
	PP-77D	Category B passive manual valve
PP-78D	Category B passive manual valve	
PP-79D	Category B passive manual valve	
PP-80D	Category B passive manual valve	
PP-81D	Category B passive manual valve	

HBRSEP, Unit No. 2 IST Program Plan - Fourth Interval

7.4 Excluded Valve Table

P&ID	Valve No	Reason For Exclusion
G-190261 (3)	PP-82D	Category B passive manual valve
	PP-83D	Category B passive manual valve
	PP-84D	Category B passive manual valve
	PP-85D	Category B passive manual valve
	PP-86D	Category B passive manual valve
	PP-87D	Category B passive manual valve
	PP-88D	Category B passive manual valve
	PP-89D	Category B passive manual valve
	PP-90D	Category B passive manual valve
	PP-91D	Category B passive manual valve
	PP-92D	Category B passive manual valve
	PP-93D	Category B passive manual valve
	PP-94D	Category B passive manual valve
	PP-95D	Category B passive manual valve
	PP-96D	Category B passive manual valve
	PP-97D	Category B passive manual valve
	PP-98D	Category B passive manual valve
	PP-99D	Category B passive manual valve
	G-190261 (4)	PP-108D
PP-109C		Category B passive manual valve
PP-110D		Category B passive manual valve
PP-14A		Category B passive manual valve
PP-15A		Category B passive manual valve
PP-209D		Category B passive manual valve
PP-210C		Category B passive manual valve
PP-211D		Category B passive manual valve
PP-222C		Category B passive manual valve
PP-223C		Category B passive manual valve
PP-224C		Category B passive manual valve
PP-225C		Category B passive manual valve
PP-226C		Category B passive manual valve
PP-22A		Category B passive manual valve
PP-231C		Category B passive manual valve
PP-232C		Category B passive manual valve
PP-234C	Category B passive manual valve	
PP-235C	Category B passive manual valve	

HBRSEP, Unit No. 2 IST Program Plan - Fourth Interval

7.4 Excluded Valve Table

P&ID	Valve No	Reason For Exclusion
G-190261 (4)	PP-236C	Category B passive manual valve
	PP-237C	Category B passive manual valve
	PP-238C	Category B passive manual valve
	PP-23A	Category B passive manual valve
	PP-240C	Category B passive manual valve
	PP-241C	Category B passive manual valve
	PP-242C	Category B passive manual valve
	PP-244A	Category B passive manual valve
	PP-244C	Category B passive manual valve
	PP-245A	Category B passive manual valve
	PP-246A	Category B passive manual valve
	PP-247A	Category B passive manual valve
	PP-248A	Category B passive manual valve
	PP-249A	Category B passive manual valve
	PP-249C	Category B passive manual valve
	PP-24A	Category B passive manual valve
	PP-250C	Category B passive manual valve
	PP-251C	Category B passive manual valve
	PP-252C	Category B passive manual valve
	PP-261D	Category B passive manual valve
	PP-262A	Category B passive manual valve
	PP-262D	Category B passive manual valve
	PP-263D	Category B passive manual valve
	PP-264D	Category B passive manual valve
	PP-265D	Category B passive manual valve
	PP-266D	Category B passive manual valve
	PP-274C	Category B passive manual valve
	PP-285D	Category B passive manual valve
	PP-291A	Category B passive manual valve
	PP-291B	Category B passive manual valve
	PP-291C	Category B passive manual valve
	PP-295	Category B passive manual valve
	PP-29A	Category B passive manual valve
	PP-308	Category B passive manual valve
	PP-309	Category B passive manual valve
	PP-30A	Category B passive manual valve

HBRSEP, Unit No. 2 IST Program Plan - Fourth Interval

7.4 Excluded Valve Table

P&ID	Valve No	Reason For Exclusion
G-190261 (4)	PP-310	Category B passive manual valve
	PP-36C	Category B passive manual valve
	PP-38A	Category B passive manual valve
	PP-40A	Category B passive manual valve
	PP-41A	Category B passive manual valve
	PP-42A	Category B passive manual valve
	PP-43A	Category B passive manual valve
	PP-49C	Category B passive manual valve
	PP-89C	Category B passive manual valve
	PP-90C	Category B passive manual valve
	PP-91C	Category B passive manual valve
	PP-92C	Category B passive manual valve
	PP-93C	Category B passive manual valve
G-190262 (1)	PCV-26E	Exempt per ISTC 1.2(b),
	PCV-30A	Exempt per ISTC 1.2(b),
	PCV-30G	Exempt per ISTC 1.2(b),
	PCV-30G1	Exempt per ISTC 1.2(b),
	PCV-30G2	Exempt per ISTC 1.2(b),
HBR2-6490 (1)	VCT-15	Category B passive manual valve
	VCT-16	Category B passive manual valve
	VCT-17	Category B passive manual valve
HBR2-9067 (1)	RC-578	Category B passive manual valve
	RC-588A	Category B passive manual valve
	RC-588B	Category B passive manual valve
	RC-591	Category B passive manual valve
	RC-592	Category B passive manual valve
	RC-594A	Category B passive manual valve
	RC-594B	Category B passive manual valve
	RC-598A	Category B passive valve
	RC-598B	Category B passive manual valve
	RC-599	Category B passive manual valve
	RC-600A	Category B passive manual valve
	RC-600B	Category B passive manual valve

United States Nuclear Regulatory Commission
Attachment II to Serial: RNP-RA/01-0099
47 Pages

CAROLINA POWER AND LIGHT COMPANY

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2

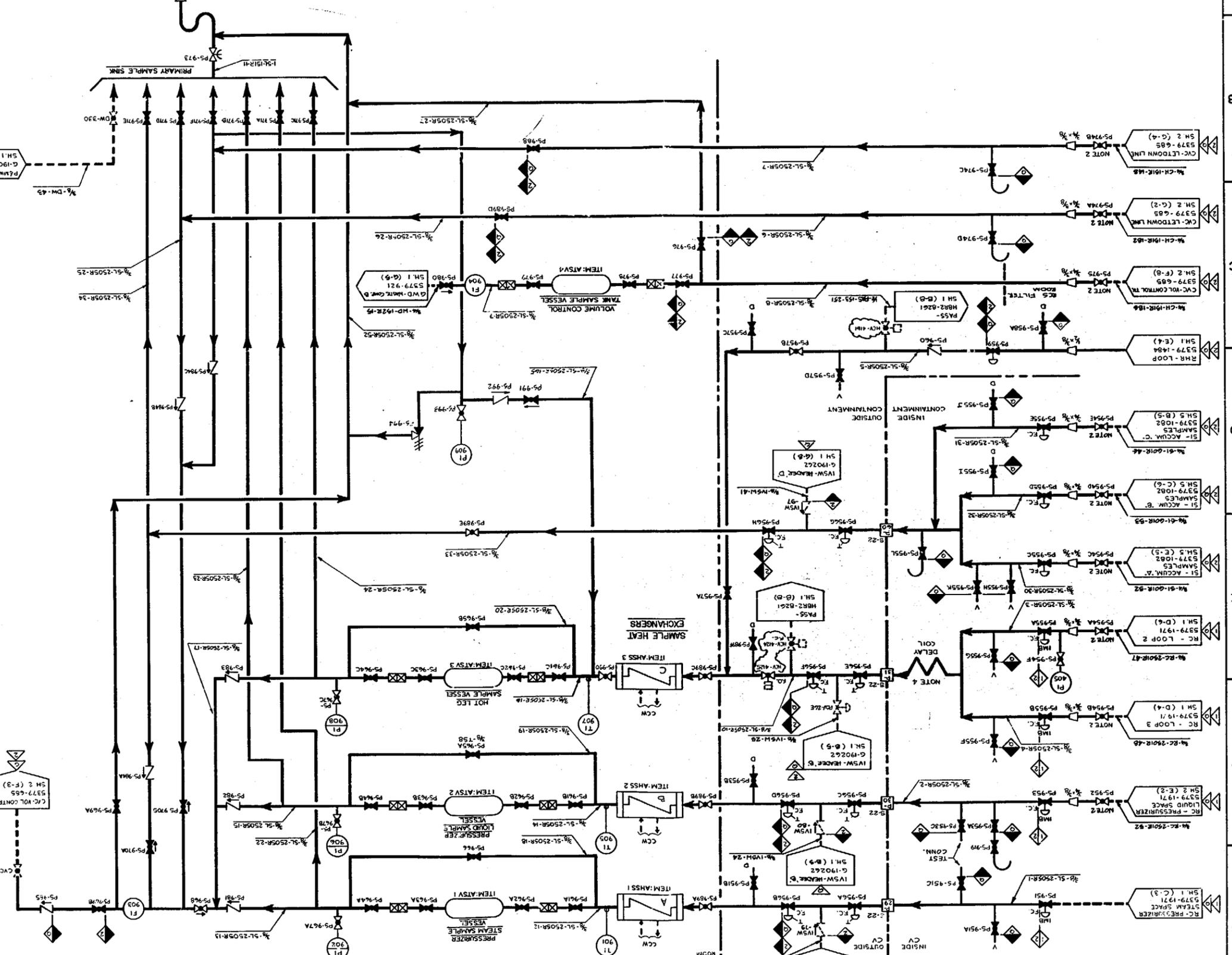
INSERVICE TESTING PROGRAM PLAN – FOURTH INTERVAL

SYSTEM DIAGRAMS

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 The flow diagram is a schematic diagram of the piping system. It shows the flow of water through various components including pumps, valves, tanks, and heat exchangers. The diagram is divided into sections by grid lines 1-8 and A-G.

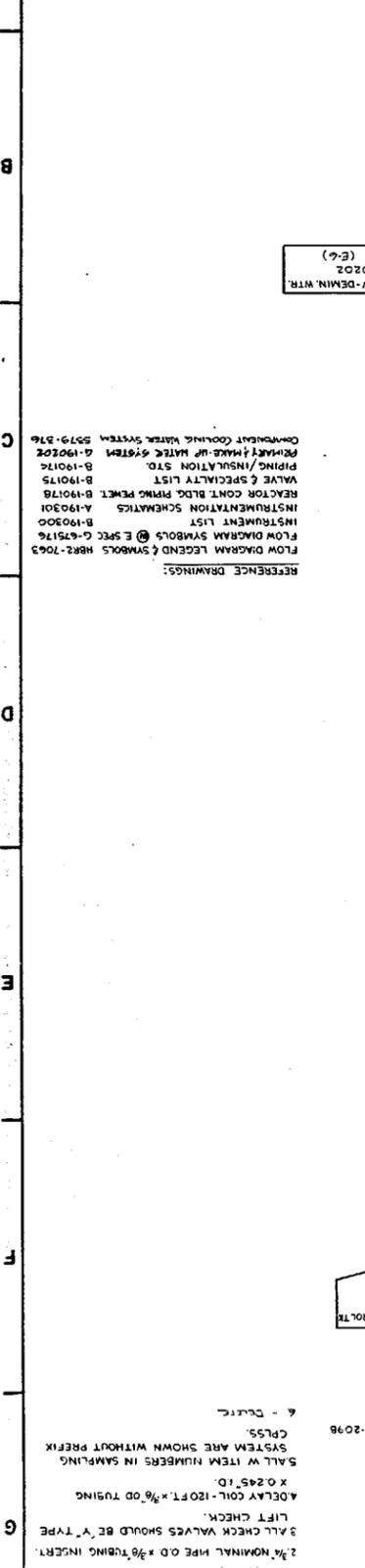
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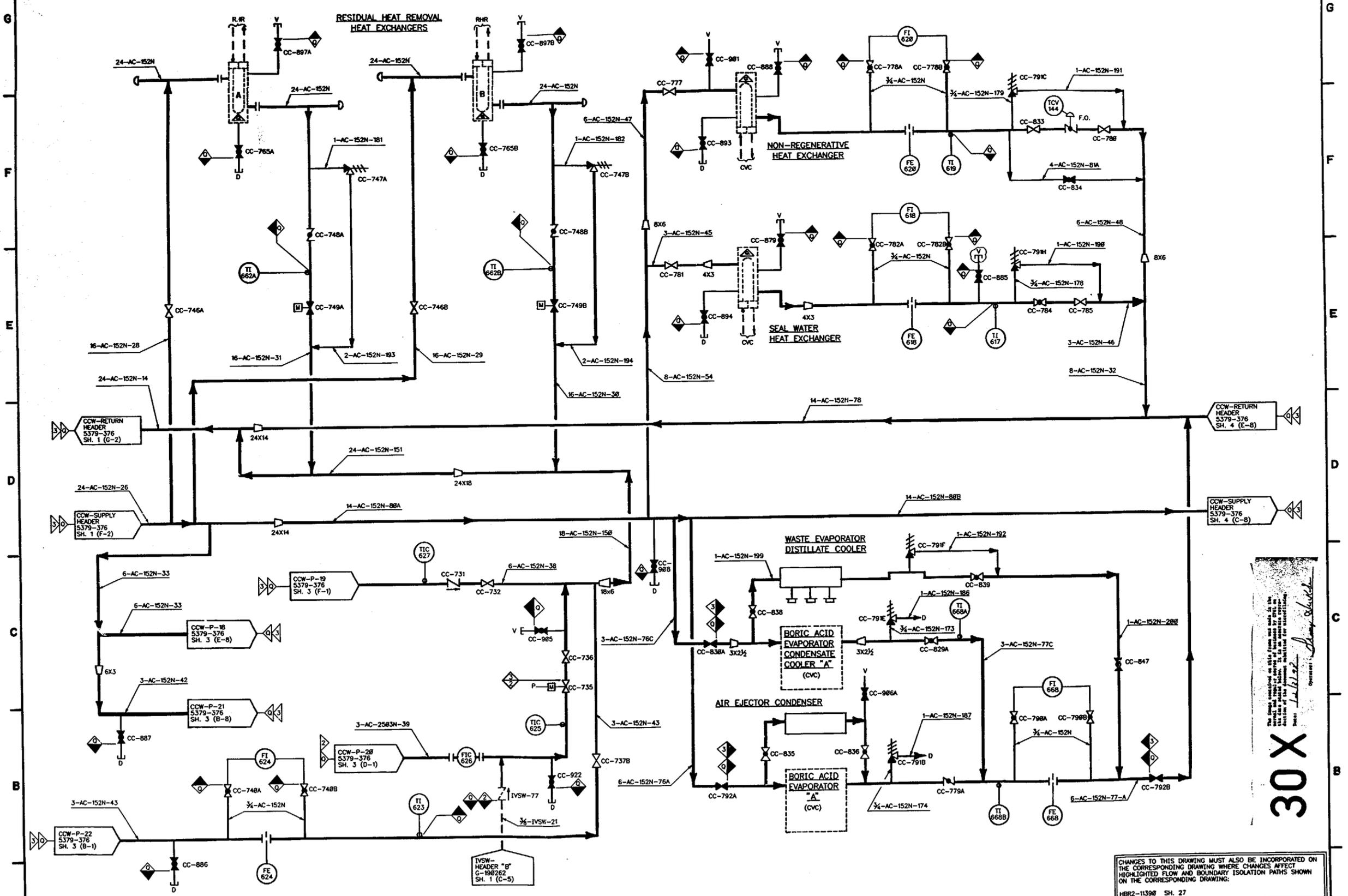
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 The flow diagram is a schematic diagram of the piping system. It shows the flow of water through various components including pumps, valves, tanks, and heat exchangers. The diagram is divided into sections by grid lines 1-8 and A-G.



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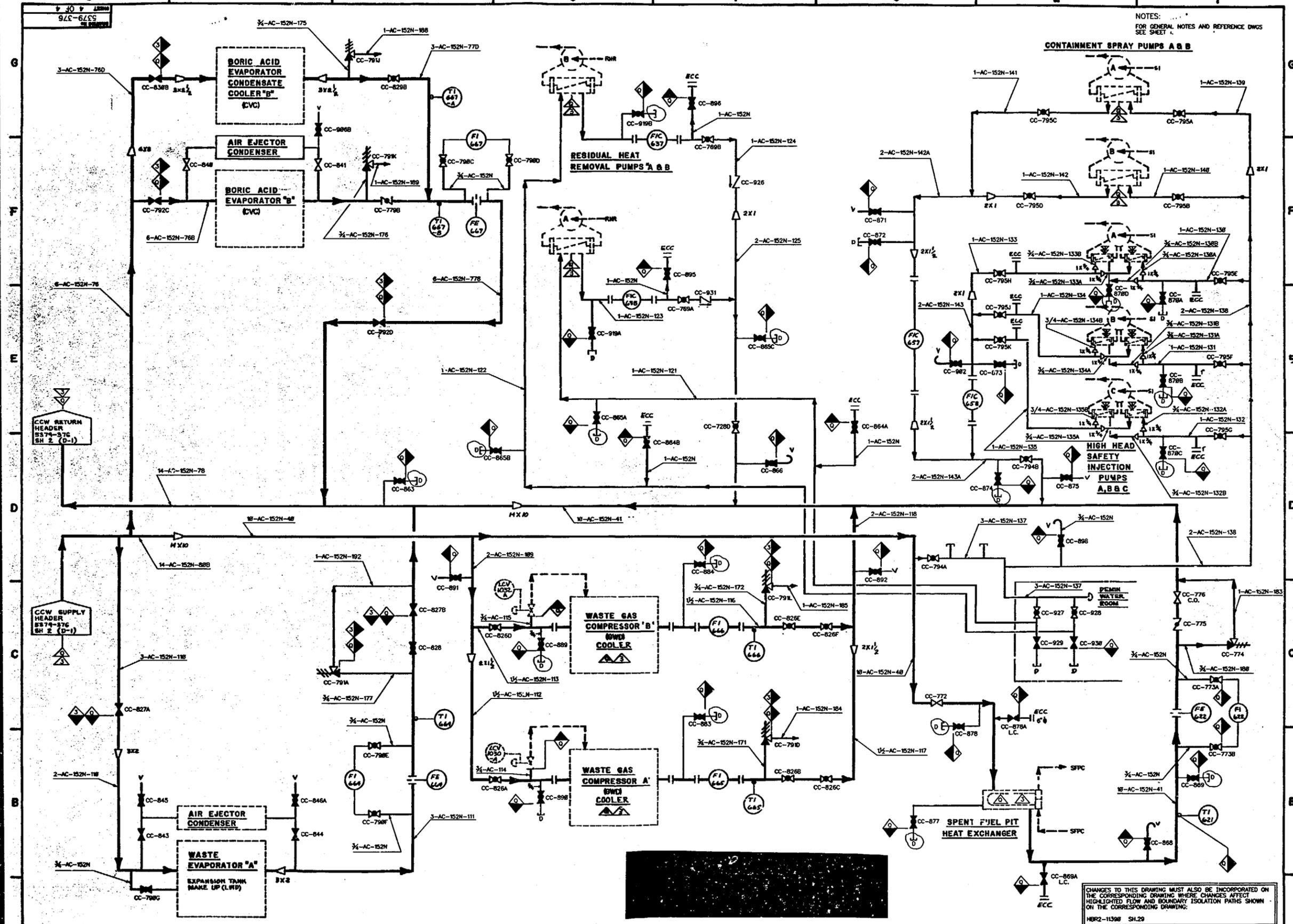
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CHANGES TO THIS DRAWING MUST ALSO BE INCORPORATED ON THE CORRESPONDING DRAWING WHERE CHANGES AFFECT HIGHLIGHTED FLOW AND BOUNDARY ISOLATION PATHS SHOWN ON THE CORRESPONDING DRAWING.
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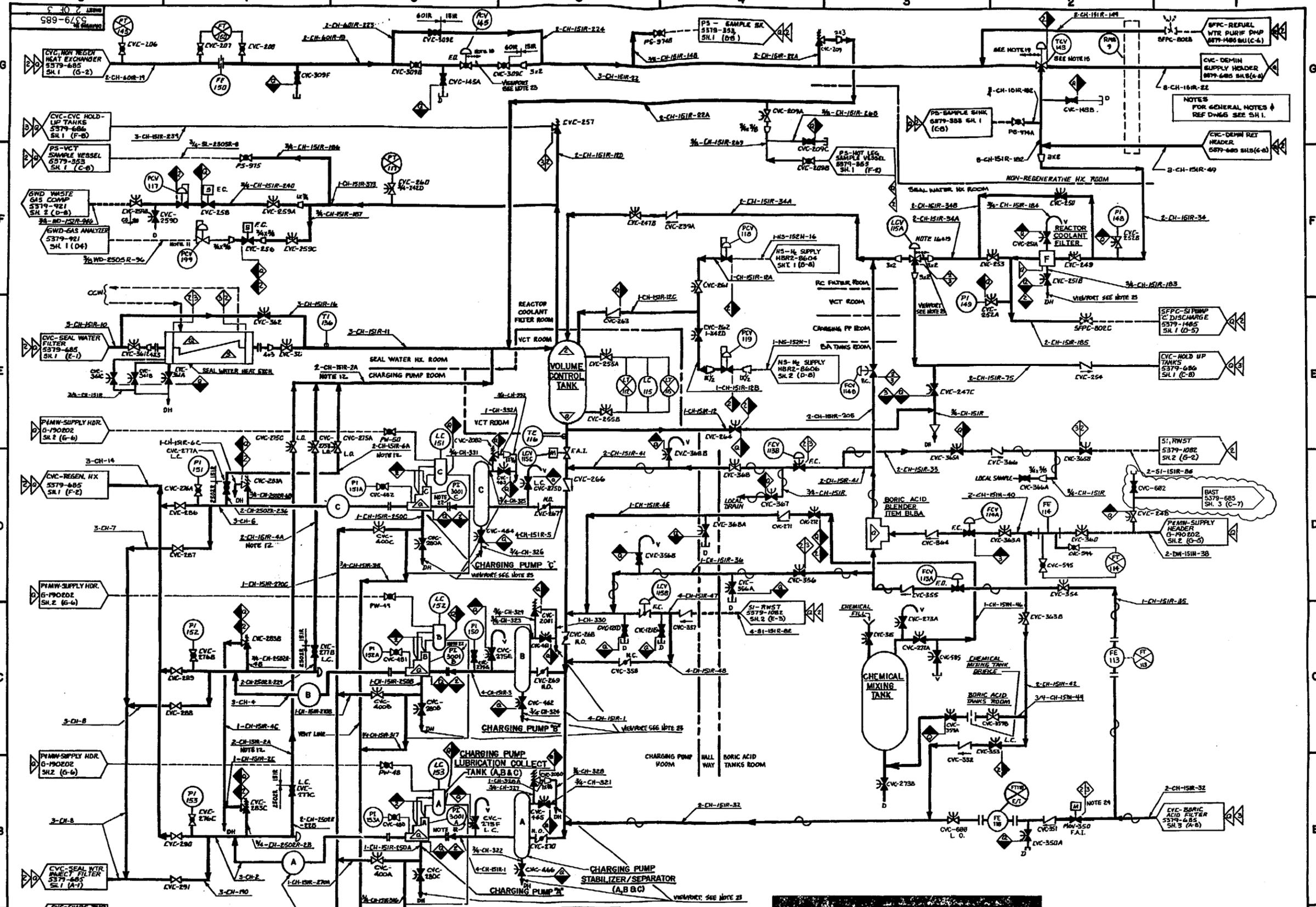
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 COMPONENT COOLING WATER SYSTEM FLOW DIAGRAM
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 SHEET 4 OF 4



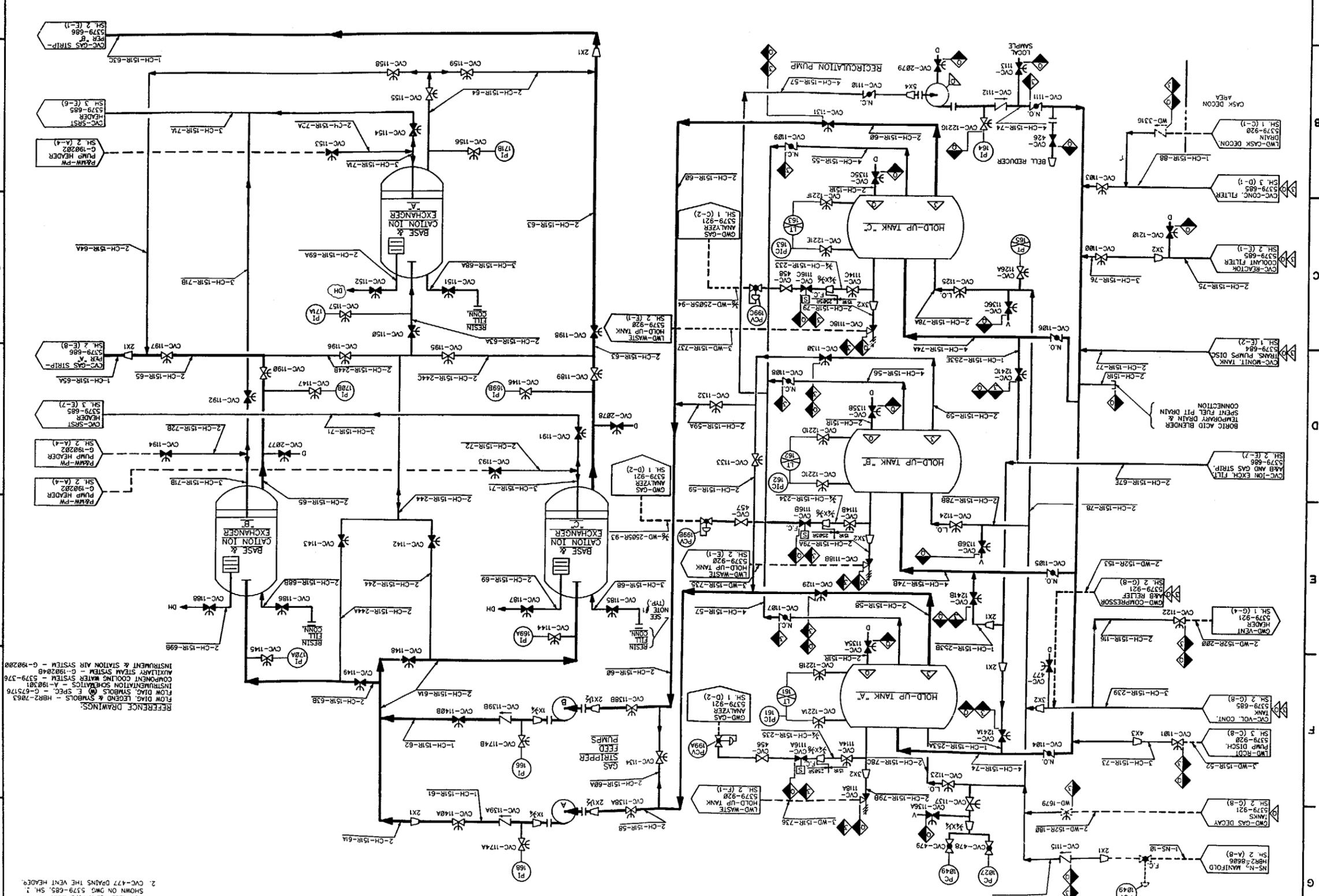
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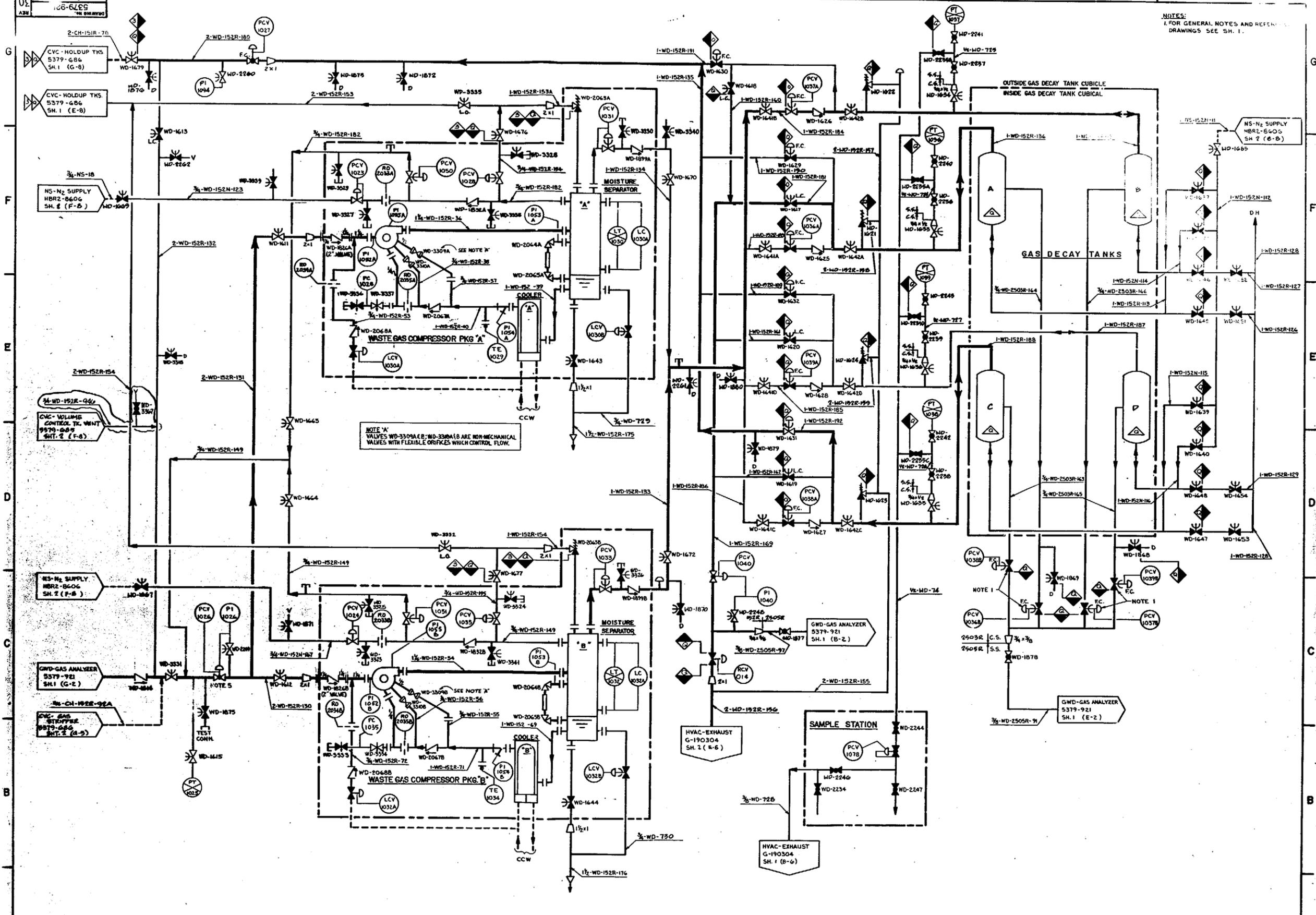
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12	REVISED & REDRAWN FOR WALKDOWN TO CR-200 5379-686, SH. 1
11	REVISED & REDRAWN FOR WALKDOWN TO CR-200 5379-686, SH. 1
10	REVISED & REDRAWN FOR WALKDOWN TO CR-200 5379-686, SH. 1
9	REVISED & REDRAWN FOR WALKDOWN TO CR-200 5379-686, SH. 1
8	REVISED & REDRAWN FOR WALKDOWN TO CR-200 5379-686, SH. 1
7	REVISED & REDRAWN FOR WALKDOWN TO CR-200 5379-686, SH. 1
6	REVISED & REDRAWN FOR WALKDOWN TO CR-200 5379-686, SH. 1
5	REVISED & REDRAWN FOR WALKDOWN TO CR-200 5379-686, SH. 1
4	REVISED & REDRAWN FOR WALKDOWN TO CR-200 5379-686, SH. 1
3	REVISED & REDRAWN FOR WALKDOWN TO CR-200 5379-686, SH. 1
2	REVISED & REDRAWN FOR WALKDOWN TO CR-200 5379-686, SH. 1
1	REVISED & REDRAWN FOR WALKDOWN TO CR-200 5379-686, SH. 1



NOTES:
 1. PORTABLE RESIN FILL TANK
 2. SHOWN ON DWG 5379-685, SH. 1
 3. CVC-477 DRAINS THE VENT HEAD?
 REFERENCE DRAWINGS:
 FLOW DIAG. LEGEND & SYMBOLS - HBR2-7063
 INSTRUMENTATION SCHEMATICS - A-19281
 COMPONENT COOLING WATER SYSTEM - 5379-376
 AUXILIARY STEAM SYSTEM - G-192848
 INSTRUMENT & STATION AIR SYSTEM - G-192820



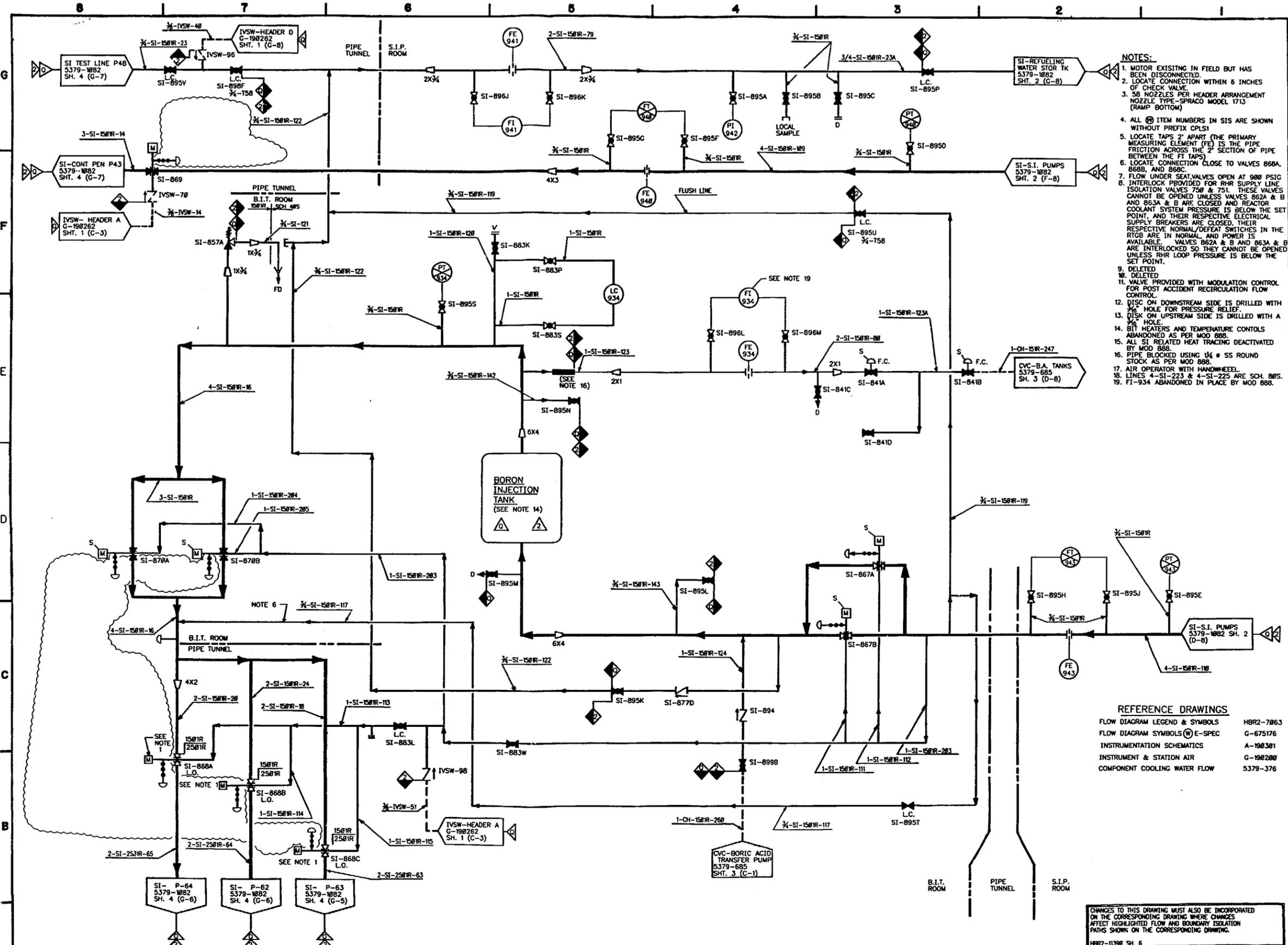
NOTES:
1. FOR GENERAL NOTES AND REFERENCES SEE SH. 1.

NOTE 'A'
VALVES WD-3309A, B; WD-3309B ARE NON-MECHANICAL VALVES WITH FLEXIBLE ORIFICES WHICH CONTROL FLOW.

NOTE 1

1	2	3	4	5	6	7	8
BY: J. WALTERS CHK: J. WALTERS DATE: 12-21-83							

DESIGNED BY: J. MAXWELL
 CHECKED BY: A. CHERRING
 DRAWING NO.: 5379-921
 SHEET NO.: 2 OF 2
 SCALE: NONE
 CAROLINA POWER & LIGHT CO.
 H. S. ROBINSON S.E. PLANT
 UNIT - No. 2 WASTE TREATMENT
 TITLE: GASEOUS WASTE DISPOSAL SYSTEM FLOW DIAGRAM



- NOTES:**
1. MOTOR EXISTING IN FIELD BUT HAS BEEN DISCONNECTED.
 2. LOCATE CONNECTION WITHIN 6 INCHES OF CHECK VALVE.
 3. 50 NOZZLES PER HEADER ARRANGEMENT NOZZLE TYPE-SPRAGO MODEL 1713 (RAMP BOTTOM)
 4. ALL ITEM NUMBERS IN SIS ARE SHOWN WITHOUT PREFIX CPLST
 5. LOCATE TAPS 2' APART (THE PRIMARY MEASURING ELEMENT (FE) IS THE PIPE FRICTION ACROSS THE 2' SECTION OF PIPE BETWEEN THE FT TAPS)
 6. LOCATE CONNECTION CLOSE TO VALVES 868A, 868B, AND 868C.
 7. FLOW UNDER SEAT VALVES OPEN AT 900 PSIC
 8. INTERLOCK PROVIDED FOR RHR SUPPLY LINE ISOLATION VALVES 750 & 751. THESE VALVES CANNOT BE OPENED UNLESS VALVES 862A & B AND 863A & B ARE CLOSED AND REACTOR COOLANT SYSTEM PRESSURE IS BELOW THE SET POINT, AND THEIR RESPECTIVE ELECTRICAL SUPPLY BREAKERS ARE CLOSED. THEIR RESPECTIVE NORMAL/DEFEAT SWITCHES IN THE RTGB ARE IN NORMAL AND POWER IS AVAILABLE. VALVES 862A & B AND 863A & B ARE INTERLOCKED SO THEY CANNOT BE OPENED UNLESS RHR LOOP PRESSURE IS BELOW THE SET POINT.
 9. DELETED
 10. DELETED
 11. VALVE PROVIDED WITH MODULATION CONTROL FOR POST ACCIDENT RECIRCULATION FLOW CONTROL.
 12. DISC ON DOWNSTREAM SIDE IS DRILLED WITH 1/8" HOLE FOR PRESSURE RELIEF.
 13. DISC ON UPSTREAM SIDE IS DRILLED WITH A 1/8" HOLE.
 14. B1T HEATERS AND TEMPERATURE CONTROLS ABANDONED AS PER MOD 888.
 15. ALL SI RELATED HEAT TRACING DEACTIVATED BY MOD 888.
 16. PIPE BLOKED USING 1 1/2" SS ROUND STOCK AS PER MOD 888.
 17. AIR OPERATOR WITH HANDWHEEL.
 18. LINES 4-SI-223 & 4-SI-225 ARE SCH. 80S.
 19. FT-934 ABANDONED IN PLACE BY MOD 888.

REFERENCE DRAWINGS

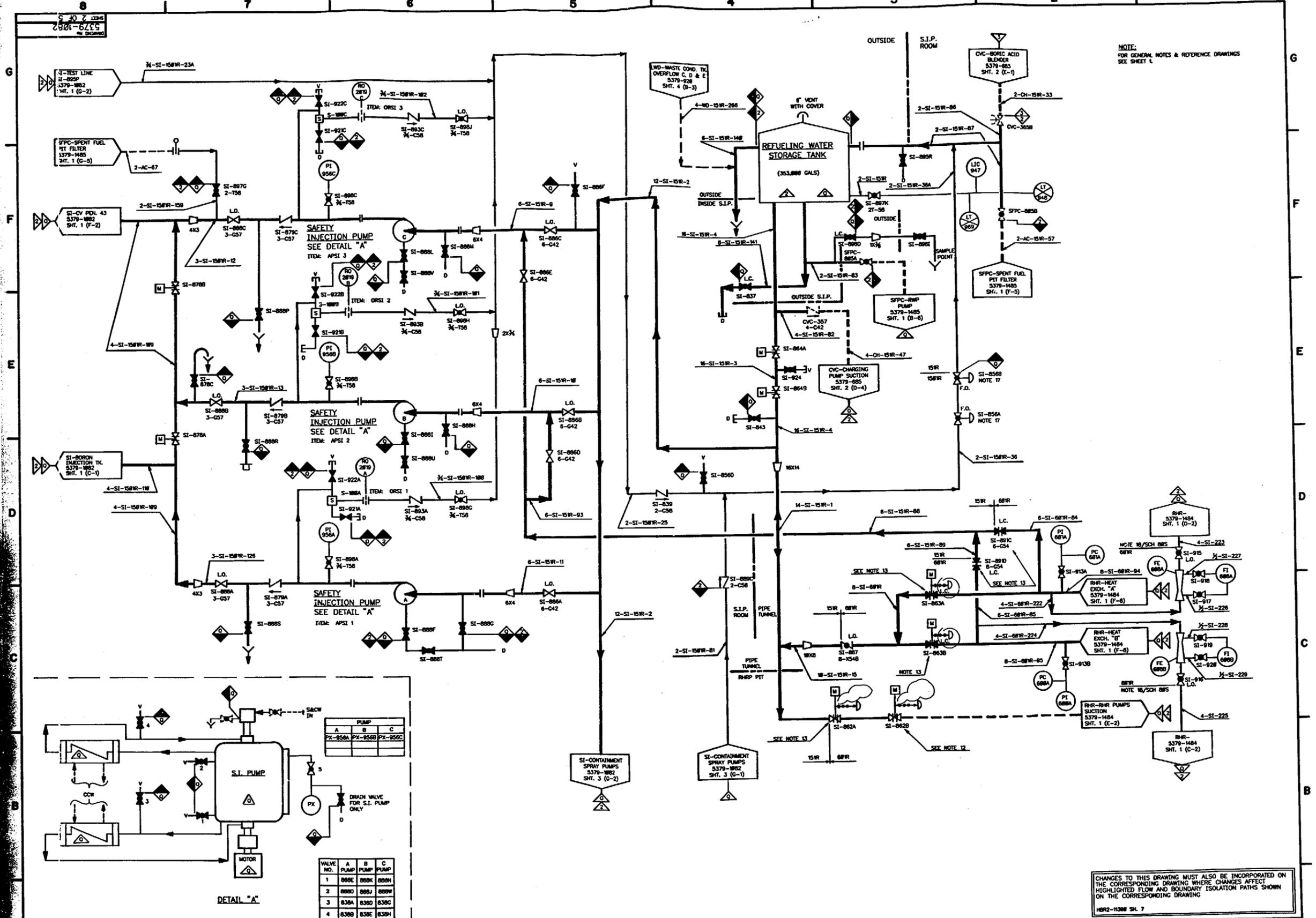
FLOW DIAGRAM LEGEND & SYMBOLS	HBR2-7863
FLOW DIAGRAM SYMBOLS (E)-SPEC	G-675176
INSTRUMENTATION SCHEMATICS	A-190301
INSTRUMENT & STATION AIR	G-190200
COMPONENT COOLING WATER FLOW	5379-376

CHANGES TO THIS DRAWING MUST ALSO BE INCORPORATED ON THE CORRESPONDING DRAWING WHERE CHANGES AFFECT HIGHLIGHTED FLOW AND BOUNDARY ISOLATION PATHS SHOWN ON THE CORRESPONDING DRAWING.

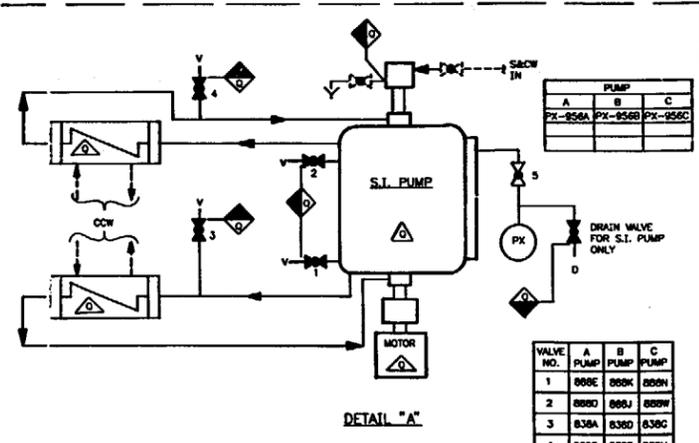
HBR2-11298 SH. 6

DCR: 98-175	37	BY: C. OLIVER	CHK: C. OLIVER	APPR: C. OLIVER	DATE: 2/17/98
DCR: 98-224	38	BY: E. PERKINS	CHK: R. MACDONALD	APPR: T. CLAY	DATE: 4/13/98
DCR: 99-740	39	BY: E. PERKINS	CHK: D.M. EDWARDS	APPR: C.L. OLIVER	DATE: 8/19/99
DCR: 99-687	40	BY: F.W. GRANTHAM	CHK: D.M. EDWARDS	APPR: C.L. OLIVER	DATE: 12/23/98
DCR: 99-386	41	BY: E.S. PERKINS	CHK: R. MACDONALD	APPR: T. CLAY	DATE: 8/19/98

DESIGNED BY: H.E.L. LOYD	DATE: 10/11/97	SCALE: NONE
CHECKED BY: W. JOHNSON	DATE: 10/11/97	SHEET 1 OF 5
TITLE: SAFETY INJECTION SYSTEM FLOW DIAGRAM		
VENDOR NO.	DATE: 5/379-1082	REV: 41



NOTE:
FOR GENERAL NOTES & REFERENCE DRAWINGS
SEE SHEET 1.



PUMP	A	B	C
PX-956A	PX-956B	PX-956C	

VALVE NO.	A	B	C
1	839C	839K	839H
2	839D	839J	839W
3	839A	839D	839C
4	839B	839E	839H
5	839C	839F	839I

CHANGES TO THIS DRAWING MUST ALSO BE INCORPORATED ON THE CORRESPONDING DRAWING WHERE CHANGES AFFECT HIGHLIGHTED FLOW AND BOUNDARY ISOLATION PATHS SHOWN ON THE CORRESPONDING DRAWING

HR2-11388 SH. 7

15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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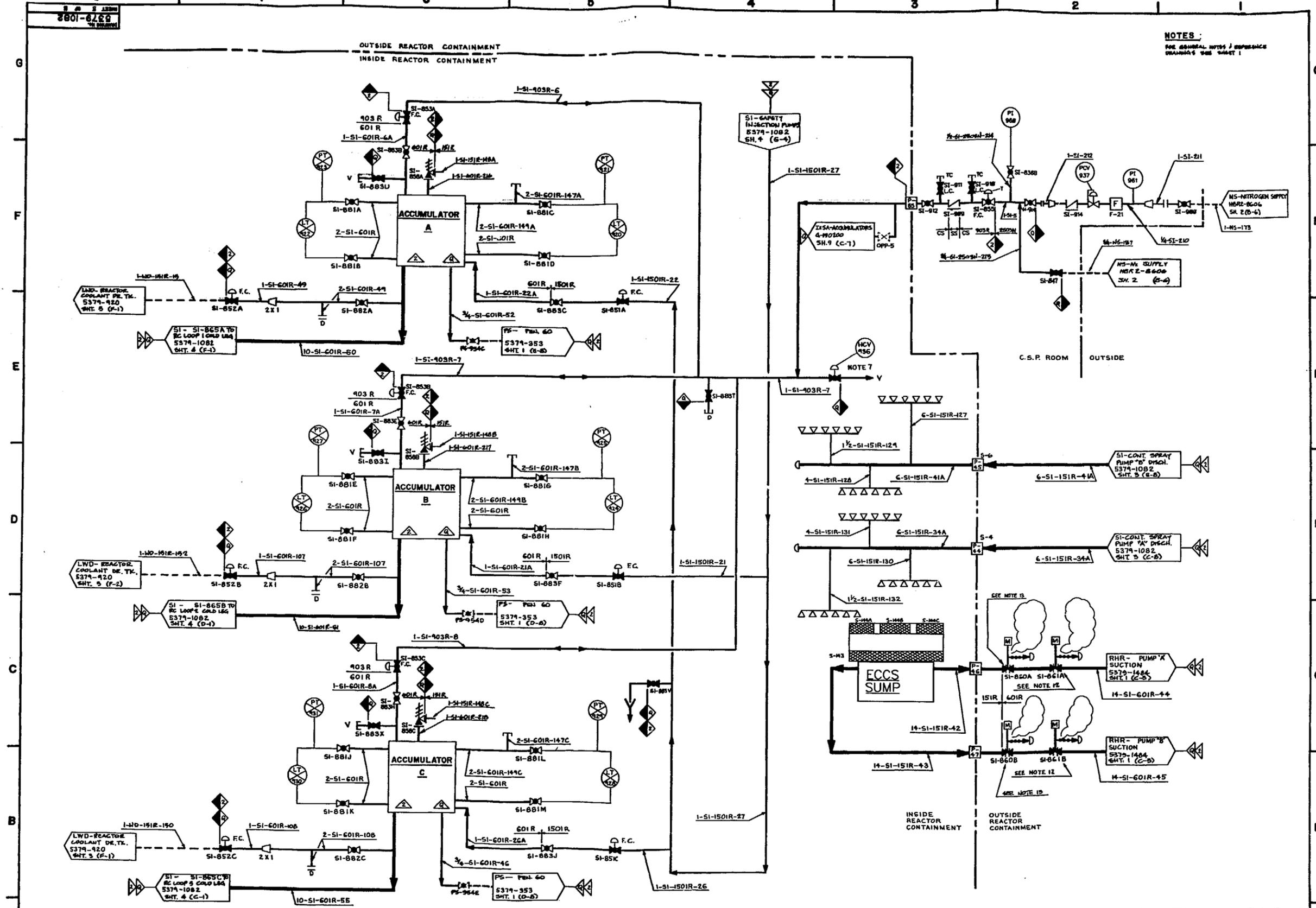
CAROLINA POWER & LIGHT CO.
H. B. ROBINSON S.E. PLANT
UNIT - NO. 2 MATTHEWVILLE, N.C.

TITLE: SAFETY INJECTION SYSTEM FLOW DIAGRAM

REVISION NO. 1
DATE: 5/3/79

SCALE: NONE

SHEET 2 OF 5



NOTES:
FOR GENERAL NOTES / REFERENCES
DRAWING'S SHEET 1

CHANGES TO THIS DRAWING MUST ALSO BE INCORPORATED
ON THE CORRESPONDING DRAWING WHERE CHANGES
AFFECT HIGHLIGHTED FLOW AND BOUNDARY ISOLATOR
PATTERNS SHOWN ON THE CORRESPONDING DRAWING
HR2-11398 SH. 18

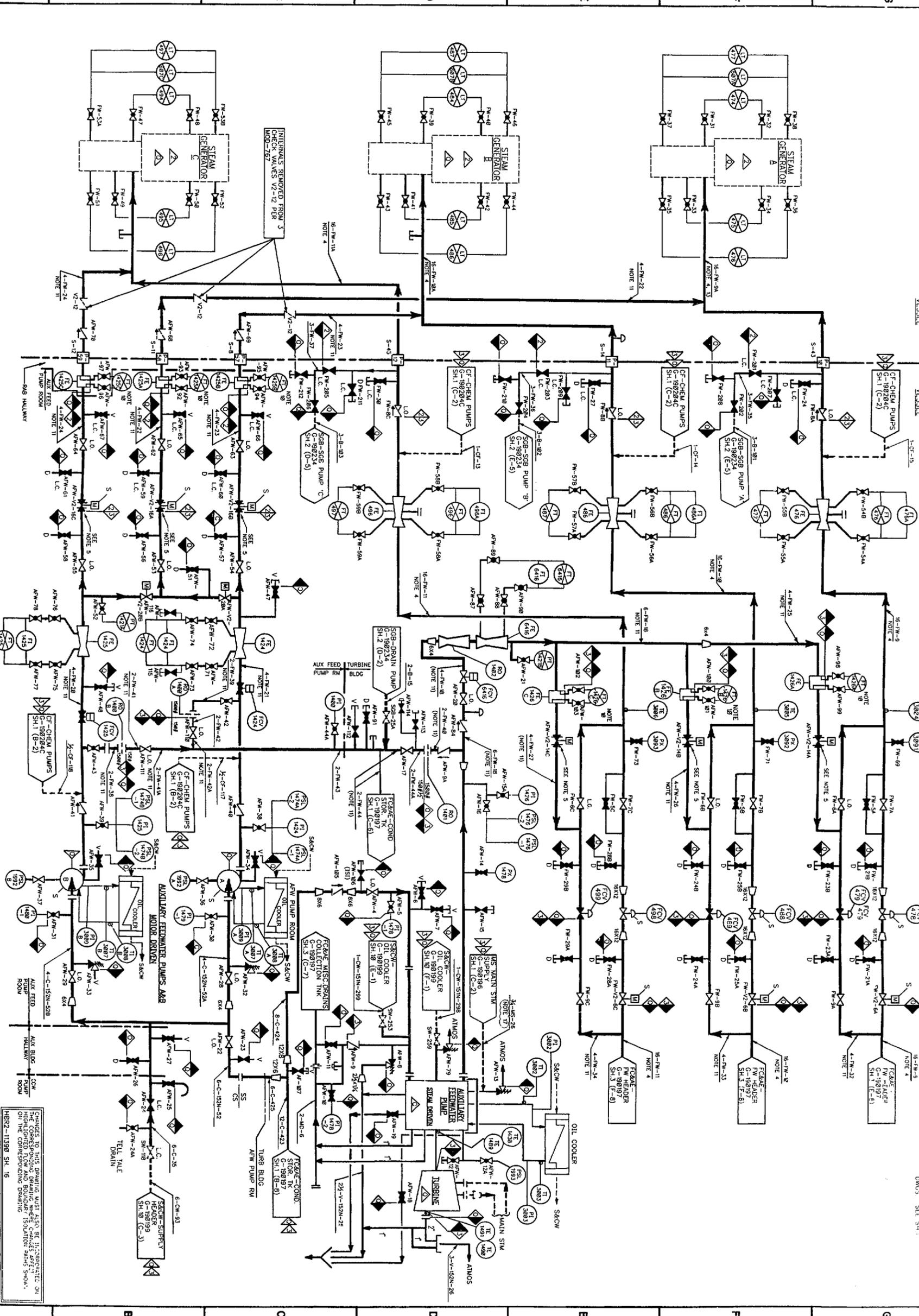
REV 14	BY J. WALTERS	DATE 11/12/82	CHK P. HADWALLO
REV 13	BY J. WALTERS	DATE 11/12/82	CHK P. HADWALLO
REV 12	BY J. WALTERS	DATE 11/12/82	CHK P. HADWALLO
REV 11	BY J. WALTERS	DATE 11/12/82	CHK P. HADWALLO
REV 10	BY J. WALTERS	DATE 11/12/82	CHK P. HADWALLO
REV 9	BY J. WALTERS	DATE 11/12/82	CHK P. HADWALLO
REV 8	BY J. WALTERS	DATE 11/12/82	CHK P. HADWALLO
REV 7	BY J. WALTERS	DATE 11/12/82	CHK P. HADWALLO
REV 6	BY J. WALTERS	DATE 11/12/82	CHK P. HADWALLO
REV 5	BY J. WALTERS	DATE 11/12/82	CHK P. HADWALLO
REV 4	BY J. WALTERS	DATE 11/12/82	CHK P. HADWALLO
REV 3	BY J. WALTERS	DATE 11/12/82	CHK P. HADWALLO
REV 2	BY J. WALTERS	DATE 11/12/82	CHK P. HADWALLO
REV 1	BY J. WALTERS	DATE 11/12/82	CHK P. HADWALLO

DESIGNED BY: CLINT PARSONS
CHECKED BY: W. JOHNSON
DATE: 11/12/82
SCALE: NONE

CAROLINA POWER & LIGHT CO.
N.S. ROSSBORO PLANT
UNIT - 2S REACTOR, 2C

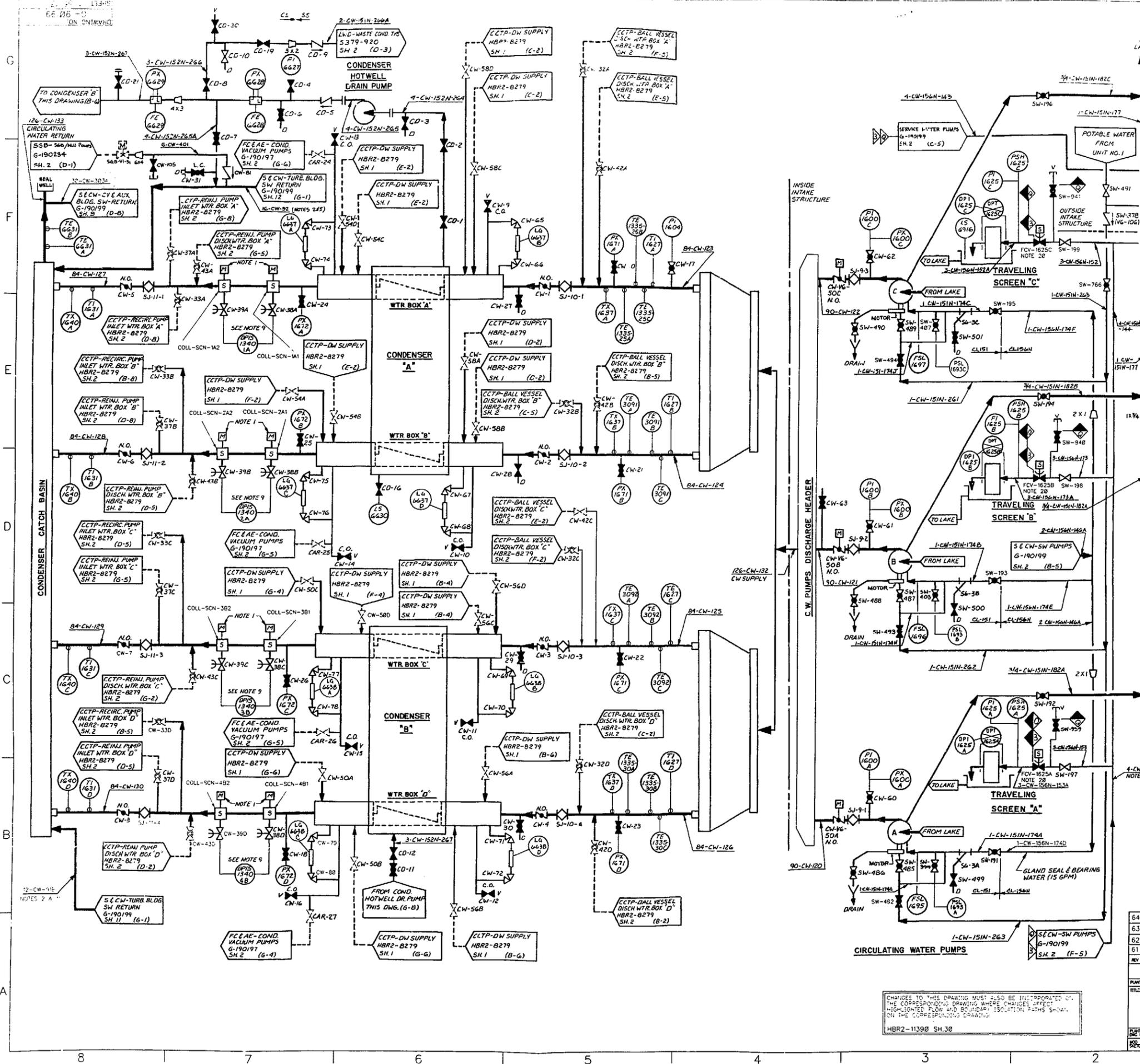
TITLE: SAFETY INJECTION SYSTEM FLOW DIAGRAM

REVISION: E
DATE: 5/3/82
SHEET: 5 OF 5



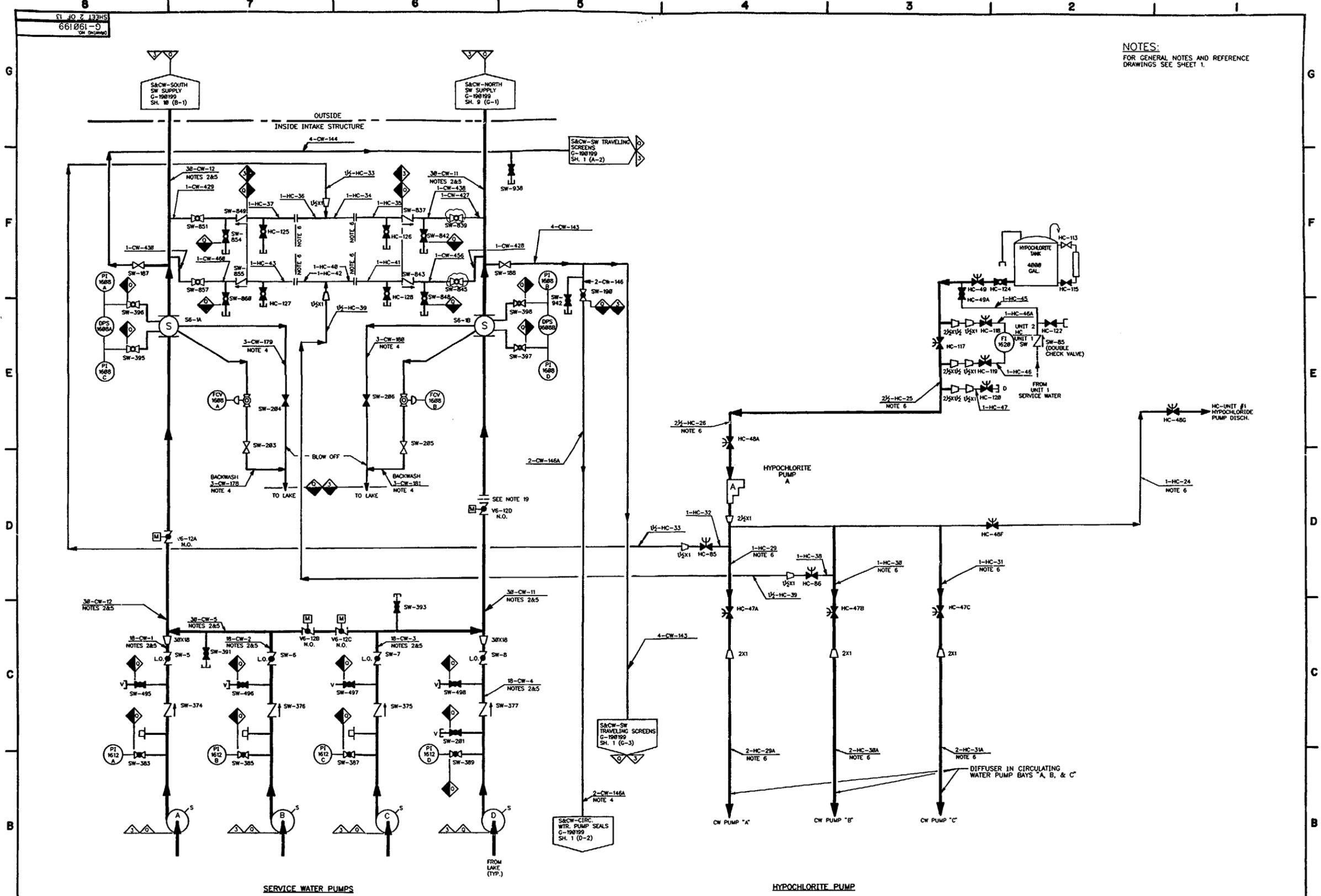
REVISIONS	DATE	BY	CHK	APPR	DESCRIPTION
28	DCA 92 603 MOD 1091	J. WALTERS	CK. HEL LLOYD	APPR. C. OLIVER	APP. C. OLIVER 3/1/72
29	DCR 92 876	J. WALTERS	CK. HEL LLOYD	APPR. C. OLIVER	APP. C. OLIVER 3/1/72
30	DCR 92 1527	J. WALTERS	CK. HEL LLOYD	APPR. C. OLIVER	APP. C. OLIVER 3/1/72
31	DCR 92 1528	J. WALTERS	CK. HEL LLOYD	APPR. C. OLIVER	APP. C. OLIVER 3/1/72
32	DCR 92 1555	J. WALTERS	CK. HEL LLOYD	APPR. C. OLIVER	APP. C. OLIVER 3/1/72
33	DCR 92 1714	J. WALTERS	CK. HEL LLOYD	APPR. C. OLIVER	APP. C. OLIVER 3/1/72
34	DCR 92 1851	J. WALTERS	CK. HEL LLOYD	APPR. C. OLIVER	APP. C. OLIVER 3/1/72
35	DCR 92 1860	J. WALTERS	CK. HEL LLOYD	APPR. C. OLIVER	APP. C. OLIVER 3/1/72
36	DCR 92 1868	J. WALTERS	CK. HEL LLOYD	APPR. C. OLIVER	APP. C. OLIVER 3/1/72
37	DCR 92 1872	J. WALTERS	CK. HEL LLOYD	APPR. C. OLIVER	APP. C. OLIVER 3/1/72
38	DCR 92 1874	J. WALTERS	CK. HEL LLOYD	APPR. C. OLIVER	APP. C. OLIVER 3/1/72
39	DCR 92 1876	J. WALTERS	CK. HEL LLOYD	APPR. C. OLIVER	APP. C. OLIVER 3/1/72
40	DCR 92 1878	J. WALTERS	CK. HEL LLOYD	APPR. C. OLIVER	APP. C. OLIVER 3/1/72
41	DCR 92 1880	J. WALTERS	CK. HEL LLOYD	APPR. C. OLIVER	APP. C. OLIVER 3/1/72
42	DCR 92 1882	J. WALTERS	CK. HEL LLOYD	APPR. C. OLIVER	APP. C. OLIVER 3/1/72
43	DCR 92 1884	J. WALTERS	CK. HEL LLOYD	APPR. C. OLIVER	APP. C. OLIVER 3/1/72
44	DCR 92 1886	J. WALTERS	CK. HEL LLOYD	APPR. C. OLIVER	APP. C. OLIVER 3/1/72
45	DCR 92 1888	J. WALTERS	CK. HEL LLOYD	APPR. C. OLIVER	APP. C. OLIVER 3/1/72
46	DCR 92 1890	J. WALTERS	CK. HEL LLOYD	APPR. C. OLIVER	APP. C. OLIVER 3/1/72
47	DCR 92 1892	J. WALTERS	CK. HEL LLOYD	APPR. C. OLIVER	APP. C. OLIVER 3/1/72
22	DCR 90-1435	J. WALTERS	CK. HEL LLOYD	APPR. C. OLIVER	APP. C. OLIVER 3/1/72
23	DCR 91-722	J. WALTERS	CK. HEL LLOYD	APPR. C. OLIVER	APP. C. OLIVER 3/1/72
24	DCR 92-52	J. WALTERS	CK. HEL LLOYD	APPR. C. OLIVER	APP. C. OLIVER 3/1/72
25	DCR 92-53	J. WALTERS	CK. HEL LLOYD	APPR. C. OLIVER	APP. C. OLIVER 3/1/72
26	DCR 92-54	J. WALTERS	CK. HEL LLOYD	APPR. C. OLIVER	APP. C. OLIVER 3/1/72
27	DCR 92-55	J. WALTERS	CK. HEL LLOYD	APPR. C. OLIVER	APP. C. OLIVER 3/1/72

SCALE: NONE
 CAROLINA POWER & LIGHT CO.
 FEEDWATER CONDENSATE
 AND AIR EVACUATION SYSTEM
 DRAWING NO. 261061-9
 SHEET 1 OF 2
 DATE: 3/1/72
 DANGER TO LIFE: GRABING VAST A.S.S. BE CAREFUL! THE CORRESPONDING DRAWING WHERE 'C' MARKS ARE ON THE CORRESPONDING DRAWING.



- NOTES**
1. MATERIAL SPEC. PIPE AND FITTINGS - CARBON STEEL PIPING WITH COAL TAP LINGING.
 2. MATERIAL SPEC. PIPE AND FITTINGS - CARBON STEEL PIPING WITH PLASTIC LINING.
 3. MATERIAL SPEC. PIPE AND FITTINGS - 316 SS.
 4. MATERIAL SPEC. PIPE AND FITTINGS - 304 SS.
 5. MATERIAL SPEC. PIPE AND FITTINGS - 304 SS.
 6. MATERIAL SPEC. PIPE AND FITTINGS - 304 SS.
 7. MATERIAL SPEC. PIPE AND FITTINGS - 304 SS.
 8. MATERIAL SPEC. PIPE AND FITTINGS - 304 SS.
 9. MATERIAL SPEC. PIPE AND FITTINGS - 304 SS.
 10. MATERIAL SPEC. PIPE AND FITTINGS - 304 SS.
 11. MATERIAL SPEC. PIPE AND FITTINGS - 304 SS.
 12. MATERIAL SPEC. PIPE AND FITTINGS - 304 SS.
 13. MATERIAL SPEC. PIPE AND FITTINGS - 304 SS.
 14. MATERIAL SPEC. PIPE AND FITTINGS - 304 SS.
 15. MATERIAL SPEC. PIPE AND FITTINGS - 304 SS.
 16. MATERIAL SPEC. PIPE AND FITTINGS - 304 SS.
 17. MATERIAL SPEC. PIPE AND FITTINGS - 304 SS.
 18. MATERIAL SPEC. PIPE AND FITTINGS - 304 SS.
 19. MATERIAL SPEC. PIPE AND FITTINGS - 304 SS.
 20. MATERIAL SPEC. PIPE AND FITTINGS - 304 SS.
 21. MATERIAL SPEC. PIPE AND FITTINGS - 304 SS.
 22. MATERIAL SPEC. PIPE AND FITTINGS - 304 SS.
 23. MATERIAL SPEC. PIPE AND FITTINGS - 304 SS.
 24. MATERIAL SPEC. PIPE AND FITTINGS - 304 SS.
 25. MATERIAL SPEC. PIPE AND FITTINGS - 304 SS.
 26. MATERIAL SPEC. PIPE AND FITTINGS - 304 SS.
 27. MATERIAL SPEC. PIPE AND FITTINGS - 304 SS.
 28. MATERIAL SPEC. PIPE AND FITTINGS - 304 SS.
 29. MATERIAL SPEC. PIPE AND FITTINGS - 304 SS.
 30. MATERIAL SPEC. PIPE AND FITTINGS - 304 SS.
- REFERENCE DRAWINGS**
- | | | | |
|----|-----------------------------|----------------|------------|
| 64 | DCR: 01-414, AR 28365 | ESP: 1-1-1 | HBR2-7863 |
| 63 | DCR: 01-20113, ESR 99-00354 | FWG/ESP: 2-1-1 | G-675776 |
| 62 | DCR: 00-48 | ESP/DWG: 2-1-1 | A-198301 |
| 61 | DCR: 99-10029, ESR 99-00347 | ESP/DWG: 1-1-1 | B-198178 |
| 60 | | | G-198196 |
| 59 | | | G-198197 |
| 58 | | | G-198200 |
| 57 | | | G-198204 |
| 56 | | | G-198234 |
| 55 | | | G-198262 |
| 54 | | | 5378-920 |
| 53 | | | HBR2-8699 |
| 52 | | | 5379-282 |
| 51 | | | HBR2-8699 |
| 50 | | | 5379-376 |
| 49 | | | HBR2-8698 |
| 48 | | | G-198224-4 |
| 47 | | | 5379-484 |
| 46 | | | G-198198 |
| 45 | | | G-198204-8 |
- CHANGES TO THIS DRAWING MUST ALSO BE INCORPORATED ON THE CORRESPONDING DRAWING WHERE CHANGE AFFECTS HIGHLIGHTED FLOW AND BOUNDARY ISOLATION PATHS SHOWN ON THE CORRESPONDING DRAWING.**
- HBR2-11398 SH.30
- SERVICE & COOLING WATER SYSTEM FLOW DIAGRAM**
- DCR No: G-190199 Rev: 64 Date: 1 of 3

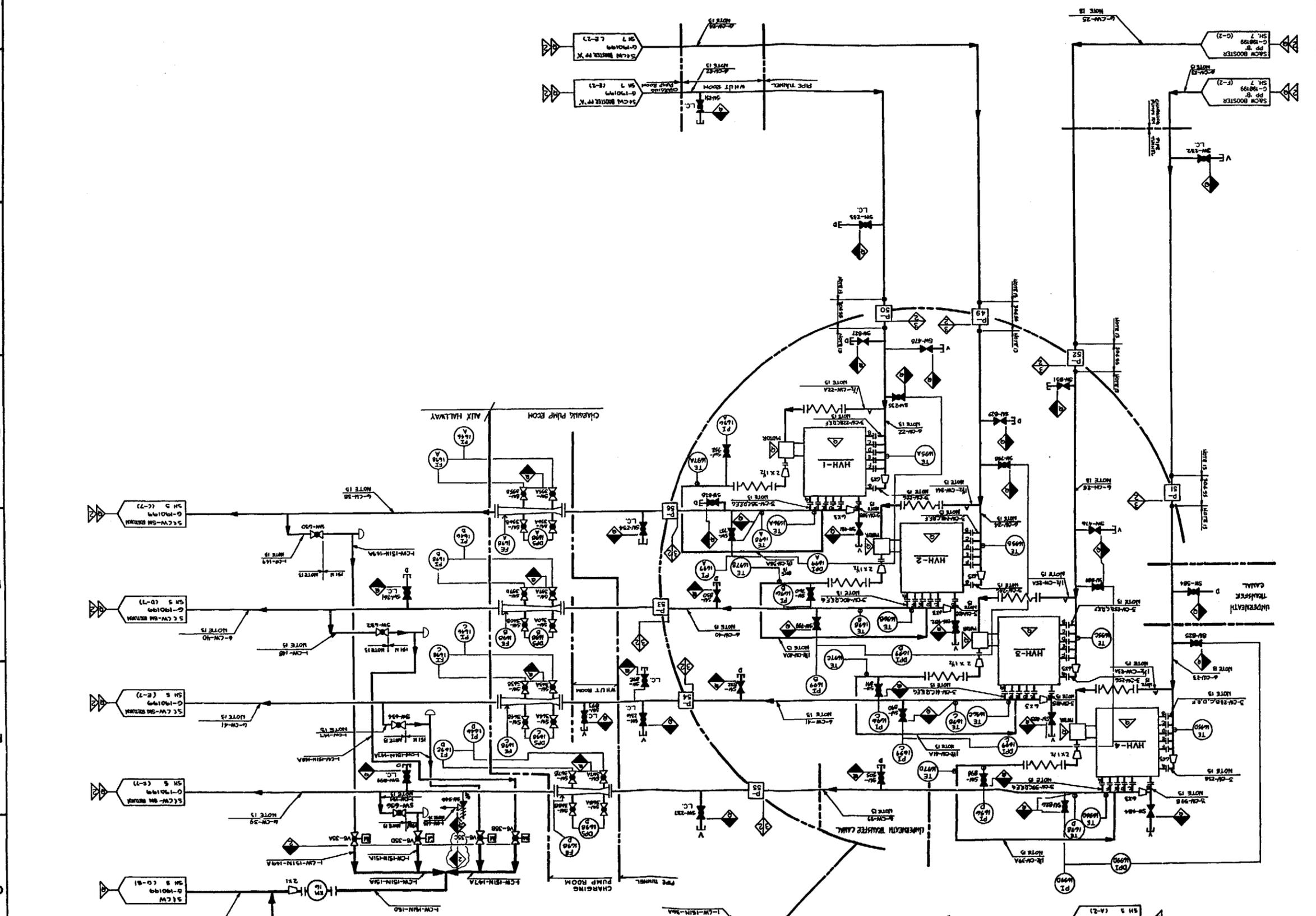
NOTES:
FOR GENERAL NOTES AND REFERENCE
DRAWINGS SEE SHEET 1.



CHANGES TO THIS DRAWING MUST ALSO BE INCORPORATED
ON THE CORRESPONDING DRAWING WHERE CHANGES
AFFECT HIGHLIGHTED FLOW AND BOUNDARY ISOLATION
PATHS SHOWN ON THE CORRESPONDING DRAWING.
HBR2-11398 SH. 31

REVISION	DATE	BY	CHK	APPR	DESCRIPTION
1	02/11/88	J. WALTERS	C. L. OLIVER	J. WALTERS	ISSUE FOR CONSTRUCTION
2	03/11/88	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR PUMP SEALS
3	04/11/88	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR HYPOCHLORITE PUMP
4	05/11/88	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR SERVICE WATER PUMPS
5	06/11/88	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR INTAKE STRUCTURES
6	07/11/88	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR VALVES
7	08/11/88	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR PIPING
8	09/11/88	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR CHECK VALVES
9	10/11/88	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR PRESSURE INDICATORS
10	11/11/88	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR BACKWASH LINES
11	12/11/88	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR SERVICE WATER PUMPS
12	01/11/89	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR HYPOCHLORITE PUMP
13	02/11/89	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR SERVICE WATER PUMPS
14	03/11/89	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR INTAKE STRUCTURES
15	04/11/89	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR VALVES
16	05/11/89	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR PIPING
17	06/11/89	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR CHECK VALVES
18	07/11/89	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR PRESSURE INDICATORS
19	08/11/89	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR BACKWASH LINES
20	09/11/89	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR SERVICE WATER PUMPS
21	10/11/89	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR HYPOCHLORITE PUMP
22	11/11/89	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR SERVICE WATER PUMPS
23	12/11/89	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR INTAKE STRUCTURES
24	01/11/90	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR VALVES
25	02/11/90	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR PIPING
26	03/11/90	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR CHECK VALVES
27	04/11/90	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR PRESSURE INDICATORS
28	05/11/90	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR BACKWASH LINES
29	06/11/90	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR SERVICE WATER PUMPS
30	07/11/90	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR HYPOCHLORITE PUMP
31	08/11/90	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR SERVICE WATER PUMPS
32	09/11/90	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR INTAKE STRUCTURES
33	10/11/90	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR VALVES
34	11/11/90	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR PIPING
35	12/11/90	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR CHECK VALVES
36	01/11/91	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR PRESSURE INDICATORS
37	02/11/91	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR BACKWASH LINES
38	03/11/91	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR SERVICE WATER PUMPS
39	04/11/91	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR HYPOCHLORITE PUMP
40	05/11/91	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR SERVICE WATER PUMPS
41	06/11/91	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR INTAKE STRUCTURES
42	07/11/91	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR VALVES
43	08/11/91	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR PIPING
44	09/11/91	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR CHECK VALVES
45	10/11/91	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR PRESSURE INDICATORS
46	11/11/91	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR BACKWASH LINES
47	12/11/91	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR SERVICE WATER PUMPS
48	01/11/92	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR HYPOCHLORITE PUMP
49	02/11/92	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR SERVICE WATER PUMPS
50	03/11/92	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR INTAKE STRUCTURES
51	04/11/92	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR VALVES
52	05/11/92	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR PIPING
53	06/11/92	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR CHECK VALVES
54	07/11/92	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR PRESSURE INDICATORS
55	08/11/92	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR BACKWASH LINES
56	09/11/92	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR SERVICE WATER PUMPS
57	10/11/92	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR HYPOCHLORITE PUMP
58	11/11/92	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR SERVICE WATER PUMPS
59	12/11/92	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR INTAKE STRUCTURES
60	01/11/93	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR VALVES
61	02/11/93	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR PIPING
62	03/11/93	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR CHECK VALVES
63	04/11/93	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR PRESSURE INDICATORS
64	05/11/93	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR BACKWASH LINES
65	06/11/93	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR SERVICE WATER PUMPS
66	07/11/93	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR HYPOCHLORITE PUMP
67	08/11/93	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR SERVICE WATER PUMPS
68	09/11/93	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR INTAKE STRUCTURES
69	10/11/93	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR VALVES
70	11/11/93	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR PIPING
71	12/11/93	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR CHECK VALVES
72	01/11/94	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR PRESSURE INDICATORS
73	02/11/94	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR BACKWASH LINES
74	03/11/94	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR SERVICE WATER PUMPS
75	04/11/94	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR HYPOCHLORITE PUMP
76	05/11/94	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR SERVICE WATER PUMPS
77	06/11/94	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR INTAKE STRUCTURES
78	07/11/94	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR VALVES
79	08/11/94	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR PIPING
80	09/11/94	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR CHECK VALVES
81	10/11/94	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR PRESSURE INDICATORS
82	11/11/94	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR BACKWASH LINES
83	12/11/94	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR SERVICE WATER PUMPS
84	01/11/95	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR HYPOCHLORITE PUMP
85	02/11/95	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR SERVICE WATER PUMPS
86	03/11/95	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR INTAKE STRUCTURES
87	04/11/95	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR VALVES
88	05/11/95	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR PIPING
89	06/11/95	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR CHECK VALVES
90	07/11/95	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR PRESSURE INDICATORS
91	08/11/95	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR BACKWASH LINES
92	09/11/95	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR SERVICE WATER PUMPS
93	10/11/95	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR HYPOCHLORITE PUMP
94	11/11/95	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR SERVICE WATER PUMPS
95	12/11/95	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR INTAKE STRUCTURES
96	01/11/96	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR VALVES
97	02/11/96	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR PIPING
98	03/11/96	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR CHECK VALVES
99	04/11/96	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR PRESSURE INDICATORS
100	05/11/96	J. WALTERS	C. L. OLIVER	J. WALTERS	REVISED FOR BACKWASH LINES

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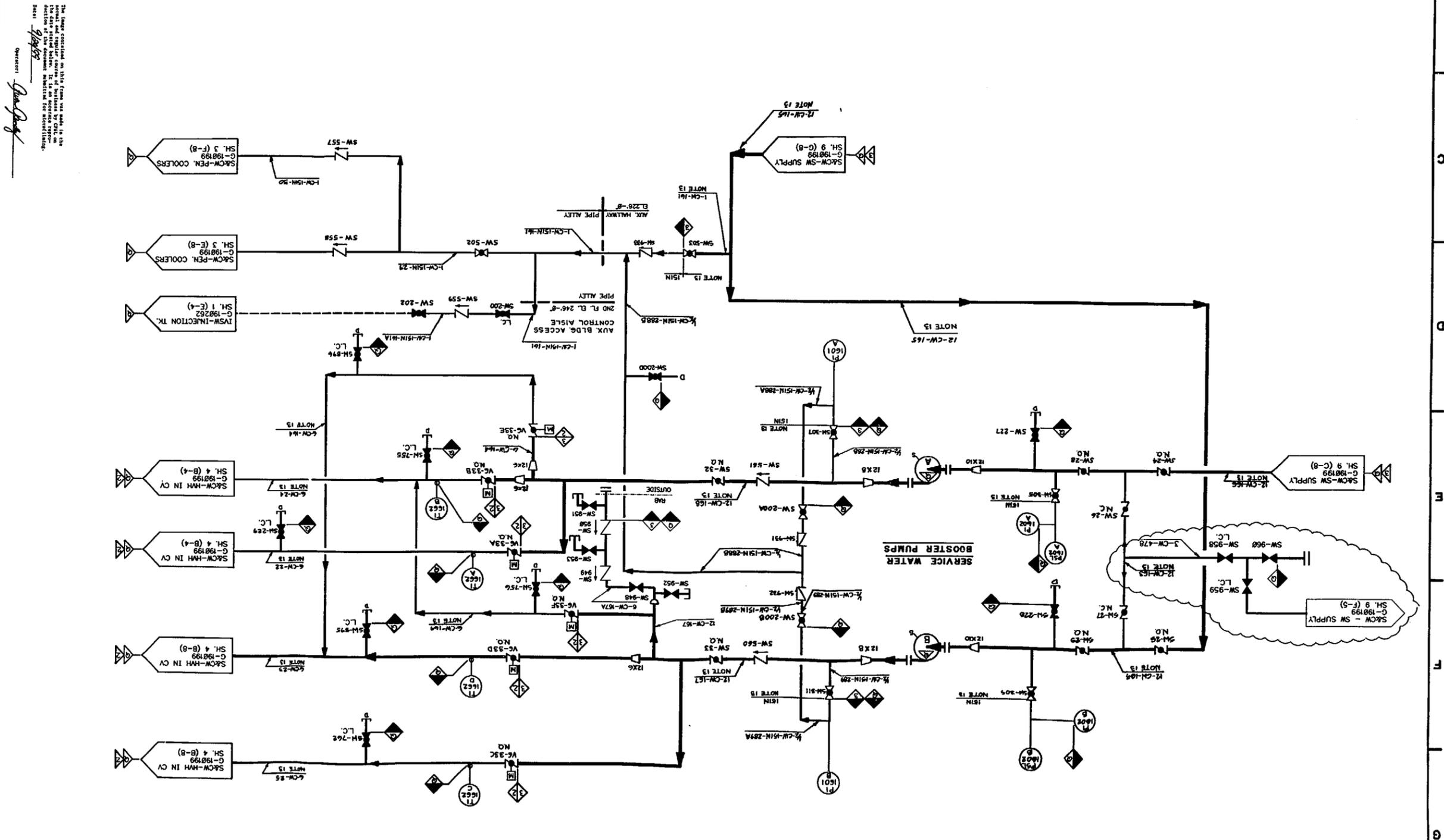
NO.	REVISION	DATE	BY	CHKD.	APPR.	DESCRIPTION
48	008-98-116		BY C. L. OLIVER	CHKD. E. S. PERKINS	APPR. C. L. OLIVER 2/4/48	
49	008-98-481		BY C. L. OLIVER	CHKD. E. S. PERKINS	APPR. C. L. OLIVER 2/4/48	
50	008-98-481		BY C. L. OLIVER	CHKD. E. S. PERKINS	APPR. C. L. OLIVER 2/4/48	
51	008-98-481		BY C. L. OLIVER	CHKD. E. S. PERKINS	APPR. C. L. OLIVER 2/4/48	
52	008-98-481		BY C. L. OLIVER	CHKD. E. S. PERKINS	APPR. C. L. OLIVER 2/4/48	
53	008-98-481		BY C. L. OLIVER	CHKD. E. S. PERKINS	APPR. C. L. OLIVER 2/4/48	
54	008-98-481		BY C. L. OLIVER	CHKD. E. S. PERKINS	APPR. C. L. OLIVER 2/4/48	
55	008-98-481		BY C. L. OLIVER	CHKD. E. S. PERKINS	APPR. C. L. OLIVER 2/4/48	
56	008-98-481		BY C. L. OLIVER	CHKD. E. S. PERKINS	APPR. C. L. OLIVER 2/4/48	
57	008-98-481		BY C. L. OLIVER	CHKD. E. S. PERKINS	APPR. C. L. OLIVER 2/4/48	
58	008-98-481		BY C. L. OLIVER	CHKD. E. S. PERKINS	APPR. C. L. OLIVER 2/4/48	
59	008-98-481		BY C. L. OLIVER	CHKD. E. S. PERKINS	APPR. C. L. OLIVER 2/4/48	
60	008-98-481		BY C. L. OLIVER	CHKD. E. S. PERKINS	APPR. C. L. OLIVER 2/4/48	
61	008-98-481		BY C. L. OLIVER	CHKD. E. S. PERKINS	APPR. C. L. OLIVER 2/4/48	
62	008-98-481		BY C. L. OLIVER	CHKD. E. S. PERKINS	APPR. C. L. OLIVER 2/4/48	
63	008-98-481		BY C. L. OLIVER	CHKD. E. S. PERKINS	APPR. C. L. OLIVER 2/4/48	
64	008-98-481		BY C. L. OLIVER	CHKD. E. S. PERKINS	APPR. C. L. OLIVER 2/4/48	
65	008-98-481		BY C. L. OLIVER	CHKD. E. S. PERKINS	APPR. C. L. OLIVER 2/4/48	
66	008-98-481		BY C. L. OLIVER	CHKD. E. S. PERKINS	APPR. C. L. OLIVER 2/4/48	
67	008-98-481		BY C. L. OLIVER	CHKD. E. S. PERKINS	APPR. C. L. OLIVER 2/4/48	
68	008-98-481		BY C. L. OLIVER	CHKD. E. S. PERKINS	APPR. C. L. OLIVER 2/4/48	
69	008-98-481		BY C. L. OLIVER	CHKD. E. S. PERKINS	APPR. C. L. OLIVER 2/4/48	
70	008-98-481		BY C. L. OLIVER	CHKD. E. S. PERKINS	APPR. C. L. OLIVER 2/4/48	
71	008-98-481		BY C. L. OLIVER	CHKD. E. S. PERKINS	APPR. C. L. OLIVER 2/4/48	
72	008-98-481		BY C. L. OLIVER	CHKD. E. S. PERKINS	APPR. C. L. OLIVER 2/4/48	
73	008-98-481		BY C. L. OLIVER	CHKD. E. S. PERKINS	APPR. C. L. OLIVER 2/4/48	
74	008-98-481		BY C. L. OLIVER	CHKD. E. S. PERKINS	APPR. C. L. OLIVER 2/4/48	
75	008-98-481		BY C. L. OLIVER	CHKD. E. S. PERKINS	APPR. C. L. OLIVER 2/4/48	
76	008-98-481		BY C. L. OLIVER	CHKD. E. S. PERKINS	APPR. C. L. OLIVER 2/4/48	
77	008-98-481		BY C. L. OLIVER	CHKD. E. S. PERKINS	APPR. C. L. OLIVER 2/4/48	
78	008-98-481		BY C. L. OLIVER	CHKD. E. S. PERKINS	APPR. C. L. OLIVER 2/4/48	
79	008-98-481		BY C. L. OLIVER	CHKD. E. S. PERKINS	APPR. C. L. OLIVER 2/4/48	
80	008-98-481		BY C. L. OLIVER	CHKD. E. S. PERKINS	APPR. C. L. OLIVER 2/4/48	
81	008-98-481		BY C. L. OLIVER	CHKD. E. S. PERKINS	APPR. C. L. OLIVER 2/4/48	
82	008-98-481		BY C. L. OLIVER	CHKD. E. S. PERKINS	APPR. C. L. OLIVER 2/4/48	
83	008-98-481		BY C. L. OLIVER	CHKD. E. S. PERKINS	APPR. C. L. OLIVER 2/4/48	
84	008-98-481		BY C. L. OLIVER	CHKD. E. S. PERKINS	APPR. C. L. OLIVER 2/4/48	
85	008-98-481		BY C. L. OLIVER	CHKD. E. S. PERKINS	APPR. C. L. OLIVER 2/4/48	
86	008-98-481		BY C. L. OLIVER	CHKD. E. S. PERKINS	APPR. C. L. OLIVER 2/4/48	
87	008-98-481		BY C. L. OLIVER	CHKD. E. S. PERKINS	APPR. C. L. OLIVER 2/4/48	
88	008-98-481		BY C. L. OLIVER	CHKD. E. S. PERKINS	APPR. C. L. OLIVER 2/4/48	
89	008-98-481		BY C. L. OLIVER	CHKD. E. S. PERKINS	APPR. C. L. OLIVER 2/4/48	
90	008-98-481		BY C. L. OLIVER	CHKD. E. S. PERKINS	APPR. C. L. OLIVER 2/4/48	
91	008-98-481		BY C. L. OLIVER	CHKD. E. S. PERKINS	APPR. C. L. OLIVER 2/4/48	
92	008-98-481		BY C. L. OLIVER	CHKD. E. S. PERKINS	APPR. C. L. OLIVER 2/4/48	
93	008-98-481		BY C. L. OLIVER	CHKD. E. S. PERKINS	APPR. C. L. OLIVER 2/4/48	
94	008-98-481		BY C. L. OLIVER	CHKD. E. S. PERKINS	APPR. C. L. OLIVER 2/4/48	
95	008-98-481		BY C. L. OLIVER	CHKD. E. S. PERKINS	APPR. C. L. OLIVER 2/4/48	
96	008-98-481		BY C. L. OLIVER	CHKD. E. S. PERKINS	APPR. C. L. OLIVER 2/4/48	
97	008-98-481		BY C. L. OLIVER	CHKD. E. S. PERKINS	APPR. C. L. OLIVER 2/4/48	
98	008-98-481		BY C. L. OLIVER	CHKD. E. S. PERKINS	APPR. C. L. OLIVER 2/4/48	
99	008-98-481		BY C. L. OLIVER	CHKD. E. S. PERKINS	APPR. C. L. OLIVER 2/4/48	
100	008-98-481		BY C. L. OLIVER	CHKD. E. S. PERKINS	APPR. C. L. OLIVER 2/4/48	

The range contained on this form was made in the normal
 below. It is an accurate reproduction of the document
 and register course of business by CP&L on the date stated

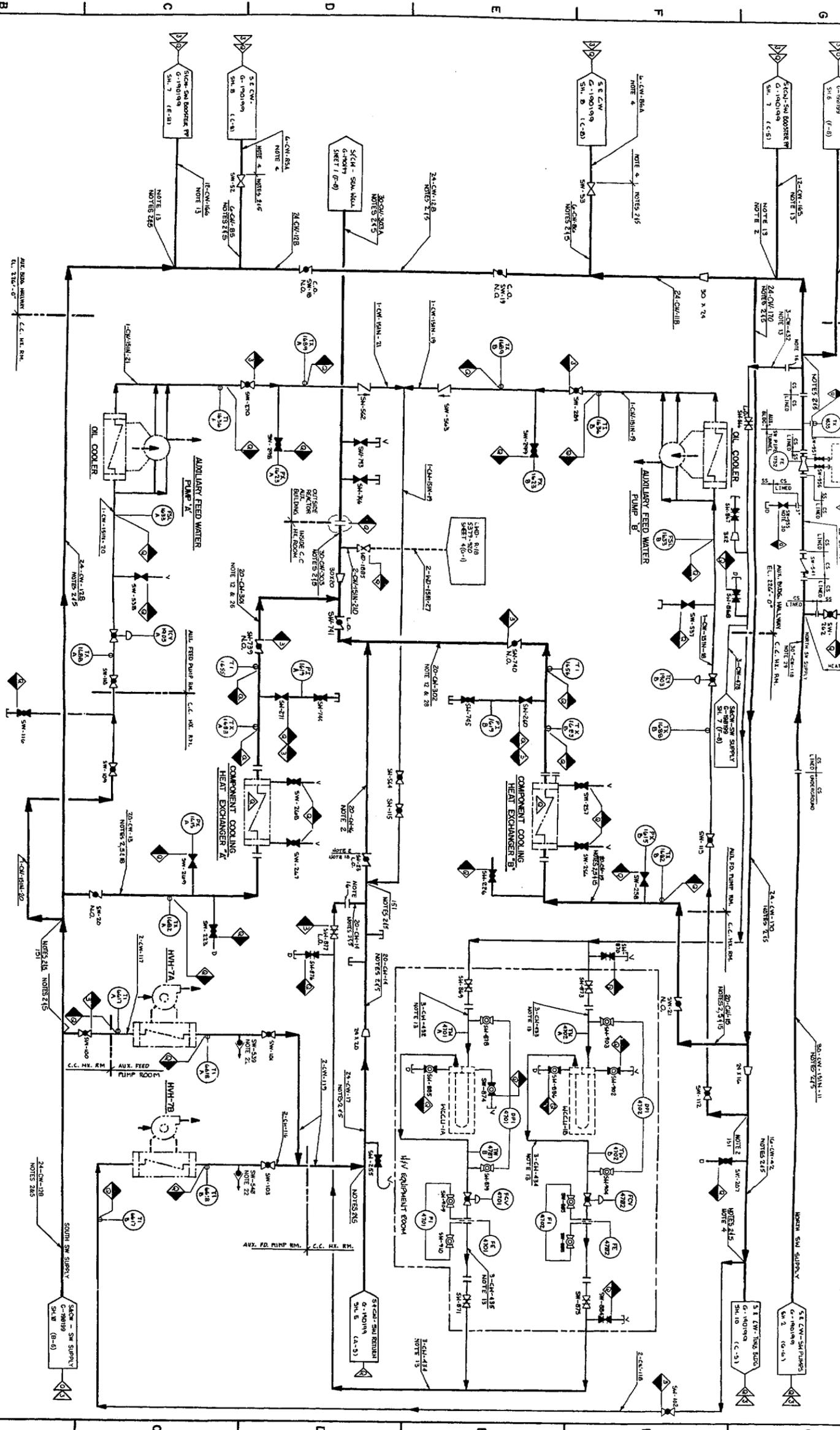
18	REVISIONS	DATE	BY	REASON
18	ISSUED FOR TRAINING			
17	UPDOTE PERMANENT			
16	BY CLINT MINVIN CK W JOHNSON			
15	APP			
14	BY J. VAUGHAN			
13	BY J. VAUGHAN			
12	BY J. VAUGHAN			
11	BY J. VAUGHAN			
10	BY J. VAUGHAN			
9	BY J. VAUGHAN			
8	BY J. VAUGHAN			
7	BY J. VAUGHAN			
6	BY J. VAUGHAN			
5	BY J. VAUGHAN			
4	BY J. VAUGHAN			
3	BY J. VAUGHAN			
2	BY J. VAUGHAN			
1	BY J. VAUGHAN			

HBR2-11398 SH. 34
 CHANGES TO THIS DRAWING MUST ALSO BE INCORPORATED
 ON THE CORRESPONDING DRAWING WHERE CHANGES
 AFFECT HIGHLIGHTED FLOW AND BOUNDARY ISOLATION
 PATNS SHOWN ON THE CORRESPONDING DRAWING.

30X
 The large contained on this frame was made in the
 normal and regular course of business by the
 division of the company and is hereby certified
 as being a true and correct copy of the original.
 Date: 9/10/83
 Operator: [Signature]



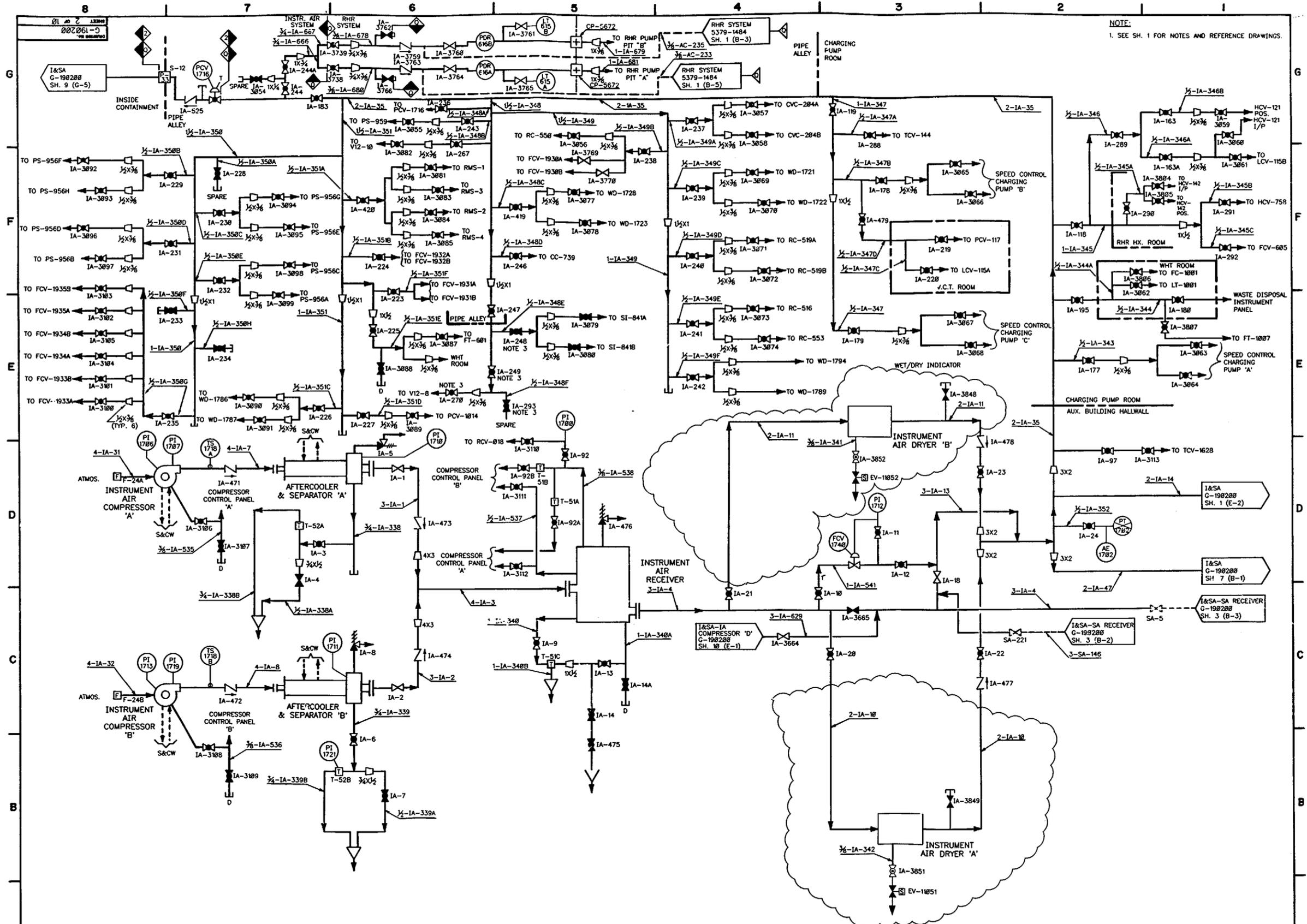
NOTE:
1. FOR GENERAL NOTES AND REF.
DIM'S. SEE SMT.



CHANGES TO THIS DRAWING MUST ALSO BE INCORPORATED ON HIGH-LIGHTED FLOW AND BOUNDARY ISOLATION PATHS SHOWN ON THE CORRESPONDING DRAWING.

18R2-11399 SH.36

NO.	DATE	BY	CHK.	APP.	DESCRIPTION
44	9/28/99	DCR: 99-678	CHK: D.M. EDWARDS	APP: J.L. OLIVER	CR 98-00779
45	9/28/99	DCR: 99-675	CHK: D.M. EDWARDS	APP: J.L. OLIVER	CR 98-00779
46	9/28/99	DCR: 99-679	CHK: D.M. EDWARDS	APP: J.L. OLIVER	CR 98-00779
47	9/28/99	DCR: 99-689	CHK: D.M. EDWARDS	APP: J.L. OLIVER	CR 98-00779
48	9/28/99	DCR: 99-699	CHK: D.M. EDWARDS	APP: J.L. OLIVER	CR 98-00779
49	9/28/99	DCR: 99-709	CHK: D.M. EDWARDS	APP: J.L. OLIVER	CR 98-00779
50	9/28/99	DCR: 99-719	CHK: D.M. EDWARDS	APP: J.L. OLIVER	CR 98-00779
51	9/28/99	DCR: 99-729	CHK: D.M. EDWARDS	APP: J.L. OLIVER	CR 98-00779
52	9/28/99	DCR: 99-739	CHK: D.M. EDWARDS	APP: J.L. OLIVER	CR 98-00779

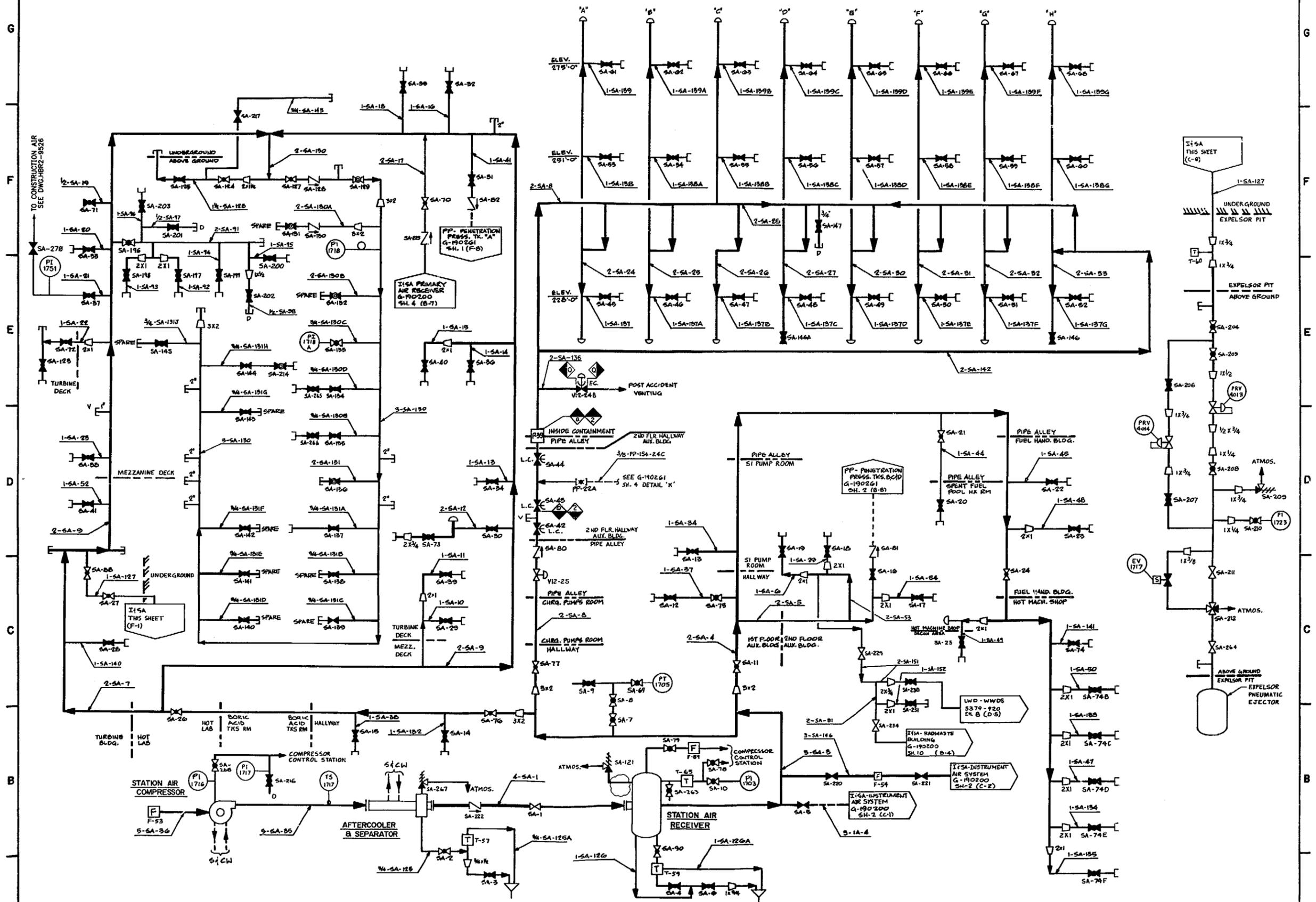


NOTE:
1. SEE SH. 1 FOR NOTES AND REFERENCE DRAWINGS.

NO.	DATE	BY	CHKD.	APPD.	REVISION
1	12-15-63	W. J. WALTERS	C. J. WALTERS	C. J. WALTERS	DESIGN
2	1-10-64	W. J. WALTERS	C. J. WALTERS	C. J. WALTERS	REVISED
3	2-10-64	W. J. WALTERS	C. J. WALTERS	C. J. WALTERS	REVISED
4	3-10-64	W. J. WALTERS	C. J. WALTERS	C. J. WALTERS	REVISED
5	4-10-64	W. J. WALTERS	C. J. WALTERS	C. J. WALTERS	REVISED
6	5-10-64	W. J. WALTERS	C. J. WALTERS	C. J. WALTERS	REVISED
7	6-10-64	W. J. WALTERS	C. J. WALTERS	C. J. WALTERS	REVISED
8	7-10-64	W. J. WALTERS	C. J. WALTERS	C. J. WALTERS	REVISED
9	8-10-64	W. J. WALTERS	C. J. WALTERS	C. J. WALTERS	REVISED
10	9-10-64	W. J. WALTERS	C. J. WALTERS	C. J. WALTERS	REVISED
11	10-10-64	W. J. WALTERS	C. J. WALTERS	C. J. WALTERS	REVISED
12	11-10-64	W. J. WALTERS	C. J. WALTERS	C. J. WALTERS	REVISED
13	12-10-64	W. J. WALTERS	C. J. WALTERS	C. J. WALTERS	REVISED
14	1-11-65	W. J. WALTERS	C. J. WALTERS	C. J. WALTERS	REVISED
15	2-11-65	W. J. WALTERS	C. J. WALTERS	C. J. WALTERS	REVISED
16	3-11-65	W. J. WALTERS	C. J. WALTERS	C. J. WALTERS	REVISED
17	4-11-65	W. J. WALTERS	C. J. WALTERS	C. J. WALTERS	REVISED
18	5-11-65	W. J. WALTERS	C. J. WALTERS	C. J. WALTERS	REVISED
19	6-11-65	W. J. WALTERS	C. J. WALTERS	C. J. WALTERS	REVISED
20	7-11-65	W. J. WALTERS	C. J. WALTERS	C. J. WALTERS	REVISED
21	8-11-65	W. J. WALTERS	C. J. WALTERS	C. J. WALTERS	REVISED
22	9-11-65	W. J. WALTERS	C. J. WALTERS	C. J. WALTERS	REVISED
23	10-11-65	W. J. WALTERS	C. J. WALTERS	C. J. WALTERS	REVISED
24	11-11-65	W. J. WALTERS	C. J. WALTERS	C. J. WALTERS	REVISED
25	12-11-65	W. J. WALTERS	C. J. WALTERS	C. J. WALTERS	REVISED
26	1-12-66	W. J. WALTERS	C. J. WALTERS	C. J. WALTERS	REVISED
27	2-12-66	W. J. WALTERS	C. J. WALTERS	C. J. WALTERS	REVISED
28	3-12-66	W. J. WALTERS	C. J. WALTERS	C. J. WALTERS	REVISED
29	4-12-66	W. J. WALTERS	C. J. WALTERS	C. J. WALTERS	REVISED
30	5-12-66	W. J. WALTERS	C. J. WALTERS	C. J. WALTERS	REVISED

DESIGNED BY: K. J. WALTERS CHECKED BY: C. J. WALTERS DATE: 12-15-63	CAROLINA POWER & LIGHT CO. H.B. ROBINSON S.E. PLANT WBT - No. 2 TITLE: INSTRUMENT & STATION AIR SYSTEM FLOW DIAGRAM SHEET 2 OF 10
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The image contained on this frame was made in the normal course of the work of the company and is hereby submitted for microfilming.
 Date: 12-15-63

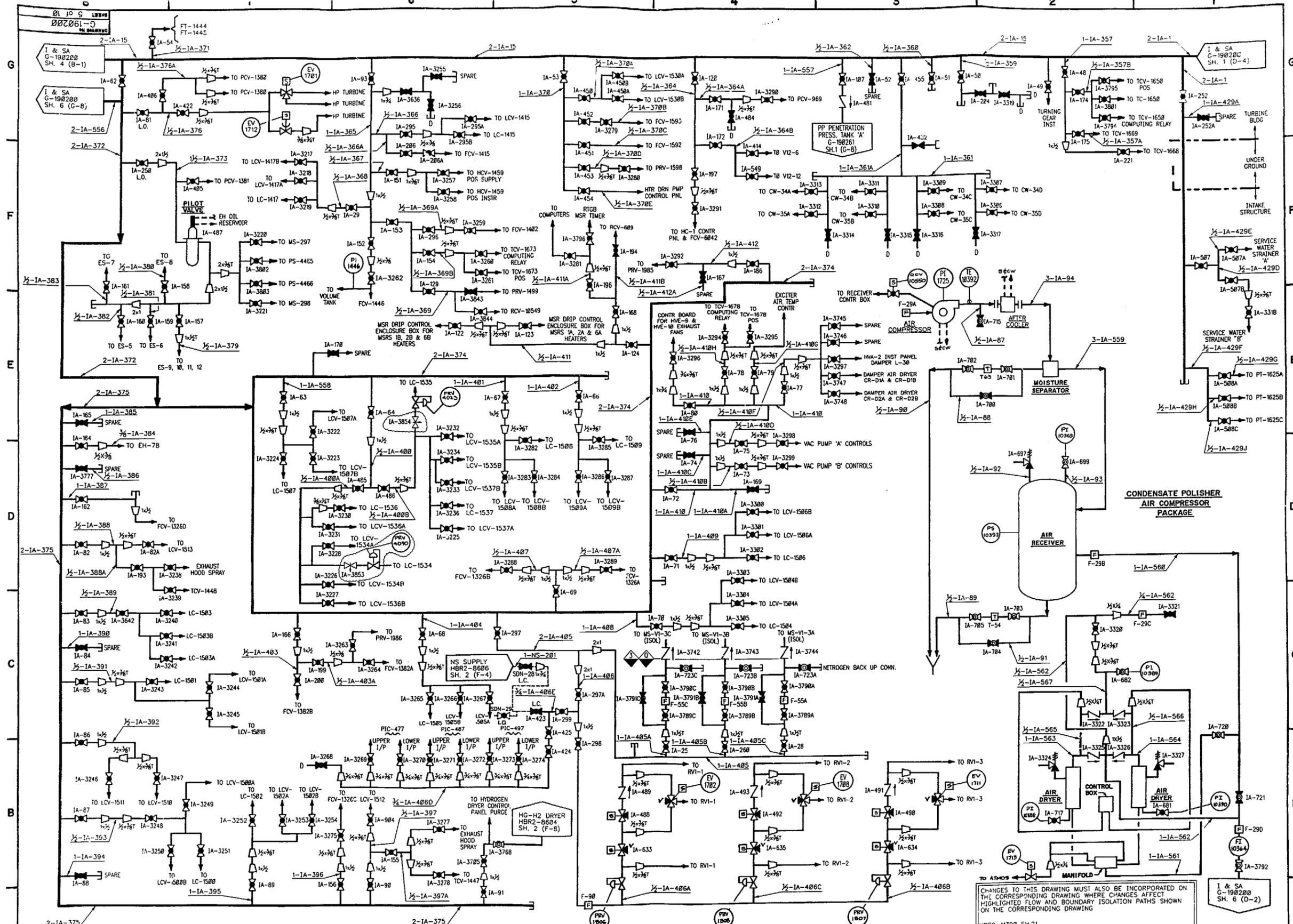


NO.	REVISION	DATE	BY	CHKD.	APP'D.
1	ISSUED	12/12/88	W. J. WALKER		
2	REVISED & REVISION TO SUPPLEMENT G-190200 SH-3, REV. 11/88	12/12/88	W. J. WALKER		
3	REVISED & REVISION TO SUPPLEMENT G-190200 SH-3, REV. 11/88	12/12/88	W. J. WALKER		
4	REVISED & REVISION TO SUPPLEMENT G-190200 SH-3, REV. 11/88	12/12/88	W. J. WALKER		
5	REVISED & REVISION TO SUPPLEMENT G-190200 SH-3, REV. 11/88	12/12/88	W. J. WALKER		
6	REVISED & REVISION TO SUPPLEMENT G-190200 SH-3, REV. 11/88	12/12/88	W. J. WALKER		
7	REVISED & REVISION TO SUPPLEMENT G-190200 SH-3, REV. 11/88	12/12/88	W. J. WALKER		
8	REVISED & REVISION TO SUPPLEMENT G-190200 SH-3, REV. 11/88	12/12/88	W. J. WALKER		
9	REVISED & REVISION TO SUPPLEMENT G-190200 SH-3, REV. 11/88	12/12/88	W. J. WALKER		
10	REVISED & REVISION TO SUPPLEMENT G-190200 SH-3, REV. 11/88	12/12/88	W. J. WALKER		
11	REVISED & REVISION TO SUPPLEMENT G-190200 SH-3, REV. 11/88	12/12/88	W. J. WALKER		
12	REVISED & REVISION TO SUPPLEMENT G-190200 SH-3, REV. 11/88	12/12/88	W. J. WALKER		
13	REVISED & REVISION TO SUPPLEMENT G-190200 SH-3, REV. 11/88	12/12/88	W. J. WALKER		
14	REVISED & REVISION TO SUPPLEMENT G-190200 SH-3, REV. 11/88	12/12/88	W. J. WALKER		
15	REVISED & REVISION TO SUPPLEMENT G-190200 SH-3, REV. 11/88	12/12/88	W. J. WALKER		
16	REVISED & REVISION TO SUPPLEMENT G-190200 SH-3, REV. 11/88	12/12/88	W. J. WALKER		
17	REVISED & REVISION TO SUPPLEMENT G-190200 SH-3, REV. 11/88	12/12/88	W. J. WALKER		
18	REVISED & REVISION TO SUPPLEMENT G-190200 SH-3, REV. 11/88	12/12/88	W. J. WALKER		
19	REVISED & REVISION TO SUPPLEMENT G-190200 SH-3, REV. 11/88	12/12/88	W. J. WALKER		
20	REVISED & REVISION TO SUPPLEMENT G-190200 SH-3, REV. 11/88	12/12/88	W. J. WALKER		
21	REVISED & REVISION TO SUPPLEMENT G-190200 SH-3, REV. 11/88	12/12/88	W. J. WALKER		
22	REVISED & REVISION TO SUPPLEMENT G-190200 SH-3, REV. 11/88	12/12/88	W. J. WALKER		
23	REVISED & REVISION TO SUPPLEMENT G-190200 SH-3, REV. 11/88	12/12/88	W. J. WALKER		
24	REVISED & REVISION TO SUPPLEMENT G-190200 SH-3, REV. 11/88	12/12/88	W. J. WALKER		
25	REVISED & REVISION TO SUPPLEMENT G-190200 SH-3, REV. 11/88	12/12/88	W. J. WALKER		
26	REVISED & REVISION TO SUPPLEMENT G-190200 SH-3, REV. 11/88	12/12/88	W. J. WALKER		
27	REVISED & REVISION TO SUPPLEMENT G-190200 SH-3, REV. 11/88	12/12/88	W. J. WALKER		
28	REVISED & REVISION TO SUPPLEMENT G-190200 SH-3, REV. 11/88	12/12/88	W. J. WALKER		
29	REVISED & REVISION TO SUPPLEMENT G-190200 SH-3, REV. 11/88	12/12/88	W. J. WALKER		
30	REVISED & REVISION TO SUPPLEMENT G-190200 SH-3, REV. 11/88	12/12/88	W. J. WALKER		
31	REVISED & REVISION TO SUPPLEMENT G-190200 SH-3, REV. 11/88	12/12/88	W. J. WALKER		
32	REVISED & REVISION TO SUPPLEMENT G-190200 SH-3, REV. 11/88	12/12/88	W. J. WALKER		
33	REVISED & REVISION TO SUPPLEMENT G-190200 SH-3, REV. 11/88	12/12/88	W. J. WALKER		
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37	REVISED & REVISION TO SUPPLEMENT G-190200 SH-3, REV. 11/88	12/12/88	W. J. WALKER		
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73	REVISED & REVISION TO SUPPLEMENT G-190200 SH-3, REV. 11/88	12/12/88	W. J. WALKER		
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75	REVISED & REVISION TO SUPPLEMENT G-190200 SH-3, REV. 11/88	12/12/88	W. J. WALKER		
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81	REVISED & REVISION TO SUPPLEMENT G-190200 SH-3, REV. 11/88	12/12/88	W. J. WALKER		
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83	REVISED & REVISION TO SUPPLEMENT G-190200 SH-3, REV. 11/88	12/12/88	W. J. WALKER		
84	REVISED & REVISION TO SUPPLEMENT G-190200 SH-3, REV. 11/88	12/12/88	W. J. WALKER		
85	REVISED & REVISION TO SUPPLEMENT G-190200 SH-3, REV. 11/88	12/12/88	W. J. WALKER		
86	REVISED & REVISION TO SUPPLEMENT G-190200 SH-3, REV. 11/88	12/12/88	W. J. WALKER		
87	REVISED & REVISION TO SUPPLEMENT G-190200 SH-3, REV. 11/88	12/12/88	W. J. WALKER		
88	REVISED & REVISION TO SUPPLEMENT G-190200 SH-3, REV. 11/88	12/12/88	W. J. WALKER		
89	REVISED & REVISION TO SUPPLEMENT G-190200 SH-3, REV. 11/88	12/12/88	W. J. WALKER		
90	REVISED & REVISION TO SUPPLEMENT G-190200 SH-3, REV. 11/88	12/12/88	W. J. WALKER		
91	REVISED & REVISION TO SUPPLEMENT G-190200 SH-3, REV. 11/88	12/12/88	W. J. WALKER		
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98	REVISED & REVISION TO SUPPLEMENT G-190200 SH-3, REV. 11/88	12/12/88	W. J. WALKER		
99	REVISED & REVISION TO SUPPLEMENT G-190200 SH-3, REV. 11/88	12/12/88	W. J. WALKER		
100	REVISED & REVISION TO SUPPLEMENT G-190200 SH-3, REV. 11/88	12/12/88	W. J. WALKER		

DESIGNED BY: G. O. HANLEY
 CHECKED BY: W. JOHNSON
 DRAWN BY: W. JOHNSON
 INSTRUMENT & STATION AIR SYSTEM FLOW DIAGRAM
 SCALE: NONE
 SHEET 3 OF 10

This sheet is to be used in conjunction with the normal and complete set of drawings by title, on the face of these drawings, in the instrument and station air system.

DATE: 11/21/88



NO.	REVISIONS	DATE	BY	CHKD.	APPR.
1	BY: F.W. GRANTHAM CHK: E.S. PERKINS APPR: C.L. OLIVER	01/19/81			
2	BY: J. WALTERS CHK: E.S. PERKINS APPR: C.L. OLIVER	01/20/81			
3	BY: J. WALTERS CHK: E.S. PERKINS APPR: C.L. OLIVER	01/20/81			
4	BY: J. WALTERS CHK: E.S. PERKINS APPR: C.L. OLIVER	01/20/81			
5	BY: J. WALTERS CHK: E.S. PERKINS APPR: C.L. OLIVER	01/20/81			
6	BY: J. WALTERS CHK: E.S. PERKINS APPR: C.L. OLIVER	01/20/81			
7	BY: J. WALTERS CHK: E.S. PERKINS APPR: C.L. OLIVER	01/20/81			
8	BY: J. WALTERS CHK: E.S. PERKINS APPR: C.L. OLIVER	01/20/81			
9	BY: J. WALTERS CHK: E.S. PERKINS APPR: C.L. OLIVER	01/20/81			
10	BY: J. WALTERS CHK: E.S. PERKINS APPR: C.L. OLIVER	01/20/81			
11	BY: J. WALTERS CHK: E.S. PERKINS APPR: C.L. OLIVER	01/20/81			
12	BY: J. WALTERS CHK: E.S. PERKINS APPR: C.L. OLIVER	01/20/81			
13	BY: J. WALTERS CHK: E.S. PERKINS APPR: C.L. OLIVER	01/20/81			
14	BY: J. WALTERS CHK: E.S. PERKINS APPR: C.L. OLIVER	01/20/81			
15	BY: J. WALTERS CHK: E.S. PERKINS APPR: C.L. OLIVER	01/20/81			
16	BY: J. WALTERS CHK: E.S. PERKINS APPR: C.L. OLIVER	01/20/81			
17	BY: J. WALTERS CHK: E.S. PERKINS APPR: C.L. OLIVER	01/20/81			
18	BY: J. WALTERS CHK: E.S. PERKINS APPR: C.L. OLIVER	01/20/81			
19	BY: J. WALTERS CHK: E.S. PERKINS APPR: C.L. OLIVER	01/20/81			
20	BY: J. WALTERS CHK: E.S. PERKINS APPR: C.L. OLIVER	01/20/81			
21	BY: J. WALTERS CHK: E.S. PERKINS APPR: C.L. OLIVER	01/20/81			
22	BY: J. WALTERS CHK: E.S. PERKINS APPR: C.L. OLIVER	01/20/81			
23	BY: J. WALTERS CHK: E.S. PERKINS APPR: C.L. OLIVER	01/20/81			
24	BY: J. WALTERS CHK: E.S. PERKINS APPR: C.L. OLIVER	01/20/81			
25	BY: J. WALTERS CHK: E.S. PERKINS APPR: C.L. OLIVER	01/20/81			
26	BY: J. WALTERS CHK: E.S. PERKINS APPR: C.L. OLIVER	01/20/81			
27	BY: J. WALTERS CHK: E.S. PERKINS APPR: C.L. OLIVER	01/20/81			
28	BY: J. WALTERS CHK: E.S. PERKINS APPR: C.L. OLIVER	01/20/81			
29	BY: J. WALTERS CHK: E.S. PERKINS APPR: C.L. OLIVER	01/20/81			
30	BY: J. WALTERS CHK: E.S. PERKINS APPR: C.L. OLIVER	01/20/81			

CHANGES TO THIS DRAWING MUST ALSO BE INCORPORATED ON THE CORRESPONDING DRAWING WHERE CHANGES AFFECT HIGHLIGHTED FLOW AND BOUNDARY ISOLATION PATHS SHOWN ON THE CORRESPONDING DRAWING

HBR2-11390 SH.21

1 & SA G-190200 SH. 6 (D-2)

CAROLINA POWER & LIGHT CO.
H. B. ROBINSON S.E. PLANT
UNIT - NO. 2 HARTSVILLE, S.C.

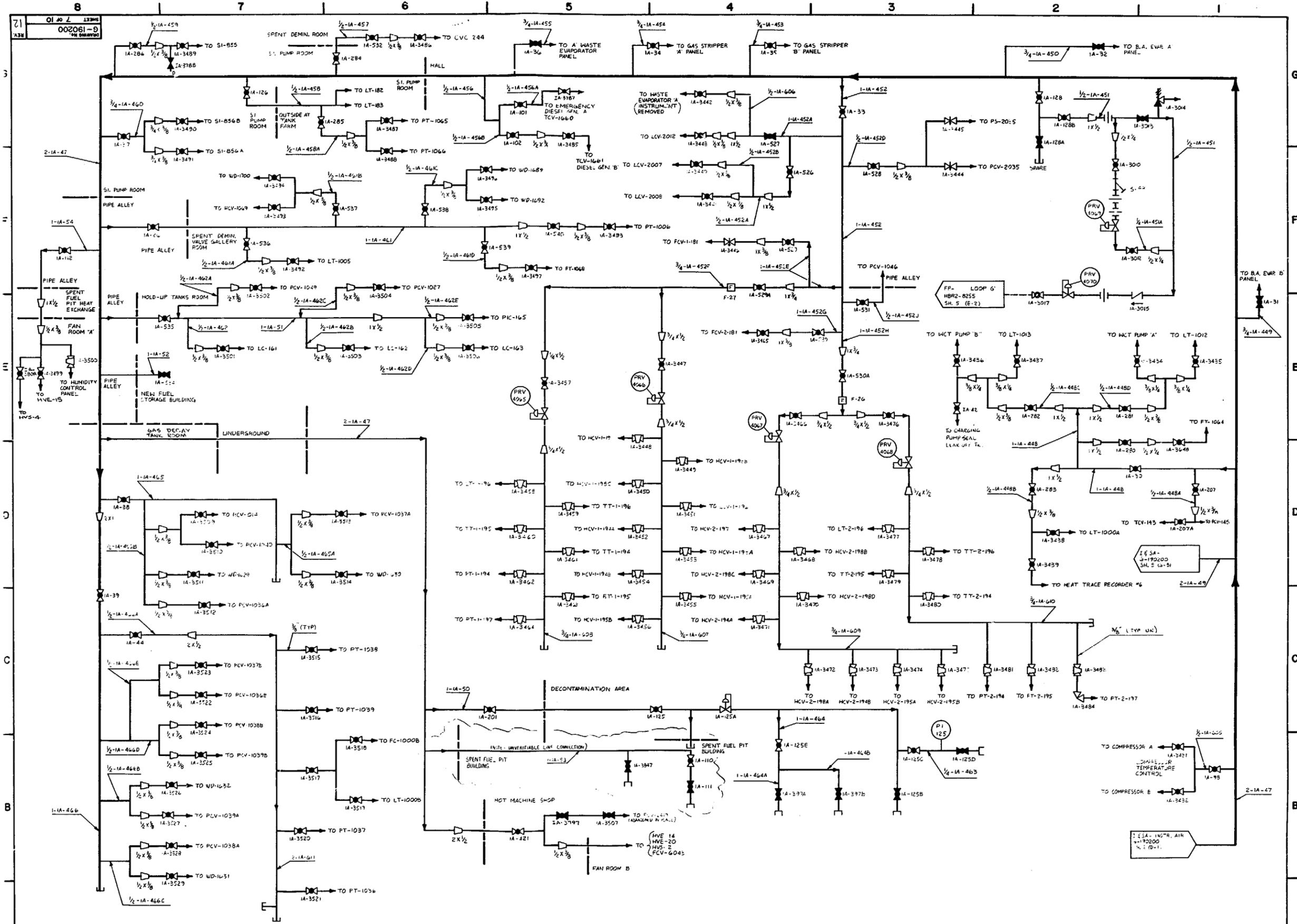
TITLE
INSTRUMENT & STATION AIR SYSTEM FLOW DIAGRAM

DATE: 01/20/81

BY: J. WALTERS
CHK: E.S. PERKINS
APPR: C.L. OLIVER

SCALE: NONE

SHEET 5 OF 19



NO.	REVISION	DATE	BY	CHKD.	APP'D.
1	REVISED	11/10/88	J. WALTERS	C. J. JOHNSON	J. WALTERS
2	REVISED	11/10/88	J. WALTERS	C. J. JOHNSON	J. WALTERS
3	REVISED	11/10/88	J. WALTERS	C. J. JOHNSON	J. WALTERS
4	REVISED	11/10/88	J. WALTERS	C. J. JOHNSON	J. WALTERS
5	REVISED	11/10/88	J. WALTERS	C. J. JOHNSON	J. WALTERS
6	REVISED	11/10/88	J. WALTERS	C. J. JOHNSON	J. WALTERS
7	REVISED	11/10/88	J. WALTERS	C. J. JOHNSON	J. WALTERS
8	REVISED	11/10/88	J. WALTERS	C. J. JOHNSON	J. WALTERS

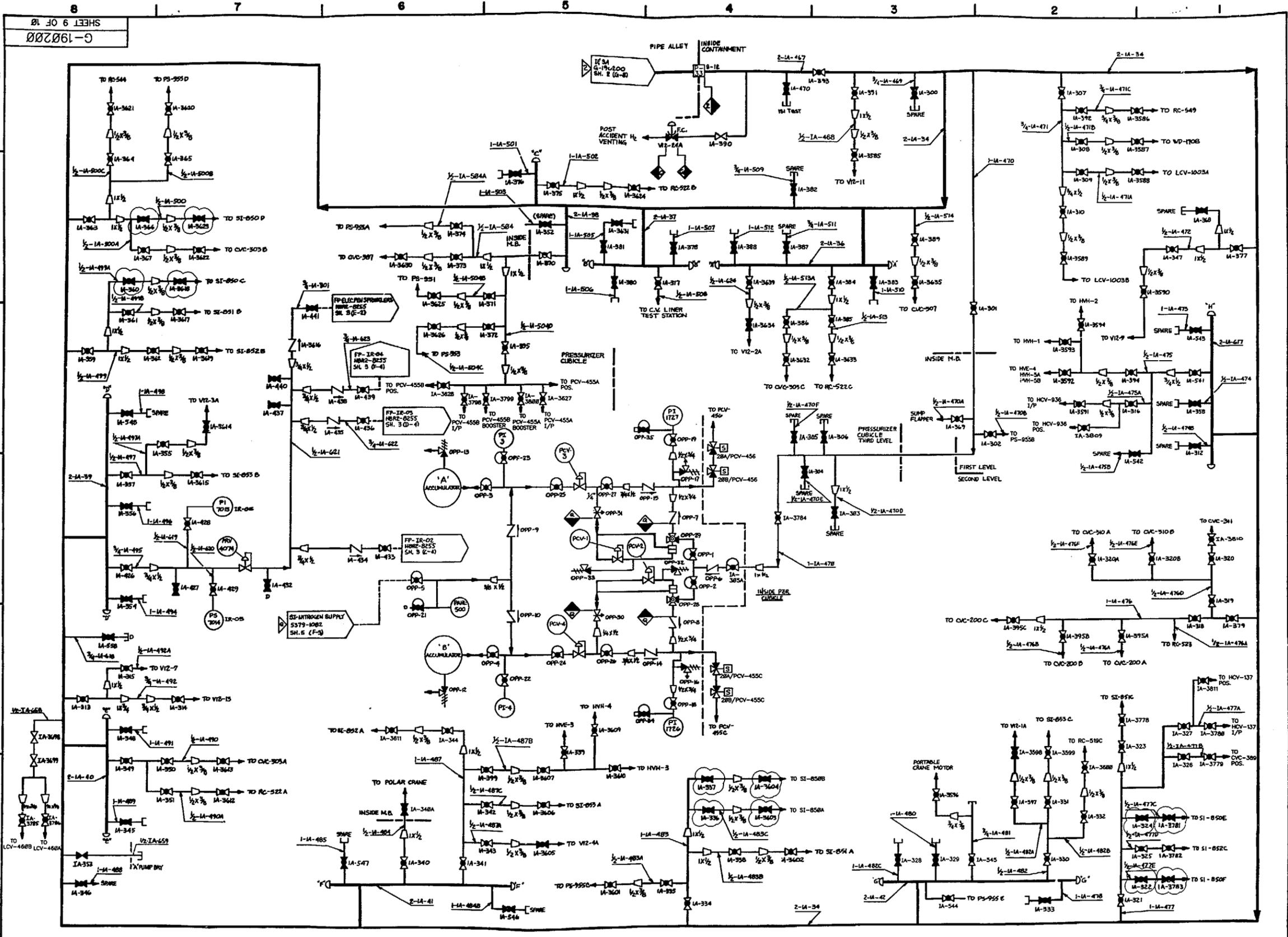
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DATE: 11/10/88

Operator: *Carroll Johnson*

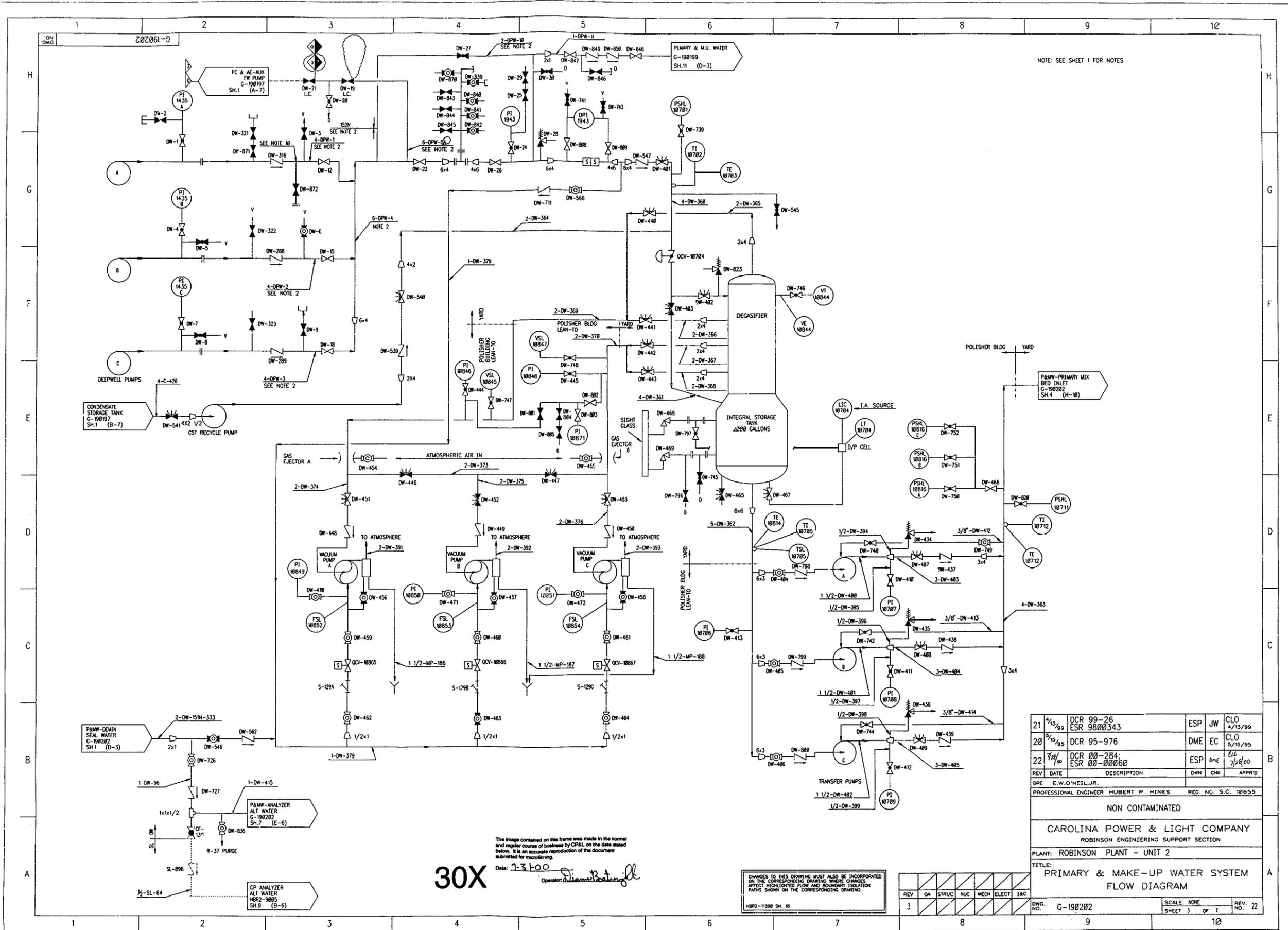
ORN: 44-100-1-100 CSM: 44-100-1-100 DATE: 11/10/88	CAROLINA POWER & LIGHT CO. H.B. ROBINSON S.E. PLANT UNIT - No. 2 HARTSVILLE, S.C.
TITLE: INSTRUMENT & STATION AIR SYSTEM FLOW DIAGRAM	VENDOR NO. _____ SIZE _____ E G-190200 SCALE _____ SHEET 7 OF 10



NO.	REVISION	DATE	BY	CHKD.	APPD.
1	ISSUED FOR CONSTRUCTION	10/1/78	W. LLOYD	M. JOHNSON	
2	REVISED TO REFLECT CHANGES TO THE AIR SYSTEM	10/15/78	W. LLOYD	M. JOHNSON	
3	REVISED TO REFLECT CHANGES TO THE AIR SYSTEM	10/20/78	W. LLOYD	M. JOHNSON	
4	REVISED TO REFLECT CHANGES TO THE AIR SYSTEM	10/25/78	W. LLOYD	M. JOHNSON	
5	REVISED TO REFLECT CHANGES TO THE AIR SYSTEM	10/30/78	W. LLOYD	M. JOHNSON	
6	REVISED TO REFLECT CHANGES TO THE AIR SYSTEM	11/5/78	W. LLOYD	M. JOHNSON	
7	REVISED TO REFLECT CHANGES TO THE AIR SYSTEM	11/10/78	W. LLOYD	M. JOHNSON	
8	REVISED TO REFLECT CHANGES TO THE AIR SYSTEM	11/15/78	W. LLOYD	M. JOHNSON	
9	REVISED TO REFLECT CHANGES TO THE AIR SYSTEM	11/20/78	W. LLOYD	M. JOHNSON	
10	REVISED TO REFLECT CHANGES TO THE AIR SYSTEM	11/25/78	W. LLOYD	M. JOHNSON	
11	REVISED TO REFLECT CHANGES TO THE AIR SYSTEM	12/1/78	W. LLOYD	M. JOHNSON	
12	REVISED TO REFLECT CHANGES TO THE AIR SYSTEM	12/5/78	W. LLOYD	M. JOHNSON	
13	REVISED TO REFLECT CHANGES TO THE AIR SYSTEM	12/10/78	W. LLOYD	M. JOHNSON	
14	REVISED TO REFLECT CHANGES TO THE AIR SYSTEM	12/15/78	W. LLOYD	M. JOHNSON	
15	REVISED TO REFLECT CHANGES TO THE AIR SYSTEM	12/20/78	W. LLOYD	M. JOHNSON	
16	REVISED TO REFLECT CHANGES TO THE AIR SYSTEM	12/25/78	W. LLOYD	M. JOHNSON	
17	REVISED TO REFLECT CHANGES TO THE AIR SYSTEM	1/1/79	W. LLOYD	M. JOHNSON	
18	REVISED TO REFLECT CHANGES TO THE AIR SYSTEM	1/5/79	W. LLOYD	M. JOHNSON	
19	REVISED TO REFLECT CHANGES TO THE AIR SYSTEM	1/10/79	W. LLOYD	M. JOHNSON	
20	REVISED TO REFLECT CHANGES TO THE AIR SYSTEM	1/15/79	W. LLOYD	M. JOHNSON	

CHANGES TO THIS DRAWING MUST ALSO BE INCORPORATED ON THE CORRESPONDING DRAWING WHERE CHANGES AFFECT HIGHLIGHTED FLOW AND BOUNDARY ISOLATION PATHS SHOWN ON THE CORRESPONDING DRAWING.

W. LLOYD
 M. JOHNSON
 TITLE: INSTRUMENT & STATION AIR SYSTEM FLOW DIAGRAM
 SCALE: NONE
 SHEET: 9 OF 10



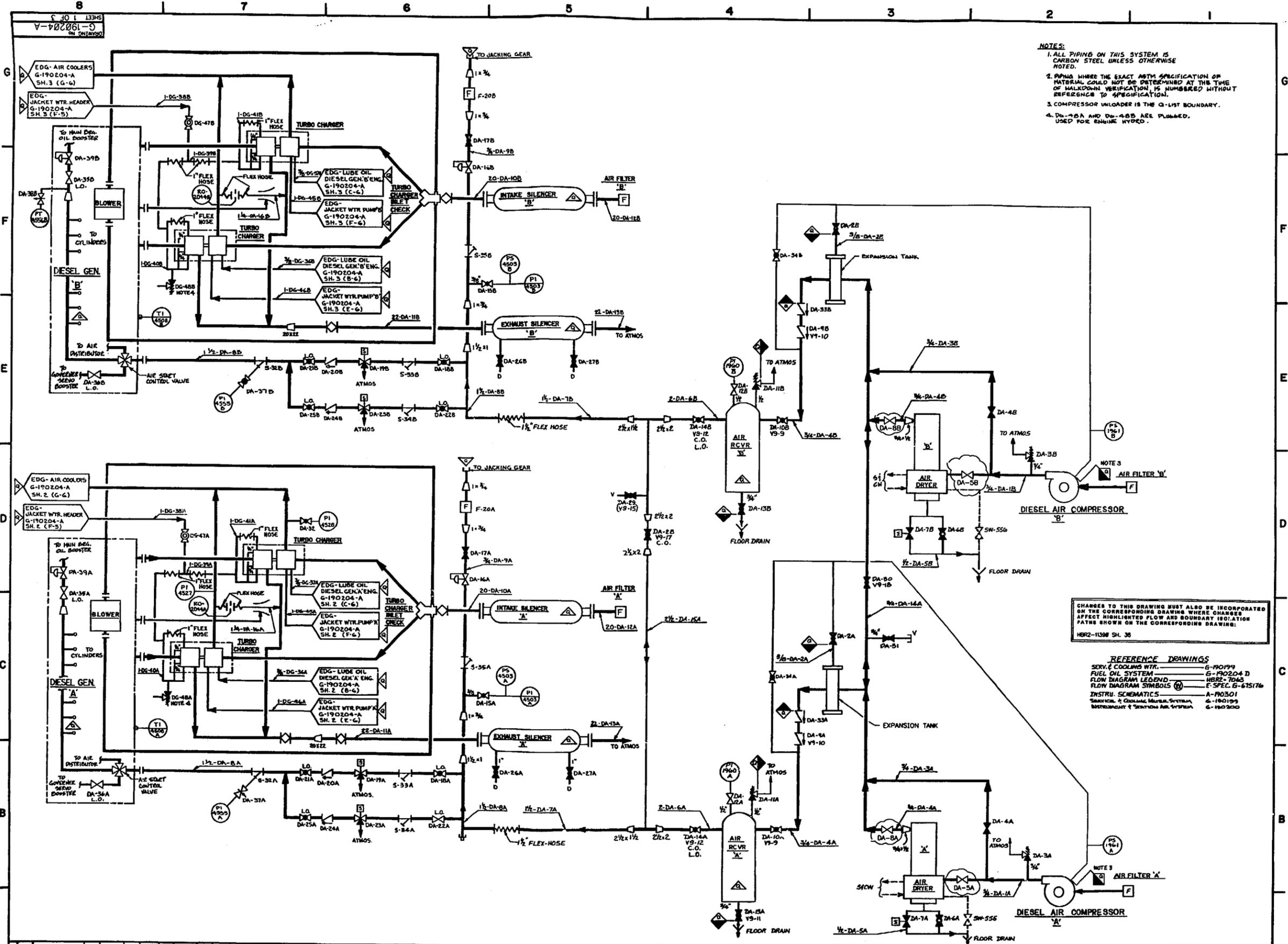
NOTE: SEE SHEET 1 FOR NOTES

30X

The image contained on this frame was made in the normal and regular course of business by CPAL on the date stated below. It is an accurate reproduction of the document submitted for microfilming.
Date: 7-31-00
Operator: [Signature]

CHANGES TO THIS DRAWING MUST ALSO BE INCORPORATED ON THE CORRESPONDING DRAWINGS WHERE CHANGES AFFECT HIGHLIGHTED FLOW AND BOUNDARY ISOLATION PATHS SHOWN ON THE CORRESPONDING DRAWING.
HBR2-11308 SH. 10

21	4/13/99	DCR 99-26 ESR 9800343	ESP	JW	CLO	4/13/99
20	5/15/99	DCR 95-976	DME	EC	CLO	5/15/99
22	7/2/00	DCR 00-284 ESR 00-00060	ESP	ONE	ELL	7/2/00
REV	DATE	DESCRIPTION	DWN	CHK	APPRD	
DPE E.W.O'NEIL, JR. PROFESSIONAL ENGINEER HUBERT P. HINES REG. NO. S.C. 10655						
NON CONTAMINATED						
CAROLINA POWER & LIGHT COMPANY ROBINSON ENGINEERING SUPPORT SECTION						
PLANT: ROBINSON PLANT - UNIT 2						
TITLE: PRIMARY & MAKE-UP WATER SYSTEM FLOW DIAGRAM						
REV	CA	STRUC	NUC	MECH	ELECT	I&C
3						
DWG. NO. G-190202		SCALE NONE		SHEET 3 OF 7		REV. NO. 22



- NOTES:**
1. ALL PIPING ON THIS SYSTEM IS CARBON STEEL UNLESS OTHERWISE NOTED.
 2. PIPING WHERE THE EXACT ASTM SPECIFICATION OF MATERIAL COULD NOT BE DETERMINED AT THE TIME OF WALKDOWN VERIFICATION IS NUMBERED WITHOUT REFERENCE TO SPECIFICATION.
 3. COMPRESSOR UNLOADER IS THE Q-LIST BOUNDARY.
 4. DA-78A AND DA-48B ARE PLUMBED USED FOR ENGINE HYDRO.

CHANGES TO THIS DRAWING MUST ALSO BE INCORPORATED ON THE CORRESPONDING DRAWING WHERE CHANGES AFFECT HIGHLIGHTED FLOW AND BOUNDARY ISOLATION PATHS SHOWN ON THE CORRESPONDING DRAWING.

HR2-1138 SH. 38

REFERENCE DRAWINGS

SERV. & COOLING WTR.	G-190199
FUEL OIL SYSTEM	G-190204-D
FLOW DIAGRAM LEGEND	HR2-7042
FLOW DIAGRAM SYMBOLS	F-SPEC. G-475174
INSTR. SCHEMATICS	A-190301
SERV. & COOLING WATER SYSTEM	G-190199
INSTRUMENT & CONTROL AIR SYSTEM	G-190200

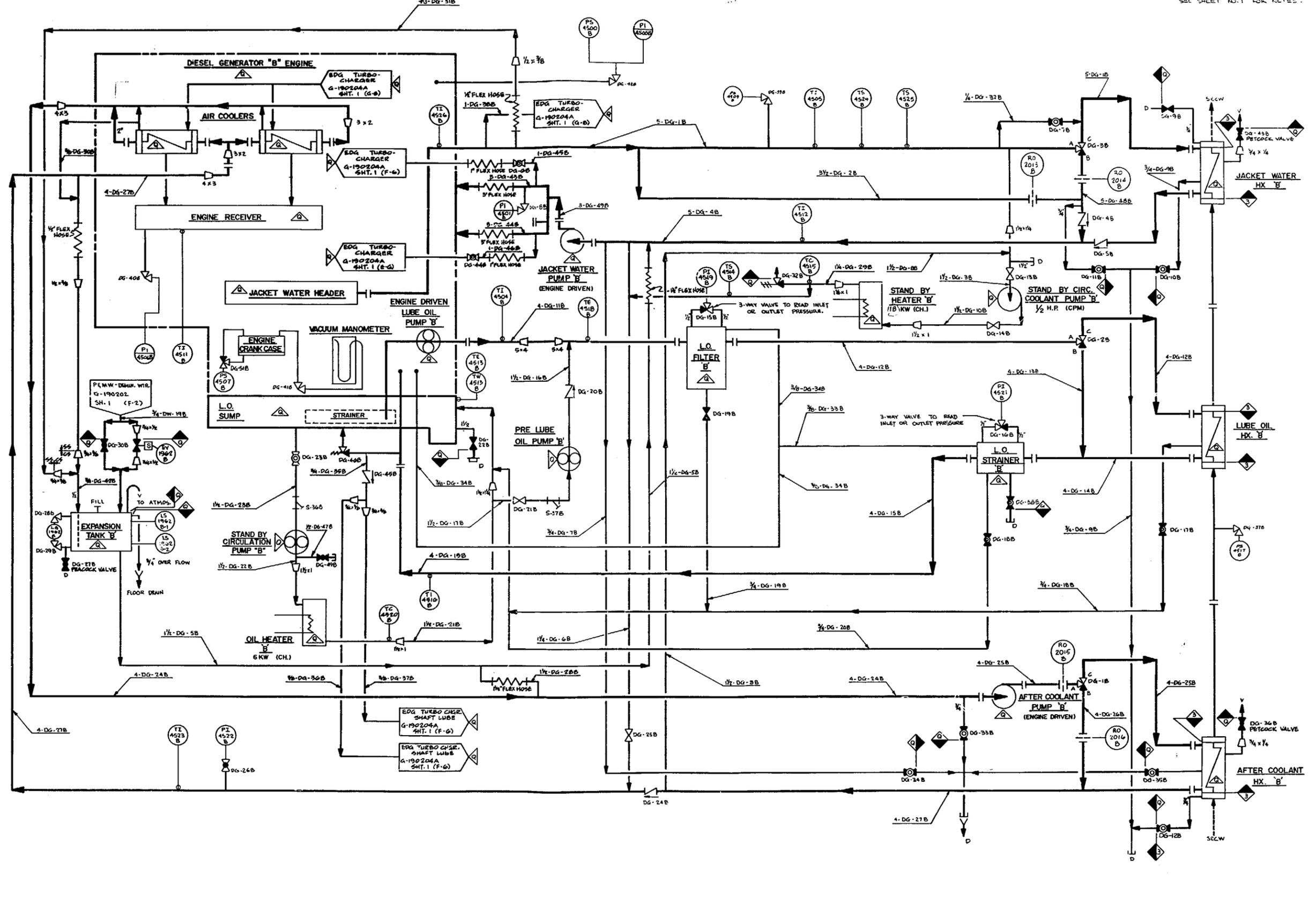
REV. 1	BY: J. WALTERS	DATE: 12-15-60
REV. 2	BY: J. WALTERS	DATE: 12-15-60
REV. 3	BY: J. WALTERS	DATE: 12-15-60
REV. 4	BY: J. WALTERS	DATE: 12-15-60
REV. 5	BY: J. WALTERS	DATE: 12-15-60
REV. 6	BY: J. WALTERS	DATE: 12-15-60
REV. 7	BY: J. WALTERS	DATE: 12-15-60
REV. 8	BY: J. WALTERS	DATE: 12-15-60
REV. 9	BY: J. WALTERS	DATE: 12-15-60
REV. 10	BY: J. WALTERS	DATE: 12-15-60
REV. 11	BY: J. WALTERS	DATE: 12-15-60
REV. 12	BY: J. WALTERS	DATE: 12-15-60
REV. 13	BY: J. WALTERS	DATE: 12-15-60
REV. 14	BY: J. WALTERS	DATE: 12-15-60
REV. 15	BY: J. WALTERS	DATE: 12-15-60
REV. 16	BY: J. WALTERS	DATE: 12-15-60
REV. 17	BY: J. WALTERS	DATE: 12-15-60
REV. 18	BY: J. WALTERS	DATE: 12-15-60
REV. 19	BY: J. WALTERS	DATE: 12-15-60
REV. 20	BY: J. WALTERS	DATE: 12-15-60
REV. 21	BY: J. WALTERS	DATE: 12-15-60
REV. 22	BY: J. WALTERS	DATE: 12-15-60
REV. 23	BY: J. WALTERS	DATE: 12-15-60
REV. 24	BY: J. WALTERS	DATE: 12-15-60
REV. 25	BY: J. WALTERS	DATE: 12-15-60
REV. 26	BY: J. WALTERS	DATE: 12-15-60
REV. 27	BY: J. WALTERS	DATE: 12-15-60
REV. 28	BY: J. WALTERS	DATE: 12-15-60

DESIGNED BY: J. WALTERS	CHECKED BY: J. WALTERS
DRAWN BY: J. WALTERS	DATE: 12-15-60
CAROLINA POWER & LIGHT CO. H. B. ROBINSON S.E. PLANT UNIT - NO. 2 SUPPLEMENT 52	
TITLE: EMERGENCY DIESEL GENERATOR SYSTEM FLOW DIAGRAM	
VEHICLE NO.	SCALE: NONE
SIZE: 11" x 17"	SHEET: 1 OF 3

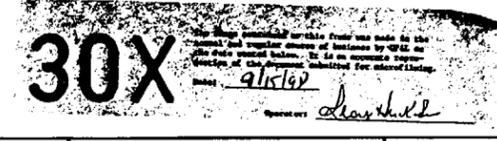
The image contained on this form was made in the normal course of business by the U.S. Government and is hereby placed in the public domain. It is an accurate reproduction of the document submitted for microfilming.

Date: 12-15-60 Operator: J. Walters

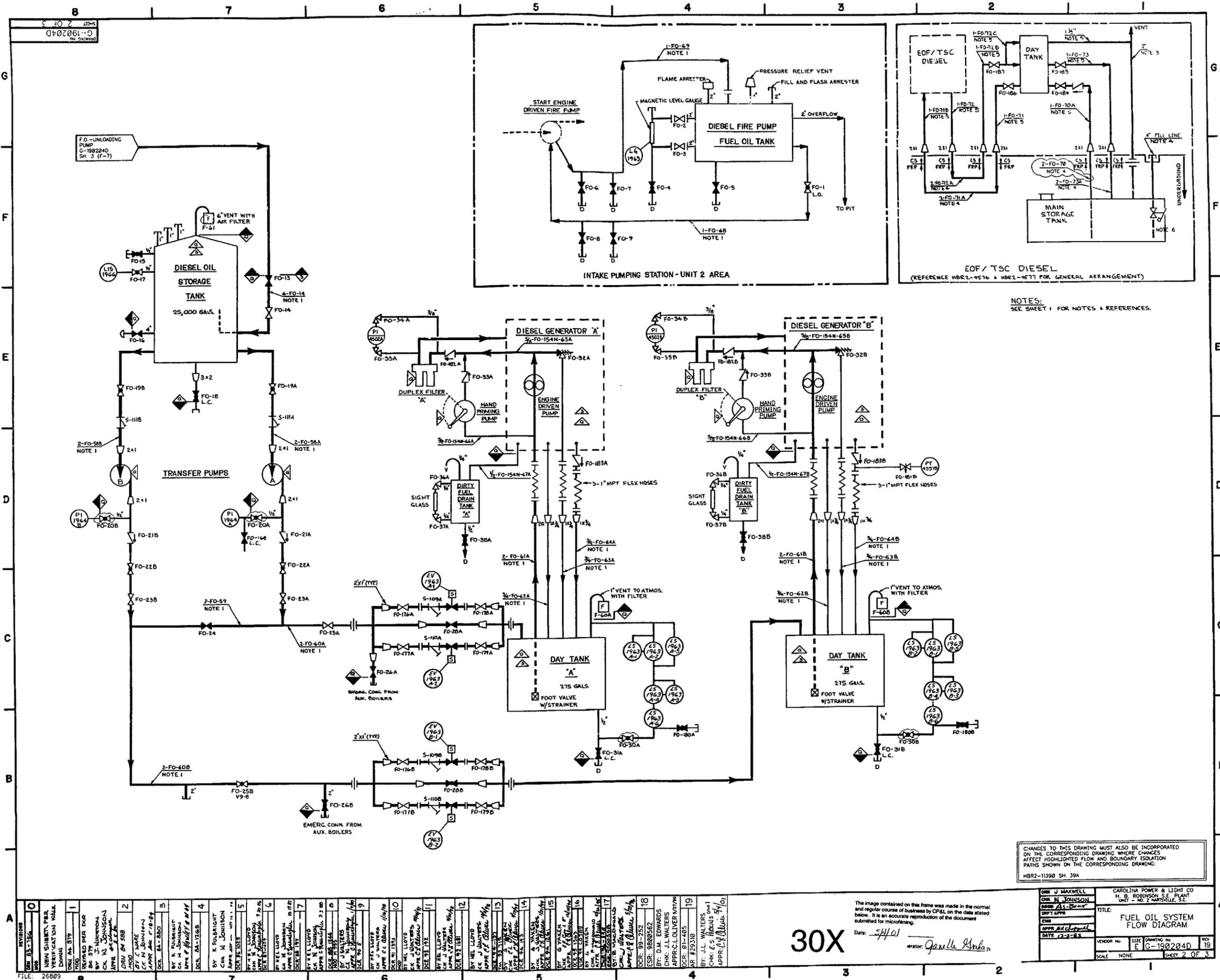
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REV.	DATE	DESCRIPTION
1	11-15-53	ISSUED AND REVISIONS PER YAW DOWN SUPER-SERIES DWG. G-190204-A SH. 3 OF 3 REV. 2
2	11-15-53	BY: T. BLANTON
3	11-15-53	BY: M. JOHNSON
4	11-15-53	BY: M. JOHNSON
5	11-15-53	BY: M. JOHNSON
6	11-15-53	BY: M. JOHNSON
7	11-15-53	BY: M. JOHNSON
8	11-15-53	BY: M. JOHNSON
9	11-15-53	BY: M. JOHNSON
10	11-15-53	BY: M. JOHNSON
11	11-15-53	BY: M. JOHNSON
12	11-15-53	BY: M. JOHNSON
13	11-15-53	BY: M. JOHNSON
14	11-15-53	BY: M. JOHNSON
15	11-15-53	BY: M. JOHNSON
16	11-15-53	BY: M. JOHNSON
17	11-15-53	BY: M. JOHNSON
18	11-15-53	BY: M. JOHNSON



DESIGNED BY: T. BLANTON CHECKED BY: M. JOHNSON DRAWN BY: M. JOHNSON APPR. BY: M. JOHNSON DATE: 11-15-53	CAROLINA POWER & LIGHT CO. H.B. ROBINSON B.L. PLANT UNIT - No. 2 HARTVILLE, S.C. EMERGENCY DIESEL GENERATOR SYSTEM FLOW DIAGRAM SCALE: R018 SHEET 3 OF 3
---	--



NOTES:
SEE SHEET 1 FOR NOTES & REFERENCES.

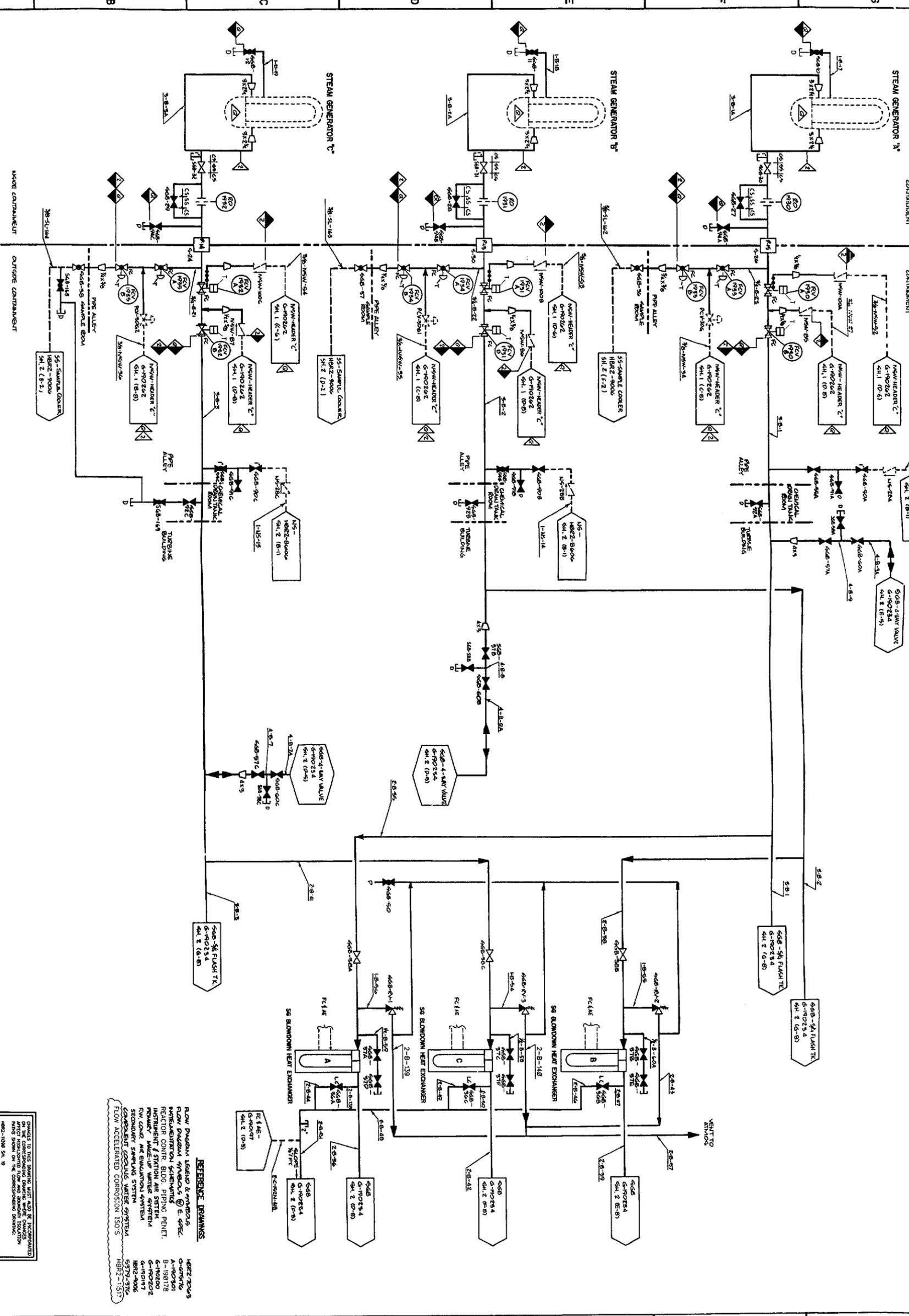
CHANGES TO THIS DRAWING MUST ALSO BE INCORPORATED ON THE CORRESPONDING DRAWING WHERE CHANGES AFFECT HIGHLIGHTED FLOW AND BOUNDARY ISOLATION PATHS SHOWN ON THE CORRESPONDING DRAWING.
HBR2-11398 SH. 39A

1	BY: J. J. WALTERS CHK: E. S. BEANS DATE: 12-2-83
2	BY: J. J. WALTERS CHK: E. S. BEANS DATE: 12-2-83
3	BY: J. J. WALTERS CHK: E. S. BEANS DATE: 12-2-83
4	BY: J. J. WALTERS CHK: E. S. BEANS DATE: 12-2-83
5	BY: J. J. WALTERS CHK: E. S. BEANS DATE: 12-2-83
6	BY: J. J. WALTERS CHK: E. S. BEANS DATE: 12-2-83
7	BY: J. J. WALTERS CHK: E. S. BEANS DATE: 12-2-83
8	BY: J. J. WALTERS CHK: E. S. BEANS DATE: 12-2-83
9	BY: J. J. WALTERS CHK: E. S. BEANS DATE: 12-2-83
10	BY: J. J. WALTERS CHK: E. S. BEANS DATE: 12-2-83
11	BY: J. J. WALTERS CHK: E. S. BEANS DATE: 12-2-83
12	BY: J. J. WALTERS CHK: E. S. BEANS DATE: 12-2-83
13	BY: J. J. WALTERS CHK: E. S. BEANS DATE: 12-2-83
14	BY: J. J. WALTERS CHK: E. S. BEANS DATE: 12-2-83
15	BY: J. J. WALTERS CHK: E. S. BEANS DATE: 12-2-83
16	BY: J. J. WALTERS CHK: E. S. BEANS DATE: 12-2-83
17	BY: J. J. WALTERS CHK: E. S. BEANS DATE: 12-2-83
18	BY: J. J. WALTERS CHK: E. S. BEANS DATE: 12-2-83
19	BY: J. J. WALTERS CHK: E. S. BEANS DATE: 12-2-83
20	BY: J. J. WALTERS CHK: E. S. BEANS DATE: 12-2-83

30X

The image contained on this frame was made in the normal and regular course of business by CP&L on the data stated below. It is an accurate reproduction of the document submitted for microfilming.
Date: 5/1/01
Operator: *Gaxelle Andon*

ONE J. MAXWELL ONE M. JOHNSON DRAW AS-B-100 DATE 12-2-83	CAROLINA POWER & LIGHT CO. H. B. ROBINSON S.E. PLANT UNIT - NO. 2 HARTSVILLE, SC. TITLE: FUEL OIL SYSTEM FLOW DIAGRAM VENDOR NO. E SIZE G-190204D SCALE NONE SHEET 2 OF 3
---	---



REVISIONS	
NO.	DESCRIPTION
16	REVISED IN RESPONSE TO COMMENTS FROM THE NRC. REVISED Dwg NO. G-190234-011 REV 16
17	DCR 84-1138 MOD
18	BY HAROLD E. LLOYD CHK N. JOHNSON APPR G. J. WALTERS DCR 85-828
19	BY HAROLD E. LLOYD CHK N. JOHNSON APPR G. J. WALTERS DCR 87-28
20	BY HAROLD E. LLOYD CHK N. JOHNSON APPR G. J. WALTERS DCR 88-531
21	BY HAROLD E. LLOYD CHK N. JOHNSON APPR G. J. WALTERS DCR 89-528
22	BY HAROLD E. LLOYD CHK N. JOHNSON APPR G. J. WALTERS DCR 90-528
23	BY HAROLD E. LLOYD CHK N. JOHNSON APPR G. J. WALTERS DCR 91-528
24	BY HAROLD E. LLOYD CHK N. JOHNSON APPR G. J. WALTERS DCR 92-528
25	BY HAROLD E. LLOYD CHK N. JOHNSON APPR G. J. WALTERS DCR 93-528
26	BY HAROLD E. LLOYD CHK N. JOHNSON APPR G. J. WALTERS DCR 94-528
27	BY HAROLD E. LLOYD CHK N. JOHNSON APPR G. J. WALTERS DCR 95-528
28	BY HAROLD E. LLOYD CHK N. JOHNSON APPR G. J. WALTERS DCR 96-528
29	BY HAROLD E. LLOYD CHK N. JOHNSON APPR G. J. WALTERS DCR 97-528
30	BY HAROLD E. LLOYD CHK N. JOHNSON APPR G. J. WALTERS DCR 98-528
31	BY HAROLD E. LLOYD CHK N. JOHNSON APPR G. J. WALTERS DCR 99-528
32	BY HAROLD E. LLOYD CHK N. JOHNSON APPR G. J. WALTERS DCR 00-528
33	BY HAROLD E. LLOYD CHK N. JOHNSON APPR G. J. WALTERS DCR 01-528
34	BY HAROLD E. LLOYD CHK N. JOHNSON APPR G. J. WALTERS DCR 02-528
35	BY HAROLD E. LLOYD CHK N. JOHNSON APPR G. J. WALTERS DCR 03-528

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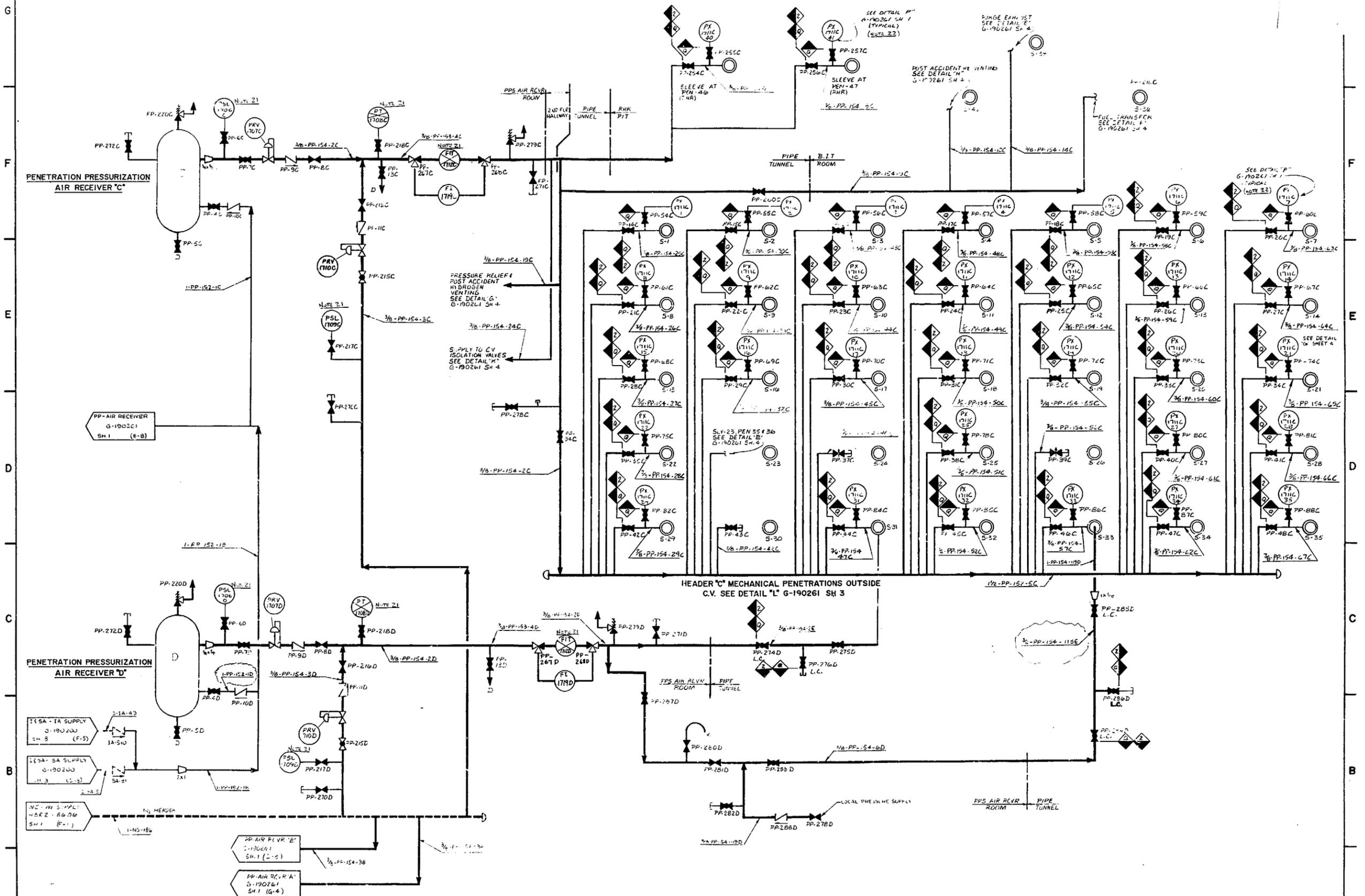
Date: 4/26/01
Operator: [Signature]

DESIGNED BY	DATE	SCALE
CHK'D BY		
APP'D BY		
TITLE	DATE	SHEET
STEAM GENERATOR BLOW-DOWN AND WET LAYUP SYSTEM FLOW DIAGRAM	G-190234	1 OF 2

REFERENCE DRAWINGS

- HRZ-700'S
- 4-07976
- A-100701
- B-198178
- G-190002
- G-190197
- HRZ-700'S
- 5779-37C
- COMPONENT COOLANT WATER SYSTEM
- HRZ-700'S
- HRZ-700'S

CHANGES TO THIS DRAWING MUST BE INCORPORATED IN THE CORRESPONDING PARENT DRAWING. THIS DRAWING IS THE CORRESPONDING DRAWING.



REV.	DATE	BY	CHKD.	DESCRIPTION
1	12-15-57	J. H. WALKER	J. H. WALKER	ISSUED FOR CONSTRUCTION
2	1-15-58	J. H. WALKER	J. H. WALKER	REVISION
3	2-15-58	J. H. WALKER	J. H. WALKER	REVISION
4	3-15-58	J. H. WALKER	J. H. WALKER	REVISION
5	4-15-58	J. H. WALKER	J. H. WALKER	REVISION
6	5-15-58	J. H. WALKER	J. H. WALKER	REVISION
7	6-15-58	J. H. WALKER	J. H. WALKER	REVISION
8	7-15-58	J. H. WALKER	J. H. WALKER	REVISION
9	8-15-58	J. H. WALKER	J. H. WALKER	REVISION
10	9-15-58	J. H. WALKER	J. H. WALKER	REVISION
11	10-15-58	J. H. WALKER	J. H. WALKER	REVISION
12	11-15-58	J. H. WALKER	J. H. WALKER	REVISION
13	12-15-58	J. H. WALKER	J. H. WALKER	REVISION
14	1-15-59	J. H. WALKER	J. H. WALKER	REVISION
15	2-15-59	J. H. WALKER	J. H. WALKER	REVISION
16	3-15-59	J. H. WALKER	J. H. WALKER	REVISION
17	4-15-59	J. H. WALKER	J. H. WALKER	REVISION
18	5-15-59	J. H. WALKER	J. H. WALKER	REVISION
19	6-15-59	J. H. WALKER	J. H. WALKER	REVISION
20	7-15-59	J. H. WALKER	J. H. WALKER	REVISION
21	8-15-59	J. H. WALKER	J. H. WALKER	REVISION
22	9-15-59	J. H. WALKER	J. H. WALKER	REVISION
23	10-15-59	J. H. WALKER	J. H. WALKER	REVISION
24	11-15-59	J. H. WALKER	J. H. WALKER	REVISION
25	12-15-59	J. H. WALKER	J. H. WALKER	REVISION
26	1-15-60	J. H. WALKER	J. H. WALKER	REVISION
27	2-15-60	J. H. WALKER	J. H. WALKER	REVISION
28	3-15-60	J. H. WALKER	J. H. WALKER	REVISION
29	4-15-60	J. H. WALKER	J. H. WALKER	REVISION
30	5-15-60	J. H. WALKER	J. H. WALKER	REVISION
31	6-15-60	J. H. WALKER	J. H. WALKER	REVISION
32	7-15-60	J. H. WALKER	J. H. WALKER	REVISION
33	8-15-60	J. H. WALKER	J. H. WALKER	REVISION
34	9-15-60	J. H. WALKER	J. H. WALKER	REVISION
35	10-15-60	J. H. WALKER	J. H. WALKER	REVISION
36	11-15-60	J. H. WALKER	J. H. WALKER	REVISION
37	12-15-60	J. H. WALKER	J. H. WALKER	REVISION
38	1-15-61	J. H. WALKER	J. H. WALKER	REVISION
39	2-15-61	J. H. WALKER	J. H. WALKER	REVISION
40	3-15-61	J. H. WALKER	J. H. WALKER	REVISION
41	4-15-61	J. H. WALKER	J. H. WALKER	REVISION
42	5-15-61	J. H. WALKER	J. H. WALKER	REVISION
43	6-15-61	J. H. WALKER	J. H. WALKER	REVISION
44	7-15-61	J. H. WALKER	J. H. WALKER	REVISION
45	8-15-61	J. H. WALKER	J. H. WALKER	REVISION
46	9-15-61	J. H. WALKER	J. H. WALKER	REVISION
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48	11-15-61	J. H. WALKER	J. H. WALKER	REVISION
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50	1-15-62	J. H. WALKER	J. H. WALKER	REVISION
51	2-15-62	J. H. WALKER	J. H. WALKER	REVISION
52	3-15-62	J. H. WALKER	J. H. WALKER	REVISION
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62	1-15-63	J. H. WALKER	J. H. WALKER	REVISION
63	2-15-63	J. H. WALKER	J. H. WALKER	REVISION
64	3-15-63	J. H. WALKER	J. H. WALKER	REVISION
65	4-15-63	J. H. WALKER	J. H. WALKER	REVISION
66	5-15-63	J. H. WALKER	J. H. WALKER	REVISION
67	6-15-63	J. H. WALKER	J. H. WALKER	REVISION
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69	8-15-63	J. H. WALKER	J. H. WALKER	REVISION
70	9-15-63	J. H. WALKER	J. H. WALKER	REVISION
71	10-15-63	J. H. WALKER	J. H. WALKER	REVISION
72	11-15-63	J. H. WALKER	J. H. WALKER	REVISION
73	12-15-63	J. H. WALKER	J. H. WALKER	REVISION
74	1-15-64	J. H. WALKER	J. H. WALKER	REVISION
75	2-15-64	J. H. WALKER	J. H. WALKER	REVISION
76	3-15-64	J. H. WALKER	J. H. WALKER	REVISION
77	4-15-64	J. H. WALKER	J. H. WALKER	REVISION
78	5-15-64	J. H. WALKER	J. H. WALKER	REVISION
79	6-15-64	J. H. WALKER	J. H. WALKER	REVISION
80	7-15-64	J. H. WALKER	J. H. WALKER	REVISION
81	8-15-64	J. H. WALKER	J. H. WALKER	REVISION
82	9-15-64	J. H. WALKER	J. H. WALKER	REVISION
83	10-15-64	J. H. WALKER	J. H. WALKER	REVISION
84	11-15-64	J. H. WALKER	J. H. WALKER	REVISION
85	12-15-64	J. H. WALKER	J. H. WALKER	REVISION
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87	2-15-65	J. H. WALKER	J. H. WALKER	REVISION
88	3-15-65	J. H. WALKER	J. H. WALKER	REVISION
89	4-15-65	J. H. WALKER	J. H. WALKER	REVISION
90	5-15-65	J. H. WALKER	J. H. WALKER	REVISION
91	6-15-65	J. H. WALKER	J. H. WALKER	REVISION
92	7-15-65	J. H. WALKER	J. H. WALKER	REVISION
93	8-15-65	J. H. WALKER	J. H. WALKER	REVISION
94	9-15-65	J. H. WALKER	J. H. WALKER	REVISION
95	10-15-65	J. H. WALKER	J. H. WALKER	REVISION
96	11-15-65	J. H. WALKER	J. H. WALKER	REVISION
97	12-15-65	J. H. WALKER	J. H. WALKER	REVISION
98	1-15-66	J. H. WALKER	J. H. WALKER	REVISION
99	2-15-66	J. H. WALKER	J. H. WALKER	REVISION
100	3-15-66	J. H. WALKER	J. H. WALKER	REVISION

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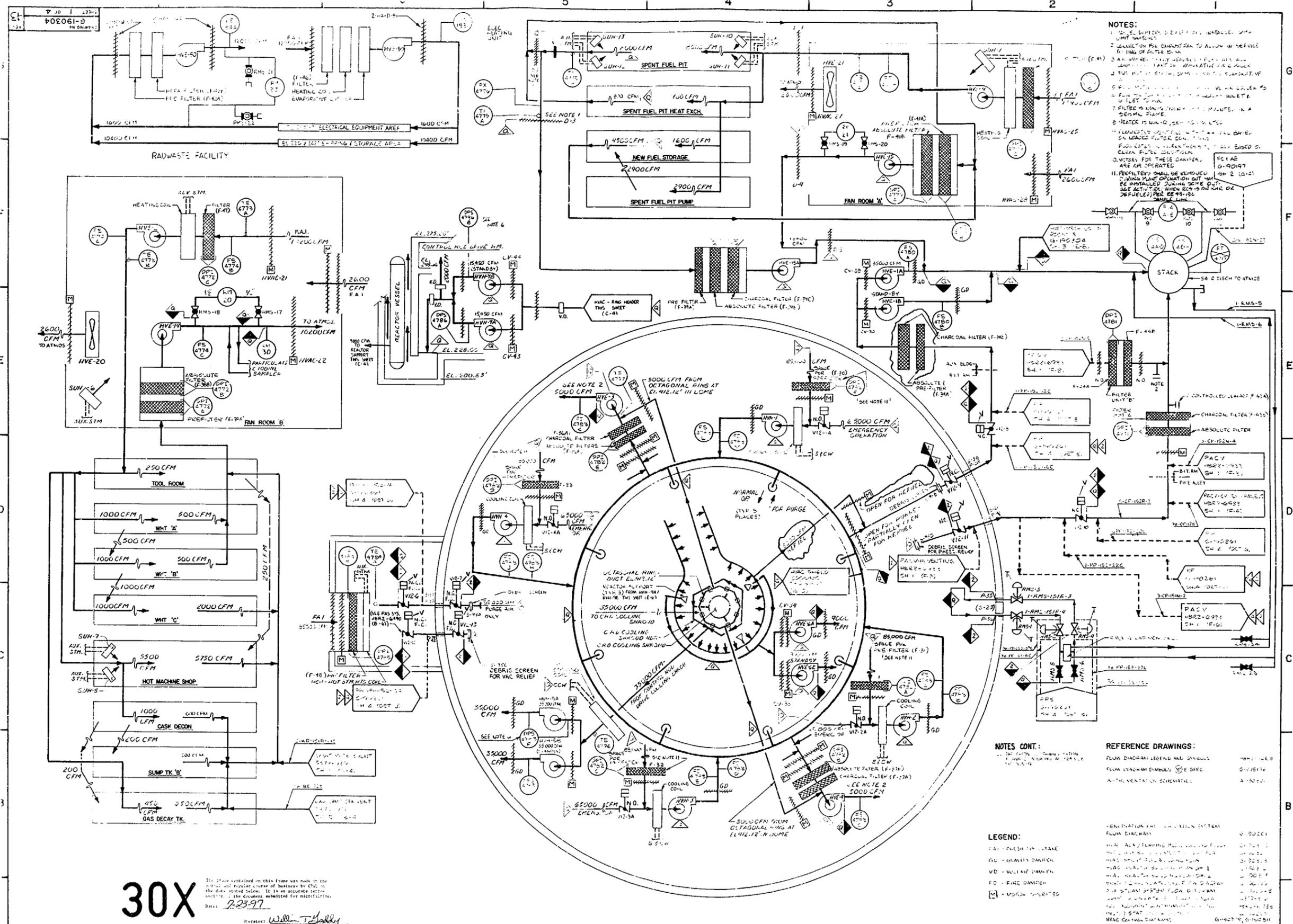
DATE: 6-1-67
OPERATOR: [Signature]

DRN: S. F. MOSES
 CHK: J. E. WALKER
 DES: J. E. WALKER
 APPR: J. E. WALKER
 DATE: 12-15-57

CAROLINA POWER & LIGHT CO.
 H. B. ROBINSON S.E. PLANT
 UNIT - No. 2 HARTSVILLE, S.C.

PENETRATION PRESSURIZATION
 FLOW DIAGRAM

VENDOR No. [] SIZE DRAWING No. []
 E G-190261 29
 SCALE NONE SHEET 2 OF 4



NOTES:

1. ALL SUPPLIES SHALL BE INSTALLED WITH UNIT CONTROLS.
2. SCHEDULE FOR EXHAUST FAN TO ALLOW IN SERVICE 15 MIN OF FILTER RUN.
3. ALL WORK SHALL BE COMPLETED BY THE END OF THE PROJECT.
4. THE UNIT SHALL BE INSTALLED IN THE SPENT FUEL PIT.
5. THE UNIT SHALL BE INSTALLED IN THE SPENT FUEL PIT.
6. THE UNIT SHALL BE INSTALLED IN THE SPENT FUEL PIT.
7. THE UNIT SHALL BE INSTALLED IN THE SPENT FUEL PIT.
8. THE UNIT SHALL BE INSTALLED IN THE SPENT FUEL PIT.
9. THE UNIT SHALL BE INSTALLED IN THE SPENT FUEL PIT.
10. THE UNIT SHALL BE INSTALLED IN THE SPENT FUEL PIT.

NOTES CONT:

REFERENCE DRAWINGS:

- FLOW DIAGRAM LEGEND AND SYMBOLS
- PLANT LAYOUT SYMBOLS
- MECHANICAL SYMBOLS
- VENTILATION SCHEMATICS

LEGEND:

- FAI - FRESH AIR INTAKE
- HEAT - HEATING COIL
- GU - GRAVITY DAMPER
- VD - VULF AIR DAMPER
- FD - FINE DAMPER
- M - MOTOR OPERATED

30X

DATE: 7-23-97
 DESIGNED BY: William T. Hall
 CHECKED BY: [Signature]

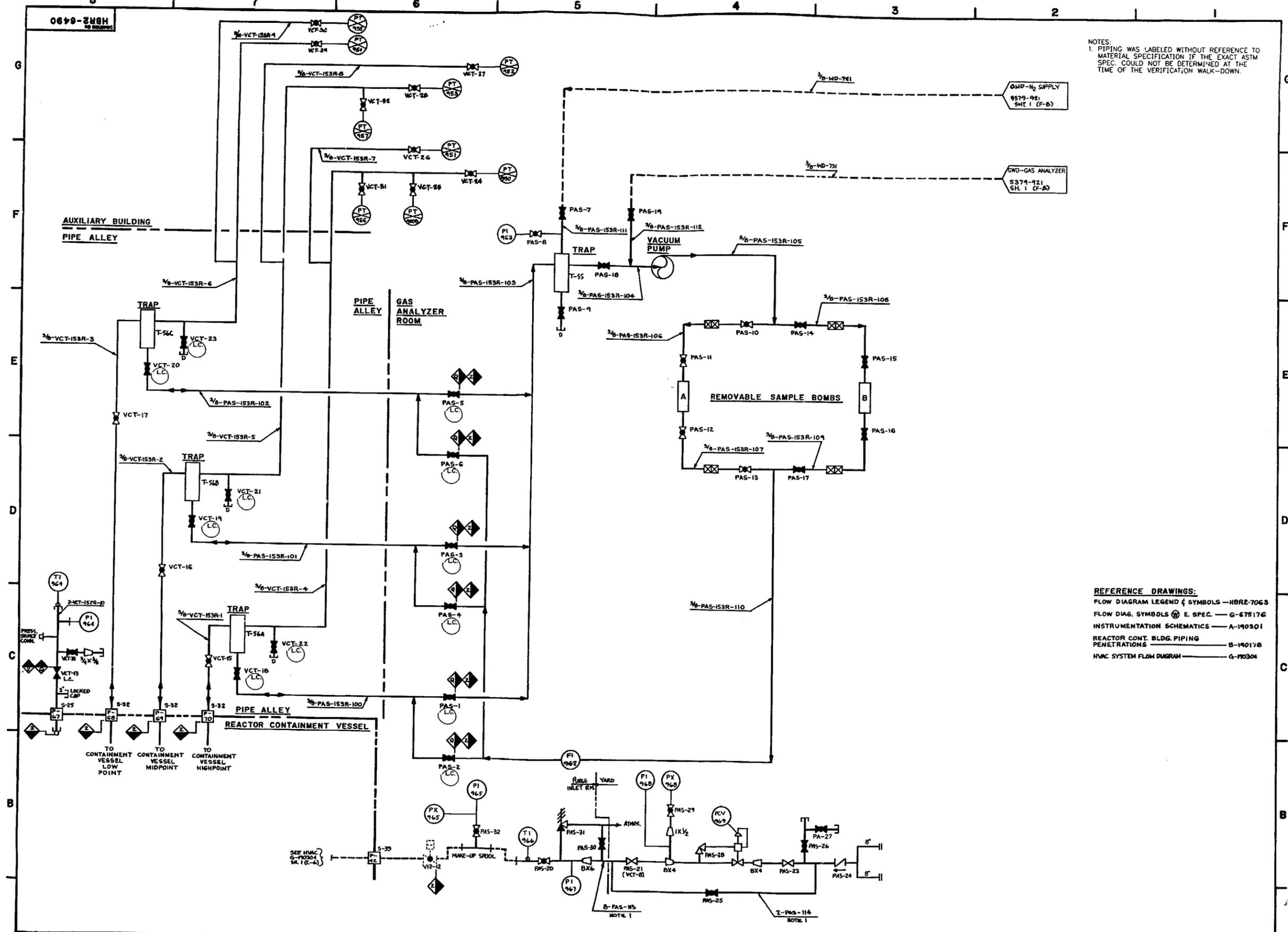
NO.	REV.	DATE	BY	CHKD.	DESCRIPTION
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ORN: [Signature]
 CHKD: A. CHWING
 DRFT APPR: [Signature]
 DESGN: [Signature]
 ENO: [Signature]
 P/APP: [Signature]
 DATE: 7-23-97

CAROLINA POWER & LIGHT CO.
 H.B. ROBINSON S.E. PLANT
 UNIT - No. 2 HARTSVILLE, S.C.

HVAC-TUBS, FAN, AUX,
 REACTOR FAN ROOM,
 BUILDING

VENDOR NO. [Blank]
 SIZE [Blank]
 DRAWING NO. G-190304
 SCALE NONE SHEET 1 OF 4



NOTES:
 1. PIPING WAS LABELED WITHOUT REFERENCE TO MATERIAL SPECIFICATION IF THE EXACT ASTM SPEC. COULD NOT BE DETERMINED AT THE TIME OF THE VERIFICATION WALK-DOWN.

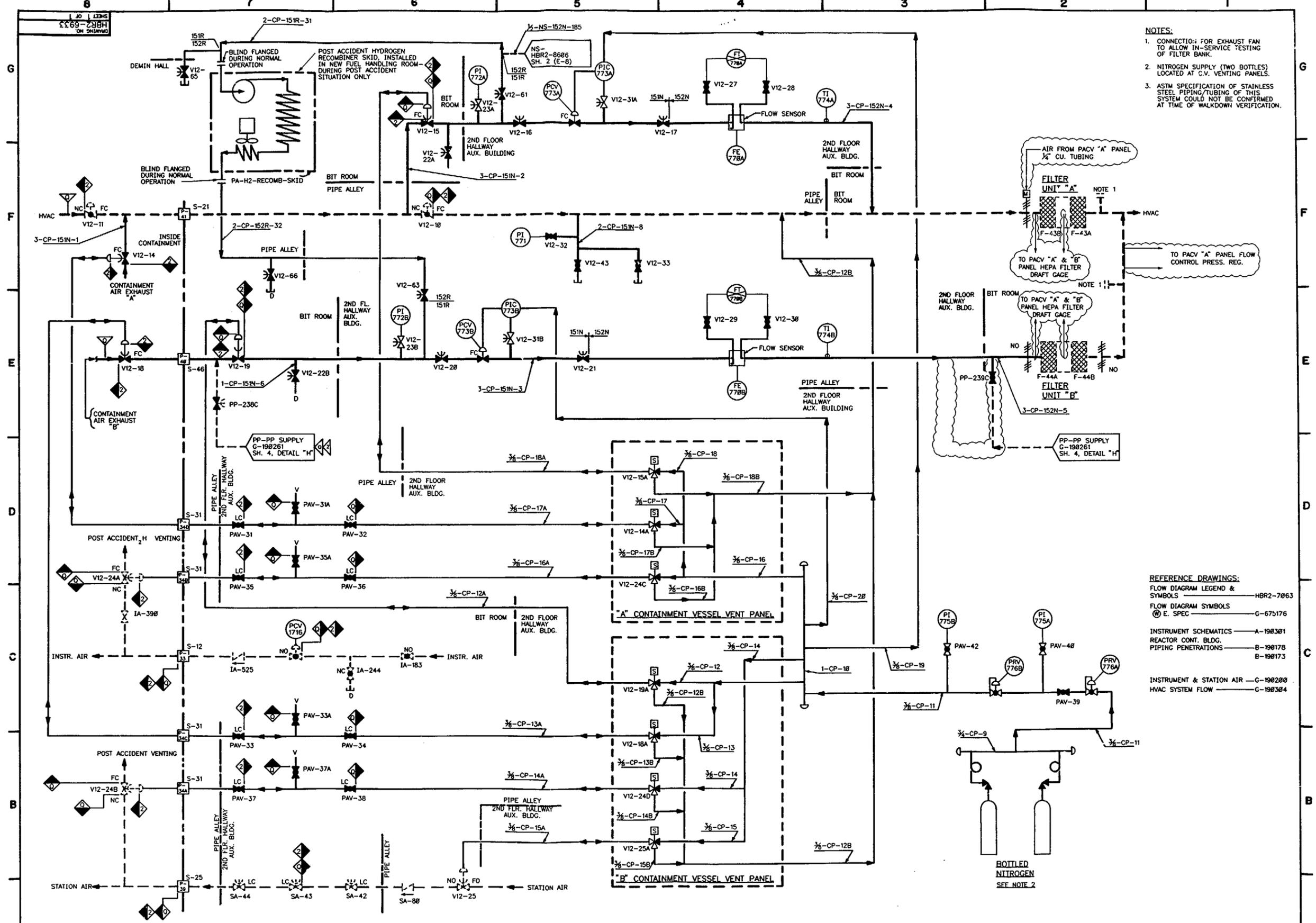
REFERENCE DRAWINGS:
 FLOW DIAG. SYMBOLS & SYMBOLS - HBR2-7063
 FLOW DIAG. SYMBOLS @ E. SPEC. - G-675176
 INSTRUMENTATION SCHEMATICS - A-140301
 REACTOR CONT. BLDG. PIPING PENETRATIONS - B-140176
 HVAC SYSTEM FLOW DIAGRAM - G-120304

1	BY J. WALTERS	12/15/88
2	BY J. WALTERS	12/15/88
3	BY J. WALTERS	12/15/88
4	BY J. WALTERS	12/15/88
5	BY J. WALTERS	12/15/88
6	BY J. WALTERS	12/15/88
7	BY J. WALTERS	12/15/88
8	BY J. WALTERS	12/15/88
9	BY J. WALTERS	12/15/88
10	BY J. WALTERS	12/15/88
11	BY J. WALTERS	12/15/88
12	BY J. WALTERS	12/15/88
13	BY J. WALTERS	12/15/88

DESIGNED BY CLINT PARVIN CHECKED BY H. A. CHEWNING DATE 12-15-88	CAROLINA POWER & LIGHT CO. H. B. ROBINSON S.E. PLANT UNIT - NO. 2 WISCONSIN, SC. CONTAINMENT VAPOR AND PRESSURE SAMPLING SYSTEM FLOW DIAGRAM VENDOR NO. SIZE DRAWING NO. REV E HBR2-6490 13 SCALE NONE SHEET 1 OF 1
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This drawing is an ASME drawing and shall be used only for the purpose of providing information to the contractor. It is not to be used for construction purposes.

30X

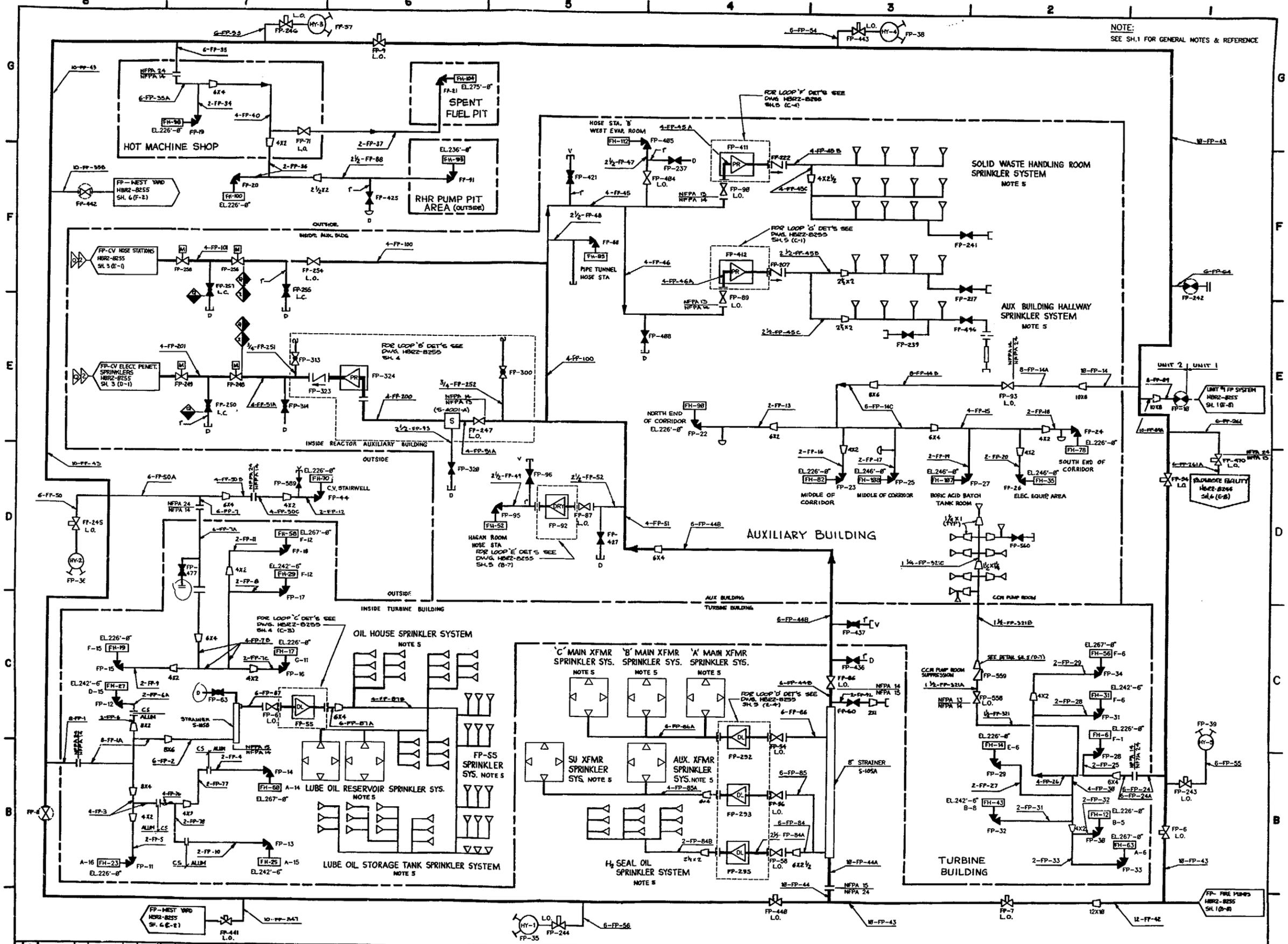


- NOTES:**
1. CONNECTION FOR EXHAUST FAN TO ALLOW IN-SERVICE TESTING OF FILTER BANK.
 2. NITROGEN SUPPLY (TWO BOTTLES) LOCATED AT C.V. VENTING PANELS.
 3. ASTM SPECIFICATION OF STAINLESS STEEL PIPING/TUBING OF THIS SYSTEM COULD NOT BE CONFIRMED AT TIME OF WALKDOWN VERIFICATION.

- REFERENCE DRAWINGS:**
- FLOW DIAGRAM LEGEND & SYMBOLS — HBR2-7063
 - FLOW DIAGRAM SYMBOLS — G-675176
 - INSTRUMENT SCHEMATICS — A-198361
 - REACTOR CONT. BLDG. — B-198178
 - PIPING PENETRATIONS — E-198173
 - INSTRUMENT & STATION AIR — G-198200
 - HVAC SYSTEM FLOW — G-198364

REVISIONS: 1. REVISED & REDRAWN PER WALKDOWN TO SUPERSEDE DING. BY CLINT PARVIN. CHK: M.A. CHWNING. APPR: J.E.C. DATE: 04-01-81. 2. MOD. BY: W. BLANCHARD. CHK: W. BLANCHARD. APPR: J.E.C. DATE: 04-12-82. 3. MOD. BY: W. BLANCHARD. CHK: W. BLANCHARD. APPR: J.E.C. DATE: 04-12-82. 4. MOD. BY: W. BLANCHARD. CHK: W. BLANCHARD. APPR: J.E.C. DATE: 04-12-82. 5. MOD. BY: W. BLANCHARD. CHK: W. BLANCHARD. APPR: J.E.C. DATE: 04-12-82. 6. MOD. BY: W. BLANCHARD. CHK: W. BLANCHARD. APPR: J.E.C. DATE: 04-12-82. 7. MOD. BY: W. BLANCHARD. CHK: W. BLANCHARD. APPR: J.E.C. DATE: 04-12-82. 8. MOD. BY: W. BLANCHARD. CHK: W. BLANCHARD. APPR: J.E.C. DATE: 04-12-82. 9. MOD. BY: W. BLANCHARD. CHK: W. BLANCHARD. APPR: J.E.C. DATE: 04-12-82. 10. MOD. BY: W. BLANCHARD. CHK: W. BLANCHARD. APPR: J.E.C. DATE: 04-12-82. 11. MOD. BY: W. BLANCHARD. CHK: W. BLANCHARD. APPR: J.E.C. DATE: 04-12-82. 12. MOD. BY: W. BLANCHARD. CHK: W. BLANCHARD. APPR: J.E.C. DATE: 04-12-82. 13. MOD. BY: W. BLANCHARD. CHK: W. BLANCHARD. APPR: J.E.C. DATE: 04-12-82. 14. MOD. BY: W. BLANCHARD. CHK: W. BLANCHARD. APPR: J.E.C. DATE: 04-12-82. 15. MOD. BY: W. BLANCHARD. CHK: W. BLANCHARD. APPR: J.E.C. DATE: 04-12-82.															CAROLINA POWER & LIGHT CO. K.B. ROBINSON S.E. PLANT UNIT - NO. 2 HARTSVILLE, SC POST ACCIDENT CONTAINMENT VENTING AND H₂ RECOMBINER SYSTEM FLOW DIAGRAM VENDOR NO. E HBR2-6933 SCALE NONE SHEET 1 OF 1				
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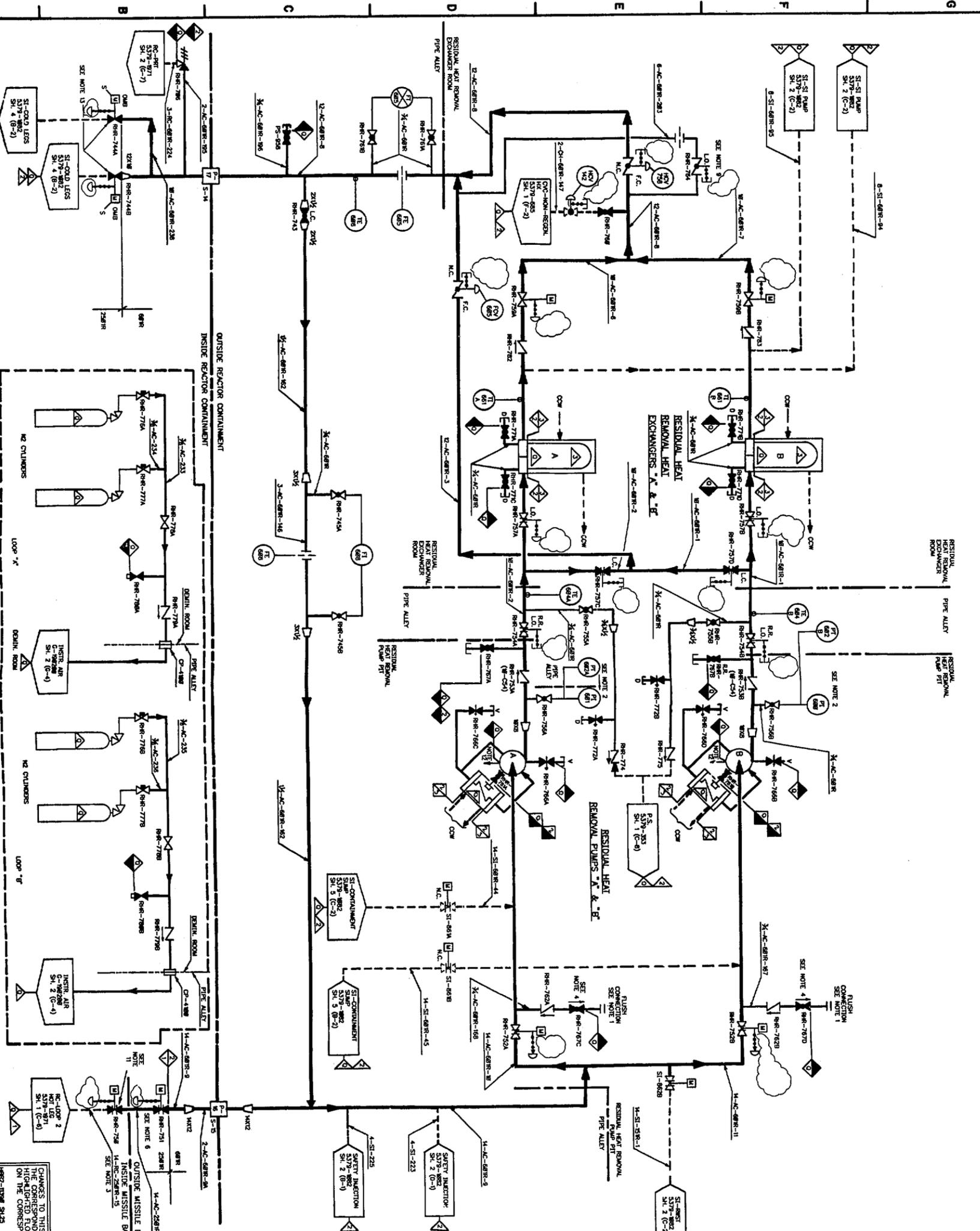
The image contained on this frame was made in the normal and regular course of business by CP&L on the date stated.



NOTE:
SEE SH.1 FOR GENERAL NOTES & REFERENCE

1	BY J. WALKER	DATE 11/15/78
2	BY J. WALKER	DATE 11/15/78
3	BY J. WALKER	DATE 11/15/78
4	BY J. WALKER	DATE 11/15/78
5	BY J. WALKER	DATE 11/15/78
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23	BY J. WALKER	DATE 11/15/78
24	BY J. WALKER	DATE 11/15/78

CAROLINA POWER & LIGHT CO.
 H. B. ROBINSON S.E. PLANT
 UNIT - NO. 2 HARTSVILLE, S.C.
 TITLE: FIRE PROTECTION SYSTEM FLOW DIAGRAM
 VENDOR NO. E HBR2-8255
 SCALE NONE
 SHEET 2 OF 6



NO.	DATE	BY	CHK	APP	DESCRIPTION
34	08/11/98	R. MACDONALD	C. L. OLIVER		REVISIONS
35	08/11/98	E. S. PERKINS	J. L. WALTERS		REVISIONS
36	08/11/98	E. S. PERKINS	J. L. WALTERS		REVISIONS
37	08/11/98	F. W. GRANTHAM	C. L. OLIVER		REVISIONS
38	08/11/98	E. S. PERKINS	J. L. WALTERS		REVISIONS
39	08/11/98	E. S. PERKINS	J. L. WALTERS		REVISIONS
40	08/11/98	E. S. PERKINS	J. L. WALTERS		REVISIONS
41	08/11/98	E. S. PERKINS	J. L. WALTERS		REVISIONS
42	08/11/98	E. S. PERKINS	J. L. WALTERS		REVISIONS
43	08/11/98	E. S. PERKINS	J. L. WALTERS		REVISIONS
44	08/11/98	E. S. PERKINS	J. L. WALTERS		REVISIONS
45	08/11/98	E. S. PERKINS	J. L. WALTERS		REVISIONS
46	08/11/98	E. S. PERKINS	J. L. WALTERS		REVISIONS
47	08/11/98	E. S. PERKINS	J. L. WALTERS		REVISIONS
48	08/11/98	E. S. PERKINS	J. L. WALTERS		REVISIONS
49	08/11/98	E. S. PERKINS	J. L. WALTERS		REVISIONS
50	08/11/98	E. S. PERKINS	J. L. WALTERS		REVISIONS
51	08/11/98	E. S. PERKINS	J. L. WALTERS		REVISIONS
52	08/11/98	E. S. PERKINS	J. L. WALTERS		REVISIONS
53	08/11/98	E. S. PERKINS	J. L. WALTERS		REVISIONS
54	08/11/98	E. S. PERKINS	J. L. WALTERS		REVISIONS
55	08/11/98	E. S. PERKINS	J. L. WALTERS		REVISIONS

The design contained on this drawing was made in the normal course of the duties of the design engineer and is not intended to be construed as a warranty or representation of the design.

CHANGES TO THIS DRAWING MUST ALSO BE INCORPORATED ON THE CORRESPONDING DRAWING WHERE CHANGES AFFECT HIGHLIGHTED FLOW AND BOUNDARY ISOLATION PATHS SHOWN ON THE CORRESPONDING DRAWING.

SCALE	AS SHOWN
TITLE	REMOVAL SYSTEM
PROJECT NO.	5379-1484
SHEET NO.	1 OF 1

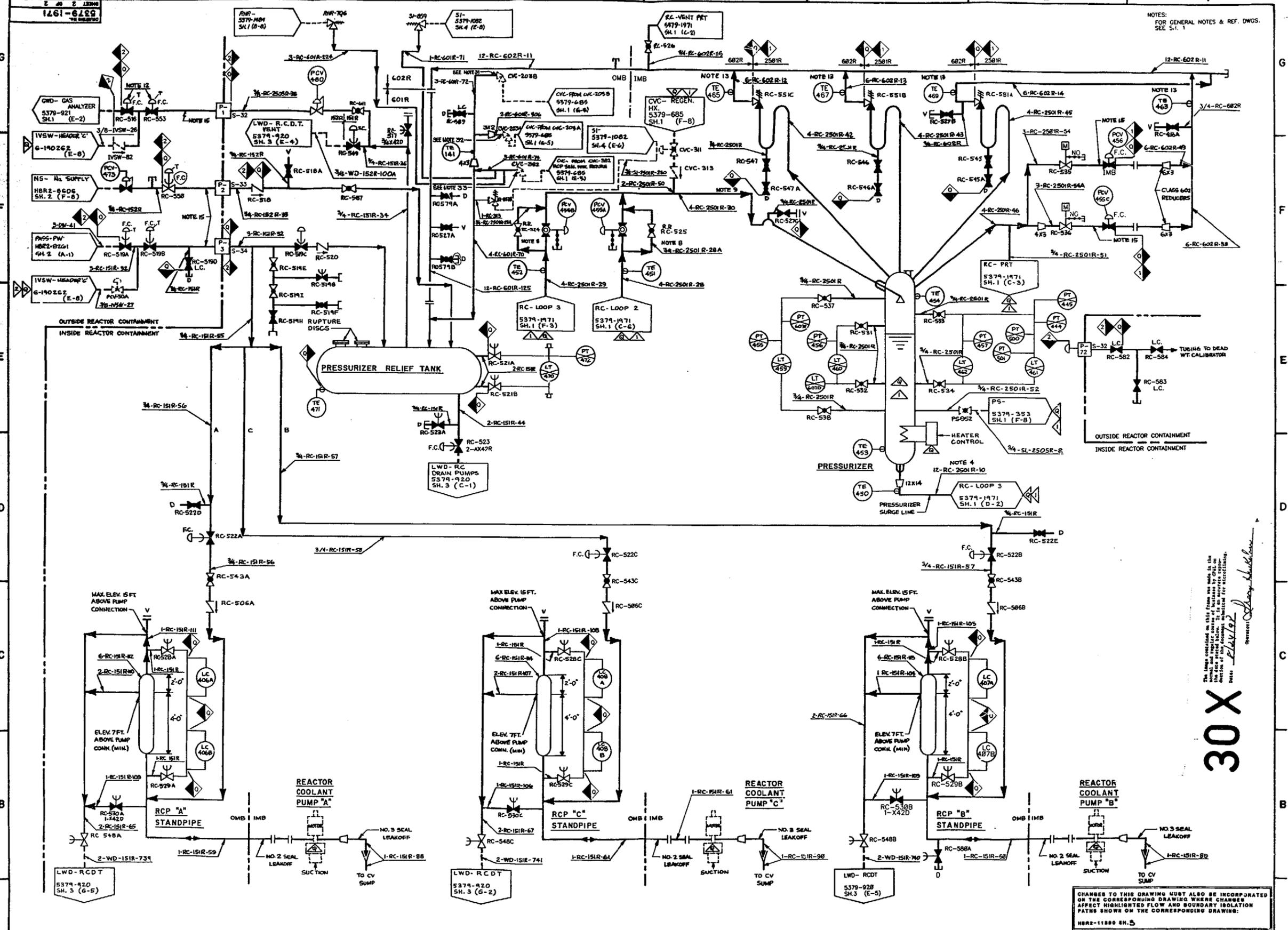
REFERENCE DRAWINGS

FLOW DIAGRAM LEGEND & SYMBOLS - 5379-7000
 FLOW DIAGRAM SYSTEM - 5379-8002
 FLOW DIAGRAM SYSTEM - 5379-9001
 LIQUID WASTE DISPOSAL SYSTEM - 5379-9200
 COMPONENT COOLING WATER SYSTEM FLOW DIAGRAM - 5379-3700

REACTOR CONT. BLDG. PIPING POWER: - B-881708

SAFETY INJECTION SYSTEM -
 FLOW DIAGRAM - 5379-8002
 FLOW DIAGRAM - 5379-9001
 LIQUID WASTE DISPOSAL SYSTEM - 5379-9200
 COMPONENT COOLING WATER SYSTEM FLOW DIAGRAM - 5379-3700

- NOTES:**
1. LOCATE ABOVE RESIDUAL HEAT REMOVAL PUMP SHIELDING AND CLOSE TO VALVES 752A & B.
 2. INSTALL AT AN ACCESSIBLE AND CONVENIENT LOCATION.
 3. SECTION CONNECTION LOCATED COOLANT PIPING, 3" ANGLE TO VALVES ARE NORMALLY INSTALLED EXCEPTIONS ARE 757C & D.
 4. INTERLOCK PROVIDED FOR RHR SHUTDOWN. THESE VALVES CANNOT BE OPENED UNLESS VALVES 750A & B AND 750C & D ARE CLOSED. THESE VALVES CANNOT BE OPENED UNLESS THEIR RESPECTIVE ELECTRICAL THEIR NORMAL/DEFERRED ARE IN NORMAL AND POWER 85A & B AND 85A & B ARE 85A & B INTERLOCKED SO THEY CANNOT BE OPENED UNLESS THEIR LOCKOUT POINT IS BELOW THE SET-POINT.
 5. DELETED
 6. DELETED
 7. ALL ITEM NOTED ARE 3" ANGLE WITHOUT PRESTA OVAL.
 8. DELETED
 9. VALVES NORMALLY OPEN DURING PLANT OPERATION & CLOSED DURING SHUTDOWN. INSTALL IN CONVENIENT OPERATING POSITION. DELETED
 10. RHR 750 HAS A 1/2" HOLE IN THE DISC.
 11. RHR 750 HAS A 1/2" HOLE IN THE DISC.
 12. SEAL LEAKAGE TO SUMP.
 13. VALVES RHR-744A & B HAVE A 1/2" HOLE IN THE REACTOR COOLANT SYSTEM SIDE OF DISC FOR PRESSURE RELIEF.



REV.	DATE	BY	CHKD.	APPR.	DESCRIPTION
1	02/10/73	W. J. WALTERS	C. H. WALKER	H. B. ROBINSON	ISSUED FOR CONSTRUCTION
2	03/05/73	W. J. WALTERS	C. H. WALKER	H. B. ROBINSON	REVISION TO RCP B STANDPIPE
3	03/15/73	W. J. WALTERS	C. H. WALKER	H. B. ROBINSON	REVISION TO RCP C STANDPIPE
4	04/01/73	W. J. WALTERS	C. H. WALKER	H. B. ROBINSON	REVISION TO RCP A STANDPIPE
5	04/15/73	W. J. WALTERS	C. H. WALKER	H. B. ROBINSON	REVISION TO PRESSURIZER SURGE LINE
6	05/01/73	W. J. WALTERS	C. H. WALKER	H. B. ROBINSON	REVISION TO RCP B STANDPIPE
7	05/15/73	W. J. WALTERS	C. H. WALKER	H. B. ROBINSON	REVISION TO RCP C STANDPIPE
8	06/01/73	W. J. WALTERS	C. H. WALKER	H. B. ROBINSON	REVISION TO RCP A STANDPIPE
9	06/15/73	W. J. WALTERS	C. H. WALKER	H. B. ROBINSON	REVISION TO PRESSURIZER SURGE LINE
10	07/01/73	W. J. WALTERS	C. H. WALKER	H. B. ROBINSON	REVISION TO RCP B STANDPIPE
11	07/15/73	W. J. WALTERS	C. H. WALKER	H. B. ROBINSON	REVISION TO RCP C STANDPIPE
12	08/01/73	W. J. WALTERS	C. H. WALKER	H. B. ROBINSON	REVISION TO RCP A STANDPIPE
13	08/15/73	W. J. WALTERS	C. H. WALKER	H. B. ROBINSON	REVISION TO PRESSURIZER SURGE LINE
14	09/01/73	W. J. WALTERS	C. H. WALKER	H. B. ROBINSON	REVISION TO RCP B STANDPIPE
15	09/15/73	W. J. WALTERS	C. H. WALKER	H. B. ROBINSON	REVISION TO RCP C STANDPIPE

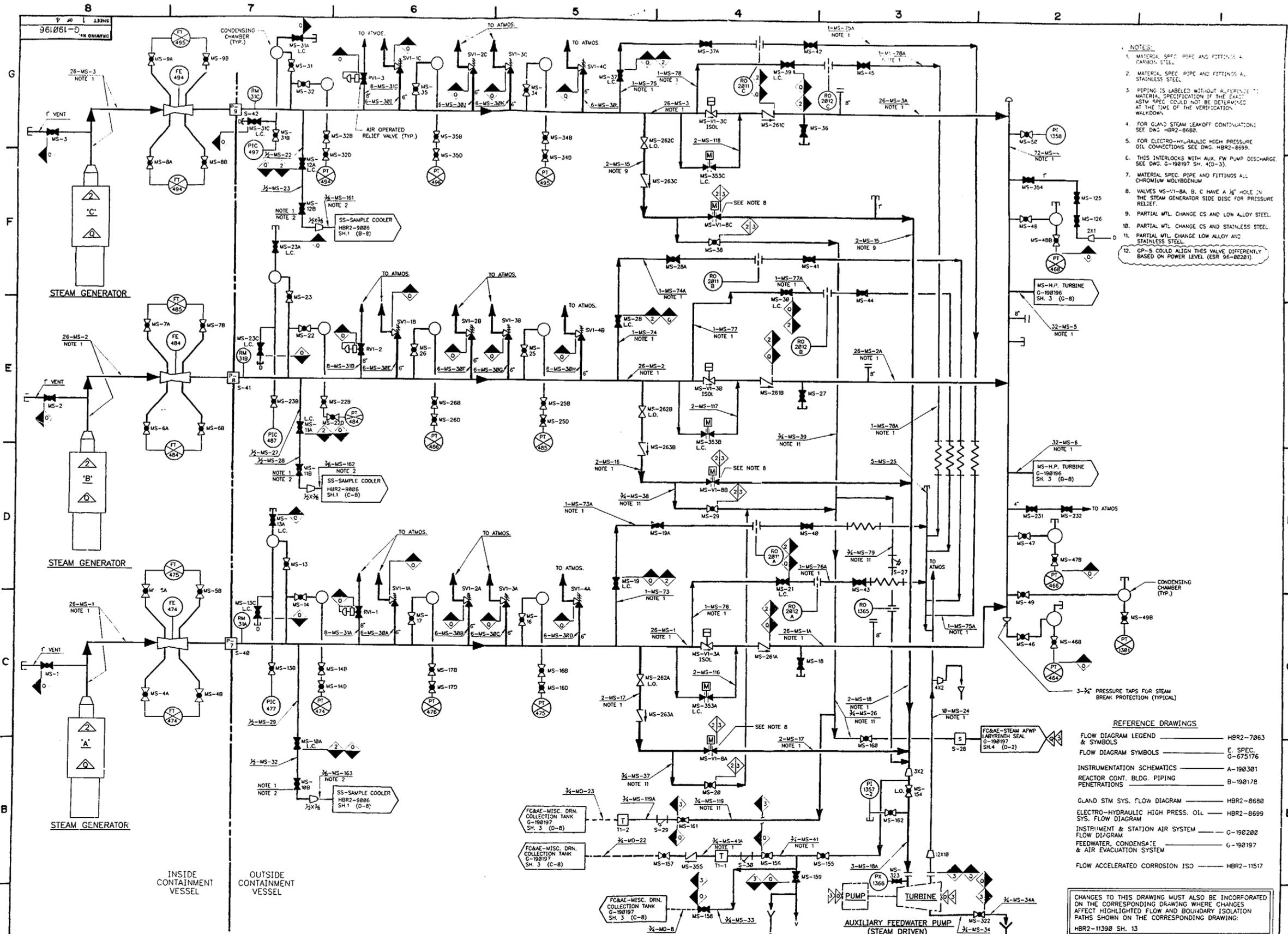
CHANGES TO THIS DRAWING MUST ALSO BE INCORPORATED ON THE CORRESPONDING DRAWING WHERE CHANGES AFFECT HIGHLIGHTED FLOW AND BOUNDARY ISOLATION PATHS SHOWN ON THE CORRESPONDING DRAWING.

CAROLINA POWER & LIGHT CO.
 H. B. ROBINSON S.E. PLANT
 UNIT - No. 2
REACTOR COOLANT SYSTEM - FLOW DIAGRAM
 SHEET 2 OF 2

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30X

REACTOR COOLANT PUMP "A"
 REACTOR COOLANT PUMP "B"
 REACTOR COOLANT PUMP "C"



- NOTES:**
1. MATERIAL SPEC PIPE AND FITTINGS ALL CARBON STEEL
 2. MATERIAL SPEC PIPE AND FITTINGS ALL STAINLESS STEEL
 3. PIPING IS LABELED WITHOUT REFERENCE TO MATERIAL SPECIFICATION IF THE EXACT ASTM SPEC COULD NOT BE DETERMINED AT THE TIME OF THE VERIFICATION WALKDOWN.
 4. FOR GLAND STEAM LEAKOFF CONTINUATION: SEE DWG HBR2-8680.
 5. FOR ELECTRO-HYDRAULIC HIGH PRESSURE OIL CONNECTIONS SEE DWG HBR2-8699.
 6. THIS INTERLOCKS WITH AUX. FW PUMP DISCHARGE SEE DWG G-190197 SH. 4(D-3).
 7. MATERIAL SPEC. PIPE AND FITTINGS ALL CHROMIUM MOLYBDENUM
 8. VALVES MS-VI-BA, B, C HAVE A 1/2" HOLE IN THE STEAM GENERATOR SIDE DISC FOR PRESSURE RELIEF.
 9. PARTIAL MTL CHANGE CS AND LOW ALLOY STEEL.
 10. PARTIAL MTL CHANGE CS AND STAINLESS STEEL.
 11. PARTIAL MTL CHANGE LOW ALLOY AND STAINLESS STEEL.
 12. GP-5 COULD ALIGN THIS VALVE DIFFERENTLY BASED ON POWER LEVEL (ESR 96-002B1).

- REFERENCE DRAWINGS**
- FLOW DIAGRAM LEGEND & SYMBOLS HBR2-7063
 - FLOW DIAGRAM SYMBOLS E. SPEC. G-675176
 - INSTRUMENTATION SCHEMATICS A-190301
 - REACTOR CONT. BLDG. PIPING B-190178
 - PENETRATIONS B-190178
 - GLAND STM SYS. FLOW DIAGRAM HBR2-8680
 - ELECTRO-HYDRAULIC HIGH PRESS. OIL SYS. FLOW DIAGRAM HBR2-8699
 - INSTRUMENT & STATION AIR SYSTEM G-190200
 - FEEDWATER, CONDENSATE & AIR EVACUATION SYSTEM G-190197
 - FLOW ACCELERATED CORROSION ISO HBR2-11517

CHANGES TO THIS DRAWING MUST ALSO BE INCORPORATED ON THE CORRESPONDING DRAWING WHERE CHANGES AFFECT HIGHLIGHTED FLOW AND BOUNDARY ISOLATION PATHS SHOWN ON THE CORRESPONDING DRAWING:
HBR2-11390 SH. 13

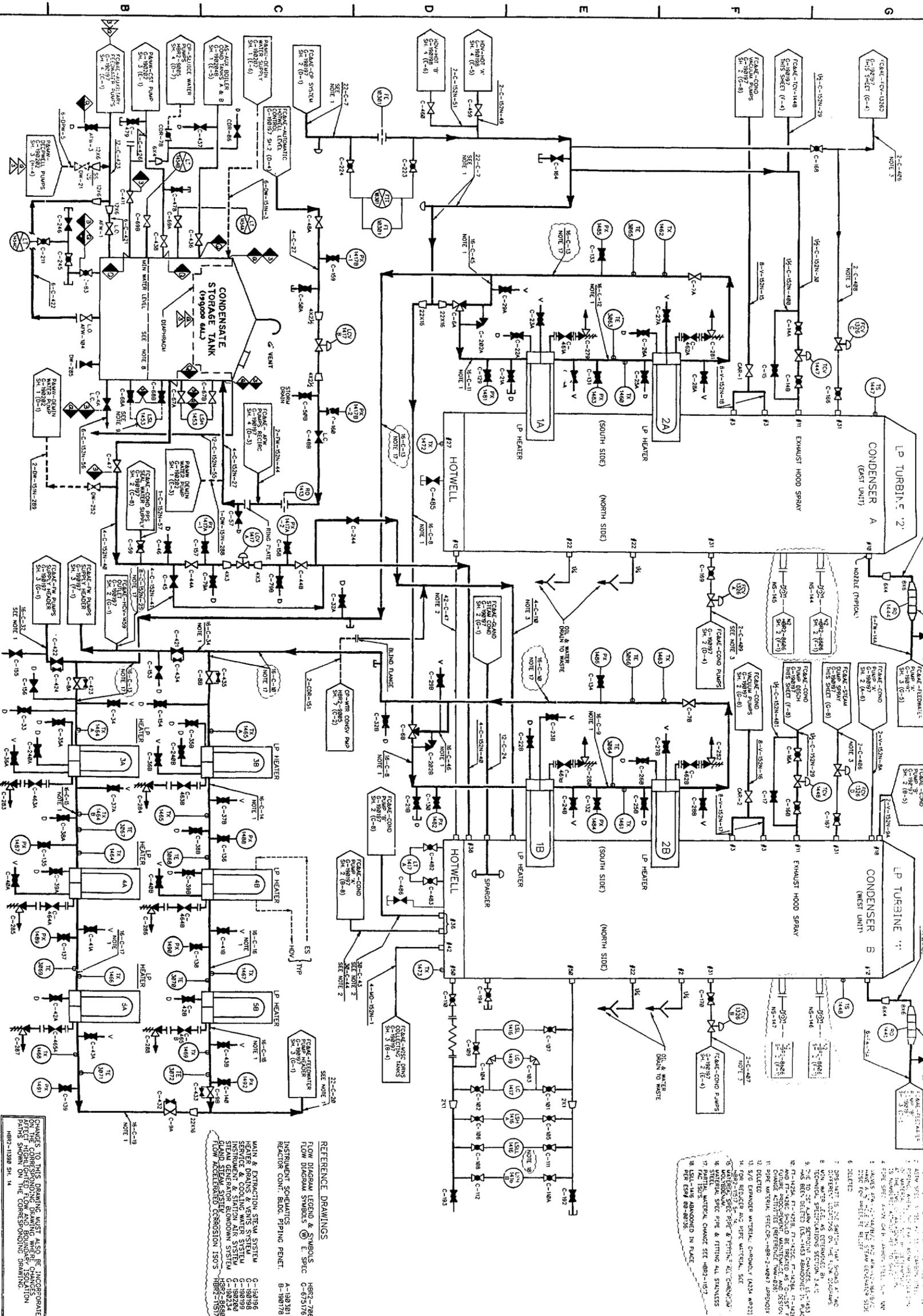
NO.	DATE	BY	CHKD	APPD	DESCRIPTION
1	01/15/83	J. WALTERS	J. WALTERS	J. WALTERS	ISSUED FOR CONSTRUCTION
2	02/10/83	J. WALTERS	J. WALTERS	J. WALTERS	REVISED FOR INSTRUMENTATION
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4	04/20/83	J. WALTERS	J. WALTERS	J. WALTERS	REVISED FOR VALVE SIZES
5	05/10/83	J. WALTERS	J. WALTERS	J. WALTERS	REVISED FOR PUMP CAPACITIES
6	06/05/83	J. WALTERS	J. WALTERS	J. WALTERS	REVISED FOR TANK VOLUMES
7	07/15/83	J. WALTERS	J. WALTERS	J. WALTERS	REVISED FOR PIPE SIZES
8	08/10/83	J. WALTERS	J. WALTERS	J. WALTERS	REVISED FOR INSTRUMENTATION
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12	12/05/83	J. WALTERS	J. WALTERS	J. WALTERS	REVISED FOR TANK VOLUMES
13	01/15/84	J. WALTERS	J. WALTERS	J. WALTERS	REVISED FOR PIPE SIZES
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24	12/05/84	J. WALTERS	J. WALTERS	J. WALTERS	REVISED FOR TANK VOLUMES
25	01/15/85	J. WALTERS	J. WALTERS	J. WALTERS	REVISED FOR PIPE SIZES
26	02/10/85	J. WALTERS	J. WALTERS	J. WALTERS	REVISED FOR INSTRUMENTATION
27	03/15/85	J. WALTERS	J. WALTERS	J. WALTERS	REVISED FOR VALVE SIZES
28	04/20/85	J. WALTERS	J. WALTERS	J. WALTERS	REVISED FOR MATERIAL SPECIFICATIONS
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36	12/05/85	J. WALTERS	J. WALTERS	J. WALTERS	REVISED FOR TANK VOLUMES
37	01/15/86	J. WALTERS	J. WALTERS	J. WALTERS	REVISED FOR PIPE SIZES
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48	12/05/86	J. WALTERS	J. WALTERS	J. WALTERS	REVISED FOR TANK VOLUMES
49	01/15/87	J. WALTERS	J. WALTERS	J. WALTERS	REVISED FOR PIPE SIZES
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85	01/15/90	J. WALTERS	J. WALTERS	J. WALTERS	REVISED FOR PIPE SIZES
86	02/10/90	J. WALTERS	J. WALTERS	J. WALTERS	REVISED FOR INSTRUMENTATION
87	03/15/90	J. WALTERS	J. WALTERS	J. WALTERS	REVISED FOR VALVE SIZES
88	04/20/90	J. WALTERS	J. WALTERS	J. WALTERS	REVISED FOR MATERIAL SPECIFICATIONS
89	05/10/90	J. WALTERS	J. WALTERS	J. WALTERS	REVISED FOR PUMP CAPACITIES
90	06/05/90	J. WALTERS	J. WALTERS	J. WALTERS	REVISED FOR TANK VOLUMES
91	07/15/90	J. WALTERS	J. WALTERS	J. WALTERS	REVISED FOR PIPE SIZES
92	08/10/90	J. WALTERS	J. WALTERS	J. WALTERS	REVISED FOR INSTRUMENTATION
93	09/05/90	J. WALTERS	J. WALTERS	J. WALTERS	REVISED FOR VALVE SIZES
94	10/15/90	J. WALTERS	J. WALTERS	J. WALTERS	REVISED FOR MATERIAL SPECIFICATIONS
95	11/10/90	J. WALTERS	J. WALTERS	J. WALTERS	REVISED FOR PUMP CAPACITIES
96	12/05/90	J. WALTERS	J. WALTERS	J. WALTERS	REVISED FOR TANK VOLUMES
97	01/15/91	J. WALTERS	J. WALTERS	J. WALTERS	REVISED FOR PIPE SIZES
98	02/10/91	J. WALTERS	J. WALTERS	J. WALTERS	REVISED FOR INSTRUMENTATION
99	03/15/91	J. WALTERS	J. WALTERS	J. WALTERS	REVISED FOR VALVE SIZES
100	04/20/91	J. WALTERS	J. WALTERS	J. WALTERS	REVISED FOR MATERIAL SPECIFICATIONS

DWG: T. LANTON
 CHK: M. JOHNSON
 DES: M. JOHNSON
 APPR: M. JOHNSON
 DATE: 11/10/87

CAROLINA POWER & LIGHT CO.
 H.B. ROBINSON S.S. PLANT
 UNIT - B. T. HAYTER, S.C.

MAIN & EXTRACTION STEAM SYSTEM FLOW DIAGRAM

VENDOR NO. 1512
 DRAWING NO. G-190196
 SHEET 1 OF 4



NO.	DATE	BY	CHK'D	APP'R	DESCRIPTION
46	91-12-1	WALTERS	WALTERS	WALTERS	REVISED FOR FEEDWATER PUMP
47	92-1-12	WALTERS	WALTERS	WALTERS	REVISED FOR CONDENSATE PUMP
48	92-1-12	WALTERS	WALTERS	WALTERS	REVISED FOR EXHAUST HOOD SPRAY
49	92-1-12	WALTERS	WALTERS	WALTERS	REVISED FOR HOTWELL
50	92-1-12	WALTERS	WALTERS	WALTERS	REVISED FOR CONDENSATE STORAGE TANK
51	92-1-12	WALTERS	WALTERS	WALTERS	REVISED FOR FEEDWATER HEATER
52	92-1-12	WALTERS	WALTERS	WALTERS	REVISED FOR EXHAUST HOOD SPRAY
53	92-1-12	WALTERS	WALTERS	WALTERS	REVISED FOR HOTWELL
54	92-1-12	WALTERS	WALTERS	WALTERS	REVISED FOR CONDENSATE STORAGE TANK
55	92-1-12	WALTERS	WALTERS	WALTERS	REVISED FOR FEEDWATER HEATER
56	92-1-12	WALTERS	WALTERS	WALTERS	REVISED FOR EXHAUST HOOD SPRAY
57	92-1-12	WALTERS	WALTERS	WALTERS	REVISED FOR HOTWELL
58	92-1-12	WALTERS	WALTERS	WALTERS	REVISED FOR CONDENSATE STORAGE TANK
59	92-1-12	WALTERS	WALTERS	WALTERS	REVISED FOR FEEDWATER HEATER
60	92-1-12	WALTERS	WALTERS	WALTERS	REVISED FOR EXHAUST HOOD SPRAY
61	92-1-12	WALTERS	WALTERS	WALTERS	REVISED FOR HOTWELL
62	92-1-12	WALTERS	WALTERS	WALTERS	REVISED FOR CONDENSATE STORAGE TANK
63	92-1-12	WALTERS	WALTERS	WALTERS	REVISED FOR FEEDWATER HEATER
64	92-1-12	WALTERS	WALTERS	WALTERS	REVISED FOR EXHAUST HOOD SPRAY
65	92-1-12	WALTERS	WALTERS	WALTERS	REVISED FOR HOTWELL
66	92-1-12	WALTERS	WALTERS	WALTERS	REVISED FOR CONDENSATE STORAGE TANK
67	92-1-12	WALTERS	WALTERS	WALTERS	REVISED FOR FEEDWATER HEATER
68	92-1-12	WALTERS	WALTERS	WALTERS	REVISED FOR EXHAUST HOOD SPRAY
69	92-1-12	WALTERS	WALTERS	WALTERS	REVISED FOR HOTWELL
70	92-1-12	WALTERS	WALTERS	WALTERS	REVISED FOR CONDENSATE STORAGE TANK
71	92-1-12	WALTERS	WALTERS	WALTERS	REVISED FOR FEEDWATER HEATER
72	92-1-12	WALTERS	WALTERS	WALTERS	REVISED FOR EXHAUST HOOD SPRAY
73	92-1-12	WALTERS	WALTERS	WALTERS	REVISED FOR HOTWELL
74	92-1-12	WALTERS	WALTERS	WALTERS	REVISED FOR CONDENSATE STORAGE TANK
75	92-1-12	WALTERS	WALTERS	WALTERS	REVISED FOR FEEDWATER HEATER
76	92-1-12	WALTERS	WALTERS	WALTERS	REVISED FOR EXHAUST HOOD SPRAY
77	92-1-12	WALTERS	WALTERS	WALTERS	REVISED FOR HOTWELL
78	92-1-12	WALTERS	WALTERS	WALTERS	REVISED FOR CONDENSATE STORAGE TANK
79	92-1-12	WALTERS	WALTERS	WALTERS	REVISED FOR FEEDWATER HEATER
80	92-1-12	WALTERS	WALTERS	WALTERS	REVISED FOR EXHAUST HOOD SPRAY

REVISIONS

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REFERENCE DRAWINGS

HBR-2-7863
 G-675178
 A-192978
 B-192978

CHANGES TO THIS DRAWING MUST ALSO BE INCORPORATED INTO THE FOLLOWING DRAWINGS:

HBR-1398 SH. 14

FEEDWATER, CONDENSATE & AIR EVACUATION SYSTEM FLOW DIAGRAM

SCALE: AS SHOWN

DATE: 9/27/97

SHEET 1 OF 2