Florida Power & Light, 9760 S.W. 344 ST. Florida City, FL 33034

FPL

MAY 1 1 2011
L-2011-141
10 CFR 50.90

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D. C. 20555-0001

Re: Turkey Point Units 3 and 4
Docket Nos. 50-250 and 50-251
Response to NRC Request for Additional Information Regarding
Extended Power Uprate License Amendment Request No. 205 and
Reactor Systems Issues

References:

(1) M. Kiley (FPL) to U.S. Nuclear Regulatory Commission (L-2010-113), "License Amendment Request No. 205: Extended Power Uprate (EPU)," (TAC Nos. ME4907 and ME4908), Accession No. ML103560169, October 21, 2010.

(2) Email from J. Paige (NRC) to T. Abbatiello (FPL), "Turkey Point EPU – Reactor Systems (SRXB) Request for Additional Information – Round 2", Accession No. ML111010080, April 11, 2011.

By letter L-2010-113 dated October 21, 2010 [Reference 1], Florida Power and Light Company (FPL) requested to amend Renewed Facility Operating Licenses DPR-31 and DPR-41 and revise the Turkey Point Units 3 and 4 Technical Specifications (TS). The proposed amendment will increase each unit's licensed core power level from 2300 megawatts thermal (MWt) to 2644 MWt and revise the Renewed Facility Operating Licenses and TS to support operation at this increased core thermal power level. This represents an approximate increase of 15% and is therefore considered an extended power uprate (EPU).

On March 31, 2011, a public meeting was held with the U.S. Nuclear Regulatory Commission (NRC) Project Manager (PM), applicable NRC technical reviewers, and FPL representatives to discuss proposed NRC requests for information (RAI) related to the EPU License Amendment Request (LAR). During the meeting, fourteen (14) RAI questions from the Reactor Systems Branch (SRXB) were presented. On April 11, 2011, FPL received an email from the NRC PM containing the final RAI [Reference 2]. The RAI consisted of ten (10) of the questions previously discussed in the above public meeting. The RAI questions and applicable FPL responses are documented in the Attachment to this letter.

In accordance with 10 CFR 50.91(b)(1), a copy of this letter is being forwarded to the State Designee of Florida.

This submittal does not alter the significant hazards consideration or environmental assessment previously submitted by FPL letter L-2010-113 [Reference 1].

This submittal contains no new commitments and no revisions to existing commitments.

Should you have any questions regarding this submittal, please contact Mr. Robert J. Tomonto, Licensing Manager, at (305) 246-7327.

A001
NRR

I declare under penalty of perjury that the foregoing is true and correct.

Executed on May 11, 2011.

Very truly yours,

R.V. [illegible] for M. Kiley

Michael Kiley
Site Vice President
Turkey Point Nuclear Plant

Attachment

cc: USNRC Regional Administrator, Region II
USNRC Project Manager, Turkey Point Nuclear Plant
USNRC Resident Inspector, Turkey Point Nuclear Plant
Mr. W. A. Passetti, Florida Department of Health

Turkey Point Units 3 and 4

RESPONSE TO NRC RAI REGARDING EPU LAR NO. 205
AND SRXB REACTOR SYSTEMS ISSUES

ATTACHMENT

Response to Request for Additional Information

The following information is provided by Florida Power and Light Company (FPL) in response to the U. S. Nuclear Regulatory Commission's (NRC) Request for Additional Information (RAI). This information was requested to support License Amendment Request (LAR) 205, Extended Power Uprate (EPU), for Turkey Point Nuclear Plant (PTN) Units 3 and 4 that was submitted to the NRC by FPL via letter (L-2010-113) dated October 21, 2010 [Reference 1].

On March 31, 2011, a public meeting was held with the U.S. Nuclear Regulatory Commission (NRC) Project Manager (PM), applicable NRC technical reviewers, and FPL representatives to discuss proposed NRC requests for information (RAI) related to the EPU License Amendment Request (LAR). During the meeting, fourteen (14) RAI questions from the Reactor Systems Branch (SRXB) were presented. On April 11, 2011, FPL received an email from the NRC PM containing the final RAI with ten (10) of the questions previously discussed in the public meeting [Reference 2]. The ten RAI questions involve specific piping design configurations, reactor fluence calculations, RCS temperature distributions and cooldown times, heat exchanger fouling factors, RHR system capability, natural circulation characteristics, and core outlet temperature monitoring. These ten RAI questions and the applicable FPL responses are documented below.

SRXB-2.1 **Provide plant piping configuration drawings that include scale three dimensional (3D) drawings or isometrics with dimensional information and piping and instrumentation diagrams (P&IDs) that describe the feedwater piping associated with the CheckPlus installation. Scaled 3D drawings comparable to Figures 1 and 2 in ER-748 Revision 1 that illustrate the Alden Laboratory test configurations are preferred in place of isometrics that cover the plant piping configuration comparable to the Alden Laboratory figures but the overall response to this RAI is for configuration information that describes piping, valves, flow straighteners (if any), feedwater flow meters, and any other components from the feedwater pumps to at least 10 pipe diameters downstream of each feedwater flow meter.**

The following Unit 3 and 4 P&ID and Isometric drawings are provided for the piping associated with the LEFM CheckPlus installations. These drawings are actually portions of engineering modifications which are ongoing, but reflect the expected configuration information requested. This ongoing work, in some cases, results in more than one version of the same drawing due to different modification packages affecting the same piping runs. For Unit 3, dimensions for the LEFM spool pieces do not exactly match the dimensions shown in Cameron's ER-748 Rev. 1 or Alden Laboratory Test Report No. 2009-100-C1229, Rev. 0. The spool pieces were moved slightly downstream, but within the specified manufacturer's tolerances, due to installation interferences. For Unit 4, the installation matches the dimensions shown in Cameron's ER-752 Rev. 1 and Alden Laboratory Test Report No. 2009-101-C1229, Rev. 1. These vendor diagrams were provided in Attachment 8 of the EPU LAR No. 205 submittal package.

<u>Unit 3</u>:	<u>Unit 4</u>:
P&ID 5613-M-3074 Sheets 1, 2, 3	P&ID 5614-M-3074 Sheets 1, 2, 3
Isometric 5613-P-817-S Sheets 1, 2, 3	Isometric 5614-P-770-S Sheets 1, 2, 3, 4

See attached figures for a full set of these Unit 3 and Unit 4 drawings.

SRXB-2.2 Section 2.8.4.3 discusses reactor vessel neutron fluence calculations performed to support the pressure and temperature limits and cold over-pressure mitigation system setpoint confirmation. Describe how the fluence calculations account for uprated core operation.

In determining the projected fast neutron (E > 1.0 MeV) fluence for the reactor materials, a plant-specific calculation was performed for fuel cycles that have been completed, and fluence projections for future operation were generated based on an assumed mode of operation. Specifically, spatial power distributions and core power level for uprated core designs were used to determine the neutron exposure during future operation. The uprated core designs were based on expected fuel management strategies for the uprate (core power level, core loading, cycle length, core power distributions, loading patterns, etc.).

SRXB-2.3 Assumption 2 in Section 2.8.4.4.2.2 states that the reactor coolant system (RCS) is assumed to be at a uniform temperature during residual heat removal (RHR) system operation and that there are no "hot spots" that could cause an unexpected increase in the bulk RCS temperature. Discuss why the uniform temperature assumption was made. Justify this assumption with respect to the core, upper plenum, upper head, and the pressurizer for both RCPs running and not running. Include a discussion of the implications where RCS temperature is not uniform and equal to average RCS temperature in the hot legs. Include drain down of RCS inventory and emptying the pressurizer in this discussion.

The uniform temperature assumption identified in Licensing Report (LR) Section 2.8.4.4.2.2 is used for the RCS cooldown analyses. The cooldown analyses performed confirm the performance of the RHR system in cooling the plant for various plant shutdown evolutions under EPU conditions. The RCS is modeled as a lumped heat source with a conservative, single-valued heat capacity. This analytical approach has been used and refined over many years and the code results are consistent with actual plant cooldown performance from many reactor-years of PWR plant operation. The consistency of the analyses to actual plant performance has confirmed that individual heat loads associated with specific RCS components (e.g., core, upper plenum, upper head, or pressurizer) do not need to be differentiated in the cooldown model. The lumped RCS heat capacity provides an appropriate representation of the RCS latent heat load on the RHR system during cooldown. Thus, uniform temperature distribution in the RCS is assumed.

The cooldown analysis is intended to accurately characterize the cooldown capabilities of the plant under EPU conditions. It is not intended to address the discrete temperature profiles of the RCS components and piping during RHR system operation. Although the actual fluid temperatures vary throughout the RCS, forced circulation via a Reactor Coolant Pump (RCP) provides for adequate mixing and acts to reduce temperature differentials across the system.

The continued operation of a Reactor Coolant Pump (RCP) during the early stages of the RHR cooldown process improves effective mixing of the reactor coolant and thermal homogeneity within the primary system. With one RCP in operation, one RCS volume is recirculated in less than one minute. Since a typical cooldown rate is approximately 1°F/minute, a single RCP running assures a relatively constant RCS temperature throughout the system, including the upper plenum, and upper head regions. PTN's procedures require one RCP to remain running down to 180°F to provide added assurance of uniformity of RCS temperature. For cooldown scenarios in which the RCPs are not available (such as Loss of Offsite Power), the operation of the RHR pumps provides for mixing capability. The RHR cooldown analysis commences in Mode 3 (350°F) when the RHR system is aligned to the RCS and continues to Mode 5 (200°F) or Mode 6 (140°F), depending on the case being analyzed.

In these cooldown scenarios, pressurizer level is procedurally maintained and the pressurizer is not drained. This is conservative since it maximizes the water mass and, therefore, the RCS heat capacity. The cooldown analyses also model core decay heat and an appropriate value of RCP heat input, consistent with the RCP normal operating procedures during plant cooldown, in which the last operating RCP is secured below 180°F.

SRXB-2.4 **Section 2.8.4.4.2.3 identifies a higher heat load that often extends cooldown time, yet, in the case of normal cooldown, time is 28 hours versus the lower heat load cooldown time of 30 hours. Explain since the expectation is that an increased heat generation rate would result in a longer cooldown time. The potential concern is that the analysis methodology used for normal cooldown may be applicable to other conditions and an understanding is necessary to assess predicted plant behavior for other conditions.**

LR Section 2.8.4.4 states that, in addition to the increased initial core power level, the updated analysis for the EPU also includes other system and component design input changes, all of which affect the cooldown results. These additional changes include seasonally adjusted best-estimate values of the maximum Intake Cooling Water (ICW) system supply temperature and auxiliary plant heat loads that more accurately reflect the actual operation of the plant. The analysis assumes that the maximum ICW temperature (which occurs in the summer) does not occur concurrently with the maximum auxiliary heat load (which is from the spent fuel pool). Note that PTN refueling outages normally occur in the spring or fall. See Table 1 below. The previous cooldown analysis did not consider these refinements in the analysis inputs. Hence, despite the increased core decay heat rate, these additional changes in the cooldown analysis input parameters for the EPU resulted in a net reduction in the reported cooldown time for the worst case normal two-train plant cooldown (EPU Case A in Table 1) when compared to the results of comparable case in previous analysis.

TABLE 1 Turkey Point EPU RAI SRXB-2.4 Normal Two-Train Plant Cooldown**			
Cooldown Analysis Input Parameters and Results	**Reactor Power Rating**		
	Current Power 2346 MWt	**Extended Power Uprate 2644 MWt**	
		Case A	**Case B**
Maximum ICW Temp. (°F)	95	92	97
Auxiliary Heat Load (MBtu/hr)	26.0	26.85	21.87
RHR Cut-in Time (Hrs. after Shutdown)	7.5	7.5	7.0
Time to Cooldown to 200°F (Hrs. after Shutdown)	30.0	28.2	26.8

**2 RHR pumps, 2 RHR HXs, 2 CCW pumps, 3 CCW HXs, 2 ICW pumps, & 1 RCP

Under the most restrictive operating parameters and in the unlikely scenario that a plant cooldown is initiated with less than all of the cooling equipment available, RCS cooldown would continue to be possible, albeit at a much slower rate. The potential for cooldown times in excess of 36 hours under certain conditions is currently being evaluated under the Turkey Point corrective action program. This performance is consistent with the current licensing basis of the plant.

SRXB-2.5 **Sections 2.8.4.4.2.3 and 2.8.4.4.2.5 state that there are no safety-related design criteria for normal plant cooldown times and, therefore, the calculated cooldown times are acceptable. Yet Section 2.8.4.4.2.5 also states a Technical Specification (TS) time limit for achieving cold shutdown of 6 + 30 = 36 hours after reactor shutdown and states that the 28 hours applies. Explain the rationale for concluding that calculated cooldown times are acceptable since there are stated to be no safety-related design criteria in contrast to using these results for meeting TS and other cooldown criteria.**

The current licensing basis for Chapter 14 events for Turkey Point defines safe shutdown as hot standby. Thus, cooldown to cold shutdown is not addressed for these events. Cold shutdown is addressed for Appendix R. Accordingly, various cooldown scenarios were addressed in the EPU LAR, two of which are considered quality-related analyses consistent with FPL Quality Assurance Topical Report (QATR) requirements: normal plant TS cooldown to cold shutdown within 36 hours and an Appendix R cooldown to cold shutdown within 72 hours.

The Appendix R cooldown is discussed in LR Section 2.5.1.4, Fire Protection. As stated in LR Section 2.5.1.4, the cooldown analysis performed for the Appendix R cooldown demonstrates that cooldown to cold shutdown would be accomplished within 63.5 hours, meeting the 72 hour acceptance criteria. The normal plant TS cooldown, as indicated in FPL responses to SRXB-2.3 and 2.4, assumes availability of two trains, i.e., the normal two-train plant cooldown presented in Table 1 above.

The designs of the CCW and RHR systems in the Turkey Point plant contain redundant pumps and heat exchangers arranged in parallel cooling trains for system reliability and maintainability. Under the most restrictive operating parameters and in the unlikely scenario that a plant cooldown is initiated with less than all of the cooling equipment available, RCS cooldown would continue to be possible, albeit at a much slower rate. The potential for cooldown times in excess of 36 hours under certain conditions is currently being evaluated under the Turkey Point corrective action program. This performance is consistent with the current licensing basis of the plant.

SRXB-2.6 There appears to be no information that addresses the effect of the EPU on heat exchanger fouling factors. Address the behavior of heat exchanger fouling factors due to the higher heat load, longer cooldown times, and greater differential temperatures.

Heat exchanger fouling factors typically are a function of water chemistry and cleanliness, which will not change due to the EPU conditions. The fouling factors are not affected by heat load, cooldown times, or differential temperatures, based on the following considerations. The analysis assumes that during normal plant cooldown using the RHR System, the flow rate of reactor coolant through the RHR heat exchanger is throttled as needed to meet two operating limitations: (a) a maximum RCS cooldown rate of 50°F per hour, and (b) a maximum CCW supply temperature of 125°F. This throttling of the RHR flow rate typically is required early in the cooldown transient when favorable heat exchanger conditions exist (i.e., high heat exchanger ΔT). These same limitations were considered in the previous cooldown analysis for the current power rating of the Turkey Point plant. As a result of the similar throttling of the RHR flow rate that is assumed to occur early in the cooldown transient for both the current and uprated power ratings, the maximum heat loads and differential temperatures for the RHR and CCW heat exchangers are unaffected by the power uprate and there is no effect on heat exchanger fouling factors.

LR Section 2.8.4.4 states that the CCW and RHR heat exchanger heat transfer rates (U and UA values) assume fouling factors that are consistent with the maintenance program for these heat exchangers. These maintenance programs contain surveillance and cleaning procedures that ensure the continued design basis heat transfer performance for these heat exchangers. In addition, PTN Technical Specification Action 4.7.2 requires that it be verified at least once every 12 hours that two CCW heat exchangers and one CCW pump can remove design basis heat loads. Hence, due to the rigorous heat exchanger maintenance program in effect at PTN, the marginally longer plant cooldown times associated with the EPU conditions are not expected to have a significant effect on the heat exchanger fouling factors.

SRXB-2.7 The end of Section 2.8.4.4.2.3 states "The EPU has no effect on the ability of the RHR system to remove residual heat at reduced reactor coolant system inventory, and therefore the PTN (Turkey Point Nuclear Power Plant) will continue to meet the current licensing basis requirements with respect to NRC Generic Letter 88-17." Justify this conclusion in light of the increased

decay heat generation rate that must be removed after shutdown. Include the effect on temperature, RHR flow rate including any limitations on flow rate as a function of RCS water level, and potential hot leg vortexing in your justification.

The core decay heat level associated with the EPU conditions will initially be greater due to the higher core power. The early stages of plant cooldown using the RHR system will be performed with the normal RCS water inventory (i.e., main coolant loops filled). However, within a period of less than two days, when the RCS water level could be reduced for plant inspection and maintenance, the decay heat generation rate will be less than one percent of the full power heat load and, therefore, not significantly different than that associated with the current licensed power level of the Turkey Point plant at two days after shutdown. Thus, the RHR flow rate required to remove decay heat at that time will also not differ significantly and will remain within current PTN procedure and Technical Specification limits.

GL 88-17 required utilities operating PWRs to implement improved analyses, procedures and equipment designs that are intended to avoid perturbations on the RCS and supporting systems while in a reduced inventory situation. PTN responded to GL 88-17 with programmatic features that ensure that the RCS will be maintained in a stable and controlled condition during reduced inventory operation. Specifically regarding reduced inventory operation, the design flow rate and operating temperature of the RHR system that will exist during plant cooldown and the level of coolant that is maintained in the main RCS loop piping during reduced inventory conditions in response to GL 88-17 are unchanged under EPU conditions. Other system parameters that are relevant to vortex formation in the RHR suction line (i.e., pipe diameter, water level and fluid flow rate and velocity) also are unchanged as a result of the EPU.

There has been no change to the licensing basis of the plant for reduced inventory operation as a result of the EPU. PTN Technical Specification 3/4.9.8.2 remains applicable to refueling operations with low water level under EPU conditions. Therefore, it has been concluded that the EPU has no effect on the ability of the RHR system to remove residual heat at reduced reactor coolant system inventory, and PTN will continue to meet the current licensing basis requirements with respect to NRC Generic Letter 88-17.

SRXB-2.8 **Section 2.8.7.2 states that a minimum subcooling margin of 50°F is maintained during natural circulation cooldown until RCS temperature is below 350°F. What temperature sensors are used to determine RCS temperature and where are they located within the RCS? If hot leg temperatures are used, address the distribution of temperature that is expected in the hot legs. What is used to determine maximum upper head temperature during natural circulation cooldown? Compare the upper head temperatures predicted to exist during natural circulation cooldown for the existing power level and the proposed power level. Include saturation temperature at the uppermost upper head elevation in the comparison.**

As directed by Turkey Point's Emergency Operations Procedures (EOPs), subcooled margin during a natural circulation cooldown is monitored using the Core Exit Thermocouples (CETs). The CETs are terminated in the upper support column where they provide the most direct indication of upper head fluid temperature.

For purposes of a natural circulation cooldown the primary concern with respect to upper head temperature is to ensure voiding does not occur in the upper head region due to temperature differences that could potentially develop if the upper head is cooled at a significantly slower rate than the RCS. After the St. Lucie cooldown event that resulted in the formation of a steam bubble in the upper head region and in support of responses to NRC Generic Letter (GL) 81-21, the Westinghouse Owners Group (WOG) performed analyses of the natural circulation cooldown capability for Westinghouse 2, 3, and 4 loop plants to prevent void formation in the upper head. The results of these analyses classified plants into two categories with cooldown rate limits to prevent head voiding based on classification type. These cooldown rates were incorporated into the WOG Emergency Response Guidelines (ERGs) which provides the guidance for creating plant specific EOPs.

To ensure the temperature of the upper head does not significantly deviate from the RCS, the RCS cooldown rate is limited to 25°F/hr by the EOPs for natural circulation cooldown. This 25°F/hr cooldown rate is the rate recommended for a T_{hot} plant as classified by the ERGs to prevent head voiding caused by significant deviations between the cooldown rates of the upper head and RCS. For both the current power and proposed power levels, the RCS cooldown rate remains limited to 25°F/hr.

Additionally, during a natural circulation cooldown one of the primary means of heat removal from the upper head and associated fluid is through the use of Control Rod Drive Mechanism (CRDM) cooling fans. For the proposed increased power level, the heat removal ability of the CRDM fans is unaffected and can adequately cool the upper head as shown in LR Section 2.8.4.1.2. Therefore, the upper head cooldown rate at the current power level and the proposed power level is the same. Therefore, both head cooldown rate and RCS cooldown rate remains unchanged due to the proposed increase in power.

SRXB-2.9 Provide representative RCS natural circulation temperatures that have been observed during operation of the Turkey Point plant and compare these to selected natural circulation temperatures provided in Section 2.8.7.2.2.3.

Since the PTN stretch power uprate in 1996, there have been multiple unit trips including a dual unit trip on 2/26/2008 but no cases of a natural recirculation cool down from full power to RHR system entry conditions (350°F). There was only one case of a partial natural circulation cooldown which occurred on 10/31/2005 while Unit 4 was in Mode 3 at 400°F to the RHR system entry conditions. This cooldown event took place over six hours or more and was punctuated by a variable cooldown rates such that actual plant performance data is would not be representative of data provided in LR Section 2.8.7.2.2.3.

SRXB-2.10 Is the Table 2.8.7.2-1 620.8°F core outlet temperature an average value or the peak value located immediately above the hottest region of the core?

The core outlet temperature of 620.8°F is the average temperature of the water directly exiting the core. After this water gets mixed with the flow which bypasses the core, the temperature of the water which enters the hot leg is reduced. The maximum average hot leg temperature established for EPU conditions is 616.8°F. This is provided in LR Table 1.1-2.

References

1. M. Kiley (FPL) to U.S. Nuclear Regulatory Commission (L-2010-113), "License Amendment Request No. 205: Extended Power Uprate (EPU)," (TAC Nos. ME4907 and ME4908), Accession No. ML103560169, October 21, 2010.
2. Email from J. Paige (NRC) to T. Abbatiello (FPL), "Turkey Point EPU – Reactor Systems (SRXB) Request for Additional Information - Round 2," Accession No. ML111010080, April 11, 2011.

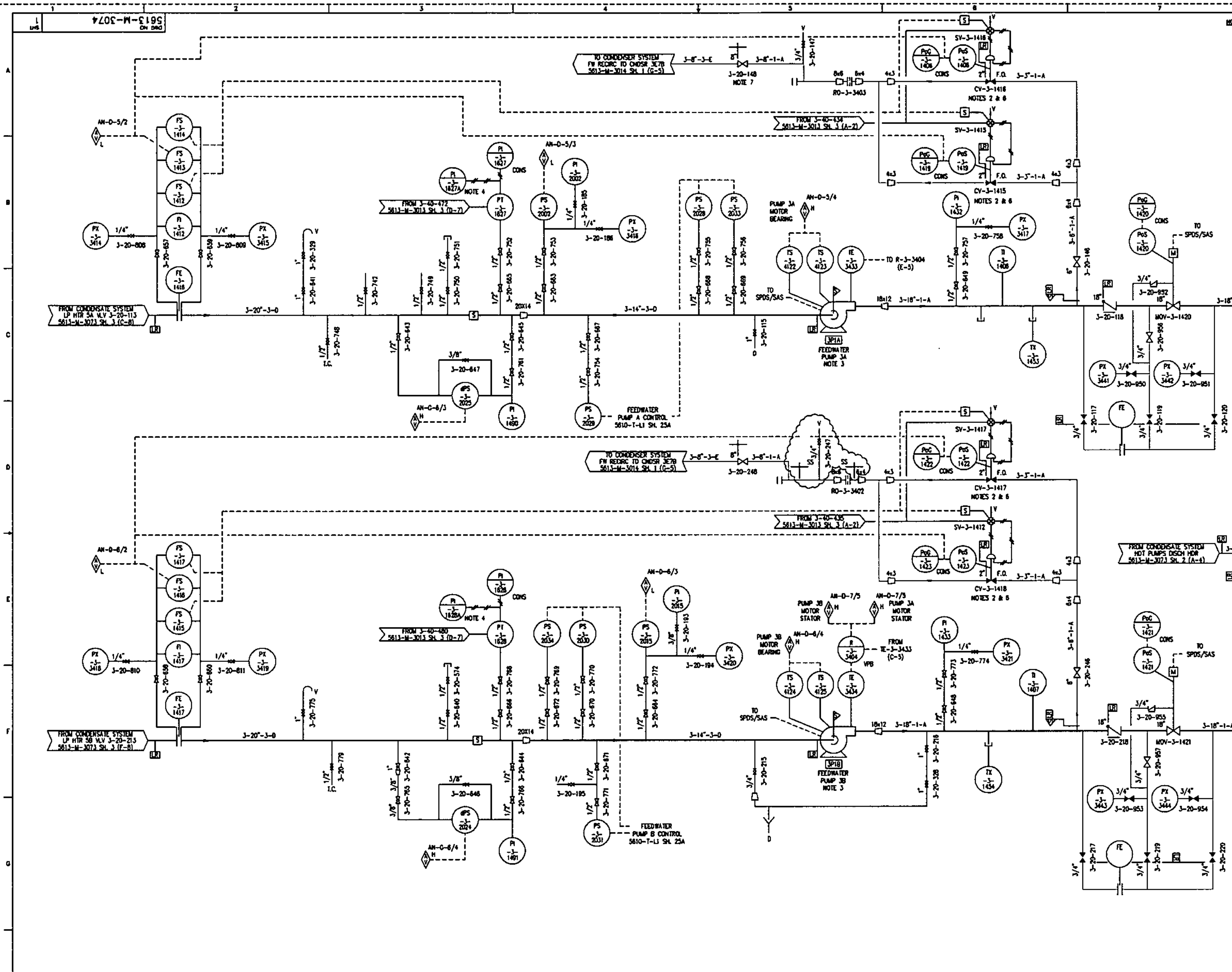
Drawings

<u>Unit 3 P&IDs (PC/M #s)</u>
5613-M-3074 SH 1
5613-M-3074 SH 2 (PC/M 09-015)
5613-M-3074 SH 3

<u>Unit 3 Isometrics (PC/M #s)</u>
5613-P-817-S SH 1 (PC/M 09-015)
5613-P-817-S SH 2 (PC/M 09-015)
5613-P-817-S SH 3 (PC/M 08-078)

<u>Unit 4 P&IDs (PC/M #s)</u>
5614-M-3074 SH 1
5614-M-3074 SH 2 (PC/M 09-019)
5614-M-3074 SH 3 (PC/M 08-093)

<u>Unit 4 Isometrics (PC/M #s)</u>
5614-P-770-S SH 1 (PC/M 08-093)
5614-P-770-S SH 2 (PC/M 08-093)
5614-P-770-S SH 3 (PC/M 08-093)
5614-P-770-S SH 4 (PC/M 09-019)



NOTES:

1. FOR GENERAL NOTES & LEGEND SEE DWG NO. 5610-M-3000 SH. 2.
2. CV-3-1415, CV-3-1416, CV-3-1417 AND CV-3-1418 ARE 2" VALVE BODIES WITH BUTT WELD ENDS FOR 3" SCHEDULE 160 PIPE.
3. FOR FEEDWATER PUMP SEAL WATER AND LUBE OIL SEE 5613-M-3074 SH. 2 DETAILS 1 & 2.
4. INDICATOR IS INTERNAL TO TRANSMITTER FOR TRANSMITTER TYPE KP13. FOR TYPE KP23 IT IS AS SHOWN.
5. UNLESS OTHERWISE NOTED, ALL BRANCH PIPING (VENTS, DRAINS, RELIEF VALVE CONNECTIONS AND INSTRUMENT TAPS) ON THIS DRAWING LESS THAN OR EQUAL TO 1 INCH NOMINAL PIPE SIZE IS OUTSIDE THE SCOPE OF LICENSE RENEWAL BASED ON HIGH ENERGY PIPE BREAK CRITERIA.
6. FAILS OPEN ON LOSS OF POWER BUT FAILS-AS-IS ON LOSS OF INSTRUMENT AIR. REQUIRES OPERATOR ACTION TO RECLOSE.
7. PORTIONS OF PIPE DOWNSTREAM OF VALVE 3-20-148 IS SCHEDULE 80. REF: CR 2007-27217.

REFERENCE DWGS:

5613-M-3074 SH. 2 & 3	FEEDWATER SYSTEM
5613-M-3014 SH. 1 & 2	CONDENSER SYSTEM
5613-M-3020 SH. 1	PRIMARY WATER MAKE-UP SYSTEM (CHEMICAL INJECT.)
5613-M-3041 SH. 1	REACTOR COOLANT SYSTEM
5613-M-3073 SH. 1, 2 & 3	CONDENSATE SYSTEM
5613-M-3075 SH. 2	AUXILIARY FEEDWATER SYSTEM AUXILIARY FEEDWATER PUMPS
5610-M-3075 SH. 1	FEEDWATER SYSTEM STANDBY S/G FEEDWATER PUMPS
5610-M-3076 SH. 1	TURBINE PLANT CHEMICAL ADDITION SYSTEM
5613-M-3078 SH. 1	STEAM GENERATOR WET LAYUP SYSTEM
5610-T-L1 SH. 14	FEEDWATER ISOLATION AND STEAM GENERATOR BLOWDOWN ISOLATION
5610-T-L1 SH. 25A	STEAM GENERATOR FEED PUMPS AND RELATED VALVES
5610-T-D-17 SH. 1	STEAM GENERATOR LEVEL CONTROL AND PROTECTION

POD

THIS DRAWING SUPERSEDES DRAWINGS: 5610-M-362 REV. 2

NOTE: THIS DWG IS MADE FROM: FPL POD 5610-T-E-4062 SH. 2 REV. 58

REV	DATE	REVISION	BY	CH	APP	APP
19	7-15-08	ISSUED AS-BUILT PER CRN M-12277 (PC/M 07-095).	RH	RY	PJV	PRB
18	10-2-07	ISSUED AS-BUILT PER PC/M 06-002 AND INCORP. CRN M-12115.	RH	BB	RSV	PRB
17	4-6-06	ISSUED AS-BUILT PER PC/M 04-163.	RH	JPG	TEB	RCS
16	3-31-06	ISSUED AS-BUILT FOR PC/M 05-109.	RY	BSC	PRB	JMM
15	3-21-06	ISSUED AS-BUILT PER PC/M 05-109 (PARTIAL).	RH	FK	JK	ASD
14	11-04-05	ISSUED AS-BUILT PER PC/M 04-163 (PARTIAL).	RH	RY	BP	TS

REV	DATE	REVISION	BY	CH	APP	APP
13	6-17-02	ISSUED AS-BUILT PER CRN-M-10465 (PC/M 00-016).	RH	RV	AGM	JSL
12	04-25-00	ISSUED AS-BUILT PER CRN-M-9993 (PC/M 99-061).	JPC	KM	—	JRH
21	3-16-10	ISSUED AS-BUILT PER CRN M-12853 (PC/M 09-106).	RH	RV	DW	PRB
20	4-9-09	ISSUED AS-BUILT PER PC/M 06-002 AND INCORP. CRN M-12115.	RH	AFG	SB	CM
0	5-14-91	THIS DWG CREATED PER THE P & ID RECONSTITUTION PROJECT SCOPE	SAM	MD	AM/RAS	LRB
—	—	AND ISSUED INTO THE FPL DWG SYSTEM PER DCR-TPM-91-137.	—	—	—	—

FPL

TURKEY POINT NUCLEAR UNIT 3

P & I D

FEEDWATER SYSTEM

STONE & WEBSTER ENGINEERING CORP.
FT. LAUDERDALE, FLORIDA

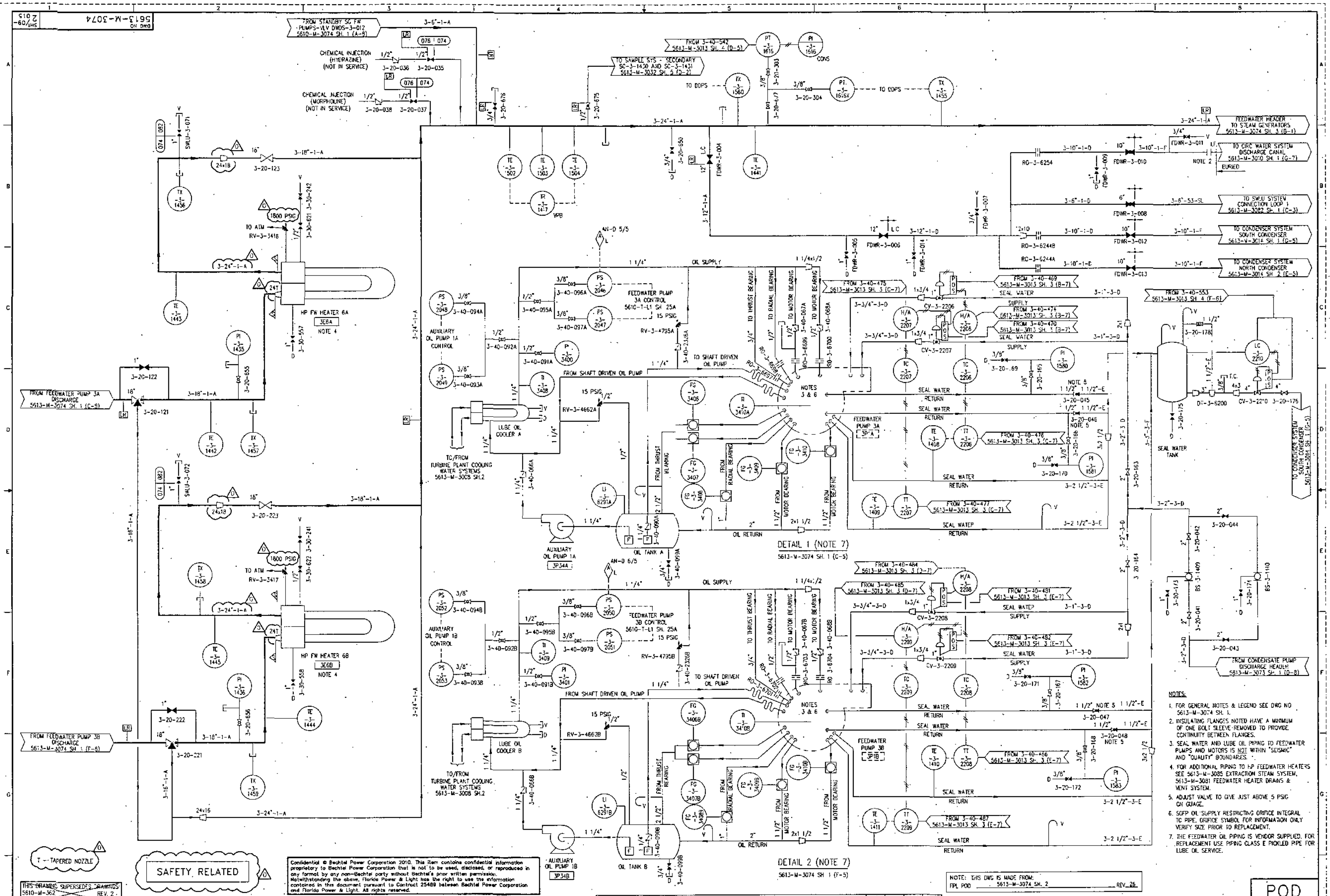
DRAWING NUMBER: 5613-M-3074

SYS: 074

REV: 21

SHEET 1

5613-M-3074_SH 1.DWG



NOTES:

1. FOR GENERAL NOTES & LEGEND SEE DWG NO 5613-M-3074 SH. 1.
2. INSULATING FLANGES NOTED HAVE A MINIMUM OF ONE BOLT SLEEVE REMOVED TO PROVIDE CONTINUITY BETWEEN FLANGES.
3. SEAL WATER AND LUBE OIL PIPING TO FEEDWATER PUMPS AND MOTORS IS NOT WITHIN "SEISMIC" AND "QUALITY" BOUNDARIES.
4. FOR ADDITIONAL PIPING TO HP FEEDWATER HEATERS SEE 5613-M-3085 EXTRACTION STEAM SYSTEM, 5613-M-3081 FEEDWATER HEATER DRAINS & VENT SYSTEM.
5. ADJUST VALVE TO GIVE JUST ABOVE 5 PSIG ON GUAGE.
6. SGFP OIL SUPPLY RESTRICTING ORIFICE INTEGRAL TO PIPE, ORIFICE SYMBOL FOR INFORMATION ONLY VERIFY SIZE PRIOR TO REPLACEMENT.
7. THE FEEDWATER OIL PIPING IS VENDOR SUPPLIED. FOR REPLACEMENT USE PIPING CLASS E PICKLED PIPE FOR LUBE OIL SERVICE.

T — TAPERED NOZZLE

SAFETY RELATED

~~THIS DRAWING SUPERSEDES DRAWINGS~~
~~5610-M-362 REV. 2~~
~~5610-M-1314 REV. 1~~

~~NOTE: THIS DWG IS MADE FROM~~
~~FPL POD 5610-M-4 SH. 1 REV. 40~~
~~FPL POD 5610-T-E-4061 SH. 2 REV. 46~~
~~FPL POD 5610-T-E-4062 SH. 2 REV. 58~~
~~FPL POD 5610-T-E-4063 SH. 1 REV. 34~~
~~FPL POD 5610-T-E-4063 SH. 2 REV. 35~~
~~FPL POD 5610-T-E-4064 SH. 1 REV. 32~~

NOTE: THIS DWG IS MADE FROM:
FPL POD 5613-M-3074 SH. 2 REV 26

REV	DATE	REVISION	BY	CH	APP	APP
19	2-3-99	ISSUED AS-BUILT PER CRN-M-9580 (PC/M 98-045).	RH	RV	DF	JJC
18	2-15-96	INCORPORATED CRN-M-5560 FOR PC/M 95-169	RH	RV	TSC	BD
17	11-6-95	ISSUED AS-BUILT FOR PC/M 94-092.	RH	RV	TDN	BD
26	3-27-07	ISSUED AS-BUILT PER CRN M-11960 (PC/M 06-108).	RH	RV	BSG	PRB
25	8/22/06	ISSUED AS-BUILT PER CRN M-11677 (PC/M 06-010).	RH	RV	JK	JTL
24	4/13/06	ISSUED AS-BUILT PER PC/M 05-075.	RV	BB	RSV	JTL

REV	DATE	REVISION	BY	CH	APP	APP
0	3/22/10	ISSUED FOR CONSTRUCTION	OR	JB	MPR	JBR
23	5/31/06	ISSUED AS-BUILT PER PC/M 05-054	RV	BSC	PRB	JMM
22	3/21/06	ISSUED AS-BUILT PER PC/M 05-075 (PARTIAL).	RH	SB	JK	ASD
21	04-25-00	ISSUED AS-BUILT PER CRN-M-9993 (PC/M 99-061)	JPG	KGM	—	JRH
20	3-31-00	ISSUED AS-BUILT PER PC/M 99-008.	RH	RV	CZ	JM
0	5-14-91	THIS DWG CREATED PER THE P & ID RECONSTITUTION PROJECT SCOPE AND ISSUED INTO THE FPL DWG SYSTEM PER DCR-FPM-91-137	TPC	MO	AM / RS	LRB

POD

FPL

TURKEY POINT NUCLEAR UNIT 3

P & I D

FEEDWATER SYSTEM

BECHTEL
FREDERICK, MARYLAND

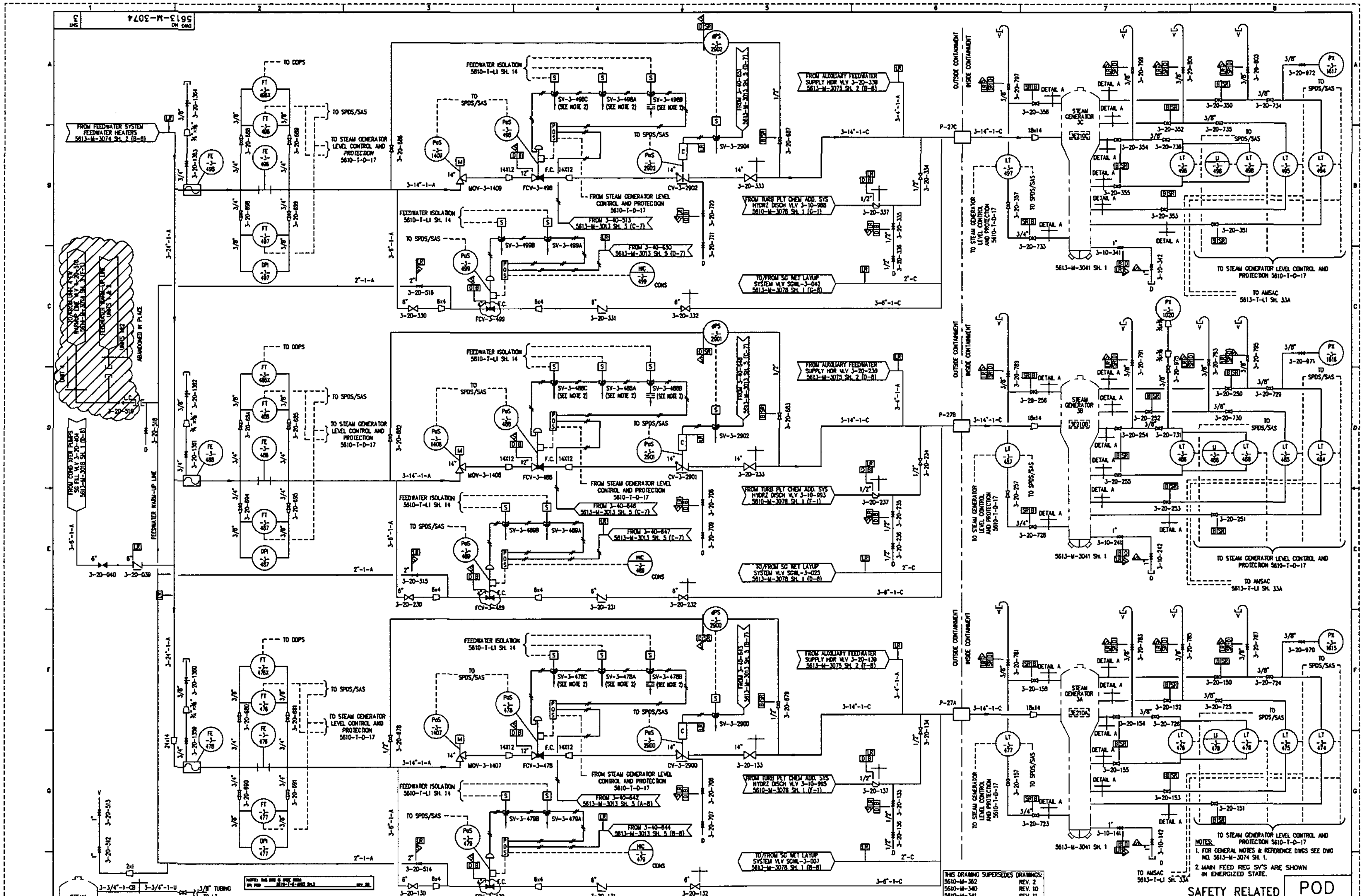
DRAWING NUMBER 5613-M-3074

SYS 074

SHEET 2 / 09-015

REV 0

5613-M-3074_SH_2_09-015.DWG



NOTES:
1. FOR GENERAL NOTES & REFERENCE DWGS SEE DWG NO. 5613-M-3074 SH. 1.
2. MAIN FEED REG SV'S ARE SHOWN IN ENERGIZED STATE.

THIS DRAWING SUPERSEDES DRAWINGS:	
5610-M-382	REV. 2
5610-M-340	REV. 10
5610-M-341	REV. 11

SAFETY RELATED POD

REV	DATE	REVISION	BY	CH	APP	APP
18	4-3-08	ISSUED AS-BUILT PER PC/M 05-073.	RY	BB	ASD	JMM
17	1-5-05	ISSUED AS-BUILT PER PC/M 04-145	RH	RV	CMZ	JTL
16	1-31-01	ISSUED AS-BUILT PER CRN-M-10215 (PC/M 00-016).	RH	RV	RSV	ASD
15	3-18-00	ISSUED AS-BUILT PER CRN M-9926 (PC/M 99-046).	RH	RV	JK	ASD
24	1-21-11	ISSUED AS-BUILT PER EC-DCR 270807.	RH	RV	BSG	PRB
23	10-30-10	ISSUED AS-BUILT PER EC 242400 (PC/M 08-034).	RY	YV	CP	JD

REV	DATE	REVISION	BY	CH	APP	APP
22	10-22-10	ISSUED AS-BUILT PER EC 242434 (PC/M 06-078) AND INCORP. CRN I-5185.	RV	BB	PSB	ELB
21	4-9-09	ISSUED AS-BUILT FOR PC/M 08-034 AND INCORP. CRN M-12638.	RV	CW	DW	JEA
20	7-16-07	ISSUED AS-BUILT PER CRN I-4604 (PC/M 05-073).	RH	RY	BSG	PRB
19	8-3-06	ISSUED AS-BUILT CRN-I-4479(PC/M 03-108).	RV	RH	-	KCP
0	5-14-91	THIS DWG CREATED PER THE P & ID RECONSTITUTION PROJECT SCOPE	RBB	MD	AH/RS	URB
—	—	AND ISSUED INTO THE FPL DWG SYSTEM PER DCR-TPM-91-137.	—	—	—	—

FPL

TURKEY POINT NUCLEAR UNIT 3

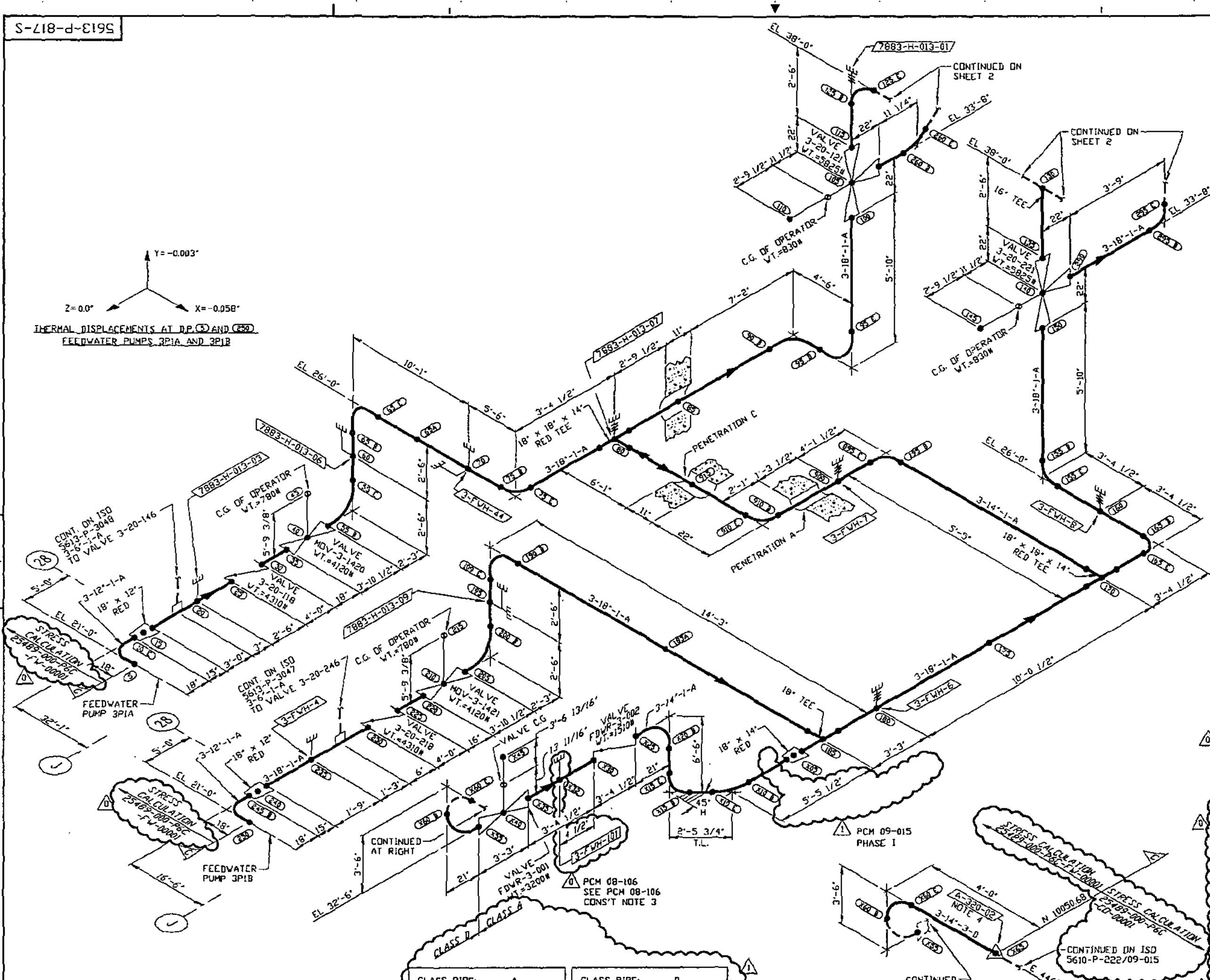
P & I D

FEEDWATER SYSTEM

STONE & WEBSTER ENGINEERING CORP.
FT. LAUDERDALE, FLORIDA

DRAWING NUMBER 5613-M-3074 | SYS 074 | SHEET 3 | REV 24

5613-M-3074_SH 3



CLASS PIPE:	A
DESIGN TEMP:	450 °F
DESIGN PRESS:	1600 PSIG
MAX. OP. TEMP:	440 °F
MAX. OP. PRESS:	1600 PSIG

CLASS PIPE:	B
DESIGN TEMP:	600 °F
DESIGN PRESS:	545 PSIG
MAX. OP. TEMP:	373 °F
MAX. OP. PRESS:	500 PSIG

RESTRAINTS: SINGLE ACTING IN DIRECTION OF STEM; SNUBBER; DOUBLE ACTING; SPRING HANGER; ANCHOR; GROUTED ANCHOR; WELDED STANCHION; SUPPORT MARK NO.; ANALYSIS NODE NO.

GLOBAL COORDINATE SYSTEM

REFERENCE P&ID NO. 5613-M-3074 SH 1, 2 & 3
REFERENCE OPERATING DIAGRAM NO. 5613-M-3074 SH 1, 2 & 3
PIPING FROM FEEDWATER PUMPS 3P1A AND 3P1B TO HIGH POINT HEATERS 3E6A AND 3E6B AND FROM ABOVE HEATERS TO CONTAINMENT PENETRATIONS P-27A, P-27B, AND P-27C AND TO STRESS PROBLEMS AFW-003, FR-2, C-2 AND 001

THIS DRAWING MADE FROM 79-14 WALKDOWN INDEX FOR STRESS PROBLEM FW-2
REFERENCE DOCUMENTS: 5177-089-P-320 REV. 4
5613-P-3114 REV 1 — 5177-SK-P-110 REV. B
5610-P-182 REV. 1
5610-P-210 REV. 1
5610-P-222 REV. 2

SEISMICALLY ANALYZED PIPING

REGION	HYDRO PRESS PSIG	DESIGN TEMP °F	DESIGN PRESS. PSIG	MAX OPERATING TEMP °F	MAX OPERATING PRESS. PSIG
A	1356	450	1085	440	1045
A	2000	450	1600	440	1200
A	2000	450	1600	375	1200

~~SYSTEM TEMPERATURE AND PRESSURE OPERATING MODES~~

~~MODE~~	~~TEMPERATURE °F~~	~~PRESSURE PSIG~~
~~NORMAL~~	~~AS NOTED~~	~~1200~~

PIPE MATERIAL	LINE SPEC	LINE SIZE	INSULATION
A106 GRC	3-24"-1-A	24" SCH 80	3"
A106 GRC	3-18"-1-A	18" SCH 80	3"
A106 GRC	3-16"-1-A	16" SCH 80	3"
A106 GRB	3-14"-1-C	14" SCH 60	3"
A106 GRC	3-14"-1-A	14" SCH 80	3"
A106 GRB	3-14"-3-D	14" SCH STD	3"
A106 GRC	3-12"-1-A	12" SCH 80	3"
A106 GRC	3-6"-1-A	6" SCH 80	3"
A106 GRB	3-6"-1-C	6" SCH 40	3"

GENERAL NOTES

1. ALL ELBOWS ASSUMED LONG RADIUS UNLESS OTHERWISE SPECIFIED
2. FOR PIPE SUPPORT DETAILS SEE DRAWING SERIES 5613-H-817
3. NODES 5, 250, 285, 400, 300, AND 355 ARE ANALYTICAL ANCHORS
4. FOR SUPPORT MARK#S A-320-02 AND A-320-01 SEE DRAWING SERIES 5610-H-222
5. THIS DRAWING SUPERSEDES 5613-P-3114 REV 1.
6. SEE CALCULATION #M08-102-06) FOR EQUIPMENT MOTIONS, VALVE WEIGHTS, ETC.
7. THIS SHEET SHALL BE COORDINATED AND WORKED WITH ALL OTHER SHEETS ON DRAWINGS 5613-P-817-S SHEETS 1-6.
8. PIPING SHOWN ON THIS ISOMETRIC HAS BEEN EVALUATED UNDER STRESS CALCULATION #25489-000-P6C-FW-00001.
9. FOR PIPING MATERIAL AND INSTALLATION SPECIFICATIONS REFERENCE FP&L SPEC. MN-3.10 AND MN-3.11.
10. ALL PIPE IS INSULATED ACCORDING TO FP&L SPEC M-068..

PCM 09-015 / CONSTRUCTION NOTES

1. WORK ON THIS PCM 09-015 SHALL BE COORDINATED WITH PCM 08-078, PCM 08-106, AND PCM 08-107.

PCM 08-106 / CONSTRUCTION NOTES

1. WORK ON THIS PCM 08-106 SHALL BE COORDINATED WITH PCMS 08-107 AND 09-015.
2. THE PIPING INSULATION SHALL BE REMOVED AND RESTORED AS PER INSULATION SPEC M-068.
3. THIS SUPPORT IS TO BE INSTALLED DURING IMPLEMENTATION OF PCM 08-106 OR FOR CONSTRUCTABILITY PURPOSES IT MAY BE INSTALLED DURING IMPLEMENTATION OF PCM 09-015 WITHOUT IMPACT TO THE PIPING SYSTEM OR STRESS CALCULATION.
4. FIELD CONSTRUCTION TO LOCATE AND PROVIDE TEMPORARY SUPPORTS AND/OR COLD SPRING BRACING BEFORE CUTTING, REMOVING, AND/OR MODIFYING EXISTING PIPING COMPONENTS AND/OR SUPPORTS.
5. VERIFY AND/OR REPLACE ALL VALVE TAGS IF MISSING, DAMAGED, OR NOT UP TO DATE.
6. SEE BECHTEL SPECIAL PROCESS MANUAL (SPM) AND FP&L PIPE WELD STANDARD STD-W-007 FOR WELDING, END PREPARATIONS, AND INSTALLATION INSTRUCTIONS.

COORDINATION SIGN-OFF

NOTE: THIS DRAWING IS MADE FROM REV. 6 OF DRAWING 5613-P-817-S SH1.

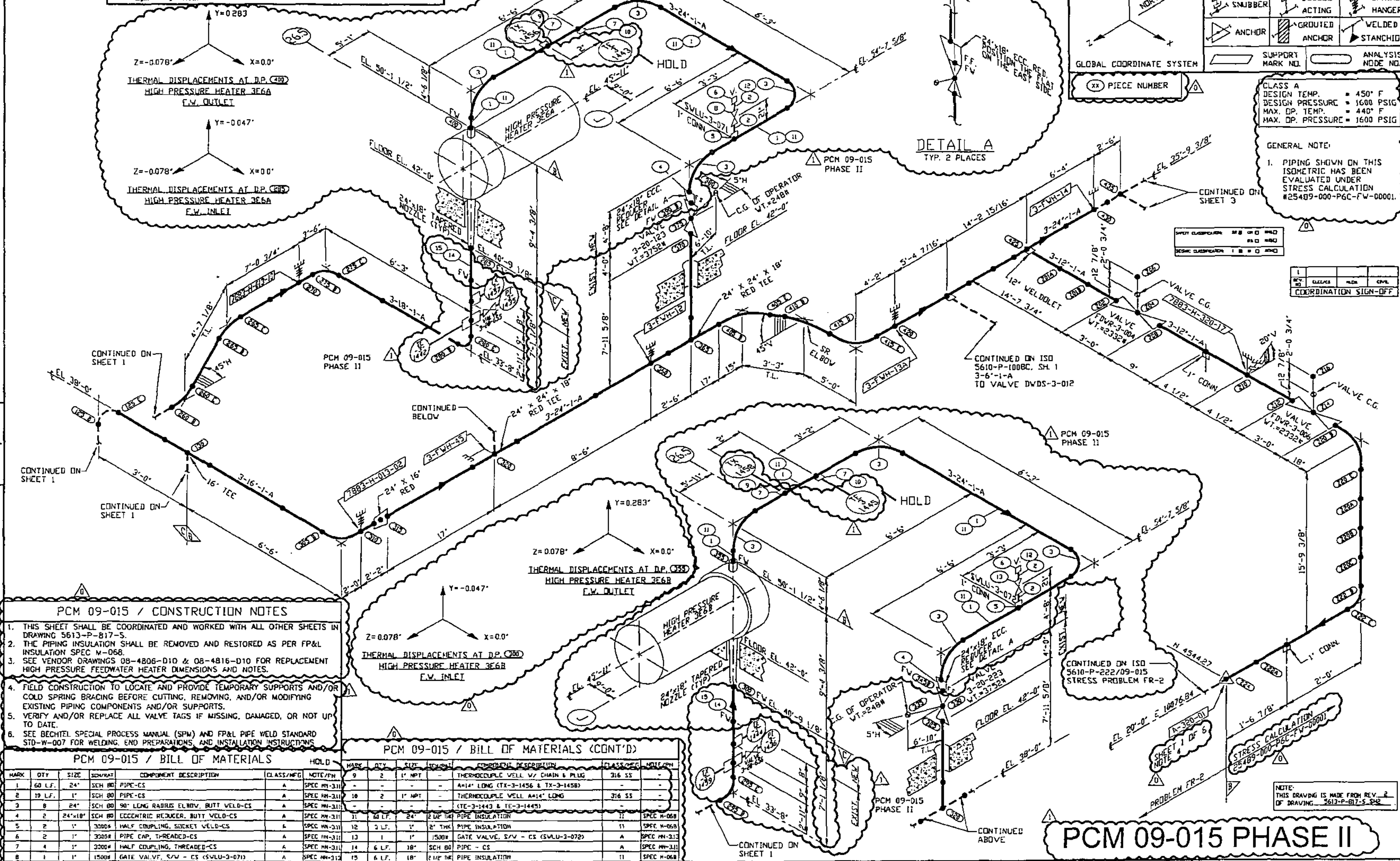
NO	DATE	REVISION	DR	CH	APP	APP
1		RE-ISSUED FOR CONSTRUCTION PER PCM 09-015 PHASE I ONLY (UNO)				
0		ISSUED FOR CONSTRUCTION PER PCM 09-015 ONLY (UNO)	MSN	EVS	PT	RP

DATE | SCALE
FPL FLORIDA POWER & LIGHT COMPANY
DR LJH/EZ | ER NO
CH HAC/RJC | COR RAE
APPROVED EAS/SHC

TURKEY POINT NUCLEAR POWER PLANT
UNIT 3
FEEDWATER SYSTEM
FW PUMPS DISCH TO FW HTR 6A & B BYPASS
PIPING ISOMETRIC

BECHTEL POWER CORPORATION
SHEET 1 OF 6
5613-P-817-S/09-015
REV NO 1

5613-P-817-S_SH 1_09-015.DWG



GLOBAL COORDINATE SYSTEM	RESTRAINTS	SINGLE ACTING IN DIRECTION OF STEM
	SNUBBER	DOUBLE ACTING
	SPRING HANGER	ANCHOR
	GROUTED ANCHOR	WELDED STANCHION
	SUPPORT MARK NO.	ANALYSIS NODE NO.

(XX) PIECE NUMBER

CLASS A
DESIGN TEMP. = 450° F
DESIGN PRESSURE = 1600 PSIG
MAX. OP. TEMP. = 440° F
MAX. OP. PRESSURE = 1600 PSIG

GENERAL NOTE:

1. PIPING SHOWN ON THIS ISOMETRIC HAS BEEN EVALUATED UNDER STRESS CALCULATION #25489-000-P6C-FW-00001.

COORDINATION SIGN-OFF

NOTE: THIS DRAWING IS MADE FROM REV. 2 OF DRAWING 5613-P-817-S_SH2

PCM 09-015 / CONSTRUCTION NOTES

1. THIS SHEET SHALL BE COORDINATED AND WORKED WITH ALL OTHER SHEETS IN DRAWING 5613-P-817-S.
2. THE PIPING INSULATION SHALL BE REMOVED AND RESTORED AS PER FP&L INSULATION SPEC M-068.
3. SEE VENDOR DRAWINGS 08-4806-D10 & 08-4816-D10 FOR REPLACEMENT HIGH PRESSURE FEEDWATER HEATER DIMENSIONS AND NOTES.
4. FIELD CONSTRUCTION TO LOCATE AND PROVIDE TEMPORARY SUPPORTS AND/OR COLD SPRING BRACING BEFORE CUTTING, REMOVING, AND/OR MODIFYING EXISTING PIPING COMPONENTS AND/OR SUPPORTS.
5. VERIFY AND/OR REPLACE ALL VALVE TAGS IF MISSING, DAMAGED, OR NOT UP TO DATE.
6. SEE BECHTEL SPECIAL PROCESS MANUAL (SPM) AND FP&L PIPE WELD STANDARD STD-W-007 FOR WELDING, END PREPARATIONS, AND INSTALLATION INSTRUCTIONS.

PCM 09-015 / BILL OF MATERIALS

MARK	QTY	SIZE	SCH/RAT	COMPONENT DESCRIPTION	CLASS/MFG	NOTE/PN
1	60 L.F.	24"	SCH 80	PIPE-CS	A	SPEC MN-3.11
2	10 L.F.	1"	SCH 80	PIPE-CS	A	SPEC MN-3.11
3	8	24"	SCH 80	90° LONG RADIUS ELBOW, BUTT WELD-CS	A	SPEC MN-3.11
4	2	24"x18"	SCH 80	ECCENTRIC REDUCER, BUTT WELD-CS	A	SPEC MN-3.11
5	2	1"	3000#	HALF COUPLING, SOCKET WELD-CS	A	SPEC MN-3.11
6	2	1"	3000#	PIPE CAP, THREADED-CS	A	SPEC MN-3.11
7	4	1"	3000#	HALF COUPLING, THREADED-CS	A	SPEC MN-3.11
8	1	1"	1500#	GATE VALVE, S/W - CS (SVLU-3-071)	A	SPEC MN-3.12

HOLD

PCM 09-015 / BILL OF MATERIALS (CONT'D)

MARK	QTY	SIZE	SCH/RAT	COMPONENT DESCRIPTION	CLASS/MFG	NOTE/PN
9	2	1" NPT	-	THERMOCOUPLE WELL W/ CHAIN & PLUG	316 SS	-
-	-	-	-	A=14" LONG (TX-3-1456 & TX-3-1458)	-	-
10	2	1" NPT	-	THERMOCOUPLE WELL A=14" LONG	316 SS	-
-	-	-	-	(TE-3-1443 & TE-3-1445)	-	-
11	60 L.F.	24"	2 1/2" THK	PIPE INSULATION	II	SPEC M-068
12	3 L.F.	1"	2" THK	PIPE INSULATION	II	SPEC M-068
13	1	1"	1500#	GATE VALVE, S/W - CS (SVLU-3-072)	A	SPEC MN-3.13
14	6 L.F.	18"	SCH 80	PIPE - CS	A	SPEC MN-3.11
15	6 L.F.	18"	2 1/2" THK	PIPE INSULATION	II	SPEC M-068

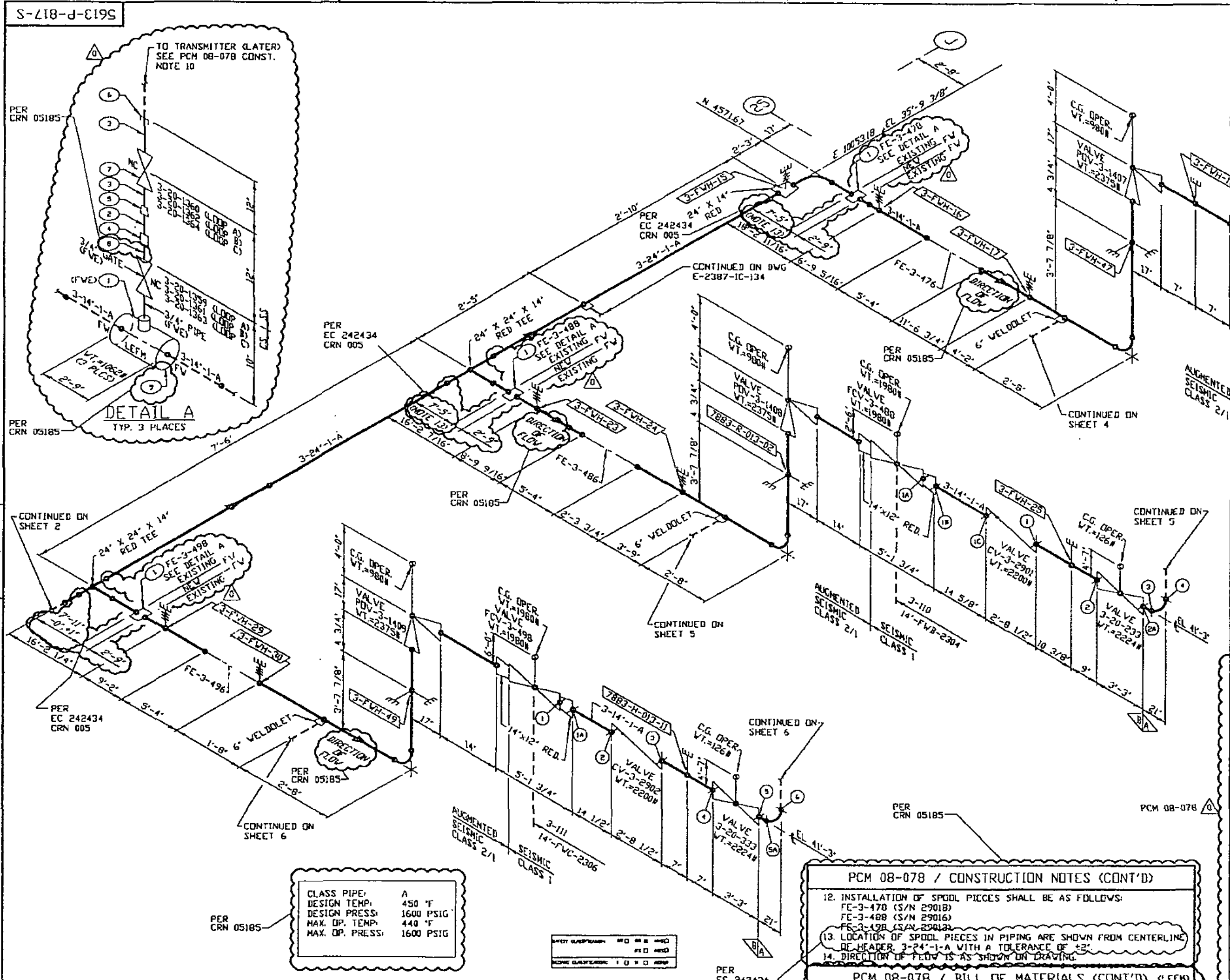
NO	DATE	REVISION	BY	CH	COR	APP

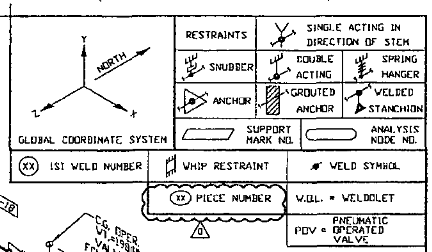
NO	DATE	REVISION	DR	CH	APP	APP
1	06/01/10	RE-ISSUED FOR CONSTRUCTION PER PCM 09-015 PHASE I ONLY (U.N.O.)				
0	03/19/10	ISSUED FOR CONSTRUCTION PER PCM 09-015 ONLY	HSN	EVS	PY	RP

PCM 09-015 PHASE II

DATE	SCALE			TURKEY POINT NUCLEAR POWER PLANT	BECHTEL POWER CORPORATION
FPL FLORIDA POWER & LIGHT COMPANY	DR LJH/EZ	ER NO		UNIT 3	SHEET 2 OF 6
	CH HAC/RJC	COR RAE		FEEDWATER SYSTEM	5613-P-817-S/09-015
	APPROVED	EAS/SHC		SYSTEM NO. 74 OUTSIDE CONTAINMENT PIPING ISOMETRIC	REV NO 1

5613-P-817-S_SH2_09-015.DWG





GENERAL NOTES

1. ALL ISI INFORMATION, WELD NUMBERS & LOCATIONS, ZONES, LINE NUMBERS & WHIP RESTRAINT LOCATIONS ARE FOR ISI REFERENCE ONLY.

ZONE NUMBER	LINE NUMBER
3-109	14"-FWA-2302
3-110	14"-FWB-2304
3-111	14"-FWC-2306

2. THIS SHEET SHALL BE COORIDINATED AND WORKED WITH ALL OTHER SHEETS IN DRAWING 5613-P-817-S.

PCM 08-078 △0

PCM 08-078 / CONSTRUCTION NOTES

1. WORK ON THIS PCM 08-078 SHALL BE COORDINATED WITH PCM 09-015.
2. SEE FP&L PIPE WELD STANDARD STD-W-007 FOR WELDING END PREPARATIONS AND INSTALLATION INSTRUCTIONS.
3. INSTALL NEW FE-3-498, FE-3-488, AND FE-3-478 ULTRASONIC FLOW METERS AT LOCATIONS SHOWN.
4. INSTALL NEW CONTROL TUBING, SWAGELOK VALVES AND FITTINGS AT EACH NEW LEFM ULTRASONIC FLOW METER. SEE DETAIL A
5. VERIFY VALVE AND EQUIPMENT TAGS/NAMEPLATES FOR VALVES AND FLOW METERS LISTED ABOVE ARE PRESENT AND INFORMATION CONTAINED WITHIN IS UP TO DATE.
6. AFTER COMPLETION OF ALL LEFM METERS, REMOVE TEMPORARY PIPING SUPPORTS. (3 PLACES)
7. FOR REMOVAL OF PIPING FOR THE INSTALLATION OF THE LEFM SEE BECHTEL DEMOLITION DWG. PTN-08-078-001.
8. THE PIPING INSULATION SHALL BE REMOVED AND RESTORED AS PER INSULATION SPEC M-068.
9. TUBING SHALL BE SUPPORTED AS PER SPEC C-021.
10. FIELD TO LEAVE CAP IN PLACE UNTIL THE IMPLEMENTATION OF THE TRANSMITTER INSTALLATION ON A LATER REVISION.
11. INSTALLATION WILL BE PERFORMED IN ACCORDANCE WITH VENDOR DOCUMENT V000904 "CAMERON FLOW MEASUREMENT SYSTEM."

PER CRN 05185

PCM 08-078 / BILL OF MATERIALS (LEFM)

MARK	QTY	SIZE	SCH/RAT	COMPONENT DESCRIPTION	CLASS/MFG	NOTE/PN
1	3	14"	1800	ULTRASONIC FLOW METER (FE-3-498, FE-3-488, FE-3-478)	CAMERON	9A-300C341
2	3 LF.	3/4"	-	TUBING, 316SS, .065 WALL	-	SPEC MN-3.11
3	3 LF.	3/8"	-	TUBING, 316SS, .065 WALL	-	SPEC MN-3.11
4	3	3/4"	-	CONNECTOR, FEMALE, MODEL SS-1210-7-12	SWAGELOK	SPEC MN-3.11
5	3	3/4"x3/8"	-	UNION, REDUCING, MODEL SS-1210-6-6	SWAGELOK	SPEC MN-3.11
6	3	3/8"	-	CAP, TUBING MODEL SS-600-C	SWAGELOK	SPEC MN-3.11
7	3	3/8"	-	VALVE, NEEDLE, MODEL SS-6MBS6	SWAGELOK	SPEC MN-3.11

* F.W.E. = FURNISHED WITH EQUIPMENT

PER CRN 05185

PCM 08-078 / CONSTRUCTION NOTES (CONT'D)

12. INSTALLATION OF SPOOL PIECES SHALL BE AS FOLLOWS:
FE-3-478 (S/N 29018)
FE-3-488 (S/N 29016)
FE-3-498 (S/N 29013)
13. LOCATION OF SPOOL PIECES IN PIPING ARE SHOWN FROM CENTERLINE OF HEADER, 3-24"-1-A WITH A TOLERANCE OF ±2".
14. DIRECTION OF FLOW IS AS SHOWN ON DRAWING.

PER EC 242434 CRN 005

PER CRN 05185

PCM 08-078 / BILL OF MATERIALS (CONT'D) (LEFM)

MARK	QTY	SIZE	SCH/RAT	COMPONENT DESCRIPTION	CLASS/MFG	NOTE/PN
8	3 LF	3/4"	SCH 160S	PIPE - SS (ASTM A376, TYPE 316)	U	SPEC MN-3.11
9	9 LF	14"Ø	3" THK	INSULATION W/ ALUMINUM JACKETING	I	SPEC M-068

COORDINATION SIGN-OFF

NOTE: THIS DRAWING IS MADE FROM REV. 3 OF DRAWING 5613-P-817-S_SH3

NO	DATE	REVISION	BY	CH	COR	APP
-	03-03-10	REVISED PER CRN #05185 & TO REFLECT VENDOR EQUIPMENT	HSH	CVS	RP	JR
0	12/04/09	ISSUED FOR CONSTRUCTION FOR PCM 08-078	MAB	CVS	-	-

DATE | SCALE

FPL — FLORIDA POWER & LIGHT COMPANY

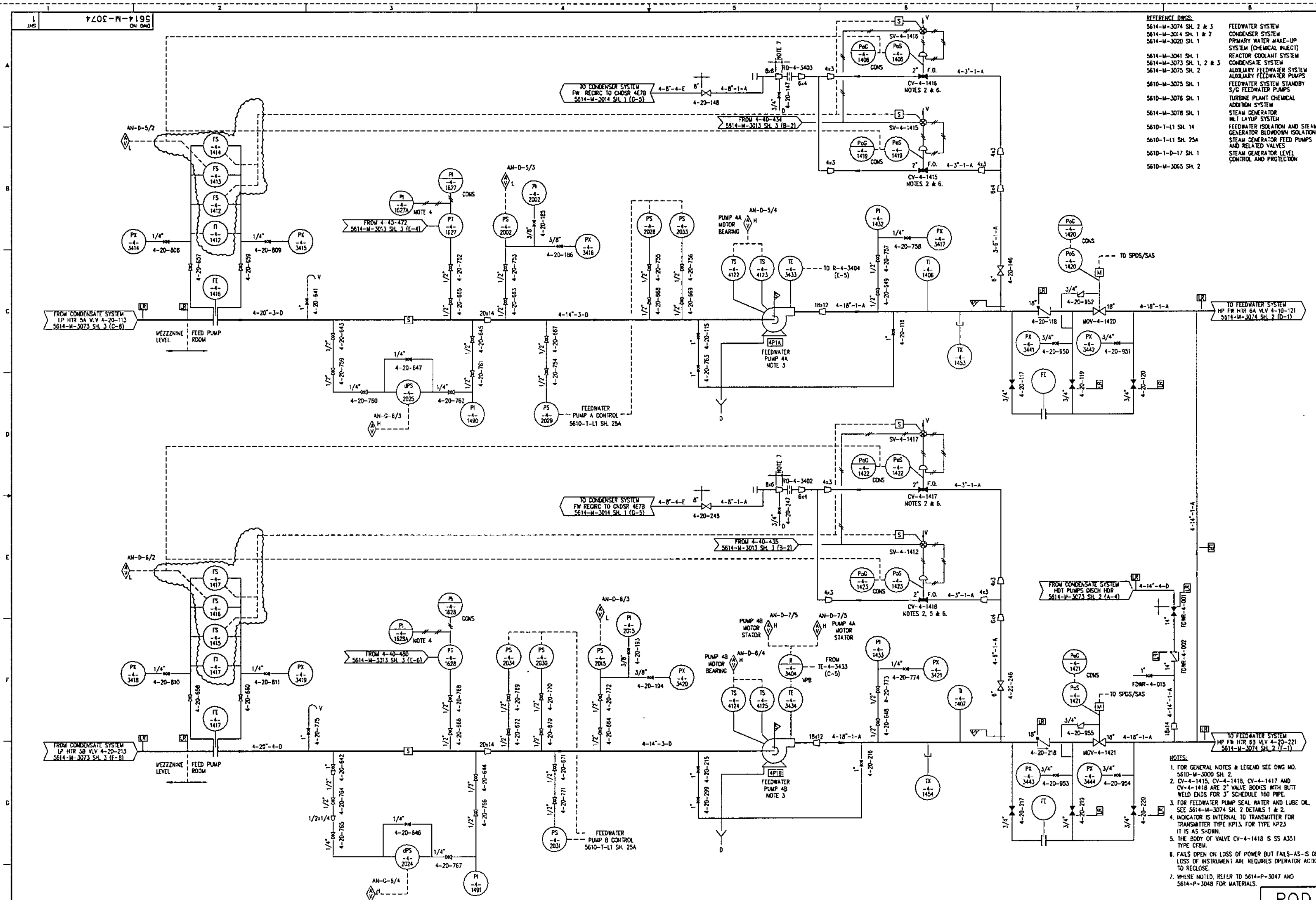
DR LJH/FZ | CR NO
CH HAC/RJC | COR RAE
APPROVED EAS/SHC

TURKEY POINT NUCLEAR POWER PLANT
UNIT 3
FEEDWATER SYSTEM
SYSTEM NO. 74 OUTSIDE CONTAINMENT
STRESS PROBLEM FW-2

BECHTEL POWER CORPORATION

SHEET 3 OF 6

5613-P-817-S/08-078 REV NO 0



REFERENCE DWGS:

5614-M-3074 SH. 2 & 3	FEEDWATER SYSTEM
5614-M-3014 SH. 1 & 2	CONDENSER SYSTEM
5614-M-3020 SH. 1	PRIMARY WATER MAKE-UP SYSTEM (CHEMICAL INJECT)
5614-M-3041 SH. 1	REACTOR COOLANT SYSTEM
5614-M-3073 SH. 1, 2 & 3	CONDENSATE SYSTEM
5614-M-3075 SH. 2	AUXILIARY FEEDWATER SYSTEM AUXILIARY FEEDWATER PUMPS
5610-M-3075 SH. 1	FEEDWATER SYSTEM STANDBY S/G FEEDWATER PUMPS
5610-M-3076 SH. 1	TURBINE PLANT CHEMICAL ADDITION SYSTEM
5614-M-3078 SH. 1	STEAM GENERATOR WET LAYUP SYSTEM
5610-T-L1 SH. 14	FEEDWATER ISOLATION AND STEAM GENERATOR BLOWDOWN ISOLATION.
5610-T-L1 SH. 25A	STEAM GENERATOR FEED PUMPS AND RELATED VALVES
5610-T-D-17 SH. 1	STEAM GENERATOR LEVEL CONTROL AND PROTECTION
5610-M-3065 SH. 2	

NOTES:

1. FOR GENERAL NOTES & LEGEND SEE DWG NO. 5610-M-3000 SH. 2.
2. CV-4-1415, CV-4-1416, CV-4-1417 AND CV-4-1418 ARE 2" VALVE BODIES WITH BUTT WELD ENDS FOR 3" SCHEDULE 160 PIPE.
3. FOR FEEDWATER PUMP SEAL WATER AND LUBE OIL, SEE 5614-M-3074 SH. 2 DETAILS 1 & 2.
4. INDICATOR IS INTERNAL TO TRANSMITTER FOR TRANSMITTER TYPE KP13. FOR TYPE KP23 IT IS AS SHOWN.
5. THE BODY OF VALVE CV-4-1418 IS SS A351 TYPE CF8M.
6. FAILS OPEN ON LOSS OF POWER BUT FAILS-AS-IS ON LOSS OF INSTRUMENT AIR. REQUIRES OPERATOR ACTION TO RECLOSE.
7. WHERE NOTED, REFER TO 5614-P-3047 AND 5614-P-3048 FOR MATERIALS.

POD

THIS DRAWING SUPERSEDES DRAWINGS: 5610-M-362 REV. 2

NOTE: THIS DWG IS MADE FROM: FPL POD 5610-T-E-4062 SH. 2 REV. 58

REV	DATE	REVISION	BY	CH	APP	APP
18	5-18-05	ISSUED AS-BUILT PER PC/M 04-163 AND INCORP. CRN-I-4324.	RV	RH	-	TBH
17	5-12-05	ISSUED AS-BUILT PER PC/M 05-035 (PARTIAL).	RH	JK	RSV	JMM
16	5-11-05	ISSUED AS-BUILT PER PC/M 05-035.	RH	JK	RSV	JMM
15	6-17-02	ISSUED AS-BUILT PER CRN-M-10465 (PC/M 00-016).	RH	RV	AGM	JTL
14	04-25-00	ISSUED AS-BUILT PER CRN-M-9993 (PC/M 99-061).	JPG	KM	—	JRH
23	3-3-08	ISSUED AS-BUILT PER CRN-M-12259 (PC/M 07-095).	RH	RV	JPG	PRB
22	12/18/06	ISSUED AS-BUILT PER PC/M 06-003 AND INCORP. CRN-I-4503.	JPG	LD	—	PMB
21	12/04/06	ISSUED AS-BUILT PER PC/M 06-003 AND INCORP. CRN-I-4501.	RV	JPG	—	PMB
20	11/28/06	ISSUED AS-BUILT PER CRN-M-11907 (PC/M 06-073).	RH	BB	BSG	JMM
19	6-7-05	ISSUED AS-BUILT PER PC/M 05-035.	RH	RV	JK	JTL
0	5-14-91	THIS DWG CREATED PER THE P & ID RECONSTITUTION PROJECT SCOPE	SAM	MD	AM/RS	LRB
—	—	AND ISSUED INTO THE FPL DWG SYSTEM PER DCR-TPM-91-137.	—	—	—	—

FPL

TURKEY POINT NUCLEAR UNIT 4

P & I D

FEEDWATER SYSTEM

STONE & WEBSTER ENGINEERING CORP. FT. LAUDERDALE, FLORIDA

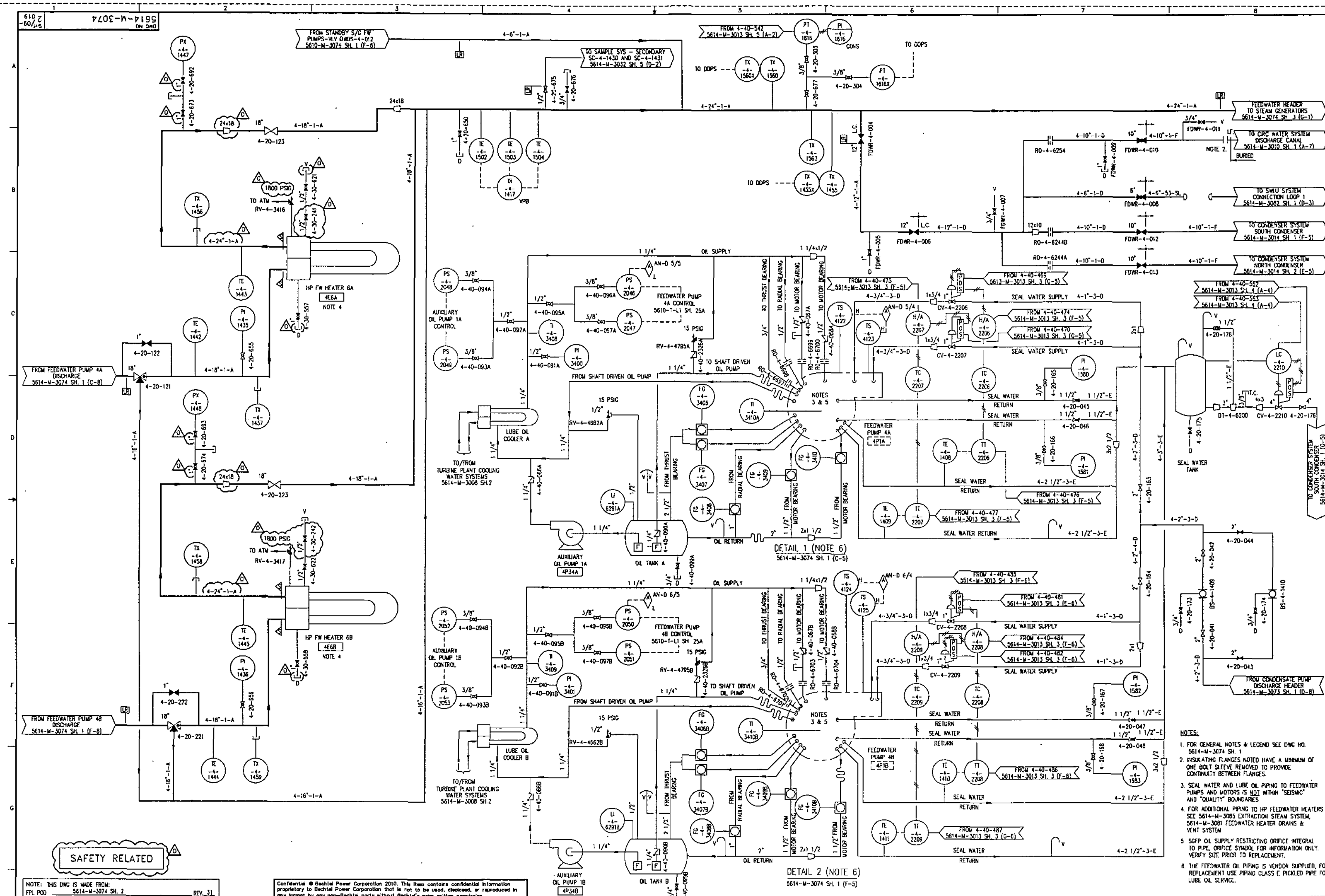
DRAWING NUMBER 5614-M-3074

SYS 074

SHEET 1

REV 23

5614-M-3074_SH 1.DWG



SAFETY RELATED

NOTE: THIS DWG IS MADE FROM:
FPL POD 5614-M-3074 SH. 2 REV. 31

~~THIS DRAWING SUPERSEDES DRAWINGS:~~
~~5610-M-362 REV. 2~~
~~5610-M-1314 REV. 1~~

~~NOTE: THIS DWG IS MADE FROM:~~
~~FPL POD 5610-M-4 SH. 1 REV. 40~~
~~FPL POD 5610-T-E-4061 SH. 2 REV. 48~~
~~FPL POD 5610-T-E-4062 SH. 2 REV. 58~~
~~FPL POD 5610-T-E-4063 SH. 1 REV. 34~~
~~FPL POD 5610-T-E-4064 SH. 1 REV. 32~~

REV	DATE	REVISION	BY	CH	APP	APP
28	12-4-06	ISSUED AS-BUILT FOR PC/M 05-051.	RV	JPG	RSV	JTL
27	11-27-06	ISSUED AS-BUILT PER CRN M-11855 (PC/M 06-067).	RH	BSG	MG	JMM
26	11-09-05	ISSUED AS-BUILT FOR PC/M 05-134.	RH	RV	AAP	JTL
25	07-31-01	ISSUED AS-BUILT PER CRN-M-10095 (PC/M 99-061).	RV	RH	CMZ	JM
24	04-25-00	ISSUED AS-BUILT PER CRN-M-9993 (PC/M 99-061).	JPG	KM	—	JRH
23	7-14-99	ISSUED AS-BUILT PER PC/M 95-035 AND INCORP. CRN-M-9756.	RH	RV	RSV	JTD

REV	DATE	REVISION	BY	CH	APP	APP
0	09/29/10	ISSUED FOR USE	[illegible]	[illegible]	MPR	JBR
22	3-23-99	ISSUED AS-BUILT PER PC/M 99-008	RH	RV	RSV	JJC
31	5/25/07	ISSUED AS-BUILT PER CRN M-12009 (PC/M 07-021))	RH	RV	PJV	PRB
30	3-27-07	ISSUED AS-BUILT PER CRN M-11960 (PC/M 06-108)	RH	RV	BSG	PRB
29	12-7-06	ISSUED AS-BUILT PER PC/M 05-064	RH	RV	JK	JTL
0	5-14-91	THIS DWG CREATED PER THE P & ID RECONSTITUTION PROJECT SCOPE	JPC	MD	AM RAS	LRB
—	—	AND ISSUED INTO THE FPL DWG SYSTEM PER DCR-TPM-91-137.	—	—	—	—

NOTES:

1. FOR GENERAL NOTES & LEGEND SEE DWG NO. 5614-M-3074 SH. 1
2. INSULATING FLANGES NOTED HAVE A MINIMUM OF ONE BOLT SLEEVE REMOVED TO PROVIDE CONTINUITY BETWEEN FLANGES.
3. SEAL WATER AND LUBE OIL PIPING TO FEEDWATER PUMPS AND MOTORS IS NOT WITHIN "SEISMIC" AND "QUALITY" BOUNDARIES
4. FOR ADDITIONAL PIPING TO HP FEEDWATER HEATERS SEE 5614-M-3085 EXTRACTION STEAM SYSTEM, 5614-M-3081 FEEDWATER HEATER DRAINS & VENT SYSTEM
5. SGFP OIL SUPPLY RESTRICTING ORIFICE INTEGRAL TO PIPE, ORIFICE SYMBOL FOR INFORMATION ONLY. VERIFY SIZE PRIOR TO REPLACEMENT.
6. THE FEEDWATER OIL PIPING IS VENDOR SUPPLIED, FOR REPLACEMENT USE PIPING CLASS E PICKLED PIPE FOR LUBE OIL SERVICE.

POD

FPL

TURKEY POINT NUCLEAR UNIT 4

P & ID

FEEDWATER SYSTEM

BECHTEL
FREDERICK, MARYLAND

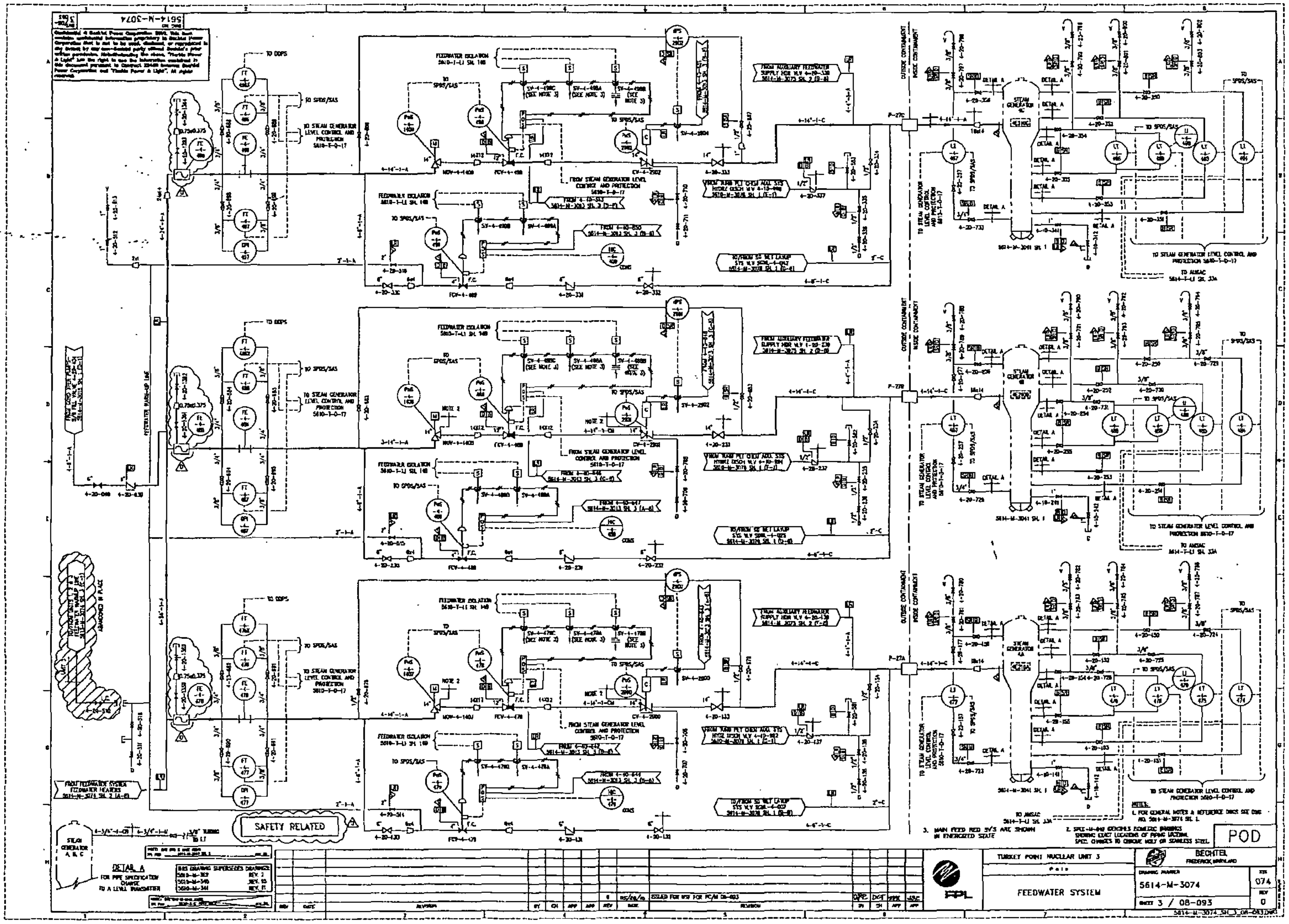
DRAWING NUMBER 5614-M-3074

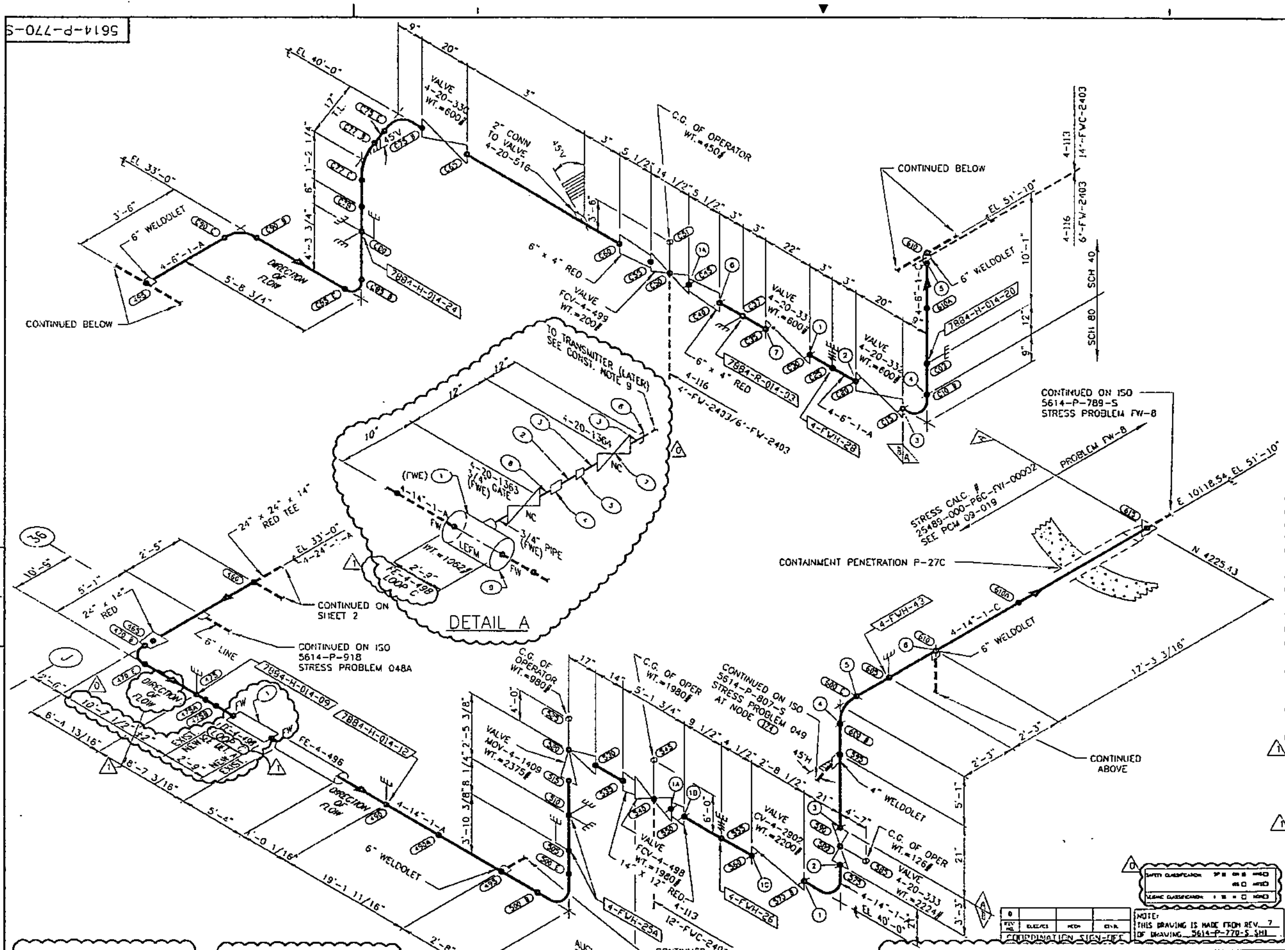
SYS 074

SHEET 2 / 09-019

REV 0

5614-M-3074_SH_2_09-019.DWG


5614-M-3074
SAFETY RELATED
DETAIL A
FEEDWATER ISOLATION
TO STEAM GENERATOR LEVEL CONTROL AND PROTECTION 5610-T-D-17
NOTES:
1. FOR GENERAL NOTES & REFERENCE DWGS SEE DWG NO. 5614-M-3074 SH. 1
3. MAIN FEED REG SV'S ARE SHOWN IN ENERGIZED STATE
POD
TURKEY POINT NUCLEAR UNIT 3
FPL
FEEDWATER SYSTEM
BECHTEL
DRAWING NUMBER
5614-M-3074
074
REV
0
SHEET 3 / 08-093



CLASS PIPE:	A
DESIGN TEMP:	450 °F
DESIGN PRESS:	1700 PSIG
MAX. OP. TEMP:	440 °F
MAX. OP. PRESS:	1700 PSIG

CLASS PIPE:	C
DESIGN TEMP:	450 °F
DESIGN PRESS:	1085 PSIG
MAX. OP. TEMP:	440 °F
MAX. OP. PRESS:	1045 PSIG

GLOBAL COORDINATE SYSTEM

RESTRAINTS	SINGLE ACTING IN DIRECTION OF STEM	
SNUBBER	DOUBLE ACTING	SPRING HANGER
ANCHOR	GROUTED ANCHOR	WELDED STANCHION
SUPPORT MARK NO.	ANALYSIS NODE NO.	

REFERENCE P&ID NO. 5614-M-3074 SHEETS 1, 2 & 3
REFERENCE OPERATING DIAGRAM NO. 5614-M-3074 SH 1, 2 & 3
PIPING FROM FEEDWATER PUMPS 4P1A AND 4P1B THROUGH H.P. HEATERS 4E6A AND 4E6B TO CONTAINMENT PENETRATIONS P-27A, P-27B, AND P-27C

THIS DRAWING MADE FROM 79-14 WALKDOWN INDEX FOR STRESS PROBLEM FW-1
REFERENCE DOCUMENTS: 5610-P-217 REV. 0
5610-P-216 REV. 1

SEISMICALLY ANALYZED PIPING

REGION	HYDRO	DESIGN		MAX OPERATING	
	PRESS PSIG	TEMP °F	PRESS. PSIG	TEMP °F	PRESS. PSIG
A	1356	450	1085	440	1045
B	2000	450	1700	440	1700
C	2000	450	1700	375	1700

(XX) ISI WELD NUMBER — WHIP RESTRAINT — WELD SYMBOL

PIPE MATERIAL	LINE SPEC	LINE SIZE	INSULATION
A106 GRC	4-6"-1-A	6" SCH 80	3"
A106 GRB	4-6"-1-C	6" SCH 40	3"
A106 GRC	4-12"-1-A	12" SCH 80	3"
A106 GRB	4-12"-1-D	12" SCH STD	NONE
A106 GRC	4-14"-1-A	14" SCH 80	3"
A106 GRB	4-14"-1-C	14" SCH 60	3"
A106 GRC	4-16"-1-A	16" SCH 80	3"
A106 GRC	4-18"-1-A	18" SCH 80	3"
A106 GRC	4-24"-1-A	24" SCH 60	3"

GENERAL NOTES

1. ALL ELBOWS ASSUMED LONG RADIUS UNLESS OTHERWISE SPECIFIED.
2. FOR PIPE SUPPORT DETAILS SEE DRAWING SERIES 5614-H-770.
3. NODES 5, 250, 300, 315, 383, AND 415 ARE ANALYTICAL ANCRS.
4. SUPPORT MARK # 7884-R-014-04 WAS COMPUTER ANALYZED AT NODE 330 ACTUAL FIELD LOCATION IS AS SHOWN.
5. FOR SUPPORT MARK # A-420-01 SEE DRAWING SERIES 5614-H-217.
6. SUPPORT MARK # 4-FVH-9 WAS COMPUTER ANALYZED AT NODE 120 B ACTUAL FIELD LOCATION IS AS SHOWN.
7. SEE CALCULATION #M09-102-008 FOR EQUIPMENT MOTIONS, VALVE WEIGHTS, ETC.
8. ALL ISI INFORMATION, WELD NUMBERS & LOCATIONS, ZONES, LINE NUMBERS & WHIP RESTRAINT LOCATIONS ARE FOR ISI REFERENCE ONLY.

ZONE NUMBER	LINE NUMBER
4-113	12"-FVC-2403
4-113	14"-FVC2403
4-116	4"-FV-2403
4-116	6"-FV-2403

9. THIS SHEET SHALL BE COORDINATED AND WORKED WITH ALL OTHER SHEETS IN DRAWING 5614-P-770-S.
10. PIPING SHOWN ON THIS DRAWING HAS BEEN EVALUATED UNDER PIPE STRESS CALCULATION # 25489-000-P6C-FW-00002.(REF: PCM 09-019)
11. LEFM STRESS REVIEW HAS BEEN EVALUATED UNDER PIPE STRESS CALCULATION #25489-000-P6C-FW-00004.
12. PIPING & ASSOCIATED COMPONENTS FOR THIS SYSTEM SHALL BE FIELD CHECKED FOR INTERFERENCES PRIOR TO FABRICATION AND INSTALLATION.
13. FOR PIPING MATERIAL AND INSTALLATION SPECIFICATIONS REFERENCE FP&L SPECIFICATIONS MN-3.10 & MN-3.11.
14. ALL PIPE IS INSULATED ACCORDING TO FP&L INSULATION SPEC. M-068.
15. ALL FITTINGS 2"⌀ AND SMALLER ARE ASSUMED SOCKET WELDED (U.N.O.).
16. THIS PIPING IS LOCATED IN AREA 04 OF THE TURBINE BUILDING.
17. ALL VENT AND DRAIN PIPING CAPS ARE THREADED (U.N.O.)

PCM 08-093 / CONSTRUCTION NOTES

1. WORK ON THIS PCM 08-093 SHALL BE COORDINATED WITH PCM 09-019.
2. SEE BECHTEL SPECIAL PROCESS MANUAL (SPM) AND FP&L PIPE WELD STANDARD STD-W-007 FOR WELDING, END PREPARATIONS, AND INSTALLATION INSTRUCTIONS.
3. INSTALL NEW FE-4-498 (S/N 29014) ULTRASONIC FLOW METER AT LOCATION SHOWN.
4. INSTALL NEW CONTROL TUBING, SWAGELOK VALVES AND FITTINGS AT NEW LEFM ULTRASONIC FLOW METER. SEE DETAIL A
5. AFTER COMPLETION OF ALL LEFM METERS, REMOVE TEMPORARY PIPING SUPPORT.
6. FOR REMOVAL OF PIPING FOR THE INSTALLATION OF THE LEFM SEE BECHTEL DEMOLITION DWG. PTN-P-08-093-001.
7. INSULATION SHALL BE REMOVED/RESTORED ON PIPING AND VALVES IN ACCORDANCE WITH FP&L INSULATION SPECIFICATION M-053, INCLUDING ALL DAMAGED INSULATION.
8. TUBING SHALL BE SUPPORTED AS PER SPEC C-071.
9. FIELD TO LEAVE CAP IN PLACE UNTIL THE IMPLEMENTATION OF THE TRANSMITTER INSTALLATION ON A LATER PCM.
10. INSTALLATION WILL BE PERFORMED IN ACCORDANCE WITH VENDOR DOCUMENT (LATER) "CAMERON FLOW MEASUREMENT SYSTEM."
11. LOCATION OF SPOOL PIECE IN PIPING SHALL BE 10'-7 1/2" ±2" FROM CENTERLINE OF HEADER, 4-24"-1-A.
12. DIRECTION OF FLOW IS AS SHOWN ON DRAWING
13. FIELD CONSTRUCTION TO LOCATE AND PROVIDE TEMPORARY SUPPORTS AND/OR COLD SPRING BRACING BEFORE CUTTING, REMOVING, AND/OR MODIFYING EXISTING PIPING COMPONENTS AND/OR SUPPORTS
14. VERIFY AND/OR REPLACE VALVE TAGS IF MISSING, DAMAGED, OR NOT UP TO DATE.
15. FIELD WELDS SHALL BE SUBMITTED TO ENGINEERING WITH DIMENSIONAL DATA AS AN AS-BUILT MARK-UP FOR FINAL DISPOSITION.

SAFETY CLASSIFICATION	SR	QR	NNSR
		NS	NNSR
SEISMIC CLASSIFICATION	I	II	NONE

0			
REV NO.	ELEC/I&C	MECH	CIVIL

COORDINATION SIGN-OFF

NOTE:
THIS DRAWING IS MADE FROM REV. 7 OF DRAWING 5614-P-770-S SH1

PCM 08-093 / BILL OF MATERIALS

MARK	QTY	SIZE	SCH/RAT	COMPONENT DESCRIPTION	CLASS/MFG	NOTE/PN
1	1	14"	1800	ULTRASONIC FLOW METER (FE-4-498) S/N 29014	CAMERON	9A-300C337
2	1 L.F.	3/4"	-	TUBING, 316SS, .065 WALL	2505	SPEC MN-3.1
3	1 L.F.	3/8"	-	TUBING, 316SS, .065 WALL	2505	SPEC MN-3.1
4	1	3/4"	-	FEMALE CONNECTOR, SWAGELOK SS-1210-7-12	2505	SPEC MN-3.1
5	1	3/4"x3/8"	-	REDUCING UNION, SWAGELOK SS-1210-6-6	2505	SPEC MN-3.1
6	1	3/8"	-	TUBING CAP, SWAGELOK SS-600-C	2505	SPEC MN-3.1
7	1	3/8"	-	VALVE, NEEDLE, SWAGELOK SS-6NBS8	2505	SPEC MN-3.1
8	1 L.F.	3/4"	SCH 160S	PIPE - SS (ASTM A376, TYPE 316)	U	SPEC MN-3.1
9	3 L.F.	14"⌀	3" THK	INSULATION, W/ ALUMN. JACKET	I	SPEC M-068

* F.W.E. = FURNISHED WITH EQUIPMENT

NO	DATE	REVISION	BY	CH	COR	APP

NO	DATE	REVISION	DR	CH	COR	APP
1	4/5/10	ISSUED FOR USE AND INCORPORATION OF 3R25 LESSONS LEARNED				
0	05/17/10	ISSUED FOR CONSTRUCTION PER PCM 08-093	MSN	EWS	PY	RP

DATE | SCALE 0

FPL
FLORIDA POWER & LIGHT COMPANY

DR AEG	ER NO
CH JRS / IL	COR GM
APPROVED FBS / SHC	

TURKEY POINT NUCLEAR POWER PLANT UNIT 4

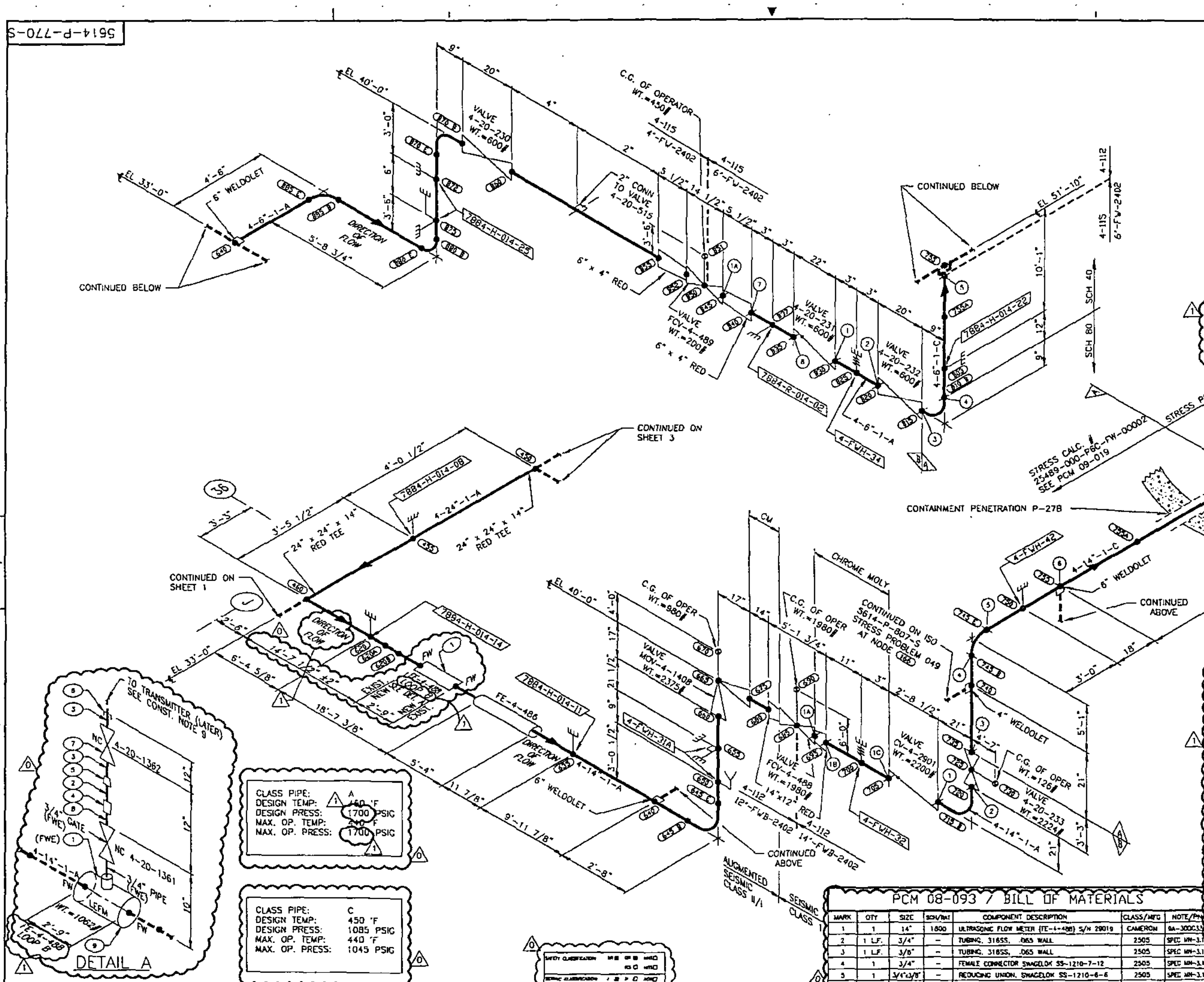
BECHTEL POWER CORPORATION

FEEDWATER SYSTEM
FROM FW HEADER TO PEN P27C
PIPING ISOMETRIC

SHEET 1 OF 4

5614-P-770-S/08-093 — REV NO 1

5614-P-770-S_SH 1_08-093_Rev1.DWG



CLASS PIPE:	A
DESIGN TEMP:	450 °F
DESIGN PRESS:	1700 PSIG
MAX. OP. TEMP:	440 °F
MAX. OP. PRESS:	1700 PSIG

CLASS PIPE:	C
DESIGN TEMP:	450 °F
DESIGN PRESS:	1085 PSIG
MAX. OP. TEMP:	440 °F
MAX. OP. PRESS:	1045 PSIG

GLOBAL COORDINATE SYSTEM

RESTRAINTS: SINGLE ACTING IN DIRECTION OF STEM; SNUBBER; DOUBLE ACTING; SPRING HANGER; ANCHOR; GROUTED ANCHOR; WELDED STANCHION; SUPPORT MARK NO.; ANALYSIS NODE NO.

(XX) ISI WELD NUMBER; WHIP RESTRAINT; WELD SYMBOL

GENERAL NOTES

1) ALL ISI INFORMATION, WELD NUMBERS & LOCATIONS. ZONES, LINE NUMBERS & WHIP RESTRAINT LOCATIONS ARE FOR ISI REFERENCE ONLY.

ZONE NUMBER	LINE NUMBER
4-112	12"-FWB-2402
4-112	14"-FWB-2402
4-115	4"-FW-2402
4-115	6"-FW-2402

2) THIS SHEET SHALL BE COORDINATED AND WORKED WITH ALL OTHER SHEETS IN DRAWING 5614-P-770-S.
3) LEFM STRESS REVIEW HAS BEEN EVALUATED UNDER PIPE STRESS CALCULATION #25489-000-P6C-FW-00004.
4) FOR GENERAL NOTES SEE 5614-P-770-S SH1/08-093.

PCM 08-093 / CONSTRUCTION NOTES

1. WORK ON THIS PCM 08-093 SHALL BE COORDINATED WITH PCM 09-019.
2. SEE BECHTEL SPECIAL PROCESS MANUAL (SPM) FOR WELDING END PREPARATIONS AND INSTALLATION INSTRUCTIONS.
3. INSTALL NEW FE-4-488 (S/N 29019) ULTRASONIC FLOW METER AT LOCATION SHOWN.
4. INSTALL NEW CONTROL TUBING, SWAGELOK VALVES AND FITTINGS AT NEW LEFM ULTRASONIC FLOW METER. SEE DETAIL A
5. AFTER COMPLETION OF ALL LEFM METERS, REMOVE TEMPORARY PIPING SUPPORT.
6. FOR REMOVAL OF PIPING FOR THE INSTALLATION OF THE LEFM SEE BECHTEL DEMOLITION DWG. PTN-P-08-093-002.
7. THE PIPING INSULATION SHALL BE REMOVED AND RESTORED AS PER INSULATION SPEC M-060.
8. TUBING SHALL BE SUPPORTED AS PER SPEC C-021.
9. FIELD TO LEAVE CAP IN PLACE UNTIL THE IMPLEMENTATION OF THE TRANSMITTER INSTALLATION ON A LATER PCM.
10. INSTALLATION WILL BE PERFORMED IN ACCORDANCE WITH VENDOR DOCUMENT (LATER) 'CAMERON FLOW MEASUREMENT SYSTEM.'
11. LOCATION OF SPOOL PIECE IN PIPING SHALL BE 14'-7 1/2" ±2" FROM CENTERLINE OF HEADER, 4-24"-1-A.
12. DIRECTION OF FLOW IS AS SHOWN ON DRAWING.
13. PIPING SHOWN ON THIS DRAWING HAS BEEN EVALUATED UNDER PIPE STRESS CALCULATION # 25489-000-P6C-FW-00002.(REF: PCM 09-019)
14. FIELD CONSTRUCTION TO LOCATE AND PROVIDE TEMPORARY SUPPORTS AND/OR COLD SPRING BRACING BEFORE CUTTING, REMOVING, AND/OR MODIFYING EXISTING PIPING COMPONENTS AND/OR SUPPORTS.
15. VERIFY AND/OR REPLACE VALVE TAGS IF MISSING, DAMAGED, OR NOT UP TO DATE.

PCM 08-093 / BILL OF MATERIALS

MARK	QTY	SIZE	SCH/RAT	COMPONENT DESCRIPTION	CLASS/MFG	NOTE/PN
1	1	14"	1800	ULTRASONIC FLOW METER (FE-4-488) S/N 29019	CAMERON	9A-300C33
2	1 L.F.	3/4"	-	TUBING, 316SS, .065 WALL	2505	SPEC MN-3.11
3	1 L.F.	3/8"	-	TUBING, 316SS, .065 WALL	2505	SPEC MN-3.11
4	1	3/4"	-	FEMALE CONNECTOR SWAGELOK SS-1210-7-12	2505	SPEC MN-3.11
5	1	3/4"x3/8"	-	REDUCING UNION, SWAGELOK SS-1210-6-6	2505	SPEC MN-3.11
6	1	3/8"	-	TUBING CAP, SWAGELOK SS-600-C	2505	SPEC MN-3.11
7	1	3/8"	-	VALVE, NEEDLE, SWAGELOK SS-6NBS6	2505	SPEC MN-3.13
8	1 L.F.	3/4"	SCH 160S	PIPE - SS (ASTM A376, TYPE 316)	U	SPEC MN-3.11
9	3 L.F.	14"*	3" THK	INSULATION W/ ALUMN. JACKET	I	SPEC M-060

* F.W.E. = FURNISHED WITH EQUIPMENT

COORDINATION SIGN-OFF

NOTE: THIS DRAWING IS MADE FROM REV 9 OF DRAWING 5614-P-770-S SH2

NO	DATE	REVISION	DR	CH	COR	APP
1	1/5/10	ISSUED FOR USE & INCORPORATION OF 3R25 LESSONS LEARNED				
0	05/27/10	ISSUED FOR CONSTRUCTION PER PCM 08-093				

DATE | SCALE

FPL FLORIDA POWER & LIGHT COMPANY

DR AEG | ER NO
CH JRS/DIL | COR GM
APPROVED FBS / SHC

TURKEY POINT NUCLEAR POWER PLANT UNIT 4

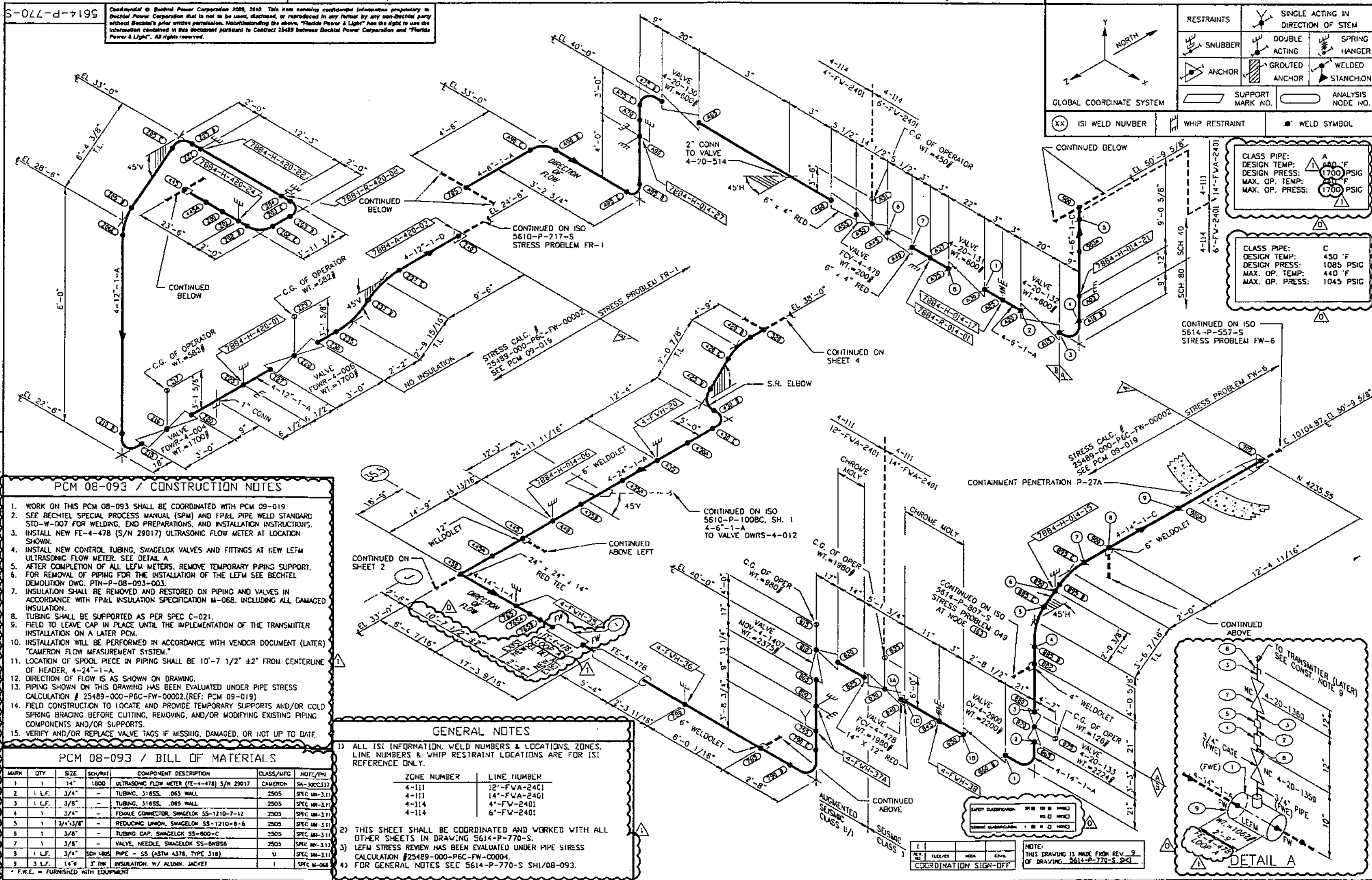
MAIN FEEDWATER SYSTEM
SYSTEM NO. 74 OUTSIDE CONTAINMENT
PIPING ISOMETRIC

BECHTEL POWER CORPORATION

SHEET 2 OF 4

5614-P-770-S/08-093 REV NO 1

5614-P-770-S_SH 2_08-093_Rev1.DWG



PCM 08-093 / CONSTRUCTION NOTES

1. WORK ON THIS PCM 08-093 SHALL BE COORDINATED WITH PCM 09-019.
2. SEE BECHTEL SPECIAL PROCESS MANUAL (SPM) AND FP&L PIPE WELD STANDARD STD-W-007 FOR WELDING, END PREPARATIONS, AND INSTALLATION INSTRUCTIONS.
3. INSTALL NEW FE-4-478 (S/N 29017) ULTRASONIC FLOW METER AT LOCATION SHOWN.
4. INSTALL NEW CONTROL TUBING, SWAGELOK VALVES AND FITTINGS AT NEW LEFM ULTRASONIC FLOW METER. SEE DETAIL A
5. AFTER COMPLETION OF ALL LEFM METERS, REMOVE TEMPORARY PIPING SUPPORT.
6. FOR REMOVAL OF PIPING FOR THE INSTALLATION OF THE LEFM SEE BECHTEL DEMOLITION DWG. PTN-P-08-093-003.
7. INSULATION SHALL BE REMOVED AND RESTORED ON PIPING AND VALVES IN ACCORDANCE WITH FP&L INSULATION SPECIFICATION M-068. INCLUDING ALL DAMAGED INSULATION.
8. TUBING SHALL BE SUPPORTED AS PER SPEC C-021.
9. FIELD TO LEAVE CAP IN PLACE UNTIL THE IMPLEMENTATION OF THE TRANSMITTER INSTALLATION ON A LATER PCM.
10. INSTALLATION WILL BE PERFORMED IN ACCORDANCE WITH VENDOR DOCUMENT (LATER) "CAMERON FLOW MEASUREMENT SYSTEM."
11. LOCATION OF SPOOL PIECE IN PIPING SHALL BE 10'-7 1/2" ±2" FROM CENTERLINE OF HEADER, 4-24"-1-A.
12. DIRECTION OF FLOW IS AS SHOWN ON DRAWING.
13. PIPING SHOWN ON THIS DRAWING HAS BEEN EVALUATED UNDER PIPE STRESS CALCULATION # 25489-000-P6C-FW-00002.(REF: PCM 09-019)
14. FIELD CONSTRUCTION TO LOCATE AND PROVIDE TEMPORARY SUPPORTS AND/OR COLD SPRING BRACING BEFORE CUTTING, REMOVING, AND/OR MODIFYING EXISTING PIPING COMPONENTS AND/OR SUPPORTS.
15. VERIFY AND/OR REPLACE VALVE TAGS IF MISSING, DAMAGED, OR NOT UP TO DATE.

PCM 08-093 / BILL OF MATERIALS

MARK	QTY	SIZE	SCH/RAT	COMPONENT DESCRIPTION	CLASS/MFG	NOTE/PN
1	1	14"	1800	ULTRASONIC FLOW METER (FE-4-478) S/N 29017	CAMERON	SA-300C337
2	1 L.F.	3/4"	-	TUBING, 316SS, .065 WALL	2505	SPEC MN-3.11
3	1 L.F.	3/8"	-	TUBING, 316SS, .065 WALL	2505	SPEC MN-3.11
4	1	3/4"	-	FEMALE CONNECTOR, SWAGELOK SS-1210-7-12	2505	SPEC MN-3.11
5	1	3/4"x3/8"	-	REDUCING UNION, SWAGELOK SS-1210-6-6	2505	SPEC MN-3.11
6	1	3/8"	-	TUBING CAP, SWAGELOK SS-600-C	2505	SPEC MN-3.11
7	1	3/8"	-	VALVE, NEEDLE, SWAGELOK SS-6NBS6	2505	SPEC MN-3.13
8	1 L.F.	3/4"	SCH 160S	PIPE - SS (ASTM A376, TYPE 316)	U	SPEC MN-3.11
9	3 L.F.	14"ø	3" THK	INSULATION, W/ ALUMN. JACKET	I	SPEC M-068

* F.W.E. = FURNISHED WITH EQUIPMENT

GENERAL NOTES

1) ALL ISI INFORMATION, WELD NUMBERS & LOCATIONS, ZONES, LINE NUMBERS & WHIP RESTRAINT LOCATIONS ARE FOR ISI REFERENCE ONLY.

ZONE NUMBER	LINE NUMBER
4-111	12"-FWA-2401
4-111	14"-FWA-2401
4-114	4"-FW-2401
4-114	6"-FW-2401

2) THIS SHEET SHALL BE COORDINATED AND WORKED WITH ALL OTHER SHEETS IN DRAWING 5614-P-770-S.
3) LEFM STRESS REVIEW HAS BEEN EVALUATED UNDER PIPE STRESS CALCULATION #25489-000-P6C-FW-00004.
4) FOR GENERAL NOTES SEE 5614-P-770-S SH1/08-093.

NO	DATE	REVISION	DR	CH	COR	APP
1	4/5/10	ISSUED FOR USE & INCORPORATION OF 3R25 LESSONS LEARNED	AB	ES		JR
0	5/27/10	ISSUED FOR CONSTRUCTION PER PCM 08-093	AGA	DIS	PT	FP

DATE | SCALE

FPL — FLORIDA POWER & LIGHT COMPANY

DR AEG | ER NO
CH JRS / DIL | COR GM
APPROVED FBS / SHC

TURKEY POINT NUCLEAR POWER PLANT UNIT 4

MAIN FEEDWATER SYSTEM
SYSTEM NO. 74 OUTSIDE CONTAINMENT
PIPING ISOMETRIC

BECHTEL POWER CORPORATION

SHEET 3 OF 4

5614-P-770-S/08-093 REV NO 1

5614-P-770-S_SH 3_08-093_Rev1.DWG

5614-P-770-S

PCM ALL / CONSTRUCTION NOTES

1. WORK ON THIS DRAWING SHALL BE COORDINATED WITH PCM 09-019 (EC246949), PCM 08-093 (EC242139), PCM 08-118 (EC246878), AND PCM 08-119 (EC246879).
2. FOR DEMOLITION OF COMPONENTS SEE DWG. PTN-P-09-019-C01.
3. FOR PIPING AND INSTRUMENTATION DIAGRAM FOR THIS SYSTEM, SEE DWG. 5614-M-3074 SHEETS 1 THRU 3/09-019.
4. SEE CONSTRUCTION NOTES / PCM ALL ON DRAWING 5614-P-770-S SH1/09-019 FOR ADDITIONAL CONSTRUCTION NOTES RELATED TO THIS DRAWING.

PCM 09-019 / CONSTRUCTION NOTES

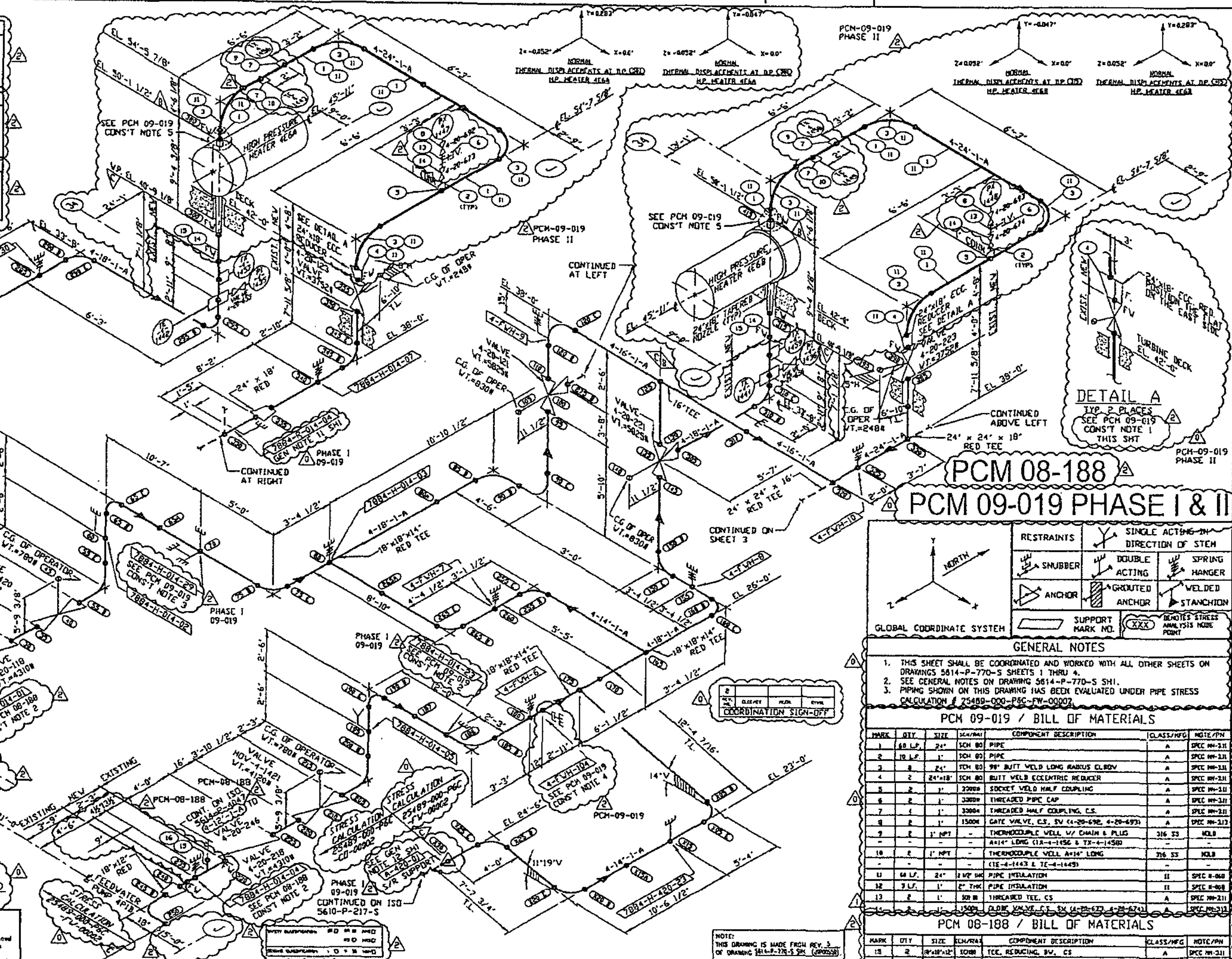
1. DETAIL "A", B.O.M. ITEM "4", MUST BE INSTALLED AS SHOWN TO AVOID CONTACT WITH TURBINE DECK CRANE.
2. SEE HANGER DWG. 5614-H-770 SH36B FOR SUPPORT MODIFICATION.
3. SEE HANGER DWG. 5614-H-770 SH40C FOR SUPPORT MODIFICATION.
4. THIS SUPPORT TO BE INSTALLED IN PCM 09-019 PHASE II.
5. SEE HELB SHIELD CALC. 25489-P6C-FW-00005 FOR SHIELD DESIGN AND INSTALLATION

PCM 08-188 / CONSTRUCTION NOTES

1. FOR PIPING AND INSTRUMENTATION DIAGRAM FOR THIS SYSTEM, SEE DWG. 5613-M-3074 SHEET 1, 2, & 3/08-188.
2. THIS PIPE SUPPORT IS TO BE REMOVED, MODIFIED, AND REPLACED IN THE SAME LOCATION DURING 4R27 OUTAGE.
3. THE COGNIZANT FIELD ENGINEERS SHALL ADJUST OR REROUTE SMALL BORE PIPING AS NEEDED TO FACILITATE INSTALLATION OF THE NEW FW RECIRC TAKE-OFFS.

CLASS PIPE:	A
DESIGN TEMP:	450°F
DESIGN PRESS:	1700 PSIG
MAX. OP. TEMP:	440°F
MAX. OP. PRESS:	1700 PSIG

* NOTE: DESIGN PRESSURE ANALYZED IS 1240psig AS PER BECHTEL CALC.# HDC-ADAE-00001 REV. 0



GENERAL NOTES

1. THIS SHEET SHALL BE COORDINATED AND WORKED WITH ALL OTHER SHEETS ON DRAWINGS 5614-P-770-S SHEETS 1 THRU 4.
2. SEE GENERAL NOTES ON DRAWING 5614-P-770-S SH1.
3. PIPING SHOWN ON THIS DRAWING HAS BEEN EVALUATED UNDER PIPE STRESS CALCULATION # 25489-000-P6C-FW-00002.

PCM 09-019 / BILL OF MATERIALS

MARK	QTY	SIZE	SCH/RAT	COMPONENT DESCRIPTION	CLASS/MFG	NOTE/PN
1	60 L.F.	24"	SCH 80	PIPE	A	SPEC MM-311
2	10 L.F.	1"	SCH 80	PIPE	A	SPEC MM-311
3	8	24"	SCH 80	90° BUTT WELD LONG RADIUS ELBOW	A	SPEC MM-311
4	2	24"x18"	SCH 80	BUTT WELD ECCENTRIC REDUCER	A	SPEC MM-311
5	2	1"	3000#	SOCKET WELD HALF COUPLING	A	SPEC MM-311
6	2	1"	3000#	THREADED PIPE CAP	A	SPEC MM-311
7	4	1"	3000#	THREADED HALF COUPLING, C.S.	A	SPEC MM-311
8	2	1"	1500#	GATE VALVE, C.S., SV (4-20-692, 4-20-693)	A	SPEC MM-313
9	2	1" NPT	-	THERMOCOUPLE WELL W/ CHAIN & PLUG	316 SS	HOLD
-	-	-	-	A=14" LONG (TX-4-1456 & TX-4-1458)	-	-
10	2	1" NPT	-	THERMOCOUPLE WELL A=14" LONG	316 SS	HOLD
-	-	-	-	(TE-4-1443 & TE-4-1449)	-	-
11	60 L.F.	24"	2 1/2" THK	PIPE INSULATION	II	SPEC H-068
12	3 L.F.	1"	2" THK	PIPE INSULATION	II	SPEC H-068
13	2	1"	3000#	THREADED TEE, CS	A	SPEC MM-311
14	2	1"	1500#	GLOBE VALVE, C.S., SV (4-20-673, 4-20-674)	A	SPEC MM-313

PCM 08-188 / BILL OF MATERIALS

MARK	QTY	SIZE	SCH/RAT	COMPONENT DESCRIPTION	CLASS/MFG	NOTE/PN
15	2	18"x18"x12"	SCH80	TEE, REDUCING, BW, CS	A	SPEC MM-311
16	10 LF	18"	2 1/2"THK	PIPING INSULATION	II	SPEC H-068

NO	DATE	REVISION	DR	CH	COR	APP
2	2/9/11	ISSUED FOR USE & INCORPORATION FOR PCM 09-019, PCM 08-118, PCM 08-119, PCM 08-188	AZ	ES	PY	JJZ
1	09/14/10	RE - ISSUED FOR CONSTRUCTION PER PCM 09-019	HSM	EVS	PY	RP
0	06/30/10	ISSUED FOR CONSTRUCTION PCR PCM 09-019	HSM	EVS	YN	PY

FPL — FLORIDA POWER & LIGHT COMPANY

DATE | SCALE | DR ACG | ER NO | CH JRS / TL | COR CH | APPROVED FBS / SHC

TURKEY POINT NUCLEAR POWER PLANT
UNIT 4
MAIN FEEDWATER SYSTEM
SYSTEM NO. 74 OUTSIDE CONTAINMENT
PIPING ISOMETRIC

BECHTEL POWER CORPORATION
SHEET 4 OF 4
5614-P-770-S/09-019
REV NO 2

5614-P-770-S-SH4_09-019.dwg