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FAC System Susceptibility Evaluation (SSE)

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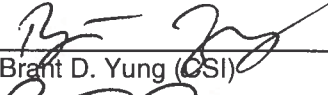
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**Indian Point Energy Center
Unit 2
FAC System Susceptibility Evaluation (SSE)**

**Report No. 0700.104-02
Revision 2
Issued For-Use**

October 14, 2011

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1. Introduction

Flow-Accelerated Corrosion (FAC) is a form of material degradation that results in thinning of the inside pipe wall in carbon steel piping and fittings under certain flow and chemistry conditions. If undetected, FAC may result in piping rupture and subsequent fatalities, injuries, equipment damage, unplanned plant shutdown, and transients that pose undesirable challenges to plant operators. Consequently, all US nuclear plants, including Indian Point, have FAC programs in place to detect and mitigate FAC before piping failure in accordance with Generic Letter 89-08 [7.1].

An effective FAC program includes three key elements: the System Susceptibility Evaluation (SSE), which defines and controls the program scope; the CHECWORKS computer model, which predicts wear rates for every modeled component; and the Susceptible Non-Modeled (SNM) Program, which prioritizes non-modeled but susceptible lines according to FAC potential.

2. Purpose

This document contains the development and results of an FAC System Susceptibility Evaluation (SSE) for Indian Point Energy Center Unit 2. Each plant system, subsystem, and line is classified as either susceptible or non-susceptible to FAC. Susceptible piping forms the scope of the Indian Point FAC program, while non-susceptible piping is excluded from the FAC program. Susceptible piping is further categorized as either modelable in the EPRI computer program CHECWORKS Steam/Feedwater Application (SFA) or non-modelable. Susceptible Non-Modeled (SNM) piping falls outside the capabilities of CHECWORKS SFA.

The purpose of this document is to:

- Define the scope of the Flow-Accelerated Corrosion (FAC) program.
- Identify all plant lines to be modeled in the EPRI computer program CHECWORKS Steam/Feedwater Application (SFA).
- Identify all plant lines that form the scope of the Susceptible Non-Modeled (SNM) program.

3. Scope

The scope of this System Susceptibility Evaluation is all plant piping. This includes piping in all systems, subsystems, and lines. This document reflects the current operating status of the plant. Periodic review and update of this document is recommended by EPRI'S "Recommendations for an Effective Flow-Accelerated Corrosion Program," NSAC 202L [7.2].

Section 4 of this document contains a record of all assumptions made. Section 5 describes the methodology employed in this analysis. The results obtained are documented in Section 6 and in the Appendices. Finally, Section 7 includes a list of all references used in this analysis.

4. Assumptions

4.1. General Assumptions

The following assumptions apply to all plant systems, subsystems, or lines.

- 4.1.1. Piping with nominal pipe size less than or equal to 2" is assumed to be socket welded. Likewise, lines over 2" in diameter are assumed butt-welded.
- 4.1.2. If piping material is unknown, carbon steel material is assumed.
- 4.1.3. If a portion of a system, subsystem, or line is susceptible, then the entire system, subsystem, or line is considered susceptible. An exception is made for lines where valves are the only susceptible components. Since valves are inspected by the Preventative Maintenance or Corrective Action programs, they are considered outside the FAC program.
- 4.1.4. Lines on the Indian Point P&IDs [7.3] containing normally closed valves are assumed to operate less than 2% of the time. Likewise, lines containing valves that are normally open are assumed to operate greater than 2% of the time. This assumption is used when specific valve information is not found in the System Descriptions [7.4], Plant Operating Manuals [7.5], or responses to questions by Indian Point personnel [7.6].
- 4.1.5. It is assumed that no normally closed valves leak, unless confirmed otherwise by plant operating history.
- 4.1.6. Lines that exist in non-susceptible systems or subsystems are excluded from further analysis on the system or subsystem level, respectively. These lines may or may not appear in the Appendices.

4.2. System, Subsystem, and Line Specific Assumptions

Assumptions and susceptibility decisions made specifically for a single system, subsystem, or line appear in the Comments field of the Susceptibility Evaluation reports in the Appendices.

- 4.2.1. Instrumentation, level control lines, and indicator lines are assumed to have insufficient flow to be susceptible to FAC.
- 4.2.2. Floor drains, miscellaneous capped drain and vent lines, and miscellaneous vent lines to the atmosphere are assumed to have insufficient flow to be susceptible to FAC (or operate infrequently).
- 4.2.3. Multiple line names are used for the same line in cases where susceptibility changed along the line and in cases where relationships to CHECWORKS are simplified by separating sections of lines.

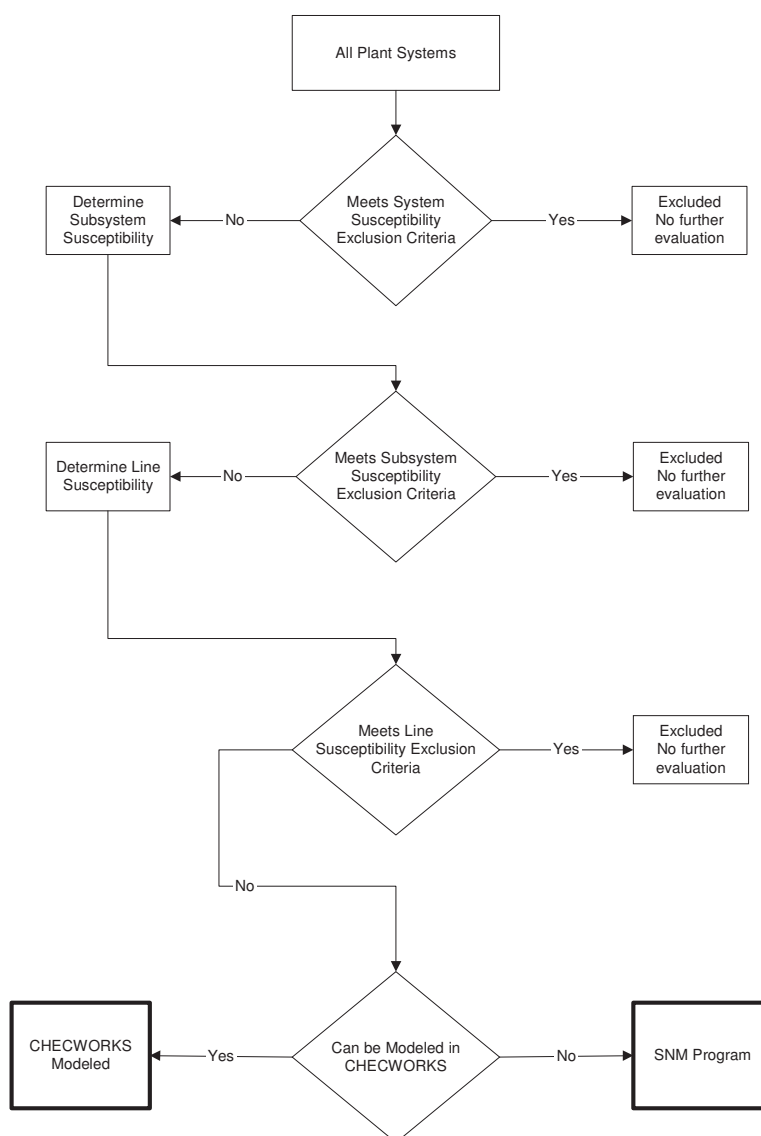
- 4.2.4. The supply and return headers for multiple unit heaters, lines 2-UH-003 and 2-UH-071, are continued on a drawing that could not be located by Indian Point personnel. The continuations of these lines, as well as any lines fed by these headers should be considered FAC-susceptible until proven otherwise.
- 4.2.5. It is assumed that Boiler Feed Pump seal water lines from the Condensate system do not increase to above 200°F when passing through the Boiler Feed Pumps.
- 4.2.6. Judging by the flow configuration on drawing A209775 [7.3], the header containing steam from several unit heaters (24UHR, 211UHR, 219UHR, 221UHR), steam traps (UHT-2-2, UHT-4-1), and the oil preheater does not appear to have an outlet. If an outlet exists that is not shown on the drawing, it should be assumed susceptible to FAC until proven otherwise through further evaluation.
- 4.2.7. Judging by the flow configuration on drawing B193201 [7.3], lines 2-UH-002 and 2-UH-079 appear to have no inlet. If an inlet exists that is not shown on the drawing, it should be assumed susceptible to FAC until proven otherwise by further evaluation.

5. Methodology

The methodology employed in this analysis consisted of a number of successive steps. Each step is explained in detail in the following sections. A flowchart of the methodology used is included in the Figure 5.1

Each plant system, subsystem, and line was reviewed against FAC susceptibility criteria and CHECWORKS modelability criteria (as defined in Section 5.1 and Section 5.2) to determine its susceptibility category. If an entire system or subsystem was determined to be non-susceptible, a line-by-line review was not conducted; however, where that was not the case, each line was evaluated and categorized accordingly and individually.

Figure 5.1 Susceptibility Evaluation Methodology



5.1. Susceptibility Exclusion Criteria

The criteria used to determine susceptibility to FAC was taken from Section 4.2 of EPRI NSAC 202L [7.2]. Systems, subsystems, and/or lines are not considered susceptible to FAC if one or more of the conditions discussed below apply.

5.1.1. FAC Resistant Material

Stainless steel or low-alloy steel with chromium content equal or greater than 1.25% are FAC-resistant [7.2 and 7.7]. Lines or systems made, or replaced with, such materials are not sufficiently susceptible to FAC to warrant further analysis. It should be noted, however, that resistance to FAC does not ensure against other corrosion mechanisms such as cavitation or impingement. Therefore, even if components are replaced with FAC-resistant material, the root cause of wear should be determined before excluding the replaced components from the inspection program.

Wholesale replacement of a line with FAC resistant material would cause that line to be excluded from the FAC program. However, if one component on a line is susceptible, then the whole line was considered susceptible.

Piping material was obtained from the Piping Specifications [7.8], P&IDs [7.3], or the Indian Point isometric drawings [7.9].

5.1.2. Superheated Steam

Piping transporting superheated steam with no moisture content was classified as non-susceptible. According to EPRI's "Recommendations for an Effective Flow-Accelerated Corrosion Program", FAC is known to occur only under flowing water or wet steam conditions, and has not been documented in superheated steam piping [7.2].

Steam quality was obtained from the PEPSE Model [7.10] first, followed by the operating conditions found in the Piping Specification [7.8].

5.1.3. Single-Phase Piping at Low Temperature

Piping with single-phase flow and an operating temperature below 200°F does not experience FAC and was classified as non-susceptible. No temperature exclusion exists for two-phase lines [7.2]. Other degradation mechanisms, such as cavitation, may occur at low temperatures but such mechanisms are outside the scope of this analysis.

Operating temperature was obtained from the PEPSE Model [7.10] first, followed by the operating conditions found in the Piping Specification [7.8].

5.1.4. Low Operating Frequency

Piping that operates less than 2% of the plant operating time was deemed non-susceptible. In general, such piping does not experience the amount of flow required to make FAC a legitimate concern and is excluded from further analysis in favor of piping with greater FAC susceptibility. Piping

in this category includes lines with normally closed valves and those feeding or emerging from equipment that operate less than 2% of the plant operating time.

Exceptions to this rule are made when the operating frequency may be low, but the service is especially severe [7.2].

All lines excluded due to infrequent operation would be susceptible to FAC if operating frequency is increased above the 2% threshold. Therefore, if operating frequency is increased, these lines should be reviewed for inclusion in the FAC Program.

Operating frequency was determined by information from Plant Operating Manuals [7.5], by information found in the System Descriptions [7.4], responses to questions by Indian Point personnel [7.6], and by valve position on the P&IDs [7.3]. See Assumption 4.1.3 for more details.

5.1.5. Combination Single-Phase Piping with Low Temperature and Operating Frequency

This category is a derivative of the two previous susceptibility criteria described in Sections 5.1.3 and 5.1.4. It may be used for a system, subsystem, or a line that operates >2% of total plant operating time but only occasionally (<2% of the time) will the temperature of the single-phase fluid, within the piping, exceed 200°F. Thus, piping containing a single-phase flow that operates less than 2% of the time above 200°F was classified as non-susceptible to FAC.

5.1.6. Non-Water/Steam Piping

Piping that transports fluids other than water or steam, such as air or oil, are not susceptible to FAC.

5.1.7. Dissolved Oxygen Concentration

Lines containing water with high levels of dissolved oxygen (typically greater than 1000 ppb) are considered immune to FAC and can be excluded from further analysis [7.2]. Systems normally meeting this criterion include Service Water, Circulating Water, and Fire Protection.

5.1.8. Low or No Flow

While instrumentation and/or sensing lines may operate continuously, they experience very limited fluid flow. Such piping does not experience the amount of flow required to make FAC a legitimate concern and is excluded from further analysis in favor of piping with greater FAC susceptibility.

5.1.9. Non-Piping

Systems that do not contain piping (e.g. computer system) were excluded from the FAC program.

5.1.10. Piping Removed from Service

Piping that has been removed from service and capped was excluded from the FAC program. Degradation mechanisms may occur in such piping, but for Flow-Accelerated Corrosion to occur, flow is required [7.2].

Table 5.1 provides a summary of the FAC susceptibility exclusion parameters discussed in this section. Also provided is the abbreviation used for each criterion.

Table 5.1 Susceptibility Exclusion Criteria

Abbreviation	Reason	Description
EM	Material	<u>E</u> xcluded due to FAC-resistant <u>M</u> aterial
EQ	Superheated	<u>E</u> xcluded due to high steam <u>Q</u> uality (superheated steam)
ET	Single Phase, T<200°F	<u>E</u> xcluded due to <u>T</u> emperature
EI	Time <2%	<u>E</u> xcluded due to <u>I</u> nfrequent operation (note: would be FAC susceptible if operated at a higher frequency)
EC	Single Phase, T>200°F for time<2%	<u>E</u> xcluded due to a <u>C</u> ombination of infrequent operation above temperature threshold
EW	Non-water/steam	<u>E</u> xcluded due to no <u>W</u> ater or steam present
EO	High D.O.	<u>E</u> xcluded due to dissolved <u>O</u> ₂ content >1000 ppb
EF	Low or No Flow	<u>E</u> xcluded due to Low or No <u>F</u> low
EP	Non-Piping	<u>E</u> xcluded due to no <u>P</u> iping components present
ER	Pipe Removed	<u>E</u> xcluded due to <u>R</u> emoval of piping from service

5.2. Susceptible Non-Modeled (SNM) Criteria

Each line that was not excluded due to criteria listed in Table 5.1 was determined to be susceptible to FAC. An explicit determination of suitability for CHECWORKS modeling was made for these lines. For each line that is susceptible but unsuitable for modeling, the basis for that determination was recorded. Lines were determined to be non-modelable in CHECWORKS if one or more of the conditions discussed below apply.

5.2.1. Weld Type

Lines with socket-welded fittings were classified as non-modelable. Almost all small bore lines (less than or equal to 2" in diameter) are constructed using socket-welded fittings. The socket weld uses a fit-up gap of variable size. This gap can greatly impact turbulence in piping, which in turn has a significant impact on wear rate. Since the size of the fit-up gap is unknown, CHECWORKS cannot accurately predict wear for socket-welded components [7.11].

For this analysis, all small bore lines were considered socket-welded and therefore non-modelable (see 4.1.1). In addition, the extremely large linear footage of small-bore lines and the often unknown thermodynamic conditions combine to make detailed modeling of small-bore piping inefficient and sometimes inaccurate.

5.2.2. Unknown Operating Conditions

In cases where operating conditions cannot be accurately obtained or calculated, accurate modeling cannot be performed. In addition to chemistry, CHECWORKS requires a value for flow, frequency of operation, and two thermodynamic values (pressure, temperature, quality, or enthalpy) to predict wear. The PEPSE Model was the primary source of flow and thermodynamic conditions [7.10]. Thermodynamic conditions were also obtained from the operating conditions found in the Piping Specification [7.8]. Operating frequency was determined by valve position in the Plant Operating Manuals [7.5], on the P&IDs [7.3], from information found in System Descriptions [7.4], and through responses to questions by Indian Point personnel [7.6].

Where operating conditions were unknown or varied, the lines were classified as SNM.

5.2.3. Conditions outside CHECWORKS Modeling Capabilities

Lines that operate with conditions outside of CHECWORKS modeling capabilities were considered SNM. For example, lines with entrained moisture or vent lines containing non-condensable gases were classified as non-modelable.

5.2.4. Visually Inspected Lines

Lines that are visually inspected during outages do not require modeling. For many plants, this criterion applies to the Turbine crossunder piping.

5.2.5. Localized FAC Susceptibility

Lines that were classified as FAC susceptible only at a single location were deemed non-modelable. Examples include carbon steel nozzles and valves in a low alloy line.

5.2.6. High Steam Quality

Lines that contain very high quality (but not superheated) steam were classified as SNM. Modeling such lines is of little value as CHECWORKS predictions would be trivial.

Steam quality was primarily obtained from the PEPSE model [7.10], followed by the operating conditions found in the Pipe Class Specifications [7.8].

Table 5.2 provides a summary of the CHECWORKS model exclusion parameters discussed in this section. Also provided is the abbreviation used for each criterion.

Table 5.2 CHECWORKS Model Exclusion Criteria

Abbreviation	Reason	Description
NS	Socket-welded	<u>N</u> on-modeled due to <u>S</u> ocket-welds
NC	Unknown conditions	<u>N</u> on-modeled due to unknown or varying operating <u>C</u> onditions
NM	Conditions outside CHECWORKS modeling capabilities	<u>N</u> on-modeled due to conditions outside CHECWORKS <u>M</u> odeling capabilities
NV	Visual inspections	<u>N</u> on-modeled due to <u>V</u> isual inspections
NL	Localized FAC	<u>N</u> on-modeled due to <u>L</u> ocalized FAC susceptibility
NQ	High Steam Quality	<u>N</u> on-modeled due to high steam <u>Q</u> uality resulting in CHECWORKS predictions of little value

6. Results

The following sections contain a description of the data found in the appendices.

6.1. System Susceptibility Evaluation

The results of the System Susceptibility Evaluation appear in Appendix A. The report in this appendix lists all plant systems and classifies each as susceptible or non-susceptible to FAC. For those deemed non-susceptible, the reason for exclusion from the FAC program is provided. The following fields appear in this report.

6.1.1. System Code

This field contains the common two-letter designation for the system.

6.1.2. System Name

This field contains a brief description or name of the system.

6.1.3. Susceptible?

This field states if the system is FAC susceptible.

6.1.4. Exclusion Criteria (Excl. Crit.)

This field contains the reason the system is non-susceptible to FAC (see Table 5.1), if applicable.

6.1.5. Comments

Pertinent information about the system appears in this field.

6.1.6. Reference

References used in determining susceptibility appear in this field.

6.2. Subsystem Susceptibility Evaluation

Susceptible systems were divided into subsystems by grouping lines of similar function. The results of the Subsystem Susceptibility Evaluation appear in Appendix B. Only subsystems from susceptible systems were analyzed. The reports in these appendices classify each subsystem as susceptible or non-susceptible to FAC. For those deemed non-susceptible, the reason for exclusion from the FAC program is provided. The following fields appear in this report.

6.2.1. Subsystem Number

This field contains the number of the subsystem, where a subsystem is a subset of the system piping with similar operating parameters. Subsystem names were created for this evaluation and include the unit number, common system designation and a sequential number in the following format.

A-BBBB-CC

A	Unit Number
BBBB	System Abbreviation
CC	Sequential Number

Example: 2-BFD-01, 2-3EX-02

6.2.2. Subsystem Name

This field contains the name of the subsystem preceded by the system (represented by the system code) that it falls into.

6.2.3. Subsystem Boundary

A description of the lines that are grouped in this subsystem is shown here.

6.2.4. Flow Diagram (P&ID)

This field lists the flow diagram(s) on which the subsystem is found.

6.2.5. FAC Susceptible? (FAC. Sus.?)

This field states if the subsystem is FAC susceptible.

6.2.6. Exclusion Criteria (Excl. Crit.)

This field contains the reason the subsystem is non-susceptible to FAC (see Table 5.1), if applicable.

6.2.7. Comments

Pertinent information about the subsystem appears in this field.

6.2.8. Reference

References used in determining susceptibility appear in this field.

6.3. Line Susceptibility Evaluation

Lines in FAC susceptible systems were placed into one of three categories:

- Excluded lines (non-susceptible)
- Susceptible lines to be modeled in CHECWORKS
- Susceptible non-modeled (SNM) lines

Appendix C contains the results of the line susceptibility evaluation for Indian Point Energy Center Unit 2. Appendix C is organized into sections with Section A listing CHECWORKS modeled lines, Section B listing SNM program lines, and Section C listing excluded lines. For SNM lines, the reason for exclusion from the CHECWORKS model is provided. For excluded lines, the reason for exclusion from the FAC program is provided. Not every line in a non-susceptible subsystem was explicitly analyzed and therefore only selected lines will appear in the report (see Section 4.1.6).

The following fields appear in this report.

6.3.1. Line Number

Indian Point does not maintain a complete piping line list. Therefore, line names needed to be created. The majority of main piping lines, depending on susceptibility, were assigned a unique Line Number. The naming convention follows a format which includes unit number, system abbreviation, a sequential number, and, if necessary, a section designator used either for parts of the same line with different susceptibility characteristics or specifications or for preventing duplicate line names:

A-BBBB-CCC-D

A	Unit Number
BBBB	System Abbreviation
CCC	Sequential Number
D	Section Designator

Examples: 2-1EST-014, 2-MS-011-A

6.3.2. Size

The diameter, in inches, of the majority of the line is listed here.

6.3.3. Flow Diagram

This field lists the flow diagram(s) on which that the line is found.

6.3.4. Susceptibility Category (Sus. Cat.)

The susceptibility category is listed in this field. Table 6.1 defines the three susceptibility categories.

Table 6.1 Susceptibility Categories

Abbreviation	Category
M	CHECWORKS <u>M</u> odeled
S	<u>S</u> usceptible non-modeled (SNM)
E	<u>E</u> xcluded from the FAC program (non-susceptible)

6.3.5. Model Exclusion Criteria (Mod. Ex. Crit.)

This field appears only for SNM lines. It contains the reason each line is not modeled in CHECWORKS (see Table 5.2) when applicable.

6.3.6. Susceptibility Exclusion Criteria (FAC Ex. Crit.)

This field appears only for excluded lines. It contains the reason each line is non-susceptible to FAC (see Table 5.1) when applicable.

6.3.7. Comments

Pertinent information about the line appears in this field.

6.3.8. Reference

References used in determining susceptibility or modelability appear in this field.

6.3.9. Line Description

This field contains a description of the line.

6.4. Color-Coded Flow Diagrams

Flow diagrams of all FAC susceptible systems addressed in this document are included in the Color-Coded Flow Diagrams document. The flow diagrams are color-coded based upon FAC susceptibility category and labeled to indicate line numbers. Line numbers were added to the flow diagrams. See the Color-Coded Flow Diagrams Document 0700.104-04 for the color-code convention.

6.5. Revision History

Changes made for each revision of this report are documented in Appendix D.

6.6. Industry FAC Experience Table

Attachment A contains a table of important industry FAC events. This table was used as an aide in determining FAC susceptibility.

6.7. FAC-Susceptible Lines Containing Orifices

As a subtask of the project, a list of FAC-susceptible lines containing orifices was gathered and is shown in Table 6.2 below.

Table 6.2 FAC Susceptible Lines Containing Orifices

Line Number	Line Description	P&ID	Coord.
2-3HD-027	FWH 23A Vent to 3EX-53	A235304	H4
2-3HD-028	FWH 23A Vent to 3EX-534	A235304	H4
2-3HD-029	FWH 23B Vent to 3EX-536	A235304	H5
2-3HD-030	FWH 23B Vent to 3EX-539	A235304	H5
2-3HD-031	FWH 23C Vent to 3EX-541	A235304	H6
2-3HD-032	FWH 23C Vent to 3EX-544	A235304	H6
2-5HD-047	FWH 25A Vent	9321-F-2022	I4
2-5HD-048	FWH 25B Vent	9321-F-2022	I5
2-5HD-049	FWH 25C Vent	9321-F-2022	I6
2-AF-011-A	#21 BFP discharge overflow line upstream of orifice	9321-F-2120	H3
2-AF-012-A	#22 BFP discharge overflow line upstream of orifice	9321-F-2120	G3
2-AF-013-A	#23 BFP discharge overflow line upstream of orifice	9321-F-2120	G3
2-AF-043	Service Boiler Deaerator Drain to Service Boiler Feed Pumps	B193201	C2
2-AF-053	AF57 Vent to Service Boiler Deaerator	B193201	D2
2-AS-003	Aux. Steam from #22 LH Boiler	9321-F-2120	E5
2-AS-004	Aux. Steam from #21 RH Boiler	9321-F-2120	B5
2-AS-009	Steam to AST-26	9321-F-2120	A5
2-AS-031	Steam Header to Barge Steam Connections	B192490	C4
2-AS-066	Steam to and from FP-1198	192491	G5
2-CD-025	Condensate from Header to BFP No. 21	A235307	B5
2-CD-026	Condensate from Header to BFP No. 22	A235307	E5
2-HD-001	#21 HDP to Heater Drain Pump Header	9321-F-2022	D1
2-HD-002	#22 HDP to Heater Drain Pump Header	9321-F-2022	D1
2-MS-143	Main Steam Stop Valve drain to 23 Cond. West Side	A235308	D1
2-MS-144	Main Steam Stop Valve drain to 23 Cond. East Side	A235308	D2
2-MSD-157	Reheater Drain Tank 21A Drain to Header	9321-F-2023	G2
2-MSD-158	Reheater Drain Tank 22A Drain to Header	9321-F-2023	E2
2-MSD-159	Reheater Drain Tank 23A Drain to Header	9321-F-2023	D2
2-MSD-166	Reheater Drain Tank 21B Drain to Header	9321-F-2023	H5
2-MSD-167	Reheater Drain Tank 22B Drain to Header	9321-F-2023	F5
2-MSD-168	Reheater Drain Tank 23B Drain to Header	9321-F-2023	D5

7. References

- 7.1. “Erosion/Corrosion-Induced Pipe Wall Thinning”, Generic Letter 89-08, U.S. Nuclear Regulatory Commission (NRC), May 2, 1989.
- 7.2. “Recommendations for an Effective Flow-Accelerated Corrosion Program,” EPRI NSAC 202L-R3, 1011838, May 2006.
- 7.3. Indian Point 2 FAC Susceptible Piping and Instrumentation Diagrams.

System (Drawing Title)	P&ID #	Rev #
Main Steam	9321-F-2017	84
Main Steam	A235308	49
Main Steam	227780	53
Main Steam Traps (Sheet 1)	9321-F-2041	35
Main Steam Traps (Sheet 2)	9321-F-2042	21
Steam Drain and Gland Seal for Low and High Pressure Turbines	B237144	4
Steam Drain and Gland Seal for Low and High Pressure Turbines	B237145	6
Boiler Feed Pump Turbine Steam Lines Drains & Vents	9321-H-2024	23
Moisture Separator and Reheater Drains & Vents	9321-F-2023	35
Moisture Preseparator	A228272	16
Extraction Steam	9321-F-2020	43
Extraction Steam Trap System	9321-F-2031	17
Heater Drains & Vents	9321-F-2022	53
Heater Drains & Vents	A235304	23
Moisture Separator Reheaters Vent Chamber Discharge	A209847	13
Superheater Building Service Boilers	9321-F-2120	69
Auxiliary Steam Supply and Condensate Return System	A209775	45
Auxiliary Steam System (Sheet 1)	B192490	22
Auxiliary Steam System (Sheet 2)	192491	39
Auxiliary Steam System (Sheet 3)	B192493	8
Water Treatment System (Sheet 3)	A192496	18
Steam Activated Carbon Filter	B227209	16
Auxiliary Boiler Feed	B193201	15
Condensate & Boiler Feed Pump Suction (Sheet 1)	9321-2018	141
Condensate & Boiler Feed Pump Suction (Sheet 2)	A235307	32
Boiler Feedwater	9321-F-2019	113
Steam Generator Blowdown & Blowdown Sample System	9321-F-2729	69

- 7.4. Indian Point System Descriptions/Design Manuals.

System Name	SD No.
Main and Reheat Steam Supply	18.00
Extraction Steam and Heater Drains and Vents	19.02
Condensate	20.00
Feedwater	21.00
Circulating Water	23.04
Service Water	24.00

System Name	SD No.
Main Turbine Lube Oil	26.00
Auxiliary Steam	29.01
Instrument Air	29.02

7.5. Indian Point Plant Operating Manuals

Operating Manual	Doc. No	Rev.
Auxiliary Steam	2-SOP-29-01	19
House Service Boilers	2-SOP-29-01-01	17
House Service Boilers Fuel Oil	2-SOP-29-01-02	18
House Service Boilers Feedwater	2-SOP-29-01-03	14

7.6. Electronic correspondence between CSI and Indian Point personnel (see Attachment B).

7.6.1. Email from Ryan Doremus (CSI) to Ian Mew (IPEC) regarding a Line Naming Convention, dated 7/27/2009.

7.6.2. Email from Ian Mew (IPEC) to Ryan Doremus (CSI) regarding responses to information requests, dated 8/10/2009.

7.6.3. Email from Ian Mew (IPEC) to Ryan Doremus (CSI) regarding responses to information requests, dated 8/13/2009.

7.7. EPRI, Flow-Accelerated Corrosion in Power Plants, B. Chexal et al, EPRI TR-106611-R1, 1998.

7.8. “Entergy Nuclear Northeast Indian Point Energy Center – Unit No. 2: Specification For Fabrication of Piping Systems Turbine Generator Plant”; Specification No. 9321-01-248-18; Revision 18; January 15, 2010.

7.9. Indian Point Isometric Drawings for FAC-susceptible piping, gathered by CSI on 4/3/2009.

7.10. Indian Point “Uprate PEPSE Model with New HP Turbine High Pressure Turbine Expansion”, Run Date 10/26/06.

7.11. “CHECWORKS Steam/Feedwater Application Guidelines for Plant Modeling and Evaluation of Component Inspection Data”. EPRI, Palo Alto, CA and CSI Technologies, Inc., Elgin, IL: 2009. 1019176.

7.12. “Flow Accelerated Corrosion Program Plan Supplement”; Edited by Hazel Pearsall, FAC Program Engineer; Dated April 28, 2003 (For information only).

7.13. Indian Point FAC Program History Outage Reports, transmitted to CSI on 7/15/2009 (For information only).

7.14. CHUG Industry Experience Documents (see Attachment A) (For information only).

7.15. Indian Point System List. Transmitted to CSI on 1/6/2010 (For information only).

Appendix A

System Susceptibility Evaluation Report

System Code	System Name	System Number	Susceptible?	Excl. Crit.	Comments	Reference
AF	Auxiliary Feedwater		Yes		This system delivers feedwater to the Service Boilers	P&ID
AS	Auxiliary Steam		Yes		This system generates and distributes steam to the various auxiliaries requiring steam for operation.	SD No. 29.01
AST	Auxiliary Steam Traps		Yes		This system includes all steam trap lines for the Auxiliary Steam System	SD No. 29.01
BD	Steam Generator Blowdown		Yes		This system takes water from the steam generators for maintaining proper Steam Generator Chemistry.	P&ID
CD	Condensate Pump Discharge		Yes		This system includes piping from some high temperature Feedwater Heaters.	SD No. 20.0
EST	Extraction Steam Traps		Yes		This system includes all steam trap lines originating from extraction steam, heater drains, heater vents, and moisture separator drains.	SD No. 19.02
EX	Extraction Steam		Yes		This system includes extraction steam to the Feedwater Heaters	SD No. 19.02
FW	Main Feed Water		Yes		This system supplies feedwater to the steam generators.	SD No. 21.0
GS	Gland Sealing Steam		Yes		This system supplies sealing steam to the HP, LP, and BFP Turbines.	P&IDs
GST	Gland Steam Traps		Yes		This system includes all steam trap lines for the Gland Steam System	P&ID
HD	Heater Drains & Vents		Yes		This system includes Feedwater Heater Drains and Vents, and piping from the Heater Drain Pumps to the Boiler Feed Pump suction.	SD No. 19.02

System Code	System Name	System Number	Susceptible?	Excl. Crit.	Comments	Reference
MS	Main Steam		Yes		This system supplies steam to the HP and BFP Turbines and the MSRs.	SD No. 18.0
MSD	Moisture Separator Reheater Drains		Yes		This system includes MSR Drains to the Heater Drain Tank, No. 25 Feedwater Heaters, and the Drains Collecting Tank	P&ID
MST	Main Steam Traps		Yes		This system includes all steam trap lines for the Main Steam System	SD No. 18.0
PD	Moisture Preseparator Drains		Yes		This system removes moisture from piping upstream of the HP Turbine Crossunder Piping.	P&ID
RST	Reheat Steam Traps		Yes		This system includes all steam trap lines from the Reheater Steam system.	SD No. 18.0
SB	Service Boiler		Yes		This system contains some steam piping from the Service Boiler.	P&ID
UH	Condensate Return Unit Heaters to Service Boiler D		Yes		This system contains condensate from the condensate return unit heaters to the service boiler deaerator.	Pipe Spec
UHT	Condensate Return Unit Heater Steam Traps		Yes		This system includes all steam trap lines for the Condensate Return Unit Heaters to Service Boiler Deaerator system.	P&ID
VCD	MSR Vent Chamber Discharge		Yes		This system contains steam from the MSRs.	P&ID
A	4160 VAC		No	EP	This is an electrical system that does not contain piping.	
AAC	AAC EDG Controls & Excitation		No	EP	This system does not contain piping.	
AAC	Alternate AC Diesel Generator		No	EP	This system contains only the generator and not the associated piping.	

System Code	System Name	System Number	Susceptible?	Excl. Crit.	Comments	Reference
AB	Auxiliary Building		No	EP	This system includes the building and not the associated piping.	
ABS	Auxiliary Building Sump		No	ET	This system handles low temperature water from floor drains.	
ABV	Auxiliary Building Ventilations		No	EW	This system vents non-condensable gases.	
AC	Chill Water System		No	ET	This system operates at under 200 degF	
ACW	Auxiliary Cooling Water		No	ET	This system operates at under 200 degF	P&ID
ADM	Admin Building		No	EP	This system includes the building and not the associated piping.	
ARMS	Area Radiation Monitoring Systems		No	EP	This system does not contain piping.	
B	480 VAC		No	EP	This is an electrical system that does not contain piping.	
BA	Breathing Air		No	EW	This system does not contain water or steam.	
BMS	Boron Management		No	EW	This system does not contain water or steam.	
BS	Containment (Building) Spray		No	EI	Containment spray only operates in emergency situations.	SD No. 10.2
CA	Secondary Chemical Addition		No	EW	This system does not contain water or steam.	
CCW	Component Cooling Water System		No	ET	This system provides low-temperature water to various equipment in the plant.	P&ID

System Code	System Name	System Number	Susceptible?	Excl. Crit.	Comments	Reference
CEDM	Control Element Drive Mechanism Control		No	EP	This system does not contain piping.	
CF	Chemical Feed		No	EW	This system does not contain water or steam.	P&IDs
CL	Chlorination		No	EW	This system does not contain water or steam.	P&ID
COMM	Communications		No	EP	This system does not contain piping.	
CP	Cathodic Protection		No	EP	This is an electrical system that does not contain piping.	
CPC	Core Protection Calculators		No	EP	This system does not contain piping.	
CPV	Penetration Room Ventilation		No	EW	This system vents non-condensable gases.	
CRDX	Cardox (CO2 Fire Protection System)		No	EW	This system does not contain water or steam.	P&ID
CRV	Control Room Ventilation		No	EW	This system vents non-condensable gases.	
CS	Condensate Pump Suction		No	ET	This system transports low-temperature water from the Condensers to the Condensate Pump.	SD No. 20.0
CT	Condensate Storage & Transfer		No	ET	Condensate transfer is a low-temperature system used to ensure there is no raw water contamination of the condensate.	SD No. 20.0
CV	Condenser Air Vents		No	EW	This system does not contain water or steam.	
CVCS	Chemical and Volume Control System		No	EM	This system is comprised entirely of FAC-resistant piping.	P&IDs

System Code	System Name	System Number	Susceptible?	Excl. Crit.	Comments	Reference
CVH	Containment Vent Header		No	EW	This system vents non-condensable gases.	
CW	Circulating Water		No	EO	This system provides river water to cool the steam in the condensers.	SD No. 23.0
D	125 VDC		No	EP	This is an electrical system that does not contain piping.	
DA	Diesel Generator Starting Air		No	EW	This system does not contain water or steam.	P&ID
DCH	Drain Collection Header		No	EF	Flow in this system is too low to facilitate FAC.	
DF	Diesel Generator Fuel Oil		No	EW	This system does not contain water or steam.	P&ID
DFAS	Diverse Emergency Feed Actuation		No	EP	This system does not contain piping.	
DSS	Diverse Scram System		No	EP	This system does not contain piping.	
DW	Domestic Water		No	EO	This system contains highly oxygenated water from the city supply.	
EC	Plant Computer		No	EP	This system does not contain piping.	
EDG	Emergency Diesel Generator		No	EP	This system does not contain piping.	
EDG	EDG Controls & Excitation		No	EP	This system does not contain piping.	
EFW	Emergency Feed Water		No	EI	This system only operates in emergency situations.	
EHC	Electro-Hydraulic (Mechanical)		No	EP	This system does not contain piping.	

System Code	System Name	System Number	Susceptible?	Excl. Crit.	Comments	Reference
EHC	MFP EHC Controls		No	EP	This system does not contain piping.	
EHC	MTG EHC Controls		No	EP	This system does not contain piping.	
EL	Emergency Lighting (Safe Shutdown)		No	EP	This system does not contain piping.	
EOF	Emergency Operations Facility		No	EP	This system does not contain piping.	
ES	ESFAS		No	EP	This system does not contain piping.	
EXCT	Main Generator Excitation & Protection		No	EP	This system does not contain piping.	
F	Switchyard		No	EP	This system does not contain piping.	
FD	Fire Detection		No	EP	This system does not contain piping.	
FHS	Fuel Handling System		No	EW	This system does not contain water or steam.	
FO	Diesel Fuel Oil Storage and Transfer		No	EW	This system does not contain water or steam.	P&ID
FP	Spent Fuel Pool Cooling		No	ET	This system operates at under 200 degF	
FS	Fire Protection (Water)		No	ET	This system uses low-temperature city water.	P&IDs
FWCS	Feed Water Control System		No	EF	This system contains low-flow instrumentation lines.	
GCH	Gas Collection Header		No	EW	This system does not contain water or steam.	

System Code	System Name	System Number	Susceptible?	Excl. Crit.	Comments	Reference
GG	Generator Gas		No	EW	This system does not contain water or steam.	
GSO	Hydrogen Seal Oil (Mechanical)		No	EW	This system does not contain water or steam.	
GZ	Gaseous Radwaste		No	EW	This system does not contain water or steam.	
H	6900 VAC		No	EP	This is an electrical system that does not contain piping.	
H2	Hydrogen		No	EW	This system does not contain water or steam.	
HAL	Halon		No	EW	This system does not contain water or steam.	
HPA	Hydrogen Purge System		No	EW	This system does not contain water or steam.	
HPSI	High Pressure Safety Injection		No	EM	Lines in this system are composed of FAC-resistant material.	Pipe Spec
HR	H2 Recombiners		No	EW	This system does not contain water or steam.	
HS	Generator Hydrogen Supply		No	EW	This system provides hydrogen to the steam generators.	P&ID
HT	Heat Tracking		No	EP	This system does not contain piping.	
IA	Instrument Air		No	EW	This system does not contain water or steam.	SD No. 29.02
IB	Isophase Bus		No	EP	This system does not contain piping.	
IBC	Isophase Bus Cooling		No	ET	This system operates at under 200 degF	

System Code	System Name	System Number	Susceptible?	Excl. Crit.	Comments	Reference
IC	Incore Instrumentation		No	EF	This system contains low-flow instrumentation lines.	
ICC	Reactor Vessel Level Monitoring & CETs		No	EF	This system contains low-flow instrumentation lines.	
IS	Intake Structure		No	EO	This system contains highly oxygenated water.	
JW	Diesel Generator Jacket Water		No	EO	This system is fed with raw water.	P&ID
K	Annunciators		No	EP	This system does not contain piping.	
LA	120/208 VAC Misc. Lighting & Power Dist.		No	EP	This is an electrical system that does not contain piping.	
LLRW	Low Level Radwaste Bldg		No	EP	This system does not contain piping.	
LO	Main Turbine Lube Oil		No	EW	This system does not contain water or steam.	P&ID
LPSI	Low Pressure Safety Injection		No	EM	Lines in this system are composed of FAC-resistant material.	Pipe Spec
LRBV	Low Level Radwaste Building Ventilation		No	EW	This system vents non-condensable gases.	
LRW	Liq Radwaste Mgmt		No	EW	This system does not contain water or steam.	
MET	Meteorological Instrumentation		No	EP	This system does not contain piping.	
MW	City Water Make-Up		No	EO	This system contains highly oxygenated water from the city supply.	P&ID
N2	Nitrogen		No	EW	This system does not contain water or steam.	P&ID

System Code	System Name	System Number	Susceptible?	Excl. Crit.	Comments	Reference
NI	Nuclear Instrumentation		No	EP	This system does not contain piping.	
NT	Neutralizing System		No	EP	This system does not contain piping.	
PA	Reactor Building Purge Air		No	EW	This system does not contain water or steam.	
PASS	Post Accident Sampling		No	EI	This system only operates in post-accident conditions	
PCA	Penetration Cooling Air		No	EW	This system does not contain water or steam.	P&ID
PH	Plant Heating		No	EW	This system does not contain water or steam.	
PMU	Makeup Demineralizer System		No	ET	This system operates at under 200 degF	
PPS	Plant Protection System		No	EP	This system does not contain piping.	
PS	Primary Sampling		No	EI	This system operates less than 2% of plant operation	
PW	Primary Water		No	ET	This system contains low-temperature water	P&ID
RB	Reactor Building		No	EP	This system does not contain piping.	
RBHV	Reactor Building Ventilation		No	EW	This system vents non-condensable gases.	
RCP	Reactor Coolant Pumps		No	EP	This system does not contain piping.	
RCS	Reactor Coolant System		No	EM	All lines in the RCS system are composed of FAC-resistant piping	P&ID

System Code	System Name	System Number	Susceptible?	Excl. Crit.	Comments	Reference
RDAC/S PING	RDAC (Radiation Dose Assessment Computer)/SPING (S		No	EP	This system does not contain piping.	
RHR	Residual Heat Removal System		No	EM	All lines in the RHR system are stainless steel.	Pipe Spec
RMS	Radiation Monitoring		No	EP	This system does not contain piping.	
RPS	Reactor Protection System		No	EP	This system does not contain piping.	
RRS	Reactor Regulating System		No	EP	This system does not contain piping.	
RS	Reheat Steam		No	EQ	Reheater Steam provides superheated steam to the LP and BFP Turbines.	SD No. 18.0
RT	Resin Transfer		No	EW	This system does not contain water or steam.	
RWB	Radwaste Building		No	EP	This system does not contain piping.	
RX	Reactor Core		No	EP	This system does not contain piping.	
RZ	Regen Waste		No	EP	This system does not contain piping.	
SA	Service Air		No	EW	This system does not contain water or steam.	P&ID
SDBC	Steam Dump Bypass Control System		No	EP	This system does not contain piping.	
SDC	Shutdown Cooling		No	EI	This system only operates during shutdown.	
SEC	Security		No	EP	This system does not contain piping.	

System Code	System Name	System Number	Susceptible?	Excl. Crit.	Comments	Reference
SFP	Spent Fuel Pit		No	ET	The water in this system is low-temperature.	
SGS	Stm. Gen. Secondary		No	EP	This system does not contain piping.	
SI	Safety Injection System		No	EM	This system is comprised entirely of FAC-resistant piping.	P&ID
SMS	Seismic Monitoring System		No	EP	This system does not contain piping.	
SP	Sample System		No	EM	Sample piping at IPEC is stainless steel.	Pipe Spec
SPDS	Safety Parameter Display System		No	EP	This system does not contain piping.	
SS	Secondary Sampling		No	EM	Sample piping at IPEC is stainless steel.	Pipe Spec
STP	Sewage Treatment Plant		No	EP	This system does not contain piping.	
SW	Service Water		No	EO	Service Water has a high concentration of dissolved oxygen.	P&ID
SWC	Stator Water Cooling		No	ET	This system operates at under 200 degF	
SZ	Solid Waste Management		No	EW	This system does not contain water or steam.	
TB	Turbine Building		No	EP	This system does not contain piping.	
TBS	Turbine Building Sump		No	EF	Flow in this system is too low to facilitate FAC.	
TBV	Turbine Building Ventilation		No	EW	This system vents non-condensable gases.	

System Code	System Name	System Number	Susceptible?	Excl. Crit.	Comments	Reference
TG	Main Turbine & Generator		No	EP	This system does not contain piping.	
TG	MTG & MFPT Supervisory Instrumentation		No	EP	This system does not contain piping.	
TS	Traveling Screens		No	EP	This system does not contain piping.	
VENT	Miscellaneous Ventilation System		No	EW	This system vents non-condensable gases.	
VLPM	U2 Vibration & Loose Parts Monitoring System		No	EP	This system does not contain piping.	
VS	Condenser Vacuum		No	EW	This system vents non-condensable gases.	
XFMR	Main, Auxiliary & Startup Transformers		No	EP	This system does not contain piping.	
Y	Inverters & Vital 120 VAC		No	EP	This is an electrical system that does not contain piping.	

System Code	System Name	System Number	Susceptible?	Excl. Crit.	Comments	Reference
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Exclusion Criteria Legend:

EC	Excluded due to Combination of infrequent op above temp threshold
EF	Excluded due to low or no Flow
EI	Excluded due to Infrequent operation
EM	Excluded due to FAC-resistant Material
EO	Excluded due to high dissolved Oxygen content
EP	Excluded, does not contain Piping
EQ	Excluded due to high steam Quality
ER	Excluded, Removed from service and "cut" and "capped"
ET	Excluded due to operating Temperature (single phase, < 200 deg F)
EW	Excluded because system, subsystem, or line is non-Water

Appendix B
Subsystem Susceptibility Evaluation Report
Indian Point Unit 2

Auxiliary Feedwater (AF), Unit 2

Subsystem Number	Subsystem Name	Subsystem Boundary	P&ID No.	FAC Sus?	Excl. Crit.	Comments	Reference
2-AF-01	Service Boiler Auxiliary Feedwater Lines		9321-F-2120, B193201	Yes			P&ID
2-AF-02	Aux Feedwater to and from Sample Coolers		9321-F-2120	No	EI	Valves to coolers shown closed on P&ID	P&ID

Auxiliary Steam (AS), Unit 2

Subsystem Number	Subsystem Name	Subsystem Boundary	P&ID No.	FAC Sus?	Excl. Crit.	Comments	Reference
2-AS-01	Auxiliary Steam to Burner Atomizing Steam		9321-F-2120	No	EQ	Atomizing steam is superheated	SD No. 29.01
2-AS-02	Auxiliary Steam to Fuel Oil Suction Heaters		B192493	No	ER	Source line shown capped on P&ID	P&ID
2-AS-03	Remainder of Auxiliary Steam		9321-F-2120, A209775, B192490, B192491, B192493, B192496, B193201, B227209	Yes			SD No. 29.01

Auxiliary Steam Traps (AST), Unit 2

Subsystem Number	Subsystem Name	Subsystem Boundary	P&ID No.	FAC Sus?	Excl. Crit.	Comments	Reference
2-AST-01	Steam Trap Lines from Auxiliary Steam Lines		9321-F-2120, B192490, B192491	Yes			P&ID

Steam Generator Blowdown (BD), Unit 2

Subsystem Number	Subsystem Name	Subsystem Boundary	P&ID No.	FAC Sus?	Excl. Crit.	Comments	Reference
2-BD-01	Steam Generator Blowdown to Sample Coolers and Blowdown Tank		9321-F-2729	Yes			SD No. 18.0

Condensate Pump Discharge (CD), Unit 2

Subsystem Number	Subsystem Name	Subsystem Boundary	P&ID No.	FAC Sus?	Excl. Crit.	Comments	Reference
2-CD-01	Condensate Lines Between Condensate Pumps and #22 Feedwater Heaters		9321-2018, A235307	No	ET	Condensate is below 200 degF before passing through the #22 FWHs	PEPSE
2-CD-02	Condensate Lines Downstream of #22 Feedwater Heaters		9321-2018, A235307	Yes			PEPSE

Extraction Steam Traps (EST), Unit 2

Subsystem Number	Subsystem Name	Subsystem Boundary	P&ID No.	FAC Sus?	Excl. Crit.	Comments	Reference
2-1EST-01	Extraction Steam Trap Headers to the Drains Collecting Tank		9321-F-2031	Yes			P&ID
2-3EST-01	Steam Trap lines from Extraction Steam to the #23 FWHs		9321-F-2031	Yes			P&ID
2-4EST-01	Lines from Stm Traps to the Stm Trap Drains Header from Ext lines to #24 FWHs		9321-F-2031	Yes			P&IDs
2-4EST-02	Lines upstream of the Stm Traps from #24 FWH's Ext Stm Header		9321-F-2031	No	EQ	Lines upstream of the steam traps are superheated.	PEPSE
2-5EST-01	Steam Trap lines from Extraction Steam to the #25 FWHs		9321-F-2031	Yes			P&ID
2-6EST-01	Steam Trap lines from Extraction Steam to the #26 FWHs		9321-F-2031	Yes			P&ID

Extraction Steam (EX), Unit 2

Subsystem Number	Subsystem Name	Subsystem Boundary	P&ID No.	FAC Sus?	Excl. Crit.	Comments	Reference
2-1EX-01	LP Turb Ext Stm to #21 FWHS		9321-F-2020	Yes			PEPSE
2-2EX-01	LP Turbine Extraction Steam to #22 Feedwater Heaters		9321-F-2020	Yes			PEPSE
2-3EX-01	Boiler Feed Pump Turbine Drains to Condensers		A227780	Yes			PEPSE
2-3EX-02	LP Turbine Extraction Steam to #23 Feedwater Heaters		9321-F-2020, 9321-F-2031	Yes			PEPSE
2-4EX-01	Extraction Steam Lines to #24 Feedwater Heaters		9321-F-2020, 9321-F-2031	No	EQ	Steam is superheated upstream of the steam traps.	P&IDs
2-5EX-01	HP Turbine Crossunder Piping Drip Pots to the Condenser		A235308	Yes			P&IDs
2-5EX-02	Small Bore Steam Drains to the Condenser via FCV-1156, 1157, 1164, 1165, and 1166.		A235308	No	EI	Control valves in these lines are normally closed.	SD No. 18.0
2-5EX-03	Extraction Steam from Separating Tanks to #25 Feedwater Heaters		9321-F-2020, 9321-F-2031	Yes			PEPSE
2-6EX-01	HP Turbine Extraction Steam to #26 Feedwater Heaters		9321-F-2020	Yes			PEPSE

Main Feed Water (FW), Unit 2

Subsystem Number	Subsystem Name	Subsystem Boundary	P&ID No.	FAC Sus?	Excl. Crit.	Comments	Reference
2-FW-01	Feedwater Lines from the Boiler Feed Pumps to the Steam Generators		9321-F-2019	Yes			PEPSE
2-FW-02	Auxiliary Feedwater Lines to Steam Generator		9321-F-2019	No	EI	Auxiliary Feedwater only operates during startup, shutdown, and emergency conditions.	SD No. 21.0
2-FW-03	Boiler Feed Pump Recirc Lines to the Drains Collecting Tank		9321-F-2019	Yes			SD No. 21.0

Gland Sealing Steam (GS), Unit 2

Subsystem Number	Subsystem Name	Subsystem Boundary	P&ID No.	FAC Sus?	Excl. Crit.	Comments	Reference
2-GS-01	Gland Steam to and from HP, LP, and BFP Turbines		A235308, B237144, B237145, 9321-H-2024	Yes			P&IDs

Gland Steam Traps (GST), Unit 2

Subsystem Number	Subsystem Name	Subsystem Boundary	P&ID No.	FAC Sus?	Excl. Crit.	Comments	Reference
2-GST-01	Steam Trap Lines from the Gland Seal System		9321-H-2024	Yes			P&ID

Heater Drains & Vents (HD), Unit 2

Subsystem Number	Subsystem Name	Subsystem Boundary	P&ID No.	FAC Sus?	Excl. Crit.	Comments	Reference
2-1HD-01	#21 Feedwater Heater Drain Lines		A235304	Yes			PEPSE
2-1HD-02	#21 Feedwater Heater Vents		A235304	Yes			P&ID
2-2HD-01	#22 Feedwater Heater Drain Lines		A235304	Yes			PEPSE
2-2HD-02	#22 Feedwater Heater Vents		A235304	Yes			P&ID
2-3HD-01	#23 Feedwater Heater Drain Lines		A235304	Yes			PEPSE
2-3HD-02	#23 Feedwater Heater Vents		A235304	Yes			P&ID
2-4HD-01	#24 Feedwater Heater Drain Lines		A235304	Yes			PEPSE
2-4HD-02	#24 Feedwater Heater Vents		A235304	Yes			P&ID
2-5HD-01	Heater Drains from #25 Feedwater Heaters		9321-F-2022	Yes			PEPSE
2-5HD-02	Heater Vents from #25 Feedwater Heater and Heater Drain Tank vents to #25 Feedwater Heaters		9321-F-2022, A235304	Yes			P&ID
2-5HD-03	HDT Drains to HDPs and Condensers and HDP Vents to HDT		9321-F-2022, A235304	Yes			PEPSE

Heater Drains & Vents (HD), Unit 2

Subsystem Number	Subsystem Name	Subsystem Boundary	P&ID No.	FAC Sus?	Excl. Crit.	Comments	Reference
2-6HD-01	Heater Drains from #26 Feedwater Heaters		9321-F-2022	Yes			PEPSE
2-6HD-02	Heater Vents from #26 Feedwater Heater		9321-F-2022, A235304	Yes			P&ID
2-HD-01	Heater Drain Pump discharge to Boiler Feed Pumps		9321-F-2022	Yes			PEPSE

Main Steam (MS), Unit 2

Subsystem Number	Subsystem Name	Subsystem Boundary	P&ID No.	FAC Sus?	Excl. Crit.	Comments	Reference
2-MS-01	Main Steam from Stm Gen to HP Turbine, BFP Turbine, MSRs, Aux. Steam, SJAES, and Priming Ejectors.		9321-F-2017, A227780, A235308	Yes			P&IDs
2-MS-02	Main Steam to MSR Header Dumps to Condenser		A227780	No	EI	These lines operate during startup and shutdown.	SD No. 18.0
2-MS-03	Small Bore Turbine Steam Drains to the Condenser via FCV-1154, 1155, 1158, and 1159		A235308	No	EI	Control valves in these lines are normally closed.	SD No. 18.0
2-MS-04	H.P. Cylinder Steam Heating and Seals		A235308	No	EI	Control valves in line are closed during normal operation.	SD No. 18.0
2-MS-05	Scavenging Steam from 6th Stage Extraction Steam		9321-F-2023	No	ER	Piping is abandoned in place.	P&ID
2-MS-06	Main Steam Supply to Gland Steam Header		A235308	Yes			P&ID
2-MS-07	HP Turbine Crossunder Piping to the Moisture Separators		A235308, A227780	Yes			PEPSE

Moisture Separator Reheater Drains (MSD), Unit 2

Subsystem Number	Subsystem Name	Subsystem Boundary	P&ID No.	FAC Sus?	Excl. Crit.	Comments	Reference
2-MSD-01	Moisture Separator Drains to the Heater Drain Tank and Drains Collecting Tank		9321-F-2023	Yes			PEPSE
2-MSD-02	Reheater Drains to #26 Feedwater Heaters and Condensers		9321-F-2023	Yes			PEPSE

Main Steam Traps (MST), Unit 2

Subsystem Number	Subsystem Name	Subsystem Boundary	P&ID No.	FAC Sus?	Excl. Crit.	Comments	Reference
2-MST-01	Steam Trap Lines from the Main Steam System		9321-F-2041, 9321-F-2042	Yes			P&ID

Moisture Preseparator Drains (PD), Unit 2

Subsystem Number	Subsystem Name	Subsystem Boundary	P&ID No.	FAC Sus?	Excl. Crit.	Comments	Reference
2-PD-01	Moisture Preseparator Drain Lines		A228272	Yes			PEPSE

Reheat Steam Traps (RST), Unit 2

Subsystem Number	Subsystem Name	Subsystem Boundary	P&ID No.	FAC Sus?	Excl. Crit.	Comments	Reference
2-RST-01	Reheat Steam Trap Lines Downstream of Reheater Steam Traps		9321-H-2024	Yes			P&IDs
2-RST-02	All other Reheater Steam Trap Lines		A227780, 9321-H-2024	No	EQ	Reheat Steam upstream of the steam traps is superheated.	PEPSE

Service Boiler (SB), Unit 2

Subsystem Number	Subsystem Name	Subsystem Boundary	P&ID No.	FAC Sus?	Excl. Crit.	Comments	Reference
2-SB-01	Service Boiler Lines		9321-F-2120, A227780, A209775, B193201	Yes			SD No. 29.01

Condensate Return Unit Heaters to Service Boiler D (UH), Unit 2

Subsystem Number	Subsystem Name	Subsystem Boundary	P&ID No.	FAC Sus?	Excl. Crit.	Comments	Reference
2-UH-01	Condensate Return from Unit Heaters to the Deaerator		9321-F-2120, A209775, B192491, B193201	Yes			P&IDs

Condensate Return Unit Heater Steam Traps (UHT), Unit 2

Subsystem Number	Subsystem Name	Subsystem Boundary	P&ID No.	FAC Sus?	Excl. Crit.	Comments	Reference
2-UHT-01	Steam Trap Lines from the Condensate Return from Unit Heaters to the Deaerator system		A209775	Yes			P&ID

MSR Vent Chamber Discharge (VCD), Unit 2

Subsystem Number	Subsystem Name	Subsystem Boundary	P&ID No.	FAC Sus?	Excl. Crit.	Comments	Reference
2-VCD-01	Moisture Separator Reheater Vent Chamber Discharge Lines		A209847	Yes			PEPSE

Exclusion Criteria (Excl. Crit.) Legend:

EC	Excluded due to Combination of infrequent op above temp threshold
EF	Excluded due to low or no Flow
EI	Excluded due to Infrequent operation
EM	Excluded due to FAC-resistant Material
EO	Excluded due to high dissolved Oxygen content
EP	Excluded, does not contain Piping
EQ	Excluded due to high steam Quality
ER	Excluded, Removed from service and "cut" and "capped"
ET	Excluded due to operating Temperature (single phase, < 200 deg F)
EW	Excluded because system, subsystem, or line is non-Water

Appendix C
Line Susceptibility Evaluation Report
Indian Point Unit 2

Auxiliary Feedwater (AF), Unit 2

Section B: SNM Program Lines

2-AF-01: Service Boiler Auxiliary Feedwater Lines

Line Number	Size (In.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-AF-001	6	9321-F-2120	S	NC	Operating conditions unknown.	P&ID	Deaerator Header to Boiler Feed Pumps
2-AF-002	4	9321-F-2120	S	NC	Operating conditions unknown.	P&ID	Aux. Feed header to #23 Boiler Feed Pump and #10 House Service Deaerator
2-AF-003	4	9321-F-2120	S	NC	Operating conditions unknown.	P&ID	Aux. Feed header to #21 Boiler Feed Pump
2-AF-004	4	9321-F-2120	S	NC	Operating conditions unknown.	P&ID	Aux. Feed header to #22 Boiler Feed Pump
2-AF-005	4	9321-F-2120	S	NC	Operating conditions unknown.	P&ID	Aux. Feed header to #23 Boiler Feed Pump
2-AF-006	6	9321-F-2120	S	NC	Operating conditions unknown.	P&ID	Aux. Feed header to #10 House Service Deaerator
2-AF-007	1.5	9321-F-2120	S	NS	Operating conditions unknown.	P&ID	Boiler Feed Pump overflow header to Deaerator
2-AF-008	1.5	9321-F-2120	S	NS	Operating conditions unknown.	P&ID	Boiler Feed Pump discharge Unit #3 tie-in.
2-AF-011-A	1	9321-F-2120	S	NS	Operating conditions unknown.	P&ID	#21 BFP discharge overflow line upstream of orifice
2-AF-011-B	1	9321-F-2120	S	NS	Operating conditions unknown.	P&ID	#21 BFP discharge overflow line downstream of orifice
2-AF-012-A	1	9321-F-2120	S	NS	Operating conditions unknown.	P&ID	#22 BFP discharge overflow line upstream of orifice
2-AF-012-B	1	9321-F-2120	S	NS	Operating conditions unknown.	P&ID	#22 BFP discharge overflow line downstream of orifice
2-AF-013-A	1	9321-F-2120	S	NS	Operating conditions unknown.	P&ID	#23 BFP discharge overflow line upstream of orifice

Auxiliary Feedwater (AF), Unit 2

Section B: SNM Program Lines

2-AF-01: Service Boiler Auxiliary Feedwater Lines

Line Number	Size (In.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-AF-013-B	1	9321-F-2120	S	NS	Operating conditions unknown.	P&ID	#23 BFP discharge overflow line downstream of orifice
2-AF-014	3	9321-F-2120	S	NC	Operating conditions unknown.	P&ID	#21 BFP discharge line
2-AF-015	3	9321-F-2120	S	NC	Operating conditions unknown.	P&ID	#22 BFP discharge line
2-AF-016	3	9321-F-2120	S	NC	Operating conditions unknown.	P&ID	#23 BFP discharge line
2-AF-017	4	9321-F-2120	S	NC	Operating conditions unknown.	P&ID	#21 and #22 BFP discharge header
2-AF-018	2.5	9321-F-2120	S	NC	Operating conditions unknown.	P&ID	LH Boiler #22 Feed Line
2-AF-019	2.5	9321-F-2120	S	NC	Operating conditions unknown.	P&ID	AF-144 bypass line
2-AF-020	4	B193201, 9321-F-2021	S	NC	Operating conditions unknown.	P&ID	Unit 1 Service Boiler Feed Pump discharge tie-in line.
2-AF-021	1	9321-F-2120	S	NS	Operating conditions unknown.	P&ID	BFP discharge header to Desuperheater Station
2-AF-022	2.5	9321-F-2120	S	NC	Operating conditions unknown.	P&ID	RH Boiler #21 Feed Line
2-AF-023	2.5	9321-F-2120	S	NC	Operating conditions unknown.	P&ID	AF-138 bypass line
2-AF-024	0.75	9321-F-2120	S	NS	Operating conditions unknown.	P&ID	RH Boiler #21 Continuous Blowdown Line
2-AF-025	1.5	9321-F-2120	S	NS	Operating conditions unknown.	P&ID	RH Boiler #21 Intermittent Blowdown Line
2-AF-026	0.75	9321-F-2120	S	NS	Operating conditions unknown.	P&ID	LH Boiler #22 Continuous Blowdown Line
2-AF-027	1.5	9321-F-2120	S	NS	Operating conditions unknown.	P&ID	LH Boiler #22 Intermittent Blowdown Line
2-AF-028	0.75	9321-F-2120	S	NS	Operating conditions unknown.	P&ID	Continuous Blowdown line to HSBSPCLs

Auxiliary Feedwater (AF), Unit 2

Section B: SNM Program Lines

2-AF-01: Service Boiler Auxiliary Feedwater Lines

Line Number	Size (In.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-AF-029	1.5	9321-F-2120	S	NS	Operating conditions unknown.	P&ID	Boiler Blowdown Tank Bottom Drain
2-AF-030	1.5	9321-F-2120	S	NS	Operating conditions unknown.	P&ID	Boiler Blowdown Tank Drain Bypass
2-AF-031	1.25	9321-F-2120	S	NS	Operating conditions unknown.	P&ID	Boiler Blowdown Tank Drain Vent
2-AF-032	6	9321-F-2120	S	NC	Operating conditions unknown.	P&ID	Boiler Blowdown Tank Drain
2-AF-033		B193201, 9321-F-2120	S	NS	Operating conditions unknown.	P&ID	ABSPCLB Aux. Feed Inlet
2-AF-034		9321-F-2120	S	NS	Operating conditions unknown.	P&ID	ABSPCLB Aux. Feed Outlet to Dissolved O2 Analyzer
2-AF-035		9321-F-2120	S	NS	Operating conditions unknown.	P&ID	ABSPCLB Aux. Feed Outlet to Cooling Bath
2-AF-037	2	B193201	S	NC	Operating conditions unknown.	P&ID	Flash Tank Drain to Service Boiler Deaerator
2-AF-038	1.25	B193201	S	NS	Operating conditions unknown.	P&ID	Service Boiler Deaerator Vent
2-AF-039	6	B193201	S	NC	Operating conditions unknown.	P&ID	Service Boiler Deaerator 6" Drain to OB
2-AF-040	4	B193201	S	NC	Operating conditions unknown.	P&ID	Service Boiler Deaerator Drain vent
2-AF-041	2	B193201	S	NS	Operating conditions unknown.	P&ID	Service Boiler Deaerator 2" Drain to OB
2-AF-042	0.75	B193201	S	NS	Operating conditions unknown.	P&ID	Drain from multipoint valve.
2-AF-043	6	B193201	S	NC	Operating conditions unknown.	P&ID	Service Boiler Deaerator Drain to Service Boiler Feed Pumps
2-AF-044	4	B193201	S	NC	Operating conditions unknown.	P&ID	Service Boiler Pump No. 11 Feed Line
2-AF-045	4	B193201	S	NC	Operating conditions unknown.	P&ID	Service Boiler Pump No. 12 Feed Line

Auxiliary Feedwater (AF), Unit 2

Section B: SNM Program Lines

2-AF-01: Service Boiler Auxiliary Feedwater Lines

Line Number	Size (in.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-AF-046	4	B193201	S	NC	Operating conditions unknown.	P&ID	Service Boiler Pump No. 13 Feed Line
2-AF-047	3	B193201	S	NC	Operating conditions unknown.	P&ID	Service Boiler Pump No. 11 Discharge Line
2-AF-048	3	B193201	S	NC	Operating conditions unknown.	P&ID	Service Boiler Pump No. 12 Discharge Line
2-AF-049	3	B193201	S	NC	Operating conditions unknown.	P&ID	Service Boiler Pump No. 13 Discharge Line
2-AF-050	6	B193201	S	NC	Operating conditions unknown.	P&ID	Service Boiler Pump Discharge Header
2-AF-051	1.5	B193201	S	NS	Operating conditions unknown.	P&ID	AF59 Vent to Service Boiler Deaerator
2-AF-052	1.5	B193201	S	NS	Operating conditions unknown.	P&ID	AF58 Vent to Service Boiler Deaerator
2-AF-053	1.5	B193201	S	NS	Operating conditions unknown.	P&ID	AF57 Vent to Service Boiler Deaerator
2-AF-054	1.5	B193201	S	NS	Operating conditions unknown.	P&ID	Check valve vent header to Service Boiler Deaerator
2-AF-057		9321-F-2120	S	NS	Operating conditions unknown.	P&ID	Chemical Bench Sink

Section C: Excluded Lines

2-AF-01: Service Boiler Auxiliary Feedwater Lines

Line Number	Size (in.)	P&ID No.	Sus. Cat.	FAC Ex. Crit.	Comments	Reference	Line Description
2-AF-009	1.5	9321-F-2120	E	EI	Valve shown closed on P&ID.	P&ID	Boiler Feed Pump Bypass line to #22 BFP overflow line

Auxiliary Feedwater (AF), Unit 2**Section C: Excluded Lines****2-AF-01: Service Boiler Auxiliary Feedwater Lines**

Line Number	Size (In.)	P&ID No.	Sus. Cat.	FAC Ex. Crit.	Comments	Reference	Line Description
2-AF-010	1	9321-F-2120	E	EI	Valve shown closed on P&ID.	P&ID	Boiler Feed Pump Bypass line to #23 BFP overflow line
2-AF-036		9321-F-2120	E	ET	Low Temperature discharge from Cooling Bath	P&ID	Cooling Bath Drain
2-AF-055	2	B193201	E	ER	#20 HSB Removed from Service	SD No. 29.01	Line from #20 House Service Boiler to Service Boiler Deaerator
2-AF-056	2.5	B193201	E	ER	Piping retired in place	P&ID	Line to AF92

Auxiliary Steam (AS), Unit 2

Section B: SNM Program Lines

2-AS-03: Remainder of Auxiliary Steam

Line Number	Size (In.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-AS-001-A	10	B192493, B192490, 192491	S	NC	Operating conditions unknown.	P&ID	10" Aux. Steam Header
2-AS-002	10	9321-F-2120	S	NC	Operating conditions unknown.	P&ID	Aux. Steam Header from Service Boilers
2-AS-003	8	9321-F-2120	S	NC	Operating conditions unknown.	P&ID	Aux. Steam from #22 LH Boiler
2-AS-004	8	9321-F-2120	S	NC	Operating conditions unknown.	P&ID	Aux. Steam from #21 RH Boiler
2-AS-005	4	9321-F-2120	S	NC	Operating conditions unknown.	P&ID	Aux. Steam Drain to Deaerator
2-AS-006	1.5	9321-F-2120	S	NS	Operating conditions unknown.	P&ID	FCV-1148 Bypass Line
2-AS-008	1.25	A209775	S	NS	Operating conditions unknown.	P&ID	Steam to 21 and 22 Air Tempering Units
2-AS-009	8	9321-F-2120	S	NC	Operating conditions unknown.	P&ID	Steam to AST-26
2-AS-015	1.5	9321-F-2120	S	NS	Operating conditions unknown.	P&ID	#21 RH Boiler Drain
2-AS-016	1.5	9321-F-2120	S	NS	Operating conditions unknown.	P&ID	#22 LH Boiler Drain
2-AS-017	1.5	9321-F-2120	S	NS	Operating conditions unknown.	P&ID	Boiler Drain Header to Blowdown Tank
2-AS-018	1	9321-F-2120	S	NS	Operating conditions unknown.	P&ID	RH Boiler #21 Atomizing Steam bleed-off line
2-AS-019	1	9321-F-2120	S	NS	Operating conditions unknown.	P&ID	LH Boiler #22 Atomizing Steam bleed-off line
2-AS-025	1	9321-F-2120	S	NS	Operating conditions unknown.	P&ID	Oil Separator Tank outlet
2-AS-026	1	9321-F-2120	S	NS	Operating conditions unknown.	P&ID	Oil Separator Tank outlet to Carbon Filter Tank
2-AS-027	1	9321-F-2120	S	NS	Operating conditions unknown.	P&ID	Oil Separator Tank outlet to Floor Drain

Auxiliary Steam (AS), Unit 2

Section B: SNM Program Lines

2-AS-03: Remainder of Auxiliary Steam

Line Number	Size (In.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-AS-030	2	B 192490	S	NS	Operating conditions unknown.	P&ID	Steam to Water Heater
2-AS-031	6	B 192490	S	NC	Operating conditions unknown.	P&ID	Steam Header to Barge Steam Connections
2-AS-032	4	B 192490	S	NC	Operating conditions unknown.	P&ID	Steam to AS845
2-AS-033	1.5	B 192490	S	NS	Operating conditions unknown.	P&ID	Steam to AS840
2-AS-036	4	B 192490	S	NC	Operating conditions unknown.	P&ID	Steam line to UH-1239
2-AS-037	1	B 192490	S	NS	Operating conditions unknown.	P&ID	PRV-7343 Bypass
2-AS-039		B 192490	S	NS	Operating conditions unknown.	P&ID	Steam to Screens
2-AS-046	4	192491	S	NC	Operating conditions unknown.	P&ID	Steam header to Service Boiler Feed Pump No. 13
2-AS-047	6	192491	S	NC	Operating conditions unknown.	P&ID	Steam header to Carbon Filter Tanks
2-AS-048	2	192491	S	NS	Operating conditions unknown.	P&ID	Steam to Service Boiler Phosphate Mix Tanks and Continuous Heaters
2-AS-051	2	192491	S	NS	Operating conditions unknown.	P&ID	Steam to Service Boiler Feed Pump No. 13
2-AS-053	4	192491	S	NC	Operating conditions unknown.	P&ID	Steam from Service Boiler Feed Pump No. 13
2-AS-054	8	192491	S	NC	Operating conditions unknown.	P&ID	Steam from Service Boiler Feed Pump No. 13 to #10 Service Deaerator
2-AS-055	8	192491	S	NC	Operating conditions unknown.	P&ID	Steam from Service Boiler Feed Pump No. 13 to Atmospheric Vent header
2-AS-057	10	192491	S	NC	Operating conditions unknown.	P&ID	Steam drain to #10 Service Deaerator via AS484

Auxiliary Steam (AS), Unit 2

Section B: SNM Program Lines

2-AS-03: Remainder of Auxiliary Steam

Line Number	Size (In.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-AS-058	4	192491	S	NC	Operating conditions unknown.	P&ID	Steam to Heating and Ventilation Pressure Reducing Station
2-AS-060	2	192491	S	NS	Operating conditions unknown.	P&ID	Steam from Heating and Ventilation Pressure Reducing Station
2-AS-070	3	192491, B227209	S	NC	Operating conditions unknown.	P&ID	Steam header to Carbon Filter Tanks
2-AS-073	2	192491	S	NS	Operating conditions unknown.	P&ID	Header to Service Boiler Phosphate Mix Tanks
2-AS-074	0.75	192491	S	NS	Operating conditions unknown.	P&ID	Steam to Service Boiler Phosphate Mix Tank No. 11
2-AS-075	0.75	192491	S	NS	Operating conditions unknown.	P&ID	Steam to Service Boiler Phosphate Mix Tank No. 12
2-AS-076	2	192491	S	NS	Operating conditions unknown.	P&ID	Steam to Continuous Heaters via AS568
2-AS-077	2	192491	S	NS	Operating conditions unknown.	P&ID	Steam to Continuous Heaters via AS112
2-AS-079	2	192491	S	NS	Operating conditions unknown.	P&ID	Steam header to Continuous Heaters via AS568
2-AS-080	1	192491	S	NS	Operating conditions unknown.	P&ID	Steam to Continuous Heater No. 11
2-AS-081	1	192491	S	NS	Operating conditions unknown.	P&ID	Steam to Continuous Heater No. 12
2-AS-082-A	8	192491	S	NC	Operating conditions unknown.	P&ID	Floor trench drain to cap
2-AS-082-B	1.5	192491	S	NS	Operating conditions unknown.	P&ID	Floor trench drain downstream of cap
2-AS-083	16	192491	S	NC	Operating conditions unknown.	P&ID	Aux Steam Vent to Atmosphere
2-AS-087	3	B227209	S	NC	Operating conditions unknown.	P&ID	Steam to 21ACFT
2-AS-088	3	B227209	S	NC	Operating conditions unknown.	P&ID	Steam to 22ACFT

Auxiliary Steam (AS), Unit 2

Section B: SNM Program Lines

2-AS-03: Remainder of Auxiliary Steam

Line Number	Size (in.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-AS-091	0.75	B227209	S	NS	Operating conditions unknown.	P&ID	Port Basin drain from Aux. Steam supply to ACFTs
2-AS-093	1.5	B227209	S	NS	Operating conditions unknown.	P&ID	PRV-5245 Bypass
2-AS-096	4	192491, B193201	S	NC	Operating conditions unknown.	P&ID	Aux. Steam to Flash Tank

Section C: Excluded Lines

2-AS-03: Remainder of Auxiliary Steam

Line Number	Size (in.)	P&ID No.	Sus. Cat.	FAC Ex. Crit.	Comments	Reference	Line Description
2-AS-001-B	10	B192493, 141718	E	ER	Line capped.	P&ID	10" Aux. Steam Header
2-AS-013	0.75	9321-F-2120	E	EI	Valve shown closed on P&ID.	P&ID	#21 RH Boiler Relief Valve Drain
2-AS-014	0.75	9321-F-2120	E	EI	Valve shown closed on P&ID.	P&ID	#22 LH Boiler Relief Valve Drain
2-AS-020	1	9321-F-2120	E	EQ	Superheated Steam from steam drum	SD No. 29.01	Aux. Steam to Fuel Oil Heaters
2-AS-026-A	1	9321-F-2120	E	EI	Valve shown closed on P&ID	P&ID	Oil Separator Tank outlet line between floor drain line and Carbon Filter Tank Line
2-AS-028	1	9321-F-2120	E	EI	Valve shown closed on P&ID.	P&ID	Oil Separator Tank outlet line between floor drain line and Carbon Filter Tank Line
2-AS-029	2.5	9321-F-2120	E	EI	Soot Blowers are used infrequently	SD No. 29.01	LH Boiler #22 Soot Blower Line
2-AS-040	6	B192490	E	EI	Valve shown closed on P&ID.	P&ID	Barge Steam connections header
2-AS-045	2	B192490	E	ER	Downstream equipment retired in place.	P&ID	Line to House Service Fuel Oil Heaters
2-AS-056	3	192491	E	EI	Relief valve normally closed	P&ID	AS527 Bypass Relief Valve Line

Auxiliary Steam (AS), Unit 2**Section C: Excluded Lines****2-AS-03: Remainder of Auxiliary Steam**

Line Number	Size (In.)	P&ID No.	Sus. Cat.	FAC Ex. Crit.	Comments	Reference	Line Description
2-AS-059	2.5	192491	E	EI	Valve shown closed on P&ID.	P&ID	AS484 Bypass Line
2-AS-071	3	B227209, 192491	E	EI	Relief valve normally closed	P&ID	Relief line from Steam header to Carbon Filter Tanks
2-AS-072	10	192491	E	EI	Valve normally closed.	Engineer Judgement;	Vent from Steam header to #10 Service Deaerator
2-AS-078	0.75	192491	E	EI	Valve shown closed on P&ID.	P&ID	AS112 Bypass and Bypass Drain
2-AS-084	6	192491	E	ER	Turbine retired in place.	P&ID	Motor Gen. Unit No. 13 Turbine Drain line to Atmos. Vent
2-AS-086	6	B192490, B192493	E	ER	Equipment retired in place	P&ID	Aux. Steam to Steam Tracing in Fuel Oil Pump House
2-AS-094	4	B227209	E	EI	Valve normally closed.	P&ID	21ACFT Aux. Steam Supply floor trench drain
2-AS-095	4	B227209	E	EI	Valve shown closed on P&ID.	P&ID	22ACFT Aux. Steam Supply floor trench drain

Auxiliary Steam Traps (AST), Unit 2

Section B: SNM Program Lines

2-AST-01: Steam Trap Lines from Auxiliary Steam Lines

Line Number	Size (In.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-AST-002	0.75	A227780, A209775	S	NS	Operating conditions unknown.	P&ID	Steam to and from AST-50
2-AST-006	1.5	9321-F-2120	S	NS	Operating conditions unknown.	P&ID	Steam to Hot Water Heat Exchangers
2-AST-007	0.75	9321-F-2120	S	NS	Operating conditions unknown.	P&ID	Steam to and from AS-1176
2-AST-007-A	1	9321-F-2120	S	NS	Operating conditions unknown.	P&ID	Steam to Condensate Return via AST-35
2-AST-009	2	9321-F-2120	S	NS	Operating conditions unknown.	P&ID	Hot Water Heat Exchangers Discharge Line
2-AST-010	4	9321-F-2120	S	NC	Operating conditions unknown.	P&ID	Condensate Return Header
2-AST-011	0.75	9321-F-2120	S	NS	Operating conditions unknown.	P&ID	Steam to and from AS-1093
2-AST-013		9321-F-2120	S	NS	Operating conditions unknown.	P&ID	Steam Supply Drain to Condensate Return via AST-31
2-AST-017	8	A209775	S	NC	Operating conditions unknown.	P&ID	Steam to AST-33
2-AST-019	1	A209775	S	NS	Operating conditions unknown.	P&ID	AST-33 Discharge
2-AST-020	1	A209775	S	NS	Operating conditions unknown.	P&ID	Steam to AST-20
2-AST-021	1	9321-F-2120	S	NS	Operating conditions unknown.	P&ID	#21 Fuel Oil Heater heating steam outlet
2-AST-021-A	1	A209775	S	NS	Operating conditions unknown.	P&ID	AST-20 Discharge
2-AST-022	1	9321-F-2120	S	NS	Operating conditions unknown.	P&ID	#22 Fuel Oil Heater heating steam outlet
2-AST-023	1	9321-F-2120	S	NS	Operating conditions unknown.	P&ID	#23 Fuel Oil Heater heating steam outlet
2-AST-024	1	9321-F-2120	S	NS	Operating conditions unknown.	P&ID	Fuel Oil heating steam outlet from steam traps to oil separator tank
2-AST-025	4	A209775	S	NC	Operating conditions unknown.	P&ID	Steam to AST-2 and 3

Auxiliary Steam Traps (AST), Unit 2

Section B: SNM Program Lines

2-AST-01: Steam Trap Lines from Auxiliary Steam Lines

Line Number	Size (In.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-AST-027	0.75	A209775	S	NS	Operating conditions unknown.	P&ID	Steam to AST-6
2-AST-028	0.75	A209775	S	NS	Operating conditions unknown.	P&ID	Steam to AST-7
2-AST-032	0.75	A209775	S	NS	Operating conditions unknown.	P&ID	Steam to AST-4
2-AST-033	0.75	A209775	S	NS	Operating conditions unknown.	P&ID	Steam to AST-5
2-AST-034	0.75	B192490	S	NS	Operating conditions unknown.	P&ID	Steam to and from AS849
2-AST-035-A	0.75	A209775	S	NS	Operating conditions unknown.	P&ID	AST-6 Discharge
2-AST-036	0.75	A209775	S	NS	Operating conditions unknown.	P&ID	AST-7 Discharge
2-AST-037	1.5	A209775	S	NS	Operating conditions unknown.	P&ID	AST-4 Discharge
2-AST-038	0.75	B192490	S	NS	Operating conditions unknown.	P&ID	Steam to and from UH-1238
2-AST-038-A	0.75	A209775	S	NS	Operating conditions unknown.	P&ID	AST-5 Discharge
2-AST-041	1	B192490	S	NS	Operating conditions unknown.	P&ID	Steam to and from AST-27
2-AST-042	1	B192490	S	NS	Operating conditions unknown.	P&ID	AST-27 Bypass
2-AST-043	1	B192490	S	NS	Operating conditions unknown.	P&ID	Steam to and from AST-42
2-AST-044	1	B192490	S	NS	Operating conditions unknown.	P&ID	AST-42 Bypass
2-AST-049-A	0.5	192491	S	NS	Operating conditions unknown.	P&ID	Steam to and from AST-38
2-AST-050-A	0.5	192491	S	NS	Operating conditions unknown.	P&ID	Steam to and from AST-37
2-AST-052	0.75	192491	S	NS	Operating conditions unknown.	P&ID	Steam to and from AST-45
2-AST-058	1	A209775	S	NS	Operating conditions unknown.	P&ID	AST-2 Discharge
2-AST-059	1	A209775	S	NS	Operating conditions unknown.	P&ID	AST-3 Discharge
2-AST-061	1	192491	S	NS	Operating conditions unknown.	P&ID	Steam to and from AST-39

Auxiliary Steam Traps (AST), Unit 2

Section B: SNM Program Lines

2-AST-01: Steam Trap Lines from Auxiliary Steam Lines

Line Number	Size (in.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-AST-063	1	192491	S	NS	Operating conditions unknown.	P&ID	Steam to and from AST-32
2-AST-065	1	192491	S	NS	Operating conditions unknown.	P&ID	AST-32 and 39 drain to Cond. Return Header
2-AST-066	2	192491	S	NS	Operating conditions unknown.	P&ID	Steam to and from FP-1198
2-AST-067	2	192491	S	NS	Operating conditions unknown.	P&ID	Steam to and from UH-1300
2-AST-069-A	3	192491	S	NC	Operating conditions unknown.	P&ID	Stub to AST-30 and drain
2-AST-069-B	1	192491	S	NS	Operating conditions unknown.	P&ID	Steam to and from AST-30

Section C: Excluded Lines

2-AST-01: Steam Trap Lines from Auxiliary Steam Lines

Line Number	Size (in.)	P&ID No.	Sus. Cat.	FAC Ex. Crit.	Comments	Reference	Line Description
2-AST-003	0.75	A227780	E	EI	Valve shown closed on P&ID.	P&ID	AST-50 Bypass Line
2-AST-008	1	9321-F-2120	E	EI	Valve shown closed on P&ID.	P&ID	AST-35 Bypass Line
2-AST-012	1	9321-F-2120	E	EI	Valve normally closed.	Engineer Judgement	AST-26 Bypass Line
2-AST-014		9321-F-2120	E	EI	Valve shown closed on P&ID.	P&ID	AST-31 bypass line
2-AST-018	1	A209775	E	EI	Valve shown closed on P&ID.	P&ID	AST-33 Bypass
2-AST-035	0.75	B192490	E	EI	Valve shown closed on P&ID.	P&ID	Steam Trap Bypass
2-AST-049-B	0.5	192491	E	EI	Valve shown closed on P&ID.	P&ID	AST-38 Bypass
2-AST-050-B	0.5	192491	E	EI	Valve shown closed on P&ID.	P&ID	AST-37 Bypass
2-AST-062		192491	E	EI	Valve shown closed on P&ID.	P&ID	AST-39 Bypass

Auxiliary Steam Traps (AST), Unit 2**Section C: Excluded Lines****2-AST-01: Steam Trap Lines from Auxiliary Steam Lines**

Line Number	Size (In.)	P&ID No.	Sus. Cat.	FAC Ex. Crit.	Comments	Reference	Line Description
2-AST-064	1	192491	E	EI	Valve shown closed on P&ID.	P&ID	AST-32 Bypass
2-AST-068	1	192491	E	EI	Valve shown closed on P&ID.	P&ID	UH-1301 Bypass Line
2-AST-069-C	1	192491	E	EI	Valve shown closed on P&ID.	P&ID	AST-30 Bypass
2-AST-069-D	0.75	192491	E	EF	Low flow to floor drain	P&ID	Stub drain
2-AST-085	0.75	192491	E	ER	Turbine retired in place.	P&ID	Motor Gen. Unit No. 13 Turbine Drain line to and from steam trap

Steam Generator Blowdown (BD), Unit 2

Section B: SNM Program Lines

2-BD-01: Steam Generator Blowdown to Sample Coolers and Blowdown Tank

Line Number	Size (In.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-BD-001	2	9321-F-2729	S	NS	Small bore piping with unknown conditions.	P&ID	SG 21 Blowdown via MS-67-A
2-BD-002	2	9321-F-2729	S	NS	Small bore piping with unknown conditions.	P&ID	SG 21 Blowdown via MS-67-B
2-BD-003	2	9321-F-2729	S	NS	Small bore piping with unknown conditions.	P&ID	SG 22 Blowdown via MS-67-C
2-BD-004	2	9321-F-2729	S	NS	Small bore piping with unknown conditions.	P&ID	SG 22 Blowdown via MS-67-D
2-BD-005	2	9321-F-2729	S	NS	Small bore piping with unknown conditions.	P&ID	SG 23 Blowdown via MS-67-E
2-BD-006	2	9321-F-2729	S	NS	Small bore piping with unknown conditions.	P&ID	SG 23 Blowdown via MS-67-F
2-BD-007	2	9321-F-2729	S	NS	Small bore piping with unknown conditions.	P&ID	SG 24 Blowdown via MS-67-G
2-BD-008	2	9321-F-2729	S	NS	Small bore piping with unknown conditions.	P&ID	SG 24 Blowdown via MS-67-H
2-BD-009-A	2	9321-F-2729	S	NS	Small bore piping with unknown conditions.	P&ID	SG 21 Blowdown Upstream of Line Spec Change
2-BD-010-A	2	9321-F-2729	S	NS	Small bore piping with unknown conditions.	P&ID	SG 22 Blowdown Upstream of Line Spec Change
2-BD-011-A	2	9321-F-2729	S	NS	Small bore piping with unknown conditions.	P&ID	SG 23 Blowdown Upstream of Line Spec Change
2-BD-012-A	2	9321-F-2729	S	NS	Small bore piping with unknown conditions.	P&ID	SG 24 Blowdown Upstream of Line Spec Change
2-BD-017	1	9321-F-2729	S	NS	Small bore piping with unknown conditions.	P&ID	SG 23 1" Blowdown Line
2-BD-018	1	9321-F-2729	S	NS	Small bore piping with unknown conditions.	P&ID	SG 24 1" Blowdown Line
2-BD-019	18	9321-F-2729	S	NC	Operating conditions unknown.	P&ID	Blowdown Tank vent to Atmosphere

Steam Generator Blowdown (BD), Unit 2

Section C: Excluded Lines

2-BD-01: Steam Generator Blowdown to Sample Coolers and Blowdown Tank

Line Number	Size (In.)	P&ID No.	Sus. Cat.	FAC Ex. Crit.	Comments	Reference	Line Description
2-BD-009-B	2	9321-F-2729	E	EM	Stainless Steel Piping	Pipe Spec	SG 21 Blowdown Downstream of Line Spec Change
2-BD-010-B	2	9321-F-2729	E	EM	Stainless Steel Piping	Pipe Spec	SG 22 Blowdown Downstream of Line Spec Change
2-BD-011-B	2	9321-F-2729	E	EM	Stainless Steel Piping	Pipe Spec	SG 23 Blowdown Downstream of Line Spec Change
2-BD-012-B	2	9321-F-2729	E	EM	Stainless Steel Piping	Pipe Spec	SG 24 Blowdown Downstream of Line Spec Change
2-BD-013	0.75	9321-F-2729	E	EM	Sample lines are SS	CSI Document No. 0700.104.C.010	SG 21 Blowdown to Sample Cooler
2-BD-014	0.75	9321-F-2729	E	EM	Sample lines are SS	CSI Document No. 0700.104.C.010	SG 22 Blowdown to Sample Cooler
2-BD-015	0.75	9321-F-2729	E	EM	Sample lines are SS	CSI Document No. 0700.104.C.010	SG 23 Blowdown to Sample Cooler
2-BD-016	0.75	9321-F-2729	E	EM	Sample lines are SS	CSI Document No. 0700.104.C.010	SG 24 Blowdown to Sample Cooler
2-BD-020		9321-F-2729	E	EM	Sample lines are SS	CSI Document No. 0700.104.C.010	Line to Sample Cooler from Blowdown Tank Vent via MS-1102
2-BD-021		9321-F-2729	E	EM	Sample lines are SS	CSI Document No. 0700.104.C.010	Line to Sample Cooler from Blowdown Tank Vent via MS-1103
2-BD-022		9321-F-2729	E	EM	Sample lines are SS	CSI Document No. 0700.104.C.010	Line to Sample Cooler from Blowdown Tank Vent via MS-1104

Condensate Pump Discharge (CD), Unit 2

Section A: CHECWORKS Model Lines

2-CD-02: Condensate Lines Downstream of #22 Feedwater Heaters

Line Number	Size (In.)	P&ID No.	Sus. Cat.	Comments	Reference	Line Description
2-CD-001	14	9321-2018	M		PEPSE	CD80A-1-FWH 22A to HEADER: Condensate from FWH 22-A to Condensate Header
2-CD-002	14	9321-2018	M		PEPSE	CD80A-2-FWH 22B to HEADER: Condensate from FWH 22-B to Condensate Header
2-CD-003	14	9321-2018	M		PEPSE	CD80A-3-FWH 22C to HEADER: Condensate from FWH 22-C to Condensate Header
2-CD-004	20	9321-2018	M		PEPSE	CD80A-4-FWH 22 OUTLET HEADER: Condensate Header from FWHs 22-A and 22-B
2-CD-005	24	9321-2018, A235307	M		PEPSE	CD80A-5-FWH 22 to FWH 23 HEAD: Condensate Header to #23 FWHs
2-CD-006	24	A235307	M		PEPSE	CD80A-6-FWH 23 INLET HEADER: Condensate Header to FWHs 23-A and 23-B
2-CD-007	14	A235307	M		PEPSE	CD80A-7-HEADER to FWH 23A: Condensate line to FWH 23-A
2-CD-008	14	A235307	M		PEPSE	CD80A-8-HEADER to FWH 23B: Condensate line to FWH 23-B
2-CD-009	14	A235307	M		PEPSE	CD80A-9-HEADER to FWH 23C: Condensate line to FWH 23-C
2-CD-013	14	A235307	M		PEPSE	CD80-1-FWH 23A to FWH 24A: Condensate line to FWH 24-A
2-CD-014	14	A235307	M		PEPSE	CD80-2-FWH 23B to FWH 24B: Condensate line to FWH 24-B

Condensate Pump Discharge (CD), Unit 2

Section A: CHECWORKS Model Lines

2-CD-02: Condensate Lines Downstream of #22 Feedwater Heaters

Line Number	Size (In.)	P&ID No.	Sus. Cat.	Comments	Reference	Line Description
2-CD-015	14	A235307	M		PEPSE	CD80-3-FWH 23C to FWH 24C: Condensate line to FWH 24-C
2-CD-016	14	A235307	M		PEPSE	CD81-1-FWH 24A to FWH 25A: Condensate line to FWH 25-A
2-CD-017	14	A235307	M		PEPSE	CD81-2-FWH 24B to FWH 25B: Condensate line to FWH 25-B
2-CD-018	14	A235307	M		PEPSE	CD81-3-FWH 24C to FWH 25C: Condensate line to FWH 25-C
2-CD-019	14	A235307	M		PEPSE	CD82-1-FWH 25A to HDR: Condensate from FWH 25-A to Condensate Header
2-CD-020	14	A235307	M		PEPSE	CD82-2-FWH 25B to HDR: Condensate from FWH 25-B to Condensate Header
2-CD-021	14	A235307	M		PEPSE	CD82-3-FWH 25C to HDR: Condensate from FWH 25-C to Condensate Header
2-CD-022	24	A235307	M		PEPSE	CD82-4-HDR 25BT to 25CT: Condensate header from FWHs 25-A and 25-B
2-CD-023	24	A235307	M		PEPSE	CD82-5-HDR 25CT to HDP OUT: Condensate Header to BFPs Upstream of Heater Drain Pump inlet
2-CD-024	30	A235307	M		PEPSE	CD83-1-HDR HDP to BFP21T: Condensate Header to BFPs Downstream of Heater Drain Pump inlet
2-CD-025	24	A235307	M		PEPSE	CD83-2-HDR to BFP21: Condensate from Header to BFP No. 21

Condensate Pump Discharge (CD), Unit 2

Section A: CHECWORKS Model Lines

2-CD-02: Condensate Lines Downstream of #22 Feedwater Heaters

Line Number	Size (in.)	P&ID No.	Sus. Cat.	Comments	Reference	Line Description
2-CD-026	24	A235307	M		PEPSE	CD83-3-HDR to BFP22: Condensate from Header to BFP No. 22

Section C: Excluded Lines

2-CD-02: Condensate Lines Downstream of #22 Feedwater Heaters

Line Number	Size (in.)	P&ID No.	Sus. Cat.	FAC Ex. Crit.	Comments	Reference	Line Description
2-CD-010	1.5	A235307	E	EI	Valve shown closed on P&ID.	P&ID	CD-16 Bypass Line
2-CD-011	1.5	A235307	E	EI	Valve shown closed on P&ID.	P&ID	CD-16-1 Bypass Line
2-CD-012	1.5	A235307	E	EI	Valve shown closed on P&ID.	P&ID	CD-16-2 Bypass Line
2-CD-027	12	A235307	E	EI	Valve shown closed on P&ID.	P&ID	Feedwater Heater Bypass Line
2-CD-028	2	A235307	E	EI	Valve shown closed on P&ID.	P&ID	CD-21 Bypass Line
2-CD-029	2	A235307	E	EI	Valve shown closed on P&ID.	P&ID	CD-21-1 Bypass Line

Extraction Steam Traps (EST), Unit 2

Section B: SNM Program Lines

2-1EST-01: Extraction Steam Trap Headers to the Drains Collecting Tank

Line Number	Size (in.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-1EST-013-A	4	9321-F-2031	S	NC	Operating conditions unknown.	P&ID	Steam Trap Header from EST-1 and 1A
2-1EST-013-B	4	9321-F-2031	S	NC	Operating conditions unknown.	P&ID	Steam Trap Header from EST-1, 1A, 2, and 6
2-1EST-014	6	9321-F-2031	S	NC	Operating conditions unknown.	P&ID	Main Extraction Steam Trap Header

2-3EST-01: Steam Trap lines from Extraction Steam to the #23 FWBs

Line Number	Size (in.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-3EST-012-A	2	9321-F-2031	S	NS	Operating conditions unknown.	P&ID	Extraction Steam to EST-14
2-3EST-012-B	2	9321-F-2031	S	NS	Operating conditions unknown.	P&ID	EST-14 to Steam Trap Header
2-3EST-013-A	0.75	9321-F-2031	S	NS	Operating conditions unknown.	P&ID	Extraction Steam to EST-15
2-3EST-013-B	0.75	9321-F-2031	S	NS	Operating conditions unknown.	P&ID	Header from EST-15 to Steam Trap Header
2-3EST-014-A	0.75	9321-F-2031	S	NS	Operating conditions unknown.	P&ID	Extraction Steam to EST-16
2-3EST-014-B	0.75	9321-F-2031	S	NS	Operating conditions unknown.	P&ID	Header from EST-16 to Steam Trap Header
2-3EST-015-A	2	9321-F-2031	S	NS	Operating conditions unknown.	P&ID	Extraction Steam to EST-17
2-3EST-015-B	2	9321-F-2031	S	NS	Operating conditions unknown.	P&ID	EST-17 to Steam Trap Header
2-3EST-016-A	0.75	9321-F-2031	S	NS	Operating conditions unknown.	P&ID	Extraction Steam to EST-18
2-3EST-016-B	0.75	9321-F-2031	S	NS	Operating conditions unknown.	P&ID	EST-18 to Steam Trap Header
2-3EST-017-A	0.75	9321-F-2031	S	NS	Operating conditions unknown.	P&ID	Extraction Steam to EST-19
2-3EST-017-B	0.75	9321-F-2031	S	NS	Operating conditions unknown.	P&ID	EST-19 to Steam Trap Header
2-3EST-018-A	2	9321-F-2031	S	NS	Operating conditions unknown.	P&ID	Extraction Steam to EST-20

Extraction Steam Traps (EST), Unit 2

Section B: SNM Program Lines

2-3EST-01: Steam Trap lines from Extraction Steam to the #23 FWHs

Line Number	Size (In.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-3EST-018-B	2	9321-F-2031	S	NS	Operating conditions unknown.	P&ID	EST-20 to Steam Trap Header
2-3EST-019-A	0.75	9321-F-2031	S	NS	Operating conditions unknown.	P&ID	Extraction Steam to EST-21
2-3EST-019-B	0.75	9321-F-2031	S	NS	Operating conditions unknown.	P&ID	EST-21 to Steam Trap Header
2-3EST-020-A	0.75	9321-F-2031	S	NS	Operating conditions unknown.	P&ID	Extraction Steam to EST-23
2-3EST-020-B	0.75	9321-F-2031	S	NS	Operating conditions unknown.	P&ID	EST-23 to Steam Trap Header

2-4EST-01: Lines from S1m Traps to the S1m Trap Drains Header from Ext lines to #24 FWHs

Line Number	Size (In.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-4EST-001	0.75	9321-F-2031	S	NS	Operating conditions unknown.	P&ID	EST-5 to Steam Trap Header
2-4EST-002	0.75	9321-F-2031	S	NS	Operating conditions unknown.	P&ID	EST-6 to Steam Trap Header
2-4EST-003	0.75	9321-F-2031	S	NS	Operating conditions unknown.	P&ID	EST-7 to Steam Trap Header
2-4EST-004	0.75	9321-F-2031	S	NS	Operating conditions unknown.	P&ID	EST-8 to Steam Trap Header
2-4EST-005	0.75	9321-F-2031	S	NS	Operating conditions unknown.	P&ID	EST-9 to Steam Trap Header
2-4EST-006	0.75	9321-F-2031	S	NS	Operating conditions unknown.	P&ID	EST-10 to Steam Trap Header
2-4EST-007	0.75	9321-F-2031	S	NS	Operating conditions unknown.	P&ID	EST-11 to Steam Trap Header
2-4EST-008	0.75	9321-F-2031	S	NS	Operating conditions unknown.	P&ID	EST-12 to Steam Trap Header
2-4EST-009	0.75	9321-F-2031	S	NS	Operating conditions unknown.	P&ID	EST-13 to Steam Trap Header

2-5EST-01: Steam Trap lines from Extraction Steam to the #25 FWHs

Line Number	Size (In.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-5EST-040-A	0.75	9321-F-2031	S	NS	Flow Conditions Unknown	P&ID	Extraction steam to EST-4

Extraction Steam Traps (EST), Unit 2

Section B: SNM Program Lines

2-5EST-01: Steam Trap lines from Extraction Steam to the #25 FWHs

Line Number	Size (In.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-5EST-040-B	0.75	9321-F-2031	S	NS	Operating conditions unknown.	P&ID	EST-4 to Steam Trap Header

2-6EST-01: Steam Trap lines from Extraction Steam to the #26 FWHs

Line Number	Size (In.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-6EST-015-A	2	9321-F-2031	S	NS	Flow Conditions Unknown	P&ID	Extraction Steam to EST-1
2-6EST-015-B	2	9321-F-2031	S	NS	Flow Conditions Unknown	P&ID	Extraction Steam to EST-1A
2-6EST-015-C	2	9321-F-2031	S	NS	Operating conditions unknown.	P&ID	EST-1 to Steam Trap Header
2-6EST-015-D	2	9321-F-2031	S	NS	Operating conditions unknown.	P&ID	EST-1A to Steam Trap Header
2-6EST-016-A	0.75	9321-F-2031	S	NS	Flow Conditions Unknown	P&ID	Extraction Steam to EST-2
2-6EST-016-B	0.75	9321-F-2031	S	NS	Operating conditions unknown.	P&ID	EST-2 to Steam Trap Header

Section C: Excluded Lines

2-3EST-01: Steam Trap lines from Extraction Steam to the #23 FWHs

Line Number	Size (In.)	P&ID No.	Sus. Cat.	FAC Ex. Crit.	Comments	Reference	Line Description
2-3EST-012-C		9321-F-2031	E	EI	Valve shown closed on P&ID.	P&ID	EST-14 Bypass Line
2-3EST-013-C		9321-F-2031	E	EI	Valve shown closed on P&ID.	P&ID	EST-15 Bypass Line
2-3EST-014-C		9321-F-2031	E	EI	Valve shown closed on P&ID.	P&ID	EST-16 Bypass Line
2-3EST-015-C		9321-F-2031	E	EI	Valve shown closed on P&ID.	P&ID	EST-17 Bypass Line
2-3EST-016-C		9321-F-2031	E	EI	Valve shown closed on P&ID.	P&ID	EST-18 Bypass Line
2-3EST-017-C		9321-F-2031	E	EI	Valve shown closed on P&ID.	P&ID	EST-19 Bypass Line

Extraction Steam Traps (EST), Unit 2**Section C: Excluded Lines****2-3EST-01: Steam Trap lines from Extraction Steam to the #23 FWHs**

Line Number	Size (In.)	P&ID No.	Sus. Cat.	FAC Ex. Crit.	Comments	Reference	Line Description
2-3EST-018-C		9321-F-2031	E	EI	Valve shown closed on P&ID.	P&ID	EST-20 Bypass Line
2-3EST-019-C		9321-F-2031	E	EI	Valve shown closed on P&ID.	P&ID	EST-21 Bypass Line
2-3EST-020-C		9321-F-2031	E	EI	Valve shown closed on P&ID.	P&ID	EST-23 Bypass Line

2-5EST-01: Steam Trap lines from Extraction Steam to the #25 FWHs

Line Number	Size (In.)	P&ID No.	Sus. Cat.	FAC Ex. Crit.	Comments	Reference	Line Description
2-5EST-040-C		9321-F-2031	E	EI	Valve shown closed on P&ID.	P&ID	EST-4 Bypass Line

2-6EST-01: Steam Trap lines from Extraction Steam to the #26 FWHs

Line Number	Size (In.)	P&ID No.	Sus. Cat.	FAC Ex. Crit.	Comments	Reference	Line Description
2-6EST-015-E		9321-F-2031	E	EI	Valve shown closed on P&ID.	P&ID	EST-1 Bypass Line
2-6EST-015-F		9321-F-2031	E	EI	Valve shown closed on P&ID.	P&ID	EST-1A Bypass Line
2-6EST-016-C		9321-F-2031	E	EI	Valve shown closed on P&ID.	P&ID	EST-2 Bypass Line

Extraction Steam (EX), Unit 2**Section A: CHECWORKS Model Lines****2-1EX-01: LP Turb Ext Stm to #21 FWHs**

Line Number	Size (In.)	P&ID No.	Sus. Cat.	Comments	Reference	Line Description
2-1EX-001	26	9321-F-2020	M		PEPSE	ES?-1-1STPT ES TO FWH 21A: NE Extraction Steam to FWH 21A
2-1EX-002	26	9321-F-2020	M		PEPSE	ES?-2-1STPT ES TO FWH 21A: NW Extraction Steam to FWH 21A
2-1EX-003	26	9321-F-2020	M		PEPSE	ES?-3-1STPT ES TO FWH 21A: SW Extraction Steam to FWH 21A
2-1EX-004	26	9321-F-2020	M		PEPSE	ES?-4-1STPT ES TO FWH 21A: SE Extraction Steam to FWH 21A
2-1EX-005	26	9321-F-2020	M		PEPSE	ES?-1-1STPT ES TO FWH 21B: NE Extraction Steam to FWH 21B
2-1EX-006	26	9321-F-2020	M		PEPSE	ES?-2-1STPT ES TO FWH 21B: NW Extraction Steam to FWH 21B
2-1EX-007	26	9321-F-2020	M		PEPSE	ES?-3-1STPT ES TO FWH 21B: SW Extraction Steam to FWH 21B
2-1EX-008	26	9321-F-2020	M		PEPSE	ES?-4-1STPT ES TO FWH 21B: SE Extraction Steam to FWH 21B
2-1EX-009	26	9321-F-2020	M		PEPSE	ES?-1-1STPT ES TO FWH 21C: NE Extraction Steam to FWH 21C
2-1EX-010	26	9321-F-2020	M		PEPSE	ES?-2-1STPT ES TO FWH 21C: NW Extraction Steam to FWH 21C
2-1EX-011	26	9321-F-2020	M		PEPSE	ES?-3-1STPT ES TO FWH 21C: SW Extraction Steam to FWH 21C
2-1EX-012	26	9321-F-2020	M		PEPSE	ES?-4-1STPT ES TO FWH 21C: SE Extraction Steam to FWH 21C

Extraction Steam (EX), Unit 2**Section A: CHECWORKS Model Lines****2-2EX-01: LP Turbine Extraction Steam to #22 Feedwater Heaters**

Line Number	Size (in.)	P&ID No.	Sus. Cat.	Comments	Reference	Line Description
2-2EX-001-A	22	9321-F-2020	M		PEPSE	ES?-1-2NDPT ES TO FWH 22A: NE Extraction Steam to FWH 22A upstream of Exp. Joint
2-2EX-002-A	22	9321-F-2020	M		PEPSE	ES?-2-2NDPT ES TO FWH 22A: SW Extraction Steam to FWH 22A upstream of Exp. Joint
2-2EX-003-A	22	9321-F-2020	M		PEPSE	ES?-1-2NDPT ES TO FWH 22B: NE Extraction Steam to FWH 22B upstream of Exp. Joint
2-2EX-004-A	22	9321-F-2020	M		PEPSE	ES?-2-2NDPT ES TO FWH 22B: SW Extraction Steam to FWH 22B upstream of Exp. Joint
2-2EX-005-A	22	9321-F-2020	M		PEPSE	ES?-1-2NDPT ES TO FWH 22C: NE Extraction Steam to FWH 22C upstream of Exp. Joint
2-2EX-006-A	22	9321-F-2020	M		PEPSE	ES?-2-2NDPT ES TO FWH 22C: SW Extraction Steam to FWH 22C upstream of Exp. Joint

2-3EX-01: Boiler Feed Pump Turbine Drains to Condensers

Line Number	Size (in.)	P&ID No.	Sus. Cat.	Comments	Reference	Line Description
2-3EX-001	48	A227780	M		PEPSE	BFP #21 Drain to Condenser
2-3EX-002	48	A227780	M		PEPSE	BFP #22 Drain to Condenser

Extraction Steam (EX), Unit 2**Section A: CHECWORKS Model Lines****2-3EX-02: LP Turbine Extraction Steam to #23 Feedwater Heaters**

Line Number	Size (In.)	P&ID No.	Sus. Cat.	Comments	Reference	Line Description
2-3EX-003-A	20	9321-F-2020	M		PEPSE	ES1-1-3RDPT ES to FWH 23A: NW Extraction Steam to FWH 23A
2-3EX-003-B	20	9321-F-2020	M		PEPSE	ES1-2-3RDPT ES to FWH 23A: SE Extraction Steam to FWH 23A
2-3EX-003-C	28	9321-F-2020	M	Sections of this line were replaced with CrMo. These sections are modeled for continuity within the model.	PEPSE	ES1-3-3RDPT ES to FWH 23A: Extraction Steam to FWH 23A
2-3EX-004	20	9321-F-2020	M	Sections of this line were replaced with CrMo. These sections are modeled for continuity within the model.	PEPSE	ES1-4-3RDPT ES to FWH 23A: Extraction Steam to FWH 23A
2-3EX-005	20	9321-F-2020	M	Sections of this line were replaced with CrMo. These sections are modeled for continuity within the model.	PEPSE	ES1-5-3RDPT ES to FWH 23A: Extraction Steam to FWH 23A
2-3EX-006-A	20	9321-F-2020	M		PEPSE	ES2-1-3RDPT ES to FWH 23B: NW Extraction Steam to FWH 23B
2-3EX-006-B	20	9321-F-2020	M		PEPSE	ES2-2-3RDPT ES to FWH 23B: SE Extraction Steam to FWH 23B
2-3EX-006-C	28	9321-F-2020	M	Sections of this line were replaced with CrMo. These sections are modeled for continuity within the model.	PEPSE	ES2-3-3RDPT ES to FWH 23B: Extraction Steam to FWH 23B
2-3EX-007	20	9321-F-2020	M	Sections of this line were replaced with CrMo. These sections are modeled for continuity within the model.	PEPSE	ES2-4-3RDPT ES to FWH 23B: Extraction Steam to FWH 23B
2-3EX-008	20	9321-F-2020	M	Sections of this line were replaced with CrMo. These sections are modeled for continuity within the model.	PEPSE	ES2-5-3RDPT ES to FWH 23B: Extraction Steam to FWH 23B
2-3EX-009-A	20	9321-F-2020	M		PEPSE	ES3-1-3RDPT ES to FWH 23C: NW Extraction Steam to FWH 23C

Extraction Steam (EX), Unit 2**Section A: CHECWORKS Model Lines****2-3EX-02: LP Turbine Extraction Steam to #23 Feedwater Heaters**

Line Number	Size (In.)	P&ID No.	Sus. Cat.	Comments	Reference	Line Description
2-3EX-009-B	20	9321-F-2020	M		PEPSE	ES3-2-3RDPT ES to FWH 23C; SE Extraction Steam to FWH 23C
2-3EX-009-C	28	9321-F-2020	M	Sections of this line were replaced with CrMo. These sections are modeled for continuity within the model.	PEPSE	ES3-3-3RDPT ES to FWH 23C; Extraction Steam to FWH 23C
2-3EX-010	20	9321-F-2020	M	Sections of this line were replaced with CrMo. These sections are modeled for continuity within the model.	PEPSE	ES3-4-3RDPT ES to FWH 23C; Extraction Steam to FWH 23C
2-3EX-011	20	9321-F-2020	M	Sections of this line were replaced with CrMo. These sections are modeled for continuity within the model.	PEPSE	ES3-5-3RDPT ES to FWH 23C; Extraction Steam to FWH 23C

Section B: SNM Program Lines**2-3EX-01: Boiler Feed Pump Turbine Drains to Condensers**

Line Number	Size (In.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-3EX-021	1.5	A227780	S	NC	Unknown conditions in drip pocket to condenser	P&ID	Continuous Drain from #21 Steam Generator Feed Pump Turbine drain to #21 Condenser
2-3EX-022	1.5	A227780	S	NC	Unknown conditions in drip pocket to condenser	P&ID	Continuous Drain from #22 Steam Generator Feed Pump Turbine drain to #22 Condenser

2-5EX-01: HP Turbine Crossunder Piping Drip Pots to the Condenser

Line Number	Size (In.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-5EX-025-A	2	A235308	S	NS	Flow Conditions Unknown	PEPSE	Crossunder Piping leakoff from Moisture Preseparator A upstream of Pipe Spec Change

Extraction Steam (EX), Unit 2**Section B: SNM Program Lines****2-5EX-01: HP Turbine Crossunder Piping Drip Pots to the Condenser**

Line Number	Size (In.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-5EX-026-A	2	A235308	S	NS	Flow Conditions Unknown	PEPSE	Crossunder Piping leakoff from Moisture Preseparator B upstream of Pipe Spec Change
2-5EX-027-A	2	A235308	S	NS	Flow Conditions Unknown	PEPSE	Crossunder Piping leakoff from Moisture Preseparator C upstream of Pipe Spec Change
2-5EX-028-A	2	A235308	S	NS	Flow Conditions Unknown	PEPSE	Crossunder Piping leakoff from Moisture Preseparator D upstream of Pipe Spec Change
2-5EX-117	1.5	B237145	S	NS	Operating conditions unknown.	P&ID	HP Turbine Drain
2-5EX-118	1.5	B237145	S	NS	Operating conditions unknown.	P&ID	Crossunder piping leakoff to FCV-1156
2-5EX-119	1.5	B237145	S	NS	Operating conditions unknown.	P&ID	Crossunder piping leakoff to FCV-1164
2-5EX-120	1.5	B237145	S	NS	Operating conditions unknown.	P&ID	Crossunder piping leakoff to FCV-1157
2-5EX-121	1.5	B237145	S	NS	Operating conditions unknown.	P&ID	Crossunder piping leakoff to FCV-1165
2-5EX-122		B237145	S	NS	Operating conditions unknown.	P&ID	Crossunder piping to Moisture Separator Outlet Line
2-5EX-123		B237145	S	NS	Operating conditions unknown.	P&ID	Crossunder piping to Moisture Separator Outlet Line
2-5EX-124		B237145	S	NS	Operating conditions unknown.	P&ID	Crossunder piping to Moisture Separator Outlet Line
2-5EX-125		B237145	S	NS	Operating conditions unknown.	P&ID	Crossunder piping to Moisture Separator Outlet Line
2-5EX-128		B237145, B237144	S	NC	Operating conditions unknown.	P&ID	LP Leakoff Header to Gland Condenser

Extraction Steam (EX), Unit 2**Section B: SNM Program Lines****2-5EX-01: HP Turbine Crossunder Piping Drip Pots to the Condenser**

Line Number	Size (in.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-5EX-129	1.5	B237145	S	NS	Operating conditions unknown.	P&ID	Crossunder piping leakoff to FCV1154

2-6EX-01: HP Turbine Extraction Steam to #26 Feedwater Heaters

Line Number	Size (in.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-6EX-001-A	12	9321-F-2020	S	NL	The nozzle is the only susceptible component in this line.	SFA Model	ES8-1-6THPT ES to HDR: HP Turbine Extraction Nozzle to #26 FWHs.
2-6EX-002-A	12	9321-F-2020	S	NL	The nozzle is the only susceptible component in this line.	SFA Model	ES8-2-6THPT ES to HDR: HP Turbine Extraction Nozzle to #26 FWHs.
2-6EX-006-B	12	9321-F-2020	S	NL	The nozzle is the only susceptible component in this line.	SFA Model	ES8-7-6THPT ESHDR to FWH 26A: Extraction Steam Inlet Nozzle to FWH 26A.
2-6EX-008-B	12	9321-F-2020	S	NL	The nozzle is the only susceptible component in this line.	SFA Model	ES8-6-6THPT ESHDR to FWH 26B: Extraction Steam Inlet Nozzle to FWH 26B.
2-6EX-010-B	12	9321-F-2020	S	NL	The nozzle is the only susceptible component in this line.	SFA Model	ES8-4-6THPT ESHDR to FWH 26C: Extraction Steam Inlet Nozzle to FWH 26C.

Section C: Excluded Lines**2-2EX-01: LP Turbine Extraction Steam to #22 Feedwater Heaters**

Line Number	Size (in.)	P&ID No.	Sus. Cat.	FAC Ex. Crit.	Comments	Reference	Line Description
2-2EX-001-B	22	9321-F-2020	E	EM	This section of piping was replaced with CrMo in 2R18	Replacement History	ES?-1-2NDPT ES TO FWH 22A: NE Extraction Steam to FWH 22A downstream of Exp. Joint

Extraction Steam (EX), Unit 2

Section C: Excluded Lines

2-2EX-01: LP Turbine Extraction Steam to #22 Feedwater Heaters

Line Number	Size (in.)	P&ID No.	Sus. Cat.	FAC Ex. Crit.	Comments	Reference	Line Description
2-2EX-002-B	22	9321-F-2020	E	EM	This section of piping was replaced with CrMo in 2R18	Replacement History	ES?-2-2NDPT ES TO FWH 22A: SW Extraction Steam to FWH 22A downstream of Exp. Joint
2-2EX-003-B	22	9321-F-2020	E	EM	This section of piping was replaced with CrMo in 2R18	Replacement History	ES?-1-2NDPT ES TO FWH 22B: NE Extraction Steam to FWH 22B downstream of Exp. Joint
2-2EX-004-B	22	9321-F-2020	E	EM	This section of piping was replaced with CrMo in 2R18	Replacement History	ES?-2-2NDPT ES TO FWH 22B: SW Extraction Steam to FWH 22B downstream of Exp. Joint
2-2EX-005-B	22	9321-F-2020	E	EM	Piping is CrMo.	P&ID	ES?-1-2NDPT ES TO FWH 22C: NE Extraction Steam to FWH 22C downstream of Exp. Joint
2-2EX-006-B	22	9321-F-2020	E	EM	Piping is CrMo.	P&ID	ES?-2-2NDPT ES TO FWH 22C: SW Extraction Steam to FWH 22C downstream of Exp. Joint

2-5EX-01: HP Turbine Crossunder Piping Drip Pots to the Condenser

Line Number	Size (in.)	P&ID No.	Sus. Cat.	FAC Ex. Crit.	Comments	Reference	Line Description
2-5EX-025-B	2	A235308	E	EM	Line is stainless steel.	P&ID	Crossunder Piping leakoff from Moisture Preseparator A downstream of Pipe Spec Change
2-5EX-026-B	2	A235308	E	EM	Line is stainless steel.	P&ID	Crossunder Piping leakoff from Moisture Preseparator B downstream of Pipe Spec Change
2-5EX-027-B	2	A235308	E	EM	Line is stainless steel.	P&ID	Crossunder Piping leakoff from Moisture Preseparator C downstream of Pipe Spec Change
2-5EX-028-B	2	A235308	E	EM	Line is stainless steel.	P&ID	Crossunder Piping leakoff from Moisture Preseparator D downstream of Pipe Spec Change

Extraction Steam (EX), Unit 2

Section C: Excluded Lines

2-5EX-01: HP Turbine Crossunder Piping Drip Pots to the Condenser

Line Number	Size (In.)	P&ID No.	Sus. Cat.	FAC Ex. Crit.	Comments	Reference	Line Description
2-5EX-029	2	A235308	E	EM	Line is stainless steel.	P&ID	Crossunder Piping Leakoff Header from Moisture Preseparators A and B
2-5EX-030	2	A235308	E	EM	Line is stainless steel.	P&ID	Crossunder Piping Leakoff Header from Moisture Preseparators C and D
2-5EX-115	1.5	B237145	E	EM	Piping is SS	P&ID	HP Turbine Drain from Far Side Inlet
2-5EX-116	1.5	B237145	E	EM	Piping is SS	P&ID	HP Turbine Drain from Near Side Inlet
2-5EX-126	1.5	B237145	E	EM	Piping is SS	P&ID	Crossunder piping leakoff to 2-MS-200
2-5EX-127	1.5	B237145	E	EM	Piping is SS	P&ID	Balancing line leakoff to 2-MS-201

2-5EX-03: Extraction Steam from Separating Tanks to #25 Feedwater Heaters

Line Number	Size (In.)	P&ID No.	Sus. Cat.	FAC Ex. Crit.	Comments	Reference	Line Description
2-5EX-031	28	9321-F-2020	E	EM	Line is stainless steel.	SFA Model	ES7-1-5THPT ES to FWH 25ABC: Extraction Steam Header to #25 Heaters
2-5EX-032	1.5	9321-F-2020	E	EI	Valve shown closed on P&ID.	P&ID	5EX-1 Bypass Line
2-5EX-033	28	9321-F-2020	E	EM	Line is stainless steel.	SFA Model	ES7-3-5THPT ESHDR 25CT to BT: Extraction Steam Header to FWH 25A and 25B
2-5EX-034	18	9321-F-2020	E	EM	Line is stainless steel.	SFA Model	ES7-5-5THPT ESHDR to FWH 25A: Extraction Steam Line to FWH 25A
2-5EX-035	18	9321-F-2020	E	EM	Line is stainless steel.	SFA Model	ES7-4-5THPT ESHDR to FWH 25B: Extraction Steam Line to FWH 25B
2-5EX-036	18	9321-F-2020	E	EM	Line is stainless steel.	SFA Model	ES7-2-5THPT ESHDR to FWH 25C: Extraction Steam Line to FWH 25C
2-5EX-037	1.5	9321-F-2020	E	EI	Valve shown closed on P&ID.	P&ID	5EX-5 Bypass Line

Extraction Steam (EX), Unit 2

Section C: Excluded Lines

2-5EX-03: Extraction Steam from Separating Tanks to #25 Feedwater Heaters

Line Number	Size (In.)	P&ID No.	Sus. Cat.	FAC Ex. Crit.	Comments	Reference	Line Description
2-5EX-038	1.5	9321-F-2020	E	EI	Valve shown closed on P&ID.	P&ID	5EX-5-1 Bypass Line
2-5EX-039	1.5	9321-F-2020	E	EI	Valve shown closed on P&ID.	P&ID	5EX-5-2 Bypass Line

2-6EX-01: HP Turbine Extraction Steam to #26 Feedwater Heaters

Line Number	Size (In.)	P&ID No.	Sus. Cat.	FAC Ex. Crit.	Comments	Reference	Line Description
2-6EX-001-B	12	9321-F-2020	E	EM	Components in this line have been clad with Stainless Steel.	SFA Model	ES8-1-6THPT ES to HDR: HP Turbine Extraction Line to #26 FWHs.
2-6EX-002-B	12	9321-F-2020	E	EM	Components in this line have been clad with Stainless Steel.	SFA Model	ES8-2-6THPT ES to HDR: HP Turbine Extraction Line to #26 FWHs.
2-6EX-003	18	9321-F-2020	E	EM	Components in this line have been clad with Stainless Steel.	SFA Model	ES8-3-6THPT ESHDR to FWH 26: HP Turbine Extraction Line to #26 FWHs.
2-6EX-004	18	9321-F-2020	E	EM	Components in this line have been clad with Stainless Steel.	SFA Model	ES8-5-6THPT ESHDR 26CT to BT: Extraction Steam header to FWH 26A and 26B
2-6EX-005	12	9321-F-2020	E	EM	Components in this line have been clad with Stainless Steel.	SFA Model	ES8-7-6THPT ESHDR to FWH 26A: Extraction Steam to FWH 26A Upstream of VCD tie-in.
2-6EX-006-A	12	9321-F-2020	E	EM	Components in this line have been clad with Stainless Steel.	SFA Model	ES8-7-6THPT ESHDR to FWH 26A: Extraction Steam to FWH 26A Downstream of VCD tie-in.
2-6EX-007	12	9321-F-2020	E	EM	Components in this line have been clad with Stainless Steel.	SFA Model	ES8-6-6THPT ESHDR to FWH 26B: Extraction Steam to FWH 26B Upstream of VCD tie-in.
2-6EX-008-A	12	9321-F-2020	E	EM	Components in this line have been clad with Stainless Steel.	SFA Model	ES8-6-6THPT ESHDR to FWH 26B: Extraction Steam to FWH 26B Downstream of VCD tie-in.

Extraction Steam (EX), Unit 2**Section C: Excluded Lines****2-6EX-01: HP Turbine Extraction Steam to #26 Feedwater Heaters**

Line Number	Size (In.)	P&ID No.	Sus. Cat.	FAC Ex. Crit.	Comments	Reference	Line Description
2-6EX-009	12	9321-F-2020	E	EM	Components in this line have been clad with Stainless Steel.	SFA Model	ES8-4-6THPT ESHDR to FWH 26C: Extraction Steam to FWH 26C Upstream of VCD tie-in.
2-6EX-010-A	12	9321-F-2020	E	EM	Components in this line have been clad with Stainless Steel.	SFA Model	ES8-4-6THPT ESHDR to FWH 26C: Extraction Steam to FWH 26C Downstream of VCD tie-in.
2-6EX-011	1	9321-F-2020	E	EI	Valve shown closed on P&ID.	P&ID	6EX-6 Bypass Line
2-6EX-012	1	9321-F-2020	E	EI	Valve shown closed on P&ID.	P&ID	6EX-6-1 Bypass Line
2-6EX-013	1	9321-F-2020	E	EI	Valve shown closed on P&ID.	P&ID	6EX-6-2 Bypass Line
2-6EX-014	1.5	9321-F-2020	E	EI	Valve shown closed on P&ID.	P&ID	6EX-1 Bypass Line
2-6EX-017	1	9321-F-2020	E	EI	Valve shown closed on P&ID.	P&ID	FWH 26A Extraction Steam Line Drain
2-6EX-018	1	9321-F-2020	E	EI	Valve shown closed on P&ID.	P&ID	FWH 26B Extraction Steam Line Drain
2-6EX-019	1.5	9321-F-2020	E	EI	Valve shown closed on P&ID.	P&ID	FWH 26A and 26B Extraction Steam Line Drain Header
2-6EX-020	1	9321-F-2020	E	EI	Valve shown closed on P&ID.	P&ID	FWH 26C Extraction Steam Line Drain
2-6EX-021	2	9321-F-2020	E	EI	Valve shown closed on P&ID.	P&ID	#26 FWH Extraction Steam Line Drain Header

Main Feed Water (FW), Unit 2

Section A: CHECWORKS Model Lines

2-FW-01: Feedwater Lines from the Boiler Feed Pumps to the Steam Generators

Line Number	Size (In.)	P&ID No.	Sus. Cat.	Comments	Reference	Line Description
2-FW-001	20	9321-F-2019	M		PEPSE	FW71-1-BFP21 DISCH to HDR: BFP No. 21 Discharge Upstream of Recirc Line
2-FW-002	20	9321-F-2019	M		PEPSE	FW71-1-BFP21 DISCH to HDR: BFP No. 21 Discharge Downstream of Recirc Line
2-FW-003	20	9321-F-2019	M		PEPSE	FW72-1-BFP22 DISCH to HDR: BFP No. 22 Discharge Upstream of Recirc Line
2-FW-004	20	9321-F-2019	M		PEPSE	FW72-1-BFP22 DISCH to HDR: BFP No. 22 Discharge Downstream of Recirc Line
2-FW-005	30	9321-F-2019	M		PEPSE	FW73-1-BFPHDR to FWH26ABC: BFP Discharge Header to #26 FWHs Upstream of High Pr. FWH Bypass Line
2-FW-006	30	9321-F-2019	M		PEPSE	FW73-2-BFPHDR to FWH26ABC: BFP Discharge Header to #26 FWHs Downstream of High Pr. FWH Bypass Line
2-FW-007	30	9321-F-2019	M		PEPSE	FW73-4-BFPHDR to FWH26ABC: BFP Discharge Header to FWHs 26A and 26B
2-FW-008	18	9321-F-2019	M		PEPSE	FW73-6-BFPHDR to FWH26A: Feedwater to FWH 26A
2-FW-009	18	9321-F-2019	M		PEPSE	FW73-5-BFPHDR to FWH26B: Feedwater to FWH 26B
2-FW-010	18	9321-F-2019	M		PEPSE	FW73-3-BFPHDR to FWH26C: Feedwater to FWH 26C

Main Feed Water (FW), Unit 2**Section A: CHECWORKS Model Lines****2-FW-01: Feedwater Lines from the Boiler Feed Pumps to the Steam Generators**

Line Number	Size (In.)	P&ID No.	Sus. Cat.	Comments	Reference	Line Description
2-FW-020	18	9321-F-2019	M		PEPSE	FW74-1-FWH26A to DISHDR: Feedwater from FWH 26A
2-FW-021	18	9321-F-2019	M		PEPSE	FW74-2-FWH26B to DISHDR: Feedwater from FWH 26B
2-FW-022	18	9321-F-2019	M		PEPSE	FW74-4-FWH26C to DISHDR: Feedwater from FWH 26C
2-FW-023	30	9321-F-2019	M		PEPSE	FW74-3-FWH26 to DISHDR: Feedwater Header from FWH 26A and 26B
2-FW-024	30	9321-F-2019	M		PEPSE	FW74-5-FWH26 to DISHDR: #26 FWH Feedwater Discharge Header Upstream of Bypass Line
2-FW-025	30	9321-F-2019	M		PEPSE	FW74-5-FWH26 to DISHDR: #26 FWH Feedwater Discharge Header Downstream of Bypass Line
2-FW-026	30	9321-F-2019	M		PEPSE	FW76-2-DISHDR to SG22: Feedwater Header to Steam Generators
2-FW-027	30	9321-F-2019	M		PEPSE	FW76-2-DISHDR to SG22: Feedwater Header to Steam Generators
2-FW-028	30	9321-F-2019	M		PEPSE	FW77-2-DISHDR to SG24: Feedwater Header to Steam Generators
2-FW-029	30	9321-F-2019	M		PEPSE	FW77-2-DISHDR to SG24: Feedwater Header to Steam Generators
2-FW-030	30	9321-F-2019	M		PEPSE	FW78-1-DISHDR to SG23: Feedwater Header to Steam Generators

Main Feed Water (FW), Unit 2

Section A: CHECWORKS Model Lines

2-FW-01: Feedwater Lines from the Boiler Feed Pumps to the Steam Generators

Line Number	Size (In.)	P&ID No.	Sus. Cat.	Comments	Reference	Line Description
2-FW-031	30	9321-F-2019	M		PEPSE	FW78-1-DISHDR to SG23: Feedwater Header to Steam Generators
2-FW-032	18	9321-F-2019	M		PEPSE	FW75-1-DISHDR to SG21: Feedwater to 21 Steam Generator
2-FW-034	18	9321-F-2019	M		PEPSE	FW76-1-DISHDR to SG22: Feedwater to 22 Steam Generator
2-FW-036	18	9321-F-2019	M		PEPSE	FW77-1-DISHDR to SG24: Feedwater to 24 Steam Generator
2-FW-038	18	9321-F-2019	M		PEPSE	FW78-1-DISHDR to SG23: Feedwater to 23 Steam Generator
2-FW-058-A	18	9321-F-2019	M		PEPSE	FW75-1-DISHDR to SG21: Feedwater to 21 Steam Generator Upstream of BFD-6
2-FW-058-B	18	9321-F-2019	M	Operating pressure from PEPSE model exceeds design pressure.	PEPSE	FW75-1-DISHDR to SG21: Feedwater to 21 Steam Generator Downstream of BFD-6
2-FW-059-A	18	9321-F-2019	M		PEPSE	FW76-1-DISHDR to SG22: Feedwater to 22 Steam Generator Upstream of BFD-6-1
2-FW-059-B	18	9321-F-2019	M	Operating pressure from PEPSE model exceeds design pressure.	PEPSE	FW76-1-DISHDR to SG22: Feedwater to 22 Steam Generator Downstream of BFD-6-1
2-FW-060-A	18	9321-F-2019	M		PEPSE	FW77-1-DISHDR to SG24: Feedwater to 24 Steam Generator Upstream of BFD-6-3
2-FW-060-B	18	9321-F-2019	M	Operating pressure from PEPSE model exceeds design pressure.	PEPSE	FW77-1-DISHDR to SG24: Feedwater to 24 Steam Generator Downstream of BFD-6-3

Main Feed Water (FW), Unit 2

Section A: CHECWORKS Model Lines

2-FW-01: Feedwater Lines from the Boiler Feed Pumps to the Steam Generators

Line Number	Size (in.)	P&ID No.	Sus. Cat.	Comments	Reference	Line Description
2-FW-061-A	18	9321-F-2019	M		PEPSE	FW78-1-DISHDR to SG23: Feedwater to 23 Steam Generator Upstream of BFD-6-2
2-FW-061-B	18	9321-F-2019	M	Operating pressure from PEPSE model exceeds design pressure.	PEPSE	FW78-1-DISHDR to SG23: Feedwater to 23 Steam Generator Downstream of BFD-6-2

Section B: SNM Program Lines

2-FW-01: Feedwater Lines from the Boiler Feed Pumps to the Steam Generators

Line Number	Size (in.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-FW-031-A	30	9321-F-2019	S	NC	Flow Conditions Unknown	P&ID	Feedwater Header to Steam Generators downstream of Main Line to SG 23
2-FW-062	0.75	9321-F-2019	S	NS	Operating conditions unknown.	P&ID	Feedwater to Sampling Upstream of BFD-1138

2-FW-03: Boiler Feed Pump Recirc Lines to the Drains Collecting Tank

Line Number	Size (in.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-FW-063	6	9321-F-2019	S	NC	Flow Conditions Unknown	P&ID	BFP No. 21 Recirc to Drains Collecting Tank
2-FW-064	6	9321-F-2019	S	NC	Flow Conditions Unknown	P&ID	BFP No. 22 Recirc to Drains Collecting Tank

Main Feed Water (FW), Unit 2

Section C: Excluded Lines

2-FW-01: Feedwater Lines from the Boiler Feed Pumps to the Steam Generators

Line Number	Size (In.)	P&ID No.	Sus. Cat.	FAC Ex. Crit.	Comments	Reference	Line Description
2-FW-013	1	9321-F-2019	E	EI	Valve shown closed on P&ID.	P&ID	BFD-2-21 Bypass Line
2-FW-014	1	9321-F-2019	E	EI	Valve shown closed on P&ID.	P&ID	BFD-2-22 Bypass Line
2-FW-015	18	9321-F-2019	E	EI	Valve normally closed.	CSI Doc# 0700.104.C.8	High Pr. FWH Bypass Line
2-FW-016	1.5	9321-F-2019	E	EI	Valve shown closed on P&ID.	P&ID	BFD-8 Bypass Line
2-FW-017	1.5	9321-F-2019	E	EI	Valve shown closed on P&ID.	P&ID	BFD-3 Bypass Line
2-FW-018	1.5	9321-F-2019	E	EI	Valve shown closed on P&ID.	P&ID	BFD-3-1 Bypass Line
2-FW-019	1.5	9321-F-2019	E	EI	Valve shown closed on P&ID.	P&ID	BFD-3-2 Bypass Line
2-FW-033	6	9321-F-2019	E	EM	Piping Replaced with SS	Previous SSE	Feedwater min-flow line to 21 Steam Generator
2-FW-035	6	9321-F-2019	E	EM	Piping Replaced with SS	Previous SSE	Feedwater min-flow line to 22 Steam Generator
2-FW-037	6	9321-F-2019	E	EM	Piping Replaced with SS	Previous SSE	Feedwater min-flow line to 24 Steam Generator
2-FW-039	6	9321-F-2019	E	EM	Piping Replaced with SS	Previous SSE	Feedwater min-flow line to 23 Steam Generator
2-FW-040	0.75	9321-F-2019	E	EI	Valve shown closed on P&ID.	P&ID	Drain A from SG 23 Feedwater min-flow line.
2-FW-041	0.75	9321-F-2019	E	EI	Valve shown closed on P&ID.	P&ID	Drain A from SG 24 Feedwater min-flow line.
2-FW-042	0.75	9321-F-2019	E	EI	Valve shown closed on P&ID.	P&ID	Drain A header from SG 23 & 24 Feedwater min-flow lines.
2-FW-043	0.75	9321-F-2019	E	EI	Valve shown closed on P&ID.	P&ID	Drain A from SG 22 Feedwater min-flow line.
2-FW-044	0.75	9321-F-2019	E	EI	Valve shown closed on P&ID.	P&ID	Drain A header from SG 22, 23 & 24 Feedwater min-flow lines.

Main Feed Water (FW), Unit 2

Section C: Excluded Lines

2-FW-01: Feedwater Lines from the Boiler Feed Pumps to the Steam Generators

Line Number	Size (In.)	P&ID No.	Sus. Cat.	FAC Ex. Crit.	Comments	Reference	Line Description
2-FW-045	0.75	9321-F-2019	E	EI	Valve shown closed on P&ID.	P&ID	Drain A from SG 21 Feedwater min-flow line.
2-FW-046	0.75	9321-F-2019	E	EI	Valve shown closed on P&ID.	P&ID	Drain A header from Feedwater min-flow lines.
2-FW-047	0.75	9321-F-2019	E	EI	Valve shown closed on P&ID.	P&ID	Drain B from SG 23 Feedwater min-flow line.
2-FW-048	0.75	9321-F-2019	E	EI	Valve shown closed on P&ID.	P&ID	Drain B from SG 24 Feedwater min-flow line.
2-FW-049	0.75	9321-F-2019	E	EI	Valve shown closed on P&ID.	P&ID	Drain B header from SG 23 & 24 Feedwater min-flow lines.
2-FW-050	0.75	9321-F-2019	E	EI	Valve shown closed on P&ID.	P&ID	Drain B from SG 22 Feedwater min-flow line.
2-FW-051	0.75	9321-F-2019	E	EI	Valve shown closed on P&ID.	P&ID	Drain B header from SG 22, 23 & 24 Feedwater min-flow lines.
2-FW-052	0.75	9321-F-2019	E	EI	Valve shown closed on P&ID.	P&ID	Drain B from SG 21 Feedwater min-flow line.
2-FW-053	0.75	9321-F-2019	E	EI	Valve shown closed on P&ID.	P&ID	Drain B header from Feedwater min-flow lines.
2-FW-054	1.5	9321-F-2019	E	EI	Valve shown closed on P&ID.	P&ID	BFD-5 Bypass Line
2-FW-055	1.5	9321-F-2019	E	EI	Valve shown closed on P&ID.	P&ID	BFD-5-1 Bypass Line
2-FW-056	1.5	9321-F-2019	E	EI	Valve shown closed on P&ID.	P&ID	BFD-5-3 Bypass Line
2-FW-057	1.5	9321-F-2019	E	EI	Valve shown closed on P&ID.	P&ID	BFD-5-2 Bypass Line

Gland Sealing Steam (GS), Unit 2

Section B: SNM Program Lines

2-GS-01: Gland Steam to and from HP, LP, and BFP Turbines

Line Number	Size (In.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-GS-001	12	A235308	S	NC	Operating conditions unknown.	P&ID	Gland Seal Steam Header to HP and LP Turbines
2-GS-002	10	A235308	S	NC	Operating conditions unknown.	P&ID	Gland Seal to HP Turbine
2-GS-003	10	A235308	S	NC	Operating conditions unknown.	P&ID	Gland Seal to HP Turbine
2-GS-004	6	A235308	S	NC	Operating conditions unknown.	P&ID	Gland Seal to LP Turbine 21
2-GS-005	2	A235308	S	NC	Operating conditions unknown.	P&ID	Gland Seal to LP Turbine 21
2-GS-006	6	A235308	S	NC	Operating conditions unknown.	P&ID	Gland Seal to LP Turbine 21
2-GS-007	2	A235308	S	NC	Operating conditions unknown.	P&ID	Gland Seal to LP Turbine 21
2-GS-008	6	A235308	S	NC	Operating conditions unknown.	P&ID	Gland Seal to LP Turbine 22
2-GS-009	2	A235308	S	NC	Operating conditions unknown.	P&ID	Gland Seal to LP Turbine 22
2-GS-010	6	A235308	S	NC	Operating conditions unknown.	P&ID	Gland Seal to LP Turbine 22
2-GS-011	2	A235308	S	NC	Operating conditions unknown.	P&ID	Gland Seal to LP Turbine 22
2-GS-012	6	A235308	S	NC	Operating conditions unknown.	P&ID	Gland Seal to LP Turbine 23
2-GS-013	2	A235308	S	NC	Operating conditions unknown.	P&ID	Gland Seal to LP Turbine 23
2-GS-014	6	A235308	S	NC	Operating conditions unknown.	P&ID	Gland Seal to LP Turbine 23
2-GS-015	2	A235308	S	NC	Operating conditions unknown.	P&ID	Gland Seal to LP Turbine 23
2-GS-016	6	9321-H-2024	S	NC	Operating conditions unknown.	P&IDs	Gland Seal supply to BFP Turbines
2-GS-020	4	9321-H-2024	S	NC	Operating conditions unknown.	P&IDs	Steam to BFPT #22
2-GS-021	4	9321-H-2024	S	NC	Operating conditions unknown.	P&IDs	Steam to BFPT #21
2-GS-022	3	9321-H-2024	S	NC	Operating conditions unknown.	P&IDs	Steam to BFPT #22
2-GS-023	3	9321-H-2024	S	NC	Operating conditions unknown.	P&IDs	Steam to BFPT #21

Gland Sealing Steam (GS), Unit 2

Section B: SNM Program Lines

2-GS-01: Gland Steam to and from HP, LP, and BFP Turbines

Line Number	Size (In.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-GS-032	3	9321-H-2024	S	NC	Operating conditions unknown.	P&IDs	BFPT #22 Gland Steam Discharge
2-GS-034	3	9321-H-2024	S	NC	Operating conditions unknown.	P&IDs	BFPT #21 Gland Steam Discharge
2-GS-036	6	9321-H-2024	S	NC	Operating conditions unknown.	P&IDs	BFPT Gland Steam Discharge Header to Gland Condenser
2-GS-038	1	9321-H-2024, B237144	S	NS	Operating conditions unknown.	P&ID	BFPT Gland Steam Discharge Header drain to waste header
2-GS-039	2	9321-H-2024	S	NS	Operating conditions unknown.	P&ID	BFPT #21 Exhaust Cylinder Drain
2-GS-040	2	9321-H-2024	S	NS	Operating conditions unknown.	P&ID	BFPT #22 Exhaust Cylinder Drain
2-GS-041	3	9321-H-2024	S	NC	Operating conditions unknown.	P&IDs	BFPT Exhaust Cylinder Drain header to Boiler Feed Pump Drip Tank
2-GS-042	1	9321-H-2024	S	NS	Operating conditions unknown.	P&ID	BFPT Exhaust Cylinder Drain header line to Boiler Feed Pump Drip Tank vent
2-GS-043	3	9321-H-2024	S	NC	Operating conditions unknown.	P&ID	BFPT Drip Tank vent to Condenser #21
2-GS-047		B237145	S	NC	Operating conditions unknown.	P&ID	Gland Seal Return from HP Turbine
2-GS-048		B237145	S	NC	Operating conditions unknown.	P&ID	Gland Seal Return from HP Turbine
2-GS-049		B237144	S	NC	Operating conditions unknown.	P&ID	Gland Seal Return from #21 LP Turbine
2-GS-050		B237144	S	NC	Operating conditions unknown.	P&ID	Gland Seal Return from #21 LP Turbine
2-GS-051		B237144	S	NC	Operating conditions unknown.	P&ID	Gland Seal Return from #22 LP Turbine
2-GS-052		B237144	S	NC	Operating conditions unknown.	P&ID	Gland Seal Return from #22 LP Turbine

Gland Sealing Steam (GS), Unit 2**Section B: SNM Program Lines****2-GS-01: Gland Steam to and from HP, LP, and BFP Turbines**

Line Number	Size (in.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-GS-053		B237144	S	NC	Operating conditions unknown.	P&ID	Gland Seal Return from #23 LP Turbine
2-GS-054		B237144	S	NC	Operating conditions unknown.	P&ID	Gland Seal Return from #23 LP Turbine
2-GS-055		B237145, B237144	S	NC	Operating conditions unknown.	P&ID	Gland Seal return header to Gland Condenser
2-GS-056		B237144	S	NM	Outside modeling capabilities.	PEPSE	Gland Condenser Drain to Main Condenser

Section C: Excluded Lines**2-GS-01: Gland Steam to and from HP, LP, and BFP Turbines**

Line Number	Size (in.)	P&ID No.	Sus. Cat.	FAC Ex. Crit.	Comments	Reference	Line Description
2-GS-033	0.75	9321-H-2024	E	EF	Low flow in waste drain	P&ID	BFPT #22 Gland Steam Discharge Drain
2-GS-035	0.75	9321-H-2024	E	EF	Low flow in waste drain	P&ID	BFPT #21 Gland Steam Discharge Drain
2-GS-037	0.75	9321-H-2024	E	EI	Valve shown closed on P&ID.	P&ID	BFPT Gland Steam Discharge Header waste drain
2-GS-057		B237144	E	EI	Valve normally closed.	Engineer Judgement	Gland Condenser Waste Drain

Gland Steam Traps (GST), Unit 2

Section B: SNM Program Lines

2-GST-01: Steam Trap Lines from the Gland Seal System

Line Number	Size (in.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-GST-017	0.75	9321-H-2024	S	NS	Operating conditions unknown.	P&ID	Steam to GST-1
2-GST-019	0.75	9321-H-2024	S	NS	Operating conditions unknown.	P&ID	GST-1 Discharge to Header
2-GST-024	0.75	9321-H-2024	S	NS	Operating conditions unknown.	P&ID	Steam to GST-3
2-GST-026	0.75	9321-H-2024	S	NS	Operating conditions unknown.	P&ID	GST-3 Discharge to Header
2-GST-027	0.75	9321-H-2024	S	NS	Operating conditions unknown.	P&ID	Steam to GST-2
2-GST-029	0.75	9321-H-2024	S	NS	Operating conditions unknown.	P&ID	GST-2 Discharge to Header
2-GST-030	2	9321-H-2024	S	NS	Operating conditions unknown.	P&ID	Header from GST-1 and 3
2-GST-031	2	9321-H-2024	S	NS	Operating conditions unknown.	P&ID	Gland Steam Trap Header to Boiler Feed Pump Drip Tank

Section C: Excluded Lines

2-GST-01: Steam Trap Lines from the Gland Seal System

Line Number	Size (in.)	P&ID No.	Sus. Cat.	FAC Ex. Crit.	Comments	Reference	Line Description
2-GST-018	0.75	9321-H-2024	E	EI	Valve shown closed on P&ID.	P&ID	GST-1 Bypass
2-GST-025	0.75	9321-H-2024	E	EI	Valve shown closed on P&ID.	P&ID	GST-3 Bypass
2-GST-028	0.75	9321-H-2024	E	EI	Valve shown closed on P&ID.	P&ID	GST-2 Bypass

Heater Drains & Vents (HD), Unit 2

Section A: CHECWORKS Model Lines

2-1HD-01: #21 Feedwater Heater Drain Lines

Line Number	Size (In.)	P&ID No.	Sus. Cat.	Comments	Reference	Line Description
2-1HD-015	12	A235304	M	Low temperature line with potential for flashing	PEPSE	FWH 21A to Condenser 23 via LCV 1124
2-1HD-016	12	A235304	M	Low temperature line with potential for flashing	PEPSE	FWH 21B to Condenser 22 via LCV 1125
2-1HD-017	12	A235304	M	Low temperature line with potential for flashing	PEPSE	FWH 21C to Condenser 21 via LCV 1126

2-2HD-01: #22 Feedwater Heater Drain Lines

Line Number	Size (In.)	P&ID No.	Sus. Cat.	Comments	Reference	Line Description
2-2HD-007	12	A235304	M	Low temperature line with potential for flashing	PEPSE	FWH 22A Drain to FWH 21A
2-2HD-008	12	A235304	M	Low temperature line with potential for flashing	PEPSE	FWH 22A Drain to FWH 21A
2-2HD-009	12	A235304	M	Low temperature line with potential for flashing	PEPSE	FWH 22A Drain to FWH 21A
2-2HD-010	12	A235304	M	Low temperature line with potential for flashing	PEPSE	FWH 22B Drain to FWH 21B
2-2HD-011	12	A235304	M	Low temperature line with potential for flashing	PEPSE	FWH 22B Drain to FWH 21B
2-2HD-012	12	A235304	M	Low temperature line with potential for flashing	PEPSE	FWH 22B Drain to FWH 21B
2-2HD-013	12	A235304	M	Low temperature line with potential for flashing	PEPSE	FWH 22C Drain to FWH 21C
2-2HD-014	12	A235304	M	Low temperature line with potential for flashing	PEPSE	FWH 22C Drain to FWH 21C
2-2HD-015	12	A235304	M	Low temperature line with potential for flashing	PEPSE	FWH 22C Drain to FWH 21C

Heater Drains & Vents (HD), Unit 2

Section A: CHECWORKS Model Lines

2-3HD-01: #23 Feedwater Heater Drain Lines

Line Number	Size (in.)	P&ID No.	Sus. Cat.	Comments	Reference	Line Description
2-3HD-021	8	A235304	M		PEPSE	HD24A-1-FWH23A to CV, HD242A-1-FWH23A CV to FWH22A: FWH 23A Drain to FWH 22A
2-3HD-022	8	A235304	M		PEPSE	HD25A-1-FWH23B to CV, HD243A-1-FWH23B CV to FWH22B: FWH 23B Drain to FWH 22B
2-3HD-023	8	A235304	M		PEPSE	HD26A-1-FWH23C to CV, HD244A-1-FWH23C CV to FWH22C: FWH 23C Drain to FWH 22C

2-4HD-01: #24 Feedwater Heater Drain Lines

Line Number	Size (in.)	P&ID No.	Sus. Cat.	Comments	Reference	Line Description
2-4HD-010	6	A235304	M		PEPSE	HD21A-1-FWH24A to CV, HD21A-2-FWH24A CV to FWH23A: FWH 24A Drain to FWH 23A
2-4HD-011	6	A235304	M		PEPSE	HD22A-1-FWH24B to CV, HD22A-2-FWH24B CV to FWH23B: FWH 24B Drain to FWH 23B
2-4HD-012	6	A235304	M		PEPSE	HD23A-1-FWH24C to CV, HD23A-2-FWH24C CV to FWH23C: FWH 24C Drain to FWH 23C

2-5HD-01: Heater Drains from #25 Feedwater Heaters

Line Number	Size (in.)	P&ID No.	Sus. Cat.	Comments	Reference	Line Description
2-5HD-041	10	9321-F-2022	M		PEPSE	HD9-1-FWH25A to HTR DRN TK: FWH 25A Drain to Heater Drain Tank
2-5HD-042	10	9321-F-2022	M		PEPSE	HD9-2-FWH25B to HTR DRN TK: FWH 25B Drain to Heater Drain Tank

Heater Drains & Vents (HD), Unit 2

Section A: CHECWORKS Model Lines

2-5HD-01: Heater Drains from #25 Feedwater Heaters

Line Number	Size (in.)	P&ID No.	Sus. Cat.	Comments	Reference	Line Description
2-5HD-043	10	9321-F-2022	M		PEPSE	HD9-3-FWH25C to HTR DRN TK; FWH 25C Drain to Heater Drain Tank

2-5HD-03: HDT Drains to HDPs and Condensers and HDP Vents to HDT

Line Number	Size (in.)	P&ID No.	Sus. Cat.	Comments	Reference	Line Description
2-5HD-055	18	9321-F-2022	M		PEPSE	HD19-1-HDT to HDP 21 SUCT: HDT to #21 HDP
2-5HD-056	18	9321-F-2022	M		PEPSE	HD19-2-HDT to HDP 22 SUCT: HDT to #22 HDP

2-6HD-01: Heater Drains from #26 Feedwater Heaters

Line Number	Size (in.)	P&ID No.	Sus. Cat.	Comments	Reference	Line Description
2-6HD-022-A	10	9321-F-2022	M		PEPSE	HD12-1-FWH26A to CV: Heater Drain from FWH 26A to LCV-1101
2-6HD-022-B	10	9321-F-2022	M	This portion of line is CrMo. Modeled for continuity in SFA.	Pipe Spec	HD12-4-FWH26A CV to HTR DR TK: Heater Drain from LCV-1101 to Heater Drain Tank
2-6HD-023-A	10	9321-F-2022	M		PEPSE	HD12-2-FWH26B to CV: Heater Drain from FWH 26B to LCV-1102
2-6HD-023-B	10	9321-F-2022	M	This portion of line is CrMo. Modeled for continuity in SFA.	Pipe Spec	HD12-5-FWH26B CV to HTR DR TK: Heater Drain from LCV-1102 to Heater Drain Tank
2-6HD-024-A	10	9321-F-2022	M		PEPSE	HD12-3-FWH26C to CV: Heater Drain from FWH 26C to LCV-1103
2-6HD-024-B	10	9321-F-2022	M	This portion of line is CrMo. Modeled for continuity in SFA.	Pipe Spec	HD12-6-FWH26C CV to HTR DR TK: Heater Drain from LCV-1103 to Heater Drain Tank

Heater Drains & Vents (HD), Unit 2

Section A: CHECWORKS Model Lines

2-HD-01: Heater Drain Pump discharge to Boiler Feed Pumps

Line Number	Size (in.)	P&ID No.	Sus. Cat.	Comments	Reference	Line Description
2-HD-001	12	9321-F-2022	M		PEPSE	HD20-1-HDP21 to BFP SUCTION; #21 HDP to Heater Drain Pump Header
2-HD-002	12	9321-F-2022	M		PEPSE	HD20-2-HDP22 to BFP SUCTION; #22 HDP to Heater Drain Pump Header
2-HD-003	16	9321-F-2022	M		PEPSE	HD20-3-HDP DIS T to BFP SUC; Heater Drain Pump Header to Boiler Feed Pumps

Section B: SNM Program Lines

2-1HD-02: #21 Feedwater Heater Vents

Line Number	Size (in.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-1HD-021	6	A235304	S	NC	Operating conditions unknown.	P&ID	FWH 21A High Level Dump to Condenser 23
2-1HD-022	6	A235304	S	NC	Operating conditions unknown.	P&ID	FWH 21B High Level Dump to Condenser 22
2-1HD-023	6	A235304	S	NC	Operating conditions unknown.	P&ID	FWH 21C High Level Dump to Condenser 21
2-1HD-024	5	A235304	S	NC	Operating conditions unknown.	P&ID	FWH 21A 5" Vent to Condenser 23
2-1HD-025	5	A235304	S	NC	Operating conditions unknown.	P&ID	FWH 21B 5" Vent to Condenser 22
2-1HD-026	5	A235304	S	NC	Operating conditions unknown.	P&ID	FWH 21C 5" Vent to Condenser 21
2-1HD-027	1	A235304	S	NS	Operating conditions unknown.	P&ID	FWH 21A 1" Vent to Condenser 23
2-1HD-028	1	A235304	S	NS	Operating conditions unknown.	P&ID	FWH 21B 1" Vent to Condenser 22

Heater Drains & Vents (HD), Unit 2

Section B: SNM Program Lines

2-1HD-02: #21 Feedwater Heater Vents

Line Number	Size (in.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-1HD-029	1	A235304	S	NS	Operating conditions unknown.	P&ID	FWH 21C 1" Vent to Condenser 21

2-2HD-02: #22 Feedwater Heater Vents

Line Number	Size (in.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-2HD-019	6	A235304	S	NC	Operating conditions unknown.	P&ID	FWH 22A High Level Dump to Condenser 23
2-2HD-020	6	A235304	S	NC	Operating conditions unknown.	P&ID	FWH 22B High Level Dump to Condenser 22
2-2HD-021	6	A235304	S	NC	Operating conditions unknown.	P&ID	FWH 22C High Level Dump to Condenser 21
2-2HD-022	2.5	A235304	S	NC	Operating conditions unknown.	P&ID	FWH 22A 2-1/2" Vent to Condenser 23
2-2HD-023	2.5	A235304	S	NC	Operating conditions unknown.	P&ID	FWH 22B 2-1/2" Vent to Condenser 22
2-2HD-024	2.5	A235304	S	NC	Operating conditions unknown.	P&ID	FWH 22C 2-1/2" Vent to Condenser 21
2-2HD-025	1	A235304	S	NS	Operating conditions unknown.	P&ID	FWH 22A 1" Vent to Condenser 23
2-2HD-026	1	A235304	S	NS	Operating conditions unknown.	P&ID	FWH 22B 1" Vent to Condenser 22
2-2HD-027	1	A235304	S	NS	Operating conditions unknown.	P&ID	FWH 22C 1" Vent to Condenser 21

2-3HD-02: #23 Feedwater Heater Vents

Line Number	Size (in.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-3HD-027	2	A235304	S	NS	Operating conditions unknown.	P&ID	FWH 23A Vent to 3EX-53
2-3HD-028	2	A235304	S	NS	Operating conditions unknown.	P&ID	FWH 23A Vent to 3EX-534

Heater Drains & Vents (HD), Unit 2

Section B: SNM Program Lines

2-3HD-02: #23 Feedwater Heater Vents

Line Number	Size (in.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-3HD-029	2	A235304	S	NS	Operating conditions unknown.	P&ID	FWH 23B Vent to 3EX-536
2-3HD-030	2	A235304	S	NS	Operating conditions unknown.	P&ID	FWH 23B Vent to 3EX-539
2-3HD-031	2	A235304	S	NS	Operating conditions unknown.	P&ID	FWH 23C Vent to 3EX-541
2-3HD-032	2	A235304	S	NS	Operating conditions unknown.	P&ID	FWH 23C Vent to 3EX-544
2-3HD-039	3	A235304	S	NC	Operating conditions unknown.	P&ID	FWH 23A 3" Vent Header
2-3HD-040	3	A235304	S	NC	Operating conditions unknown.	P&ID	FWH 23B 3" Vent Header
2-3HD-041	3	A235304	S	NC	Operating conditions unknown.	P&ID	FWH 23C 3" Vent Header
2-3HD-042	4	A235304	S	NC	Operating conditions unknown.	P&ID	4" Vent Header from FWH 23A and 23B
2-3HD-043	4	A235304	S	NC	Operating conditions unknown.	P&ID	4" Vent Header from #23 FWHs
2-3HD-044	1	A235304	S	NS	Operating conditions unknown.	P&ID	FWH 23A 1" Vent
2-3HD-045	1	A235304	S	NS	Operating conditions unknown.	P&ID	FWH 23B 1" Vent
2-3HD-046	1	A235304	S	NS	Operating conditions unknown.	P&ID	FWH 23C 1" Vent
2-3HD-047	2	A235304	S	NS	Operating conditions unknown.	P&ID	2" Vent From FWH 23A and 23B
2-3HD-048	2	A235304	S	NS	Operating conditions unknown.	P&ID	2" Vent From #23 FWHs

2-4HD-02: #24 Feedwater Heater Vents

Line Number	Size (in.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-4HD-016	1	A235304	S	NS	Operating conditions unknown.	P&ID	FWH 24A 1" Vent
2-4HD-017	1	A235304	S	NS	Operating conditions unknown.	P&ID	FWH 24B 1" Vent
2-4HD-018	1	A235304	S	NS	Operating conditions unknown.	P&ID	FWH 24C 1" Vent

Heater Drains & Vents (HD), Unit 2

Section B: SNM Program Lines

2-4HD-02: #24 Feedwater Heater Vents

Line Number	Size (in.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-4HD-019	2	A235304	S	NS	Operating conditions unknown.	P&ID	2" Vent Header from FWH 24A and 24B
2-4HD-020	2	A235304	S	NS	Operating conditions unknown.	P&ID	2" Vent Header from #24 FWHs to Condenser 22
2-4HD-021	2	A235304	S	NS	Operating conditions unknown.	P&ID	FWH 24A 2" Vent
2-4HD-022	2	A235304	S	NS	Operating conditions unknown.	P&ID	FWH 24B 2" Vent
2-4HD-023	2	A235304	S	NS	Operating conditions unknown.	P&ID	FWH 24B 2" Vent
2-4HD-024	3	A235304	S	NC	Operating conditions unknown.	P&ID	3" Vent Header from FWH 24A and 24B
2-4HD-025	3	A235304	S	NC	Operating conditions unknown.	P&ID	3" Vent Header from #24 FWHs to Condenser 22

2-5HD-02: Heater Vents from #25 Feedwater Heater and Heater Drain Tank vents to #25 Feedwater Heaters

Line Number	Size (in.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-5HD-044	10	9321-F-2022	S	NC	Operating conditions unknown.	PEPSE	Heater Drain Tank vent to FWH 25A
2-5HD-045	10	9321-F-2022	S	NC	Operating conditions unknown.	PEPSE	Heater Drain Tank vent to FWH 25B
2-5HD-046	10	9321-F-2022	S	NC	Operating conditions unknown.	PEPSE	Heater Drain Tank vent to FWH 25C
2-5HD-047	1.5	9321-F-2022	S	NS	Operating conditions unknown.	PEPSE	FWH 25A Vent
2-5HD-048	1.5	9321-F-2022	S	NS	Operating conditions unknown.	PEPSE	FWH 25B Vent
2-5HD-049	1.5	9321-F-2022	S	NS	Operating conditions unknown.	PEPSE	FWH 25C Vent
2-5HD-050	2	9321-F-2022	S	NS	Operating conditions unknown.	PEPSE	Vent header from FWH 25A and 25B
2-5HD-051	2.5	9321-F-2022, A235304	S	NS	Operating conditions unknown.	PEPSE	#25 FWH Vent header to Condenser

Heater Drains & Vents (HD), Unit 2

Section B: SNM Program Lines

2-5HD-03: HDT Drains to HDPs and Condensers and HDP Vents to HDT

Line Number	Size (in.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-5HD-057	2	9321-F-2022	S	NS	Operating conditions unknown.	P&ID	#21 HDP vent to HDT
2-5HD-058	2	9321-F-2022	S	NS	Operating conditions unknown.	P&ID	#22 HDP vent to HDT
2-5HD-059	24	9321-F-2022, A235304	S	NC	Operating conditions unknown.	PEPSE	Heater Drain Tank drain to Condensers
2-5HD-060	24	A235304	S	NC	Operating conditions unknown.	PEPSE	HDT Drain Header to Condensers 21 and 22
2-5HD-061-A	14	A235304	S	NC	Operating conditions unknown.	PEPSE	HDT Drain to LCV-5003
2-5HD-061-B	8	A235304	S	NC	Operating conditions unknown.	PEPSE	LCV-5003 to Condenser 21
2-5HD-062-A	14	A235304	S	NC	Operating conditions unknown.	PEPSE	HDT Drain to LCV-5002
2-5HD-062-B	8	A235304	S	NC	Operating conditions unknown.	PEPSE	LCV-5002 to Condenser 22
2-5HD-063-A	14	A235304	S	NC	Operating conditions unknown.	PEPSE	HDT Drain to LCV-5001
2-5HD-063-B	8	A235304	S	NC	Operating conditions unknown.	PEPSE	LCV-5001 to Condenser 23

2-6HD-02: Heater Vents from #26 Feedwater Heater

Line Number	Size (in.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-6HD-025	1	9321-F-2022	S	NS	Operating conditions unknown.	P&IDs	FWH 26A vent via 6EX-10
2-6HD-026	1	9321-F-2022	S	NS	Operating conditions unknown.	P&IDs	FWH 26A vent via 6EX-500
2-6HD-027	1	9321-F-2022	S	NS	Operating conditions unknown.	P&IDs	FWH 26A vent from 6EX-10 and 6EX- 500
2-6HD-028	1	9321-F-2022	S	NS	Operating conditions unknown.	P&IDs	FWH 26A vent via 6EX-9
2-6HD-029	1	9321-F-2022	S	NS	Operating conditions unknown.	P&IDs	FWH 26B vent via 6EX-10-1
2-6HD-030	1	9321-F-2022	S	NS	Operating conditions unknown.	P&IDs	FWH 26B vent via 6EX-501

Heater Drains & Vents (HD), Unit 2

Section B: SNM Program Lines

2-6HD-02: Heater Vents from #26 Feedwater Heater

Line Number	Size (In.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-6HD-031	1	9321-F-2022	S	NS	Operating conditions unknown.	P&IDs	FWH 26B vent from 6EX-10-1 and 6EX-501
2-6HD-032	1	9321-F-2022	S	NS	Operating conditions unknown.	P&IDs	FWH 26B vent via 6EX-9-1
2-6HD-033	1	9321-F-2022	S	NS	Operating conditions unknown.	P&IDs	FWH 26C vent via 6EX-10-2
2-6HD-034	1	9321-F-2022	S	NS	Operating conditions unknown.	P&IDs	FWH 26C vent via 6EX-502
2-6HD-035	1	9321-F-2022	S	NS	Operating conditions unknown.	P&IDs	FWH 26C vent from 6EX-10-2 and 6EX-502
2-6HD-036	1	9321-F-2022	S	NS	Operating conditions unknown.	P&IDs	FWH 26C vent via 6EX-9-2
2-6HD-037	1.5	9321-F-2022	S	NS	Operating conditions unknown.	P&IDs	Heater Start Up Vent Header from FWH 26A and 26B
2-6HD-038	2	9321-F-2022, A235304	S	NS	Operating conditions unknown.	P&IDs	#26 FWH Startup Vent Header to Condenser
2-6HD-039	1.5	9321-F-2022	S	NS	Operating conditions unknown.	P&IDs	Heater Vent Header from FWH 26A and 26B
2-6HD-040	2	9321-F-2022, A235304	S	NS	Operating conditions unknown.	P&IDs	#26 FWH Vent Header to Condenser

2-HD-01: Heater Drain Pump discharge to Boiler Feed Pumps

Line Number	Size (In.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-HD-004-A	0.5	9321-F-2022	S	NS	Flow Conditions Unknown	PEPSE	#21 HDP to HDP Water Chem. Monitor Upstream of Root Isolation Valve
2-HD-005-A	0.5	9321-F-2022	S	NS	Flow Conditions Unknown	PEPSE	#22 HDP to HDP Water Chem. Monitor Upstream of Root Isolation Valve

Heater Drains & Vents (HD), Unit 2

Section C: Excluded Lines

2-1HD-01: #21 Feedwater Heater Drain Lines

Line Number	Size (in.)	P&ID No.	Sus. Cat.	FAC Ex. Crit.	Comments	Reference	Line Description
2-1HD-018	12	A235304	E	EI	Valve shown closed on P&ID.	P&ID	FWH 21A to Condenser 23 via LCV 1124A
2-1HD-019	12	A235304	E	EI	Valve shown closed on P&ID.	P&ID	FWH 21B to Condenser 22 via LCV 1125A
2-1HD-020	12	A235304	E	EI	Valve shown closed on P&ID.	P&ID	FWH 21C to Condenser 21 via LCV 1126A

2-2HD-01: #22 Feedwater Heater Drain Lines

Line Number	Size (in.)	P&ID No.	Sus. Cat.	FAC Ex. Crit.	Comments	Reference	Line Description
2-2HD-016	12	A235304	E	EI	Valve shown closed on P&ID.	P&ID	FWH 22A Drain to Condenser 23
2-2HD-017	12	A235304	E	EI	Valve shown closed on P&ID.	P&ID	FWH 22B Drain to Condenser 22
2-2HD-018	12	A235304	E	EI	Valve shown closed on P&ID.	P&ID	FWH 22C Drain to Condenser 21

2-3HD-01: #23 Feedwater Heater Drain Lines

Line Number	Size (in.)	P&ID No.	Sus. Cat.	FAC Ex. Crit.	Comments	Reference	Line Description
2-3HD-024	8	A235304	E	EI	Valve shown closed on P&ID.	P&ID	FWH 23A Drain to Condenser 23
2-3HD-025	8	A235304	E	EI	Valve shown closed on P&ID.	P&ID	FWH 23B Drain to Condenser 22
2-3HD-026	8	A235304	E	EI	Valve shown closed on P&ID.	P&ID	FWH 23C Drain to Condenser 21

2-3HD-02: #23 Feedwater Heater Vents

Line Number	Size (in.)	P&ID No.	Sus. Cat.	FAC Ex. Crit.	Comments	Reference	Line Description
2-3HD-033		A235304	E	EI	Valve shown closed on P&ID.	P&ID	Orifice Bypass via 3EX-11
2-3HD-034		A235304	E	EI	Valve shown closed on P&ID.	P&ID	Orifice Bypass via 3EX-533

Heater Drains & Vents (HD), Unit 2

Section C: Excluded Lines

2-3HD-02: #23 Feedwater Heater Vents

Line Number	Size (In.)	P&ID No.	Sus. Cat.	FAC Ex. Crit.	Comments	Reference	Line Description
2-3HD-035		A235304	E	EI	Valve shown closed on P&ID.	P&ID	Orifice Bypass via 3EX-11-1
2-3HD-036		A235304	E	EI	Valve shown closed on P&ID.	P&ID	Orifice Bypass via 3EX-538
2-3HD-037		A235304	E	EI	Valve shown closed on P&ID.	P&ID	Orifice Bypass via 3EX-11-2
2-3HD-038		A235304	E	EI	Valve shown closed on P&ID.	P&ID	Orifice Bypass via 3EX-543

2-4HD-01: #24 Feedwater Heater Drain Lines

Line Number	Size (In.)	P&ID No.	Sus. Cat.	FAC Ex. Crit.	Comments	Reference	Line Description
2-4HD-013-A	6	A235304	E	EI	Valve shown closed on P&ID.	P&ID	FWH 24A Drain to LCV-1115A
2-4HD-013-B	6	A235304	E	EI	Valve shown closed on P&ID.	P&ID	LCV-1115A to Condenser 23
2-4HD-014-A	6	A235304	E	EI	Valve shown closed on P&ID.	P&ID	FWH 24B Drain to LCV-1116A
2-4HD-014-B	6	A235304	E	EI	Valve shown closed on P&ID.	P&ID	LCV-1116A to Condenser 22
2-4HD-015-A	6	A235304	E	EI	Valve shown closed on P&ID.	P&ID	FWH 24C Drain to LCV-1117A
2-4HD-015-B	6	A235304	E	EI	Valve shown closed on P&ID.	P&ID	LCV-1117A to Condenser 21

2-5HD-02: Heater Vents from #25 Feedwater Heater and Heater Drain Tank vents to #25 Feedwater Heaters

Line Number	Size (In.)	P&ID No.	Sus. Cat.	FAC Ex. Crit.	Comments	Reference	Line Description
2-5HD-052		9321-F-2022	E	EI	Valve shown closed on P&ID.	P&ID	FE-7635 Bypass Line
2-5HD-053		9321-F-2022	E	EI	Valve shown closed on P&ID.	P&ID	FE-7636 Bypass Line
2-5HD-054		9321-F-2022	E	EI	Valve shown closed on P&ID.	P&ID	FE-7637 Bypass Line

Heater Drains & Vents (HD), Unit 2

Section C: Excluded Lines

2-5HD-03: HDT Drains to HDPs and Condensers and HDP Vents to HDT

Line Number	Size (In.)	P&ID No.	Sus. Cat.	FAC Ex. Crit.	Comments	Reference	Line Description
2-5HD-064	14	A235304	E	EI	Valve shown closed on P&ID.	P&ID	LCV-5003 Bypass Line
2-5HD-065	14	A235304	E	EI	Valve shown closed on P&ID.	P&ID	LCV-5002 Bypass Line
2-5HD-066	14	A235304	E	EI	Valve shown closed on P&ID.	P&ID	LCV-5001 Bypass Line

2-HD-01: Heater Drain Pump discharge to Boiler Feed Pumps

Line Number	Size (In.)	P&ID No.	Sus. Cat.	FAC Ex. Crit.	Comments	Reference	Line Description
2-HD-004-B	0.25	9321-F-2022	E	EM	Downstream of root isolation valve is SS	CSI Document No. 0700.104.C.010	#21 HDP to HDP Water Chem. Monitor Downstream of Root Isolation Valve
2-HD-005-B	0.25	9321-F-2022	E	EM	Downstream of root isolation valve is SS	CSI Document No. 0700.104.C.010	#22 HDP to HDP Water Chem. Monitor Downstream of Root Isolation Valve

Main Steam (MS), Unit 2

Section A: CHECWORKS Model Lines

2-MS-07: HP Turbine Crossunder Piping to the Moisture Separators

Line Number	Size (in.)	P&ID No.	Sus. Cat.	Comments	Reference	Line Description
2-MS-204	32	A235308	M		PEPSE	HP Turbine Crossunder to Moisture Preseparator A
2-MS-205	32	A235308	M		PEPSE	HP Turbine Crossunder to Moisture Preseparator B
2-MS-206	32	A235308	M		PEPSE	HP Turbine Crossunder to Moisture Preseparator C
2-MS-207	32	A235308	M		PEPSE	HP Turbine Crossunder to Moisture Preseparator D

Section B: SNM Program Lines

2-MS-01: Main Steam from Stm Gen to HP Turbine, BFP Turbine, MSRs, Aux. Steam, SJAEs, and Priming Ejectors.

Line Number	Size (in.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-MS-001	28	9321-F-2017, A235308	S	NQ	High quality main steam line.	PEPSE	Main Steam from Steam Generator 21 Shell
2-MS-002	28	9321-F-2017, A235308	S	NQ	High quality main steam line.	PEPSE	Main Steam from Steam Generator 22 Shell
2-MS-003	28	9321-F-2017, A235308	S	NQ	High quality main steam line.	PEPSE	Main Steam from Steam Generator 23 Shell
2-MS-004	28	9321-F-2017, A235308	S	NQ	High quality main steam line.	PEPSE	Main Steam from Steam Generator 24 Shell
2-MS-005	24	A235308	S	NQ	High quality main steam line.	PEPSE	Line from 2-MS-001 to Seal Steam and MSR Header.
2-MS-006	24	A235308	S	NQ	High quality main steam line.	PEPSE	Line from 2-MS-002 to Gland Seal Steam and MSR B Header.
2-MS-007	20	A235308, A227780	S	NQ	High quality main steam line.	PEPSE	Gland Seal Steam, MSR B, and Aux. Steam Header.

Main Steam (MS), Unit 2

Section B: SNM Program Lines

2-MS-01: Main Steam from SIm Gen to HP Turbine, BFP Turbine, MSRs, Aux. Steam, SJAEs, and Priming Ejectors.

Line Number	Size (In.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-MS-008	24	A235308	S	NQ	High quality main steam line.	PEPSE	Line from 2-MS-001 (3) to MSR A Header
2-MS-009	24	A235308	S	NQ	High quality main steam line.	PEPSE	Line from 2-MS-004 to MSR A Header
2-MS-010	20	A235308, A227780	S	NQ	High quality main steam line.	PEPSE	MSR A, BFP Turbine, SJAE, and Priming Ejector Header
2-MS-011	28	A235308	S	NQ	High quality main steam line.	PEPSE	Main Steam to NE HP Turbine Inlet
2-MS-011-A	4	A235308	S	NQ	High quality main steam line.	PEPSE	MS-863 Bypass
2-MS-012	28	A235308	S	NQ	High quality main steam line.	PEPSE	Main Steam to SE HP Turbine Inlet
2-MS-012-A	4	A235308	S	NQ	High quality main steam line.	PEPSE	MS-864 Bypass
2-MS-013	28	A235308	S	NQ	High quality main steam line.	PEPSE	Main Steam to NW HP Turbine Inlet
2-MS-013-A	4	A235308	S	NQ	High quality main steam line.	PEPSE	MS-865 Bypass
2-MS-014	28	A235308	S	NQ	High quality main steam line.	PEPSE	Main Steam to SW HP Turbine Inlet
2-MS-014-A	4	A235308	S	NQ	High quality main steam line.	PEPSE	MS-866 Bypass
2-MS-015	20	A235308	S	NQ	High quality main steam line.	PEPSE	Main Steam Balancing Line between 2-MS-001 and 2-MS-003
2-MS-016	12	A227780	S	NQ	High quality main steam line.	PEPSE	Main Steam to Reheater Steam Control Station A.
2-MS-017	8	A227780	S	NQ	High quality main steam line.	PEPSE	Reheater Steam Control Station A line to PCV 1175-1
2-MS-018	8	A227780	S	NQ	High quality main steam line.	PEPSE	Reheater Steam Control Station A line to PCV 1175-2
2-MS-019	1	A227780	S	NS	High quality main steam line.	PEPSE	Reheater Steam Control Station A line to PCV 1108
2-MS-020	12	A227780	S	NQ	High quality main steam line.	PEPSE	Reheater Steam Header A

Main Steam (MS), Unit 2

Section B: SNM Program Lines

2-MS-01: Main Steam from SIm Gen to HP Turbine, BFP Turbine, MSRs, Aux. Steam, SJAEs, and Priming Ejectors.

Line Number	Size (In.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-MS-021	6	A 227780	S	NQ	High quality main steam line.	PEPSE	Reheater Header to MSR 21A
2-MS-022	6	A 227780	S	NQ	High quality main steam line.	PEPSE	Reheater Header to MSR 22A
2-MS-023	6	A 227780	S	NQ	High quality main steam line.	PEPSE	Reheater Header to MSR 23A
2-MS-024	12	A 227780	S	NQ	High quality main steam line.	PEPSE	Main Steam to Reheater Steam Control Station B.
2-MS-025	8	A 227780	S	NQ	High quality main steam line.	PEPSE	Reheater Steam Control Station B line to PCV 1175-3
2-MS-026	8	A 227780	S	NQ	High quality main steam line.	PEPSE	Reheater Steam Control Station B line to PCV 1175-4
2-MS-027	1	A 227780	S	NS	High quality main steam line.	PEPSE	Reheater Steam Control Station B line to PCV 1109
2-MS-028	12	A 227780	S	NQ	High quality main steam line.	PEPSE	Reheater Steam Header B
2-MS-029	6	A 227780	S	NQ	High quality main steam line.	PEPSE	Reheater Header to MSR 21B
2-MS-030	6	A 227780	S	NQ	High quality main steam line.	PEPSE	Reheater Header to MSR 22B
2-MS-031	6	A 227780	S	NQ	High quality main steam line.	PEPSE	Reheater Header to MSR 23B
2-MS-032	1	A 227780	S	NS	High quality main steam line.	PEPSE	Reheater Cal. Line
2-MS-033	4	A 227780	S	NQ	High quality main steam line.	PEPSE	Main Steam to BFP #21 Turbine
2-MS-034	4	A 227780	S	NQ	High quality main steam line.	PEPSE	Main Steam to BFP #22 Turbine
2-MS-035	6	A 227780	S	NQ	High quality main steam line.	PEPSE	Main Steam to SJAEs and Priming Ejectors
2-MS-036-A	3	A 227780	S	NQ	High quality main steam line.	PEPSE	SJAE Steam Supply Upstream of PCV 1132
2-MS-036-B	3	A 227780	S	NC	Operating conditions unknown.	SD No. 18.0	SJAE Steam Supply Downstream of PCV 1132

Main Steam (MS), Unit 2**Section B: SNM Program Lines****2-MS-01: Main Steam from SIm Gen to HP Turbine, BFP Turbine, MSRs, Aux. Steam, SJAEs, and Priming Ejectors.**

Line Number	Size (In.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-MS-037	3	A227780	S	N	Operating conditions unknown.	SD No. 18.0	SJAE Header
2-MS-038	2	A227780	S	NS	Operating conditions unknown.	SD No. 18.0	Header to SJAE 21
2-MS-039	2	A227780	S	NS	Operating conditions unknown.	SD No. 18.0	Header to SJAE 22
2-MS-040	2	A227780	S	NS	Operating conditions unknown.	SD No. 18.0	Header to SJAE 23
2-MS-041		A227780	S	NS	Operating conditions unknown.	SD No. 18.0	SJAE Steam Supply via MS-797
2-MS-042		A227780	S	NS	Operating conditions unknown.	SD No. 18.0	SJAE Steam Supply via MS-798
2-MS-043		A227780	S	NS	Operating conditions unknown.	SD No. 18.0	SJAE Steam Supply via MS-799
2-MS-044		A227780	S	NS	Operating conditions unknown.	SD No. 18.0	SJAE Steam Supply via MS-800
2-MS-045		A227780	S	NS	Operating conditions unknown.	SD No. 18.0	SJAE Steam Supply via MS-801
2-MS-046		A227780	S	NS	Operating conditions unknown.	SD No. 18.0	SJAE Steam Supply via MS-802
2-MS-047		A227780	S	NS	Operating conditions unknown.	SD No. 18.0	SJAE Steam Supply via MS-803
2-MS-048		A227780	S	NS	Operating conditions unknown.	SD No. 18.0	SJAE Steam Supply via MS-804
2-MS-049		A227780	S	NS	Operating conditions unknown.	SD No. 18.0	SJAE Steam Supply via MS-805
2-MS-050		A227780	S	NS	Operating conditions unknown.	SD No. 18.0	SJAE Steam Supply via MS-806
2-MS-051		A227780	S	NS	Operating conditions unknown.	SD No. 18.0	SJAE Steam Supply via MS-807
2-MS-052		A227780	S	NS	Operating conditions unknown.	SD No. 18.0	SJAE Steam Supply via MS-808
2-MS-053		A227780	S	NS	Operating conditions unknown.	SD No. 18.0	SJAE Steam Supply via MS-809
2-MS-054		A227780	S	NS	Operating conditions unknown.	SD No. 18.0	SJAE Steam Supply via MS-810
2-MS-055		A227780	S	NS	Operating conditions unknown.	SD No. 18.0	SJAE Steam Supply via MS-811
2-MS-056		A227780	S	NS	Operating conditions unknown.	SD No. 18.0	SJAE Steam Supply via MS-812

Main Steam (MS), Unit 2

Section B: SNM Program Lines

2-MS-01: Main Steam from SIm Gen to HP Turbine, BFP Turbine, MSRs, Aux. Steam, SJAEs, and Priming Ejectors.

Line Number	Size (In.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-MS-057		A227780	S	NS	Operating conditions unknown.	SD No. 18.0	SJAE Steam Supply via MS-813
2-MS-058		A227780	S	NS	Operating conditions unknown.	SD No. 18.0	SJAE Steam Supply via MS-814
2-MS-059-A	6	A227780	S	NQ	High quality main steam line.	PEPSE	Main Steam to Priming Ejectors Header Upstream of PCV 1133
2-MS-059-B	6	A227780	S	N	Operating conditions unknown.	SD No. 18.0	Main Steam to Priming Ejectors Header Downstream of PCV 1133
2-MS-060	6	A227780	S	N	Operating conditions unknown.	SD No. 18.0	Priming Ejectors Header
2-MS-061	3	A227780	S	N	Operating conditions unknown.	SD No. 18.0	Priming Ejectors Header to PE 21
2-MS-062	3	A227780	S	N	Operating conditions unknown.	SD No. 18.0	Priming Ejectors Header to PE 22
2-MS-063	3	A227780	S	N	Operating conditions unknown.	SD No. 18.0	Priming Ejectors Header to PE 23
2-MS-064	12	A235308	S	NQ	High quality main steam line.	PEPSE	Balancing line between SE and SW HP Turbine Steam Feed Lines.
2-MS-076	3	A235308	S	NC	Operating conditions unknown.	P&ID	MS-863 Valve leakoff to condenser.
2-MS-077	3	A235308	S	NC	Operating conditions unknown.	P&ID	MS-864 Valve leakoff to condenser.
2-MS-078	3	A235308	S	NC	Operating conditions unknown.	P&ID	MS-865 Valve leakoff to condenser.
2-MS-079	3	A235308	S	NC	Operating conditions unknown.	P&ID	MS-866 Valve leakoff to condenser.
2-MS-143	0.75	A235308	S	NS	Operating conditions unknown.	P&ID	Main Steam Stop Valve drain to 23 Cond. West Side
2-MS-144	0.75	A235308	S	NS	Operating conditions unknown.	P&ID	Main Steam Stop Valve drain to 23 Cond. East Side
2-MS-192	4	A227780	S	NQ	High quality main steam line.	PEPSE	Main Steam Header to Aux. Steam Upstream of PCV-1015
2-MS-198		B237145	S	NS	Operating conditions unknown.	P&ID	LH Control Valve Stem Leak-off Lines

Main Steam (MS), Unit 2

Section B: SNM Program Lines

2-MS-01: Main Steam from SIm Gen to HP Turbine, BFP Turbine, MSRs, Aux. Steam, SJAEs, and Priming Ejectors.

Line Number	Size (In.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-MS-199		B237145	S	NS	Operating conditions unknown.	P&ID	RH Control Valve Stem Leak-off Lines
2-MS-200	1.5	B237145	S	NS	Operating conditions unknown.	P&ID	Upper LH HP Turbine Feed Leakoff
2-MS-201	1.5	B237145	S	NS	Operating conditions unknown.	P&ID	Lower LH HP Turbine Feed Leakoff
2-MS-202	1.5	B237145	S	NS	Operating conditions unknown.	P&ID	Upper RH HP Turbine Feed Leakoff
2-MS-203	1.5	B237145	S	NS	Operating conditions unknown.	P&ID	Lower LH HP Turbine Feed Leakoff

2-MS-06: Main Steam Supply to Gland Steam Header

Line Number	Size (In.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-MS-187	4	A235308	S	NQ	High quality main steam line.	PEPSE	Main Steam Supply to Gland Seal Regulator Station
2-MS-188-A	3	A235308	S	NQ	High quality main steam line.	PEPSE	Gland Seal Steam Supply upstream of PCV-1145-1
2-MS-188-B	12	A235308	S	NC	Operating conditions unknown.	P&ID	Gland Seal Steam Supply downstream of PCV-1145-1
2-MS-189-A	3	A235308	S	NQ	High quality main steam line.	PEPSE	Gland Seal Steam Supply upstream of PCV-1145-2
2-MS-189-B	12	A235308	S	NC	Operating conditions unknown.	P&ID	Gland Seal Steam Supply downstream of PCV-1145-2
2-MS-191	12	A235308	S	NC	Operating conditions unknown.	P&ID	Main Steam to Gland Seal Steam Header.

Main Steam (MS), Unit 2

Section C: Excluded Lines

2-MS-01: Main Steam from SIm Gen to HP Turbine, BFP Turbine, MSRs, Aux. Steam, SJAEs, and Priming Ejectors.

Line Number	Size (In.)	P&ID No.	Sus. Cat.	FAC Ex. Crit.	Comments	Reference	Line Description
2-MS-036-C	2	A227780	E	EI	Valve shown closed on P&ID.	P&ID	PCV 1132 Bypass Line
2-MS-059-C	6	A227780	E	EI	Valve shown closed on P&ID.	P&ID	PCV 1133 Bypass Line
2-MS-065	4	9321-F-2017	E	EI	Aux. FW Turbine does not run during normal operation.	SD No. 18.0	Aux. Feed Pump Turbine Drive Steam Supply from SG 22 Shell
2-MS-066	4	9321-F-2017	E	EI	Aux. FW Turbine does not run during normal operation.	SD No. 18.0	Aux. Feed Pump Turbine Drive Steam Supply from SG 23 Shell
2-MS-067-A	4	9321-F-2017	E	EI	Aux. FW Turbine does not run during normal operation.	SD No. 18.0	Aux. Feed Pump Turbine Drive Steam Header Upstream of PCV 1139
2-MS-067-B	4	9321-F-2017	E	EI	Aux. FW Turbine does not run during normal operation.	SD No. 18.0	Aux. Feed Pump Turbine Drive Steam Header Downstream of PCV 1139
2-MS-068	1	9321-F-2017	E	EI	Valve shown closed on P&ID.	P&ID	PCV 1310A Bypass Line
2-MS-069	1	9321-F-2017	E	EI	Valve shown closed on P&ID.	P&ID	PCV 1310A and 1310B Equalization Line
2-MS-070	1	9321-F-2017	E	EI	Valve shown closed on P&ID.	P&ID	PCV 1310B Bypass Line
2-MS-071	12	9321-F-2017	E	EI	Aux. FW Turbine does not run during normal operation.	SD No. 18.0	Aux. Feed Pump Turbine Drive Vent to Atmosphere.
2-MS-072	0.75	9321-F-2041	E	EI	The Aux. Feed Turbine operates less than 2% of the time.	SD No. 21.0	Aux. Feed Pump Turbine Drive Vent Drip Leg
2-MS-181	1	A209847	E	EI	FCV-5066B normally closed	SD No. 18.0	PCV-1175-1 Leakoff Line to Condenser
2-MS-182	1	A209847	E	EI	FCV-5066A normally closed	SD No. 18.0	PCV-1175-2 Leakoff Line to Condenser
2-MS-183	1	A209847	E	EI	FCV-5065B normally closed	SD No. 18.0	PCV-1175-3 Leakoff Line to Condenser

Main Steam (MS), Unit 2

Section C: Excluded Lines

2-MS-01: Main Steam from SIm Gen to HP Turbine, BFP Turbine, MSRs, Aux. Steam, SJAEs, and Priming Ejectors.

Line Number	Size (in.)	P&ID No.	Sus. Cat.	FAC Ex. Crit.	Comments	Reference	Line Description
2-MS-184	1	A209847	E	EI	FCV-5065A normally closed	SD No. 18.0	PCV-1175-4 Leakoff Line to Condenser
2-MS-185	2	A209847	E	EI	Upstream valves normally closed	SD No. 18.0	PCV-1175-1 and 2 Leakoff Header to Condenser
2-MS-186	2	A209847	E	EI	Upstream valves normally closed	SD No. 18.0	PCV-1175-3 and 4 Leakoff Header to Condenser
2-MS-194	1	A227780	E	EI	Valve shown closed on P&ID.	P&ID	MS-1133 Bypass
2-MS-195	0.75	A227780	E	EI	Valve shown closed on P&ID.	P&ID	MST-100 Bypass via MS-1139 and MS-1140
2-MS-197	3	A227780	E	EI	Valve shown closed on P&ID.	P&ID	PCV-1015 Bypass

2-MS-06: Main Steam Supply to Gland Steam Header

Line Number	Size (in.)	P&ID No.	Sus. Cat.	FAC Ex. Crit.	Comments	Reference	Line Description
2-MS-190	3	A235308	E	EI	Valve shown closed on P&ID.	P&ID	PCV-1145-1 and 2 bypass line

2-MS-07: HP Turbine Crossunder Piping to the Moisture Separators

Line Number	Size (in.)	P&ID No.	Sus. Cat.	FAC Ex. Crit.	Comments	Reference	Line Description
2-MS-208	32	A235308	E	EM	Line is clad with Stainless Steel.	SFA Model	MS56-1-PRESEP to MSR-A: Moisture Preseparator A to MSR Header
2-MS-209	32	A235308	E	EM	Line is clad with Stainless Steel.	SFA Model	MS57-1-PRESEP to MSR-B: Moisture Preseparator B to MSR Header
2-MS-210	32	A235308	E	EM	Line is clad with Stainless Steel.	SFA Model	MS56-2-PRESEP to MSR-A: Moisture Preseparator C to MSR Header

Main Steam (MS), Unit 2**Section C: Excluded Lines****2-MS-07: HP Turbine Crossunder Piping to the Moisture Separators**

Line Number	Size (In.)	P&ID No.	Sus. Cat.	FAC Ex. Crit.	Comments	Reference	Line Description
2-MS-211	32	A235308	E	EM	Line is clad with Stainless Steel.	SFA Model	MS57-2-PRESEP to MSR-B: Moisture Preseparator D to MSR Header
2-MS-212	46.5	A235308, A227780	E	EM	Line is clad with Stainless Steel.	SFA Model	MS56-3-PRESEP to MSR-A: Moisture Preseparator Header to A MSRs
2-MS-213	46.5	A235308, A227780	E	EM	Line is clad with Stainless Steel.	SFA Model	MS57-3-PRESEP to MSR-B: Moisture Preseparator Header to B MSRs
2-MS-214	37	A227780	E	EM	Line is clad with Stainless Steel.	SFA Model	MS56-5-PRESEP to MSR-A: Moisture Preseparator Header to MSR 21A and 22A
2-MS-215	37	A227780	E	EM	Line is clad with Stainless Steel.	SFA Model	MS57-5-PRESEP to MSR-B: Moisture Preseparator Header to MSR 21B and 22B
2-MS-216	26.5	A227780	E	EM	Line is clad with Stainless Steel.	SFA Model	MS56-7-PRESEP to MSR21A: Moisture Preseparator Header to MSR 21A
2-MS-217	26.5	A227780	E	EM	Line is clad with Stainless Steel.	SFA Model	MS56-6-PRESEP to MSR22A: Moisture Preseparator Header to MSR 22A
2-MS-218	26.5	A227780	E	EM	Line is clad with Stainless Steel.	SFA Model	MS56-4-PRESEP to MSR23A: Moisture Preseparator Header to MSR 23A
2-MS-219	26.5	A227780	E	EM	Line is clad with Stainless Steel.	SFA Model	MS57-7-PRESEP to MSR21B: Moisture Preseparator Header to MSR 21B
2-MS-220	26.5	A227780	E	EM	Line is clad with Stainless Steel.	SFA Model	MS57-6-PRESEP to MSR22B: Moisture Preseparator Header to MSR 22B

Main Steam (MS), Unit 2

Section C: Excluded Lines

2-MS-07: HP Turbine Crossunder Piping to the Moisture Separators

Line Number	Size (In.)	P&ID No.	Sus. Cat.	FAC Ex. Crit.	Comments	Reference	Line Description
2-MS-221	26.5	A227780	E	EM	Line is clad with Stainless Steel.	SFA Model	MS57-4-PRESEP to MSR23B: Moisture Preseparator Header to MSR 23B

Moisture Separator Reheater Drains (MSD), Unit 2**Section A: CHECWORKS Model Lines****2-MSD-01: Moisture Separator Drains to the Heater Drain Tank and Drains Collecting Tank**

Line Number	Size (In.)	P&ID No.	Sus. Cat.	Comments	Reference	Line Description
2-MSD-067	12	9321-F-2023	M		PEPSE	MSD27-1-MS21A to MSDT 21A: MSR 21A Drain from 16N
2-MSD-068	12	9321-F-2023	M		PEPSE	MSD27-2-MS21A to MSDT 21A: MSR 21A Drain from 17N
2-MSD-069	12	9321-F-2023	M		PEPSE	MSD27-4-MS21A to MSDT 21A: MSR 21A Drain Header from 16N and 17N
2-MSD-070	12	9321-F-2023	M		PEPSE	MSD27-3-MS21A to MSDT 21A: MSR 21A Drain from 19N
2-MSD-071	12	9321-F-2023	M		PEPSE	MSD27-5-MS21A to MSDT 21A: MSR 21A Drain to MSR Drain Tank 21A
2-MSD-072	12	9321-F-2023	M		PEPSE	MSD28-1-MS22A to MSDT 22A: MSR 22A Drain from 16N
2-MSD-073	12	9321-F-2023	M		PEPSE	MSD28-2-MS22A to MSDT 22A: MSR 22A Drain from 17N
2-MSD-074	12	9321-F-2023	M		PEPSE	MSD28-4-MS22A to MSDT 22A: MSR 22A Drain Header from 16N and 17N
2-MSD-075	12	9321-F-2023	M		PEPSE	MSD28-3-MS22A to MSDT 22A: MSR 22A Drain from 19N
2-MSD-076	12	9321-F-2023	M		PEPSE	MSD28-5-MS22A to MSDT 22A: MSR 22A Drain to MSR Drain Tank 22A
2-MSD-077	12	9321-F-2023	M		PEPSE	MSD29-1-MS23A to MSDT 23A: MSR 23A Drain from 16N
2-MSD-078	12	9321-F-2023	M		PEPSE	MSD29-2-MS23A to MSDT 23A: MSR 23A Drain from 17N

Moisture Separator Reheater Drains (MSD), Unit 2**Section A: CHECWORKS Model Lines****2-MSD-01: Moisture Separator Drains to the Heater Drain Tank and Drains Collecting Tank**

Line Number	Size (In.)	P&ID No.	Sus. Cat.	Comments	Reference	Line Description
2-MSD-079	12	9321-F-2023	M		PEPSE	MSD29-4-MS23A to MSDT 23A: MSR 23A Drain Header from 16N and 17N
2-MSD-080	12	9321-F-2023	M		PEPSE	MSD29-3-MS23A to MSDT 23A: MSR 23A Drain from 19N
2-MSD-081	12	9321-F-2023	M		PEPSE	MSD29-5-MS23A to MSDT 23A: MSR 23A Drain to MSR Drain Tank 23A
2-MSD-082	12	9321-F-2023	M		PEPSE	MSD30-1-MS21B to MSDT 21B: MSR 21B Drain from 19N
2-MSD-083	12	9321-F-2023	M		PEPSE	MSD30-2-MS21B to MSDT 21B: MSR 21B Drain from 18N
2-MSD-084	12	9321-F-2023	M		PEPSE	MSD30-4-MS21B to MSDT 21B: MSR 21B Drain Header from 18N and 19N
2-MSD-085	12	9321-F-2023	M		PEPSE	MSD30-3-MS21B to MSDT 21B: MSR 21B Drain from 16N
2-MSD-086	12	9321-F-2023	M		PEPSE	MSD30-5-MS21B to MSDT 21B: MSR 21B Drain to MSR Drain Tank 21B
2-MSD-087	12	9321-F-2023	M		PEPSE	MSD31-1-MS22B to MSDT 22B: MSR 22B Drain from 19N
2-MSD-088	12	9321-F-2023	M		PEPSE	MSD31-2-MS22B to MSDT 22B: MSR 22B Drain from 18N
2-MSD-089	12	9321-F-2023	M		PEPSE	MSD31-4-MS22B to MSDT 22B: MSR 22B Drain Header from 18N and 19N
2-MSD-090	12	9321-F-2023	M		PEPSE	MSD31-3-MS22B to MSDT 22B: MSR 22B Drain from 16N

Moisture Separator Reheater Drains (MSD), Unit 2**Section A: CHECWORKS Model Lines****2-MSD-01: Moisture Separator Drains to the Heater Drain Tank and Drains Collecting Tank**

Line Number	Size (In.)	P&ID No.	Sus. Cat.	Comments	Reference	Line Description
2-MSD-091	12	9321-F-2023	M		PEPSE	MSD31-5-MS22B to MSDT 22B; MSR 22B Drain to MSR Drain Tank 22B
2-MSD-092	12	9321-F-2023	M		PEPSE	MSD32-1-MS23B to MSDT 23B; MSR 23B Drain from 19N
2-MSD-093	12	9321-F-2023	M		PEPSE	MSD32-2-MS23B to MSDT 23B; MSR 23B Drain from 18N
2-MSD-094	12	9321-F-2023	M		PEPSE	MSD32-4-MS23B to MSDT 23B; MSR 23B Drain Header from 18N and 19N
2-MSD-095	12	9321-F-2023	M		PEPSE	MSD32-3-MS23B to MSDT 23B; MSR 23B Drain from 16N
2-MSD-096	12	9321-F-2023	M		PEPSE	MSD32-5-MS23B to MSDT 23B; MSR 23B Drain to MSR Drain Tank 23B

2-MSD-02: Reheater Drains to #26 Feedwater Heaters and Condensers

Line Number	Size (In.)	P&ID No.	Sus. Cat.	Comments	Reference	Line Description
2-MSD-151	6	9321-F-2023	M		PEPSE	MSD39-1-RHTR 21A to RHDT 21A; Reheater 21A to Reheater Drain Tank
2-MSD-152	6	9321-F-2023	M		PEPSE	MSD40-1-RHTR 22A to RHDT 22A; Reheater 22A to Reheater Drain Tank
2-MSD-153	6	9321-F-2023	M		PEPSE	MSD41-1-RHTR 23A to RHDT 23A; Reheater 23A to Reheater Drain Tank
2-MSD-154	6	9321-F-2023	M		PEPSE	MSD42-1-RHTR 21B to RHDT 21B; Reheater 21B to Reheater Drain Tank
2-MSD-155	6	9321-F-2023	M		PEPSE	MSD43-1-RHTR 22B to RHDT 22B; Reheater 22B to Reheater Drain Tank

Moisture Separator Reheater Drains (MSD), Unit 2**Section A: CHECWORKS Model Lines****2-MSD-02: Reheater Drains to #26 Feedwater Heaters and Condensers**

Line Number	Size (In.)	P&ID No.	Sus. Cat.	Comments	Reference	Line Description
2-MSD-156	6	9321-F-2023	M		PEPSE	MSD44-1-RHTR 23B to RHDT 23B: Reheater 23B to Reheater Drain Tank
2-MSD-157	6	9321-F-2023	M	Components downstream of the control valve in this line have been replaced with stainless steel. These components are modeled for continuity.	PEPSE	MSD45A-1-RHDT21A to CV, MSD45B-1-RHDT21A CV to FWH26: Reheater Drain Tank 21A Drain to Header
2-MSD-158	8	9321-F-2023	M	Components downstream of the control valve in this line have been replaced with stainless steel. These components are modeled for continuity.	PEPSE	MSD46A-1-RHDT22A to CV, MSD46A-2-RHDT22A CV to FWH26: Reheater Drain Tank 22A Drain to Header
2-MSD-159	6	9321-F-2023	M		PEPSE	MSD47-1-RHDT23A to CV, MSD47-2- RHDT23A CV to FWH26: Reheater Drain Tank 23A Drain to Header
2-MSD-160	10	9321-F-2023	M		PEPSE	MSD45C-1-RHDT A HDR to FWH26, MSD45C-2-RHDT A HDR to FWH26: Reheater Drain Tank Header
2-MSD-161	10	9321-F-2023	M		PEPSE	MSD45C-3-RHDT A HDR to FWH26: "A" Reheater Drain Tank Header to #26 FWHs
2-MSD-162	8	9321-F-2023	M		PEPSE	MSD45C-5-RHDT A HDR to FWH26: "A" Reheater Drain Tank Header to FWH 26A and 26B
2-MSD-163	6	9321-F-2023	M		PEPSE	MSD45D-2-RHDT A HDR to FWH26A: "A" Reheater Drain Tank Header to FWH 26A
2-MSD-164	6	9321-F-2023	M		PEPSE	MSD45D-1-RHDT A HDR to FWH26B: "A" Reheater Drain Tank Header to FWH 26B

Moisture Separator Reheater Drains (MSD), Unit 2**Section A: CHECWORKS Model Lines****2-MSD-02: Reheater Drains to #26 Feedwater Heaters and Condensers**

Line Number	Size (In.)	P&ID No.	Sus. Cat.	Comments	Reference	Line Description
2-MSD-165	6	9321-F-2023	M	A portion of this line has been replaced with stainless steel. These components are modeled for continuity.	PEPSE	MSD45C-4-RHDT A HDR to FWH26C: "A" Reheater Drain Tank Header to FWH 26C
2-MSD-166	6	9321-F-2023	M		PEPSE	MSD48A-1-RHDT21B to CV, MSD48B-1-RHDT21B CV to FWH26: Reheater Drain Tank 21B Drain to Header
2-MSD-167	10	9321-F-2023	M		PEPSE	MSD49A-1-RHDT22B to CV, MSD49B-1-RHDT22B CV to FWH26: Reheater Drain Tank 22B Drain to Header
2-MSD-168	6	9321-F-2023	M		PEPSE	MSD50A-1-RHDT23B to CV, MSD50C-1-RHDT23B CV to FWH26: Reheater Drain Tank 23B Drain to Header
2-MSD-169	8	9321-F-2023	M		PEPSE	MSD48B-2-RHDT B HDR to FWH26: Reheater Drain Tank Header Downstream of Reheater 22B and 23B Inlet
2-MSD-170	10	9321-F-2023	M		PEPSE	MSD49C-1-RHDT B HDR to FWH26: "B" Reheater Drain Tank Header to #26 FWHS
2-MSD-171	10	9321-F-2023	M		PEPSE	MSD49C-3-RHDT B HDR: "B" Reheater Drain Tank Header to FWH 26A and 26B
2-MSD-172	6	9321-F-2023	M		PEPSE	MSD49C-5-RHDT B HDR to FWH26A: "B" Reheater Drain Tank Header to FWH 26A
2-MSD-173	6	9321-F-2023	M		PEPSE	MSD49C-4-RHDT B HDR to FWH26B: "B" Reheater Drain Tank Header to FWH 26B

Moisture Separator Reheater Drains (MSD), Unit 2**Section A: CHECWORKS Model Lines****2-MSD-02: Reheater Drains to #26 Feedwater Heaters and Condensers**

Line Number	Size (In.)	P&ID No.	Sus. Cat.	Comments	Reference	Line Description
2-MSD-174	6	9321-F-2023	M		PEPSE	MSD49C-2-RHDT B HDR to FWH26C: "B" Reheater Drain Tank Header to FWH 26C

Section B: SNM Program Lines**2-MSD-01: Moisture Separator Drains to the Heater Drain Tank and Drains Collecting Tank**

Line Number	Size (In.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-MSD-097	2.5	9321-F-2023	S	NC	Operating conditions unknown.	PEPSE	MS Drain Tank 21A vent to MSR
2-MSD-098	2.5	9321-F-2023	S	NC	Operating conditions unknown.	PEPSE	MS Drain Tank 22A vent to MSR
2-MSD-099	2.5	9321-F-2023	S	NC	Operating conditions unknown.	PEPSE	MS Drain Tank 23A vent to MSR
2-MSD-100	2.5	9321-F-2023	S	NC	Operating conditions unknown.	PEPSE	MS Drain Tank 21B vent to MSR
2-MSD-101	2.5	9321-F-2023	S	NC	Operating conditions unknown.	PEPSE	MS Drain Tank 22B vent to MSR
2-MSD-102	2.5	9321-F-2023	S	NC	Operating conditions unknown.	PEPSE	MS Drain Tank 23B vent to MSR
2-MSD-103-A	6	9321-F-2023	S	NL	The nozzles are the only susceptible components in this line.	SFA Model	MSD33A-1-MSDT 21A to HDT: MS Drain Tank 21A Nozzle to Heater Drain Tank
2-MSD-103-C	6	9321-F-2023	S	NL	The nozzles are the only susceptible components in this line.	SFA Model	MSD33A-1-MSDT 21A to HDT: Heater Drain Tank Nozzle from MS Drain Tank 21A
2-MSD-104-A	6	9321-F-2023	S	NL	The nozzles are the only susceptible components in this line.	SFA Model	MSD34A-1-MSDT 22A to HDT: MS Drain Tank 22A Nozzle to Heater Drain Tank
2-MSD-104-C	6	9321-F-2023	S	NL	The nozzles are the only susceptible components in this line.	SFA Model	MSD34A-1-MSDT 22A to HDT: Heater Drain Tank Nozzle from MS Drain Tank 22A

Moisture Separator Reheater Drains (MSD), Unit 2

Section B: SNM Program Lines

2-MSD-01: Moisture Separator Drains to the Heater Drain Tank and Drains Collecting Tank

Line Number	Size (in.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-MSD-105-A	6	9321-F-2023	S	NL	The nozzles are the only susceptible components in this line.	SFA Model	MSD35A-1-MSDT 23A to HDT: MS Drain Tank 23A Nozzle to Heater Drain Tank
2-MSD-105-C	6	9321-F-2023	S	NL	The nozzles are the only susceptible components in this line.	SFA Model	MSD35A-1-MSDT 23A to HDT: Heater Drain Tank Nozzle from MS Drain Tank 23A
2-MSD-106-A	6	9321-F-2023	S	NL	The nozzles are the only susceptible components in this line.	SFA Model	MSD36A-1-MSDT 21B to HDT: MS Drain Tank 21B Nozzle to Heater Drain Tank
2-MSD-106-C	6	9321-F-2023	S	NL	The nozzles are the only susceptible components in this line.	SFA Model	MSD36A-1-MSDT 21B to HDT: Heater Drain Tank Nozzle from MS Drain Tank 21B
2-MSD-107-A	6	9321-F-2023	S	NL	The nozzles are the only susceptible components in this line.	SFA Model	MSD37A-1-MSDT 22B to HDT: MS Drain Tank 22B Nozzle to Heater Drain Tank
2-MSD-107-C	6	9321-F-2023	S	NL	The nozzles are the only susceptible components in this line.	SFA Model	MSD37A-1-MSDT 22B to HDT: Heater Drain Tank Nozzle from MS Drain Tank 22B
2-MSD-108-A	6	9321-F-2023	S	NL	The nozzles are the only susceptible components in this line.	SFA Model	MSD38A-1-MSDT 23B to HDT: MS Drain Tank 23B Nozzle to Heater Drain Tank
2-MSD-108-C	6	9321-F-2023	S	NL	The nozzles are the only susceptible components in this line.	SFA Model	MSD38A-1-MSDT 23B to HDT: Heater Drain Tank Nozzle from MS Drain Tank 23B

2-MSD-02: Reheater Drains to #26 Feedwater Heaters and Condensers

Line Number	Size (in.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-MSD-145	2.5	9321-F-2023	S	NC	Operating conditions unknown.	P&ID	Reheater Drain Tank 21A Vent to MSR

Moisture Separator Reheater Drains (MSD), Unit 2**Section B: SNM Program Lines****2-MSD-02: Reheater Drains to #26 Feedwater Heaters and Condensers**

Line Number	Size (In.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-MSD-146	2.5	9321-F-2023	S	NC	Operating conditions unknown.	P&ID	Reheater Drain Tank 22A Vent to MSR
2-MSD-147	2.5	9321-F-2023	S	NC	Operating conditions unknown.	P&ID	Reheater Drain Tank 23A Vent to MSR
2-MSD-148	2.5	9321-F-2023	S	NC	Operating conditions unknown.	P&ID	Reheater Drain Tank 21B Vent to MSR
2-MSD-149	2.5	9321-F-2023	S	NC	Operating conditions unknown.	P&ID	Reheater Drain Tank 22B Vent to MSR
2-MSD-150	2.5	9321-F-2023	S	NC	Operating conditions unknown.	P&ID	Reheater Drain Tank 23B Vent to MSR
2-MSD-175	8	9321-F-2023	S	NC	Operating conditions unknown.	P&ID	Reheater 21A to Condenser 23
2-MSD-176	8	9321-F-2023	S	NC	Operating conditions unknown.	P&ID	Reheater 22A to Condenser 22
2-MSD-177	8	9321-F-2023	S	NC	Operating conditions unknown.	P&ID	Reheater 23A to Condenser 23
2-MSD-178	6	9321-F-2023	S	NC	Operating conditions unknown.	P&ID	Reheater 21B to Condenser 21
2-MSD-179	6	9321-F-2023	S	NC	Operating conditions unknown.	P&ID	Reheater 22B to Condenser 22
2-MSD-180	6	9321-F-2023	S	NC	Operating conditions unknown.	P&ID	Reheater 23B to Condenser 21

Section C: Excluded Lines**2-MSD-01: Moisture Separator Drains to the Heater Drain Tank and Drains Collecting Tank**

Line Number	Size (In.)	P&ID No.	Sus. Cat.	FAC Ex. Crit.	Comments	Reference	Line Description
2-MSD-103-B	6	9321-F-2023	E	EM	This line has been clad with Stainless Steel.	SFA Model	MSD33A-1-MSDT 21A to HDT: MS Drain Tank 21A Drain to Heater Drain Tank

Moisture Separator Reheater Drains (MSD), Unit 2**Section C: Excluded Lines****2-MSD-01: Moisture Separator Drains to the Heater Drain Tank and Drains Collecting Tank**

Line Number	Size (In.)	P&ID No.	Sus. Cat.	FAC Ex. Crit.	Comments	Reference	Line Description
2-MSD-104-B	6	9321-F-2023	E	EM	This line has been clad with Stainless Steel.	SFA Model	MSD34A-1-MSDT 22A to HDT; MS Drain Tank 22A Drain to Heater Drain Tank
2-MSD-105-B	6	9321-F-2023	E	EM	This line has been clad with Stainless Steel.	SFA Model	MSD35A-1-MSDT 23A to HDT; MS Drain Tank 23A Drain to Heater Drain Tank
2-MSD-106-B	6	9321-F-2023	E	EM	This line has been clad with Stainless Steel.	SFA Model	MSD36A-1-MSDT 21B to HDT; MS Drain Tank 21B Drain to Heater Drain Tank
2-MSD-107-B	6	9321-F-2023	E	EM	This line has been clad with Stainless Steel.	SFA Model	MSD37A-1-MSDT 22B to HDT; MS Drain Tank 22B Drain to Heater Drain Tank
2-MSD-108-B	6	9321-F-2023	E	EM	This line has been clad with Stainless Steel.	SFA Model	MSD38A-1-MSDT 23B to HDT; MS Drain Tank 23B Drain to Heater Drain Tank
2-MSD-109	6	9321-F-2023	E	EI	Line operates less than 2% of the time	CSI Document 0700.104.C.008	MS Drain Tank 21A Drain to Drains Collecting Tank
2-MSD-110	6	9321-F-2023	E	EI	Line operates less than 2% of the time	CSI Document 0700.104.C.008	MS Drain Tank 22A Drain to Drains Collecting Tank
2-MSD-111	6	9321-F-2023	E	EI	Line operates less than 2% of the time	CSI Document 0700.104.C.008	MS Drain Tank 23A Drain to Drains Collecting Tank
2-MSD-112	6	9321-F-2023	E	EI	Line operates less than 2% of the time	CSI Document 0700.104.C.008	MS Drain Tank 21B Drain to Drains Collecting Tank
2-MSD-113	6	9321-F-2023	E	EI	Line operates less than 2% of the time	CSI Document 0700.104.C.008	MS Drain Tank 22B Drain to Drains Collecting Tank
2-MSD-114	6	9321-F-2023	E	EI	Line operates less than 2% of the time	CSI Document 0700.104.C.008	MS Drain Tank 23B Drain to Drains Collecting Tank

Main Steam Traps (MST), Unit 2

Section B: SNM Program Lines

2-MST-01: Steam Trap Lines from the Main Steam System

Line Number	Size (In.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-MST-019-A	12	A227780	S	NC	Flow Conditions Unknown	PEPSE	Crossunder Steam Trap to Condenser 21
2-MST-020-A	12	A227780	S	NC	Flow Conditions Unknown	PEPSE	Crossunder Steam Trap to Condenser 21
2-MST-021-A	12	A227780	S	NC	Flow Conditions Unknown	PEPSE	Crossunder Steam Trap to Condenser 22
2-MST-022-A	12	A227780	S	NC	Flow Conditions Unknown	PEPSE	Crossunder Steam Trap to Condenser 22
2-MST-023-A	12	A227780	S	NC	Flow Conditions Unknown	PEPSE	Crossunder Steam Trap to Condenser 23
2-MST-024-A	12	A227780	S	NC	Flow Conditions Unknown	PEPSE	Crossunder Steam Trap to Condenser 23
2-MST-080-A	1.5	9321-F-2041	S	NS	High quality main steam line.	PEPSE	Main steam to MST-1
2-MST-080-B	1.5	9321-F-2041	S	NS	Operating conditions unknown.	P&ID	MST-1 to Steam Trap Header
2-MST-081-A	1.5	9321-F-2041	S	NS	High quality main steam line.	PEPSE	Main steam to MST-2
2-MST-081-B	1.5	9321-F-2041	S	NS	Operating conditions unknown.	P&ID	MST-2 to Steam Trap Header
2-MST-082-A	1.5	9321-F-2041	S	NS	High quality main steam line.	PEPSE	Main steam to MST-3
2-MST-082-B	1.5	9321-F-2041	S	NS	Operating conditions unknown.	P&ID	MST-3 to Steam Trap Header
2-MST-083-A	1.5	9321-F-2041	S	NS	High quality main steam line.	PEPSE	Main Steam from Drain Pot to MST-4
2-MST-083-B	1	9321-F-2041	S	NS	High quality main steam line.	PEPSE	Main Steam from MS-1-24 US Leakoff to MST-4.
2-MST-083-C		9321-F-2041	S	NS	Operating conditions unknown.	P&ID	MST-4 to Steam Trap Header
2-MST-084-A	1.25	9321-F-2041	S	NS	High quality main steam line.	PEPSE	Main Steam from MS-1-21 US Leakoff to MST-5

Main Steam Traps (MST), Unit 2

Section B: SNM Program Lines

2-MST-01: Steam Trap Lines from the Main Steam System

Line Number	Size (In.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-MST-084-B	1.25	9321-F-2041	S	NS	Operating conditions unknown.	P&ID	MST-5 to Steam Trap Header
2-MST-085-A	1	9321-F-2041	S	NS	High quality main steam line.	PEPSE	Main Steam from MS-2A US Leakoff to MST-6
2-MST-085-B	1	9321-F-2041	S	NS	High quality main steam line.	PEPSE	Main Steam from MS-1-21 DS Leakoff to MST-6
2-MST-085-C	1	9321-F-2041	S	NS	Operating conditions unknown.	P&ID	MST-6 to Steam Trap Header
2-MST-086-A	1	9321-F-2041	S	NS	High quality main steam line.	PEPSE	Main Steam from MS-2A DS Leakoff to MST-8
2-MST-086-B	1	9321-F-2041	S	NS	Operating conditions unknown.	P&ID	MST-8 to Steam Trap Header
2-MST-087-A	1	9321-F-2041	S	NS	High quality main steam line.	PEPSE	Main Steam from MS-2B DS Leakoff to MST-9
2-MST-087-B	1	9321-F-2041	S	NS	Operating conditions unknown.	P&ID	MST-9 to Steam Trap Header
2-MST-088-A	1	9321-F-2041	S	NS	High quality main steam line.	PEPSE	Main Steam from MS-1-22 DS Leakoff to MST-10
2-MST-088-B	1	9321-F-2041	S	NS	High quality main steam line.	PEPSE	Main Steam from MS-2B US Leakoff to MST-10
2-MST-088-C	1	9321-F-2041	S	NS	Operating conditions unknown.	P&ID	MST-10 to Steam Trap Header
2-MST-089-A	1	9321-F-2041	S	NS	High quality main steam line.	PEPSE	Main Steam from MS-1-22 US Leakoff to MST-12
2-MST-089-B	1	9321-F-2041	S	NS	Operating conditions unknown.	P&ID	MST-12 to Steam Trap Header
2-MST-090-A	1.25	9321-F-2041	S	NS	High quality main steam line.	PEPSE	Main Steam from MS-1-23 US Leakoff to MST-13
2-MST-090-B	1.25	9321-F-2041	S	NS	Operating conditions unknown.	P&ID	MST-13 to Steam Trap Header
2-MST-091-A	1	9321-F-2041	S	NS	High quality main steam line.	PEPSE	Main Steam from MS-1-23 DS Leakoff to MST-14

Main Steam Traps (MST), Unit 2

Section B: SNM Program Lines

2-MST-01: Steam Trap Lines from the Main Steam System

Line Number	Size (In.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-MST-091-B	1	9321-F-2041	S	NS	High quality main steam line.	PEPSE	Main Steam from MS-2C US Leakoff to MST-14
2-MST-091-C	1	9321-F-2041	S	NS	Operating conditions unknown.	P&ID	MST-14 to Steam Trap Header
2-MST-092-A	1	9321-F-2041	S	NS	High quality main steam line.	PEPSE	Main Steam from MS-2C DS Leakoff to MST-16
2-MST-092-B	1	9321-F-2041	S	NS	Operating conditions unknown.	P&ID	MST-16 to Steam Trap Header
2-MST-093-A	1	9321-F-2041	S	NS	High quality main steam line.	PEPSE	Main Steam from MS-1-24 DS Leakoff to MST-18
2-MST-093-B	1	9321-F-2041	S	NS	High quality main steam line.	PEPSE	Main Steam from MS-2D US Leakoff to MST-18
2-MST-093-C	1	9321-F-2041	S	NS	Operating conditions unknown.	P&ID	MST-18 to Steam Trap Header
2-MST-094-A	1	9321-F-2041	S	NS	High quality main steam line.	PEPSE	Main Steam from MS-2D DS Leakoff to MST-20
2-MST-094-B	1	9321-F-2041	S	NS	Operating conditions unknown.	P&ID	MST-20 to Steam Trap Header
2-MST-095-A	1.5	9321-F-2041	S	NS	High quality main steam line.	PEPSE	Main Steam to MST-21
2-MST-095-B	1.5	9321-F-2041	S	NS	Operating conditions unknown.	P&ID	MST-21 to Steam Trap Header
2-MST-096-A	1.5	9321-F-2041	S	NS	High quality main steam line.	PEPSE	Main Steam to MST-22
2-MST-096-B	1.5	9321-F-2041	S	NS	Operating conditions unknown.	P&ID	MST-22 to Steam Trap Header
2-MST-097-A	1.5	9321-F-2041	S	NS	High quality main steam line.	PEPSE	Main Steam to MST-23
2-MST-097-B	1.5	9321-F-2041	S	NS	Operating conditions unknown.	P&ID	MST-23 to Steam Trap Header
2-MST-098-A	1	9321-F-2041	S	NS	DS of nozzle Chrome-Moly	PEPSE	Exit Nozzle US of Valve MS-90-1
2-MST-099-A	1	9321-F-2041	S	NS	Pressurized line with flow to steam trap.	PEPSE	Main Steam to MST-25 via Steam Dump Lines

Main Steam Traps (MST), Unit 2

Section B: SNM Program Lines

2-MST-01: Steam Trap Lines from the Main Steam System

Line Number	Size (In.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-MST-099-B	1	9321-F-2041	S	NS	Operating conditions unknown.	P&ID	MST-25 to Steam Trap Header
2-MST-100-A	1.25	9321-F-2042	S	NS	Pressurized line with flow to steam trap.	PEPSE	Main Steam to MST-26 via Steam Dump Lines
2-MST-100-B	1.25	9321-F-2042	S	NS	Operating conditions unknown.	P&ID	MST-26 to Steam Trap Header
2-MST-101-A	1	9321-F-2041	S	NS	Pressurized line with flow to steam trap.	PEPSE	Main Steam to MST-27 via Steam Dump Lines
2-MST-101-B	1	9321-F-2041	S	NS	Operating conditions unknown.	P&ID	MST-27 to Steam Trap Header
2-MST-102-A	1.25	9321-F-2042	S	NS	Pressurized line with flow to steam trap.	PEPSE	Main Steam to MST-28 via Steam Dump Lines
2-MST-102-B	1.25	9321-F-2042	S	NS	Operating conditions unknown.	P&ID	MST-28 to Steam Trap Header
2-MST-103-A	1.25	9321-F-2042	S	NS	Pressurized line with flow to steam trap.	PEPSE	Main Steam to MST-29 via Steam Dump Lines
2-MST-103-B	1.25	9321-F-2042	S	NS	Operating conditions unknown.	P&ID	MST-29 to Steam Trap Header
2-MST-104-A	1	9321-F-2042	S	NS	High quality main steam line.	PEPSE	Main Steam to MST-30
2-MST-104-B	1	9321-F-2042	S	NS	Operating conditions unknown.	P&ID	MST-30 to Steam Trap Header
2-MST-105-A	1	9321-F-2042	S	NS	High quality main steam line.	PEPSE	Main Steam to MST-31
2-MST-105-B	1	9321-F-2042	S	NS	Operating conditions unknown.	P&ID	MST-31 to Header
2-MST-105-D	1	9321-F-2042	S	NS	Operating conditions unknown.	P&ID	Header to Steam Trap Header
2-MST-106-A	1	9321-F-2042	S	NS	High quality main steam line.	PEPSE	Main Steam to MST-32
2-MST-106-B	1	9321-F-2042	S	NS	Operating conditions unknown.	P&ID	MST-32 to Steam Trap Header
2-MST-107-A	1	9321-F-2042	S	NS	Operating conditions unknown.	SD No. 18.0	Steam to MST-33
2-MST-107-B	1	9321-F-2042	S	NS	Operating conditions unknown.	P&ID	MST-33 to Steam Trap Header

Main Steam Traps (MST), Unit 2

Section B: SNM Program Lines

2-MST-01: Steam Trap Lines from the Main Steam System

Line Number	Size (In.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-MST-108-A	1.25	9321-F-2042	S	NS	High quality main steam line.	PEPSE	Main Steam to MST-34
2-MST-108-B	1.25	9321-F-2042	S	NS	Operating conditions unknown.	P&ID	MST-34 to Steam Trap Header
2-MST-109-A	1	9321-F-2042	S	NS	High quality main steam line.	PEPSE	Main Steam to MST-35
2-MST-109-B	1	9321-F-2042	S	NS	Operating conditions unknown.	P&ID	MST-35 to Steam Trap Header
2-MST-110-A	1	9321-F-2041	S	NS	High quality main steam line.	PEPSE	Main Steam to MST-36
2-MST-110-B	1	9321-F-2041	S	NS	Operating conditions unknown.	P&ID	MST-36 to Steam Trap Header
2-MST-111-A	1	9321-F-2042	S	NS	High quality main steam line.	PEPSE	Main Steam to MST-37
2-MST-111-B	1	9321-F-2042	S	NS	Operating conditions unknown.	P&ID	MST-37 to Steam Trap Header
2-MST-112-A	1	9321-F-2042	S	NS	High quality main steam line.	PEPSE	Main Steam to MST-38
2-MST-112-B	1	9321-F-2042	S	NS	Operating conditions unknown.	P&ID	MST-38 to Steam Trap Header
2-MST-113-A	1	9321-F-2042	S	NS	High quality main steam line.	PEPSE	Main Steam to MST-39
2-MST-113-B	1	9321-F-2042	S	NS	Operating conditions unknown.	P&ID	MST-39 to Header
2-MST-113-D	1.25	9321-F-2042	S	NS	Operating conditions unknown.	P&ID	Header to Steam Trap Header
2-MST-114-A	1	9321-F-2042	S	NS	High quality main steam line.	PEPSE	Main Steam to MST-40
2-MST-114-B	1	9321-F-2042	S	NS	Operating conditions unknown.	P&ID	MST-40 to Header
2-MST-115-A	1	9321-F-2041	S	NS	High quality main steam line.	PEPSE	Main Steam to MST-41
2-MST-115-B	1	9321-F-2041	S	NS	Operating conditions unknown.	P&ID	MST-41 to Header
2-MST-116-A	1.25	9321-F-2042	S	NS	Pressurized line with flow to steam trap.	PEPSE	Main Steam to MST-42 via Steam Dump Lines
2-MST-116-B	1.25	9321-F-2042	S	NS	Operating conditions unknown.	P&ID	MST-42 to Steam Trap Header

Main Steam Traps (MST), Unit 2

Section B: SNM Program Lines

2-MST-01: Steam Trap Lines from the Main Steam System

Line Number	Size (In.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-MST-117-A	1.25	9321-F-2042	S	NS	Pressurized line with flow to steam trap.	PEPSE	Main Steam to MST-43 via Steam Dump Lines
2-MST-117-B	1.25	9321-F-2042	S	NS	Operating conditions unknown.	P&ID	MST-43 to Steam Trap Header
2-MST-118-A	1.25	9321-F-2042	S	NS	Pressurized line with flow to steam trap.	PEPSE	Main Steam to MST-44 via Steam Dump Lines
2-MST-118-B	1.25	9321-F-2042	S	NS	Operating conditions unknown.	P&ID	MST-44 to Steam Trap Header
2-MST-119-A	1.25	9321-F-2042	S	NS	Pressurized line with flow to steam trap.	PEPSE	Main Steam to MST-45 via Steam Dump Lines
2-MST-119-B	1.25	9321-F-2042	S	NS	Operating conditions unknown.	P&ID	MST-45 to Steam Trap Header
2-MST-120-A	1	9321-F-2042	S	NS	Pressurized line with flow to steam trap.	PEPSE	Main Steam to MST-46 via Steam Dump Lines
2-MST-120-B	1	9321-F-2042	S	NS	Operating conditions unknown.	P&ID	MST-46 to Steam Trap Header
2-MST-121-A	1	9321-F-2042	S	NS	Pressurized line with flow to steam trap.	PEPSE	Main Steam to MST-47 via Steam Dump Lines
2-MST-121-B	1	9321-F-2042	S	NS	Operating conditions unknown.	P&ID	MST-47 to Steam Trap Header
2-MST-122-A	1	9321-F-2042	S	NS	High quality main steam line.	PEPSE	Main Steam to MST-48
2-MST-122-B	1	9321-F-2042	S	NS	Operating conditions unknown.	P&ID	MST-48 to Steam Trap Header
2-MST-123-A	1	9321-F-2042	S	NS	High quality main steam line.	PEPSE	Main Steam to MST-49
2-MST-123-B	1	9321-F-2042	S	NS	Operating conditions unknown.	P&ID	MST-49 to Steam Trap Header
2-MST-124-A	1	9321-F-2042	S	NS	High quality main steam line.	PEPSE	Main Steam to MST-50
2-MST-124-B	1	9321-F-2042	S	NS	Operating conditions unknown.	P&ID	MST-50 to Steam Trap Header
2-MST-125-A	1	9321-F-2042	S	NS	High quality main steam line.	PEPSE	Main Steam to MST-51
2-MST-125-B	1	9321-F-2042	S	NS	Operating conditions unknown.	P&ID	MST-51 to Steam Trap Header

Main Steam Traps (MST), Unit 2

Section B: SNM Program Lines

2-MST-01: Steam Trap Lines from the Main Steam System

Line Number	Size (In.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-MST-126-A	1	9321-F-2042	S	NS	High quality main steam line.	PEPSE	Main Steam to MST-52
2-MST-126-B	1	9321-F-2042	S	NS	Operating conditions unknown.	P&ID	MST-52 to Steam Trap Header
2-MST-127-A	1	9321-F-2042	S	NS	Operating conditions unknown.	SD No. 18.0	Steam to MST-56
2-MST-127-B	1	9321-F-2042	S	NS	Operating conditions unknown.	P&ID	MST-56 to Steam Trap Header
2-MST-128-A	1	9321-F-2042	S	NS	Operating conditions unknown.	SD No. 18.0	Steam to MST-57
2-MST-128-B	1	9321-F-2042	S	NS	Operating conditions unknown.	P&ID	MST-57 to Steam Trap Header
2-MST-129-A	1	9321-F-2042	S	NS	Operating conditions unknown.	SD No. 18.0	Steam to MST-58
2-MST-129-B	1	9321-F-2042	S	NS	Operating conditions unknown.	P&ID	MST-58 to Steam Trap Header
2-MST-130-A	1	9321-F-2042	S	NS	Operating conditions unknown.	SD No. 18.0	Steam to MST-59
2-MST-130-B	1	9321-F-2042	S	NS	Operating conditions unknown.	P&ID	MST-59 to Steam Trap Header
2-MST-131-A	1	9321-F-2042	S	NS	Operating conditions unknown.	SD No. 18.0	Steam to MST-60
2-MST-131-B	1	9321-F-2042	S	NS	Operating conditions unknown.	P&ID	MST-60 to Header
2-MST-132-A	1	9321-F-2042	S	NS	Operating conditions unknown.	SD No. 18.0	Steam to MST-61
2-MST-132-B	1	9321-F-2042	S	NS	Operating conditions unknown.	P&ID	MST-61 to Steam Trap Header
2-MST-133-A	1	9321-F-2042	S	NS	Operating conditions unknown.	SD No. 18.0	Steam to MST-62
2-MST-133-B	1	9321-F-2042	S	NS	Operating conditions unknown.	P&ID	MST-62 to Steam Trap Header
2-MST-134-A	1	9321-F-2042	S	NS	Operating conditions unknown.	SD No. 18.0	Steam to MST-63
2-MST-134-B	1	9321-F-2042	S	NS	Operating conditions unknown.	P&ID	MST-63 to Steam Trap Header
2-MST-135-A	1	9321-F-2041	S	NS	High quality main steam line.	PEPSE	Steam to MST-64
2-MST-135-B	1	9321-F-2041	S	NS	Operating conditions unknown.	P&ID	MST-64 to Header

Main Steam Traps (MST), Unit 2

Section B: SNM Program Lines

2-MST-01: Steam Trap Lines from the Main Steam System

Line Number	Size (In.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-MST-136-A	1	9321-F-2041	S	NS	Operating conditions unknown.	SD No. 18.0	Steam to MST-65
2-MST-136-B	1	9321-F-2041	S	NS	Operating conditions unknown.	P&ID	MST-65 to Header
2-MST-193-A	0.75	A227780	S	NQ	High quality main steam line.	PEPSE	Main Steam to MST-100
2-MST-193-B	0.75	A227780	S	NS	Operating conditions unknown.	P&ID	MST-100 to Steam Trap Header

Section C: Excluded Lines

2-MST-01: Steam Trap Lines from the Main Steam System

Line Number	Size (In.)	P&ID No.	Sus. Cat.	FAC Ex. Crit.	Comments	Reference	Line Description
2-MST-019-B	10	A227780	E	EI	SD. 18 states FCV-1206 is closed until air is actuated to the operator upon a turbine trip or loss of electrical loading.	SD No. 18.0	Crossunder Steam Trap Bypass Line & LP Turbine Steam Dump
2-MST-020-B	10	A227780	E	EI	SD. 18 states FCV-1207 is closed until air is actuated to the operator upon a turbine trip or loss of electrical loading.	SD No. 18.0	Crossunder Steam Trap Bypass Line & LP Turbine Steam Dump
2-MST-021-B	10	A227780	E	EI	SD. 18 states FCV-1208 is closed until air is actuated to the operator upon a turbine trip or loss of electrical loading.	SD No. 18.0	Crossunder Steam Trap Bypass Line & LP Turbine Steam Dump
2-MST-022-B	10	A227780	E	EI	SD. 18 states FCV-1209 is closed until air is actuated to the operator upon a turbine trip or loss of electrical loading.	SD No. 18.0	Crossunder Steam Trap Bypass Line & LP Turbine Steam Dump
2-MST-023-B	10	A227780	E	EI	SD. 18 states FCV-1210 is closed until air is actuated to the operator upon a turbine trip or loss of electrical loading.	SD No. 18.0	Crossunder Steam Trap Bypass Line & LP Turbine Steam Dump
2-MST-024-B	10	A227780	E	EI	SD. 18 states FCV-1211 is closed until air is actuated to the operator upon a turbine trip or loss of electrical loading.	SD No. 18.0	Crossunder Steam Trap Bypass Line & LP Turbine Steam Dump

Main Steam Traps (MST), Unit 2

Section C: Excluded Lines

2-MST-01: Steam Trap Lines from the Main Steam System

Line Number	Size (In.)	P&ID No.	Sus. Cat.	FAC Ex. Crit.	Comments	Reference	Line Description
2-MST-073	0.5	9321-F-2041	E	EI	The Aux. Feed Turbine operates less than 2% of the time.	SD No. 21.0	Aux. Feed Pump Turbine Drive Drain via MST-69
2-MST-074	0.75	9321-F-2041	E	EI	The Aux. Feed Turbine operates less than 2% of the time.	SD No. 21.0	Aux. Feed Pump Turbine Drive Drain via MST-68
2-MST-075	0.75	9321-F-2041	E	EI	The Aux. Feed Turbine operates less than 2% of the time.	SD No. 21.0	Aux. Feed Pump Turbine Drive Drain via MST-67
2-MST-080-C		9321-F-2041	E	EI	Valve shown closed on P&ID.	P&ID	MST-1 Bypass Line
2-MST-080-D	1.5	9321-F-2041	E	EI	Valve shown closed on P&ID.	P&ID	MST-1 Bypass Line to Steam Trap Header
2-MST-080-E		9321-F-2041	E	EI	Valve shown closed on P&ID.	P&ID	MS-91A Bypass Line
2-MST-081-C		9321-F-2041	E	EI	Valve shown closed on P&ID.	P&ID	MST-2 Bypass Line
2-MST-081-D	1.5	9321-F-2041	E	EI	Valve shown closed on P&ID.	P&ID	MST-2 Bypass Line to Steam Trap Header
2-MST-081-E	0.75	9321-F-2041	E	EI	Valve shown closed on P&ID.	P&ID	MS-91B Bypass Line
2-MST-082-C		9321-F-2041	E	EI	Valve shown closed on P&ID.	P&ID	MST-3 Bypass Line
2-MST-082-D	1.5	9321-F-2041	E	EI	Valve shown closed on P&ID.	P&ID	MST-3 Bypass Line to Steam Trap Header
2-MST-082-E	0.75	9321-F-2041	E	EI	Valve shown closed on P&ID.	P&ID	MS-91C Bypass Line
2-MST-083-D		9321-F-2041	E	EI	Valve shown closed on P&ID.	P&ID	MST-4 Bypass Line
2-MST-083-E	1.5	9321-F-2041	E	EI	Valve shown closed on P&ID.	P&ID	MST-4 Bypass Line to Steam Trap Header
2-MST-083-F	0.75	9321-F-2041	E	EI	Valve shown closed on P&ID.	P&ID	MS-91D Bypass Line
2-MST-084-C		9321-F-2041	E	EI	Valve shown closed on P&ID.	P&ID	MST-5 Bypass Line
2-MST-085-D		9321-F-2041	E	EI	Valve shown closed on P&ID.	P&ID	MST-6 Bypass Line

Main Steam Traps (MST), Unit 2

Section C: Excluded Lines

2-MST-01: Steam Trap Lines from the Main Steam System

Line Number	Size (In.)	P&ID No.	Sus. Cat.	FAC Ex. Crit.	Comments	Reference	Line Description
2-MST-085-E	3	9321-F-2041	E	EI	Valve shown closed on P&ID.	P&ID	MST-6 Drain to Steam Trap Header
2-MST-086-C		9321-F-2041	E	EI	Valve shown closed on P&ID.	P&ID	MST-8 Bypass Line
2-MST-087-C		9321-F-2041	E	EI	Valve shown closed on P&ID.	P&ID	MST-9 Bypass Line
2-MST-088-D		9321-F-2041	E	EI	Valve shown closed on P&ID.	P&ID	MST-10 Bypass Line
2-MST-088-E	1	9321-F-2041	E	EI	Valve shown closed on P&ID.	P&ID	MST-10 Bypass to Steam Trap Header
2-MST-089-C		9321-F-2041	E	EI	Valve shown closed on P&ID.	P&ID	MST-12 Bypass Line
2-MST-090-C	1.25	9321-F-2041	E	EI	Valve shown closed on P&ID.	P&ID	MST-13 Bypass Line
2-MST-091-D		9321-F-2041	E	EI	Valve shown closed on P&ID.	P&ID	MST-14 Bypass Line
2-MST-091-E	0.5	9321-F-2041	E	EI	Valve shown closed on P&ID.	P&ID	MST-14 Drain to Drain Header
2-MST-092-C		9321-F-2041	E	EI	Valve shown closed on P&ID.	P&ID	MST-16 Bypass Line
2-MST-093-D		9321-F-2041	E	EI	Valve shown closed on P&ID.	P&ID	MST-18 Bypass Line
2-MST-093-E	1	9321-F-2041	E	EI	Valve shown closed on P&ID.	P&ID	MST-18 Drain to Drain Header
2-MST-094-C		9321-F-2041	E	EI	Valve shown closed on P&ID.	P&ID	MST-20 Bypass Line
2-MST-095-C		9321-F-2041	E	EI	Valve shown closed on P&ID.	P&ID	MST-21 Bypass Line
2-MST-096-C		9321-F-2041	E	EI	Valve shown closed on P&ID.	P&ID	MST-22 Bypass Line
2-MST-097-C		9321-F-2041	E	EI	Valve shown closed on P&ID.	P&ID	MST-23 Bypass Line
2-MST-098	1	9321-F-2041	E	EM	Piping is CrMo.	P&ID	MST-24 Steam Trap Line
2-MST-099-C		9321-F-2041	E	EI	Valve shown closed on P&ID.	P&ID	MST-25 Bypass Line
2-MST-100-C	1.25	9321-F-2042	E	EI	Valve normally closed.	P&ID	MST-26 Bypass Line
2-MST-101-C		9321-F-2041	E	EI	Valve shown closed on P&ID.	P&ID	MST-27 Bypass Line

Main Steam Traps (MST), Unit 2

Section C: Excluded Lines

2-MST-01: Steam Trap Lines from the Main Steam System

Line Number	Size (In.)	P&ID No.	Sus. Cat.	FAC Ex. Crit.	Comments	Reference	Line Description
2-MST-102-C		9321-F-2042	E	EI	Valve normally closed.	P&ID	MST-28 Bypass Line
2-MST-103-C		9321-F-2042	E	EI	Valve normally closed.	P&ID	MST-29 Bypass Line
2-MST-104-C		9321-F-2042	E	EI	Valve normally closed.	P&ID	MST-30 Bypass Line
2-MST-105-C		9321-F-2042	E	EI	Valve normally closed.	P&ID	MST-31 Bypass Line
2-MST-106-C		9321-F-2042	E	EI	Valve normally closed.	P&ID	MST-32 Bypass Line
2-MST-107-C		9321-F-2042	E	EI	Valve normally closed.	P&ID	MST-33 Bypass Line
2-MST-108-C		9321-F-2042	E	EI	Valve normally closed.	P&ID	MST-34 Bypass Line
2-MST-109-C		9321-F-2042	E	EI	Valve normally closed.	P&ID	MST-35 Bypass Line
2-MST-110-C		9321-F-2041	E	EI	Valve shown closed on P&ID.	P&ID	MST-36 Bypass Line
2-MST-111-C		9321-F-2042	E	EI	Valve normally closed.	P&ID	MST-37 Bypass Line
2-MST-112-C		9321-F-2042	E	EI	Valve normally closed.	P&ID	MST-38 Bypass Line
2-MST-113-C		9321-F-2042	E	EI	Valve normally closed.	P&ID	MST-39 Bypass Line
2-MST-114-C		9321-F-2042	E	EI	Valve normally closed.	P&ID	MST-40 Bypass Line
2-MST-115-C		9321-F-2041	E	EI	Valve shown closed on P&ID.	P&ID	MST-41 Bypass Line
2-MST-116-C		9321-F-2042	E	EI	Valve normally closed.	P&ID	MST-42 Bypass Line
2-MST-117-C		9321-F-2042	E	EI	Valve normally closed.	P&ID	MST-43 Bypass Line
2-MST-118-C		9321-F-2042	E	EI	Valve normally closed.	P&ID	MST-44 Bypass Line
2-MST-119-C		9321-F-2042	E	EI	Valve normally closed.	P&ID	MST-45 Bypass Line
2-MST-120-C		9321-F-2042	E	EI	Valve normally closed.	P&ID	MST-46 Bypass Line
2-MST-121-C		9321-F-2042	E	EI	Valve normally closed.	P&ID	MST-47 Bypass Line

Main Steam Traps (MST), Unit 2

Section C: Excluded Lines

2-MST-01: Steam Trap Lines from the Main Steam System

Line Number	Size (In.)	P&ID No.	Sus. Cat.	FAC Ex. Crit.	Comments	Reference	Line Description
2-MST-122-C		9321-F-2042	E	EI	Valve normally closed.	P&ID	MST-48 Bypass Line
2-MST-123-C		9321-F-2042	E	EI	Valve normally closed.	P&ID	MST-49 Bypass Line
2-MST-124-C		9321-F-2042	E	EI	Valve normally closed.	P&ID	MST-50 Bypass Line
2-MST-125-C		9321-F-2042	E	EI	Valve normally closed.	P&ID	MST-51 Bypass Line
2-MST-126-C		9321-F-2042	E	EI	Valve normally closed.	P&ID	MST-52 Bypass Line
2-MST-127-C		9321-F-2042	E	EI	Valve normally closed.	P&ID	MST-56 Bypass Line
2-MST-128-C		9321-F-2042	E	EI	Valve normally closed.	P&ID	MST-57 Bypass Line
2-MST-129-C		9321-F-2042	E	EI	Valve normally closed.	P&ID	MST-58 Bypass Line
2-MST-130-C		9321-F-2042	E	EI	Valve normally closed.	P&ID	MST-59 Bypass Line
2-MST-131-C		9321-F-2042	E	EI	Valve normally closed.	P&ID	MST-60 Bypass Line
2-MST-132-C		9321-F-2042	E	EI	Valve normally closed.	P&ID	MST-61 Bypass Line
2-MST-133-C		9321-F-2042	E	EI	Valve normally closed.	P&ID	MST-62 Bypass Line
2-MST-134-C		9321-F-2042	E	EI	Valve normally closed.	P&ID	MST-63 Bypass Line
2-MST-135-C		9321-F-2041	E	EI	Valve shown closed on P&ID.	P&ID	MST-64 Bypass Line
2-MST-136-C		9321-F-2041	E	EI	Valve shown closed on P&ID.	P&ID	MST-65 Bypass Line
2-MST-137	1	9321-F-2041	E	ER	Scavenging steam piping removed from service.	P&ID	MST-66 Lines
2-MST-138	3	9321-F-2041	E	EI	All feeding valves shown normally closed on P&ID	P&ID	Main Steam Trap Drain and Bypass Header.
2-MST-139	4	9321-F-2041, 9321-F-2042	E	EM	Line replaced with Stainless Steel	FAC Program Plan Supplement	Main Steam Trap Main Header to Drains Collecting Tank.

Main Steam Traps (MST), Unit 2

Section C: Excluded Lines

2-MST-01: Steam Trap Lines from the Main Steam System

Line Number	Size (In.)	P&ID No.	Sus. Cat.	FAC Ex. Crit.	Comments	Reference	Line Description
2-MST-140	2	9321-F-2042	E	EM	Line replaced with Stainless Steel	FAC Program Plan Supplement	Main Steam Traps Header to Main Header
2-MST-141	2	9321-F-2042	E	EM	Line replaced with Stainless Steel	FAC Program Plan Supplement	Main Steam Traps Header to Main Header
2-MST-142	4	9321-F-2042	E	EI	Valve shown closed on P&ID.	P&ID	Main Steam Traps Main Header Drain to Discharge Tunnel
2-MST-196	0.75	A227780	E	EI	Valve shown closed on P&ID.	P&ID	MST-100 Bypass via MS-1144

Moisture Preseparator Drains (PD), Unit 2**Section A: CHECWORKS Model Lines****2-PD-01: Moisture Preseparator Drain Lines**

Line Number	Size (In.)	P&ID No.	Sus. Cat.	Comments	Reference	Line Description
2-PD-001	20	A228272	M		PEPSE	Moisture Preseparator "A" to Separating Tank A
2-PD-002	20	A228272	M		PEPSE	Moisture Preseparator "B" to Separating Tank A
2-PD-003	20	A228272	M		PEPSE	Moisture Preseparator "C" to Separating Tank B
2-PD-004	20	A228272	M		PEPSE	Moisture Preseparator "D" to Separating Tank B
2-PD-011	10	A228272	M		PEPSE	Separating Tank A Drain to Control Valves
2-PD-012	10	A228272	M		PEPSE	Separating Tank B Drain to Control Valves
2-PD-013	10	A228272	M		PEPSE	Separating Tank A to LCV 5198
2-PD-014	10	A228272	M		PEPSE	Separating Tank A to LCV 5199
2-PD-015	10	A228272	M		PEPSE	Separating Tank B to LCV 5205
2-PD-016	10	A228272	M		PEPSE	Separating Tank B to LCV 5206
2-PD-017	10	A228272	M		PEPSE	Separating Tank A control valves to Heater Drain Tank
2-PD-018	10	A228272	M		PEPSE	Separating Tank B control valves to Heater Drain Tank

Moisture Preseparator Drains (PD), Unit 2

Section B: SNM Program Lines

2-PD-01: Moisture Preseparator Drain Lines

Line Number	Size (In.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-PD-005	3	A228272	S	NC	Flow Rate unknown.	PEPSE	Moisture Preseparator "A" to 20" Line
2-PD-006	3	A228272	S	NC	Flow Rate unknown.	PEPSE	Moisture Preseparator "B" to 20" Line
2-PD-007	3	A228272	S	NC	Flow Rate unknown.	PEPSE	Moisture Preseparator "C" to 20" Line
2-PD-008	3	A228272	S	NC	Flow Rate unknown.	PEPSE	Moisture Preseparator "D" to 20" Line
2-PD-009-A	20	A228272	S	NL	The nozzle is the only susceptible component in this line.	SFA Model	ES7A-1-SEP TKA VNT to FWH25: Separating Tank A Nozzle to Extraction Steam Header
2-PD-010-A	20	A228272	S	NL	The nozzle is the only susceptible component in this line.	SFA Model	ES7A-2-SEP TKB VNT to FWH25: Separating Tank B Nozzle to Extraction Steam Header

Section C: Excluded Lines

2-PD-01: Moisture Preseparator Drain Lines

Line Number	Size (In.)	P&ID No.	Sus. Cat.	FAC Ex. Crit.	Comments	Reference	Line Description
2-PD-009-B	20	A228272	E	EM	This line was replaced with stainless steel in RFO13.	SFA Model	ES7A-1-SEP TKA VNT to FWH25: Separating Tank A to Extraction Steam Header
2-PD-010-B	20	A228272	E	EM	This line was replaced with stainless steel in RFO13.	SFA Model	ES7A-2-SEP TKB VNT to FWH25: Separating Tank B to Extraction Steam Header
2-PD-019	1	A228272	E	EI	Valve shown closed on P&ID.	P&ID	1" Line from Separating Tank B Vent to Extraction header.

Reheat Steam Traps (RST), Unit 2

Section B: SNM Program Lines

2-RST-01: Reheat Steam Trap Lines Downstream of Reheater Steam Traps

Line Number	Size (In.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-RST-001	0.75	9321-H-2024	S	NS	Operating conditions unknown.	PEPSE	RST-1 to BFP Turbine Drip Tank Header
2-RST-002	0.75	9321-H-2024	S	NS	Operating conditions unknown.	PEPSE	RST-2 to BFP Turbine Drip Tank Header
2-RST-003	0.75	9321-H-2024	S	NS	Operating conditions unknown.	PEPSE	RST-3 to BFP Turbine Drip Tank Header
2-RST-004	2	9321-H-2024	S	NS	Operating conditions unknown.	PEPSE	Reheat Steam Trap Header to BFP Turbine Drip Tank

Service Boiler (SB), Unit 2

Section B: SNM Program Lines

2-SB-01: Service Boiler Lines

Line Number	Size (In.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-SB-001	6	A227780, A209775	S	NC	Operating conditions unknown.	P&ID	Auxiliary Steam from PCV-1015
2-SB-004	2	9321-F-2120	S	NS	Operating conditions unknown.	P&ID	Steam to Condensate Return, Hot Water Heat Exchangers, and Office Unit Heaters
2-SB-005	2	9321-F-2120	S	NS	Operating conditions unknown.	P&ID	Steam to Hot Water Heat Exchangers and Office Unit Heaters
2-SB-011	1	9321-F-2120	S	NS	Operating conditions unknown.	P&ID	Header Drain to AST-35
2-SB-012	1.5	9321-F-2120	S	NS	Operating conditions unknown.	P&ID	Steam to Office Unit Heaters
2-SB-015	8	A209775	S	NC	Operating conditions unknown.	P&ID	Steam from Aux. Steam Header
2-SB-016	8	A209775	S	NC	Operating conditions unknown.	P&ID	Desuperheater Header
2-SB-022	2	A209775	S	NS	Operating conditions unknown.	P&ID	Steam trap header to Cond. Receiver
2-SB-023	4	A209775	S	NC	Operating conditions unknown.	P&ID	Header to Steam Traps
2-SB-026	1	A209775	S	NS	Operating conditions unknown.	P&ID	Desuperheater Header
2-SB-030	8	A209775	S	NC	Operating conditions unknown.	P&ID	Steam to Desuperheater
2-SB-039	4	A209775	S	NC	Operating conditions unknown.	P&ID	Service Boiler Header to Air Tempering Units
2-SB-042	6	9321-F-2021, B193201	S	NC	Operating conditions unknown.	P&ID	Line from #10 House Service Boiler Deaerator
2-SB-043	1.5	9321-F-2021, B193201	S	NS	Operating conditions unknown.	P&ID	Line from #10 House Service Boiler Deaerator

Service Boiler (SB), Unit 2

Section C: Excluded Lines

2-SB-01: Service Boiler Lines

Line Number	Size (In.)	P&ID No.	Sus. Cat.	FAC Ex. Crit.	Comments	Reference	Line Description
2-SB-010	1	9321-F-2120	E	EI	Valve shown closed on P&ID.	P&ID	Cross Tie Between 2-SB-005 and 2-SB-007
2-SB-029	0.5	A209775	E	EI	Operating conditions unknown.	P&ID	Desuperheater bypass
2-SB-031	8	A209775	E	EI	Valve shown closed on P&ID.	P&ID	PCV-1257 Bypass
2-SB-034	2	A209775	E	EF	Low flow to floor drain	P&ID	Steam to floor drain via UH-575
2-SB-040	1	A209775	E	EI	Valve shown closed on P&ID.	P&ID	PCV-1252 Bypass
2-SB-041	2	A209775	E	EI	Valve shown closed on P&ID.	P&ID	Steam to UHT-514
2-SB-044	1	A209775	E	EI	Valve shown closed on P&ID.	P&ID	TCV-1257-B Bypass Line
2-SB-045	1	A209775	E	EI	Valve shown closed on P&ID.	P&ID	TCV-1257-A Bypass Line
2-SB-046	2	A209775	E	EI	Valve shown closed on P&ID.	P&ID	Floor Drain via UH-571
2-SB-047	3	A209775	E	EI	Valve shown closed on P&ID.	P&ID	Aux. Steam to Condenser Water Box Priming Steam Jet Air Ejectors

Condensate Return Unit Heaters to Service Boiler D (UH), Unit 2

Section B: SNM Program Lines

2-UH-01: Condensate Return from Unit Heaters to the Deaerator

Line Number	Size (In.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-UH-001	4	A209775, 9321-F-2120	S	NC	Operating conditions unknown.	P&ID	Condensate return pumps to #20 House Service Deaerator
2-UH-002	4	9321-F-2120, B193201	S	NC	Operating conditions unknown.	P&ID	Condensate return to #10 House Service Deaerator
2-UH-003	10	A209775	S	NC	Operating conditions unknown.	SD No. 29.01	Desuperheater outlet header to various unit heaters
2-UH-004	8	A209775	S	NC	Operating conditions unknown.	SD No. 29.01	Desuperheater outlet steam to Gland Seal Steam Header
2-UH-071	6	A209775	S	NC	Operating conditions unknown.	P&ID	Unit Heater Drain Header to Condensate Receiver
2-UH-072	6	A209775	S	NC	Operating conditions unknown.	P&ID	Unit Heater Drain Header to Condensate Receiver
2-UH-073	4	A209775	S	NC	Operating conditions unknown.	P&ID	Condensate Receiver Vent to Atmosphere
2-UH-074	3	A209775	S	NC	Operating conditions unknown.	P&ID	Condensate Receiver Drain to Cond. Return Pump #21
2-UH-075	3	A209775	S	NC	Operating conditions unknown.	P&ID	Condensate Receiver Drain to Cond. Return Pump #22
2-UH-077	4	A209775	S	NC	Operating conditions unknown.	P&ID	Cond. Return Pump #21 Discharge
2-UH-078	4	A209775	S	NC	Operating conditions unknown.	P&ID	Cond. Return Pump #21 Discharge
2-UH-079	2	B193201	S	NS	Operating conditions unknown.	P&ID	Line from #20 House Service Boiler to Service Boiler Deaerator

Condensate Return Unit Heaters to Service Boiler D (UH), Unit 2**Section C: Excluded Lines****2-UH-01: Condensate Return from Unit Heaters to the Deaerator**

Line Number	Size (In.)	P&ID No.	Sus. Cat.	FAC Ex. Crit.	Comments	Reference	Line Description
2-UH-054	2	A209775	E	EI	Valve shown closed on P&ID.	P&ID	Drain line via UH-1103
2-UH-055	2	A209775	E	EI	Valve shown closed on P&ID.	P&ID	Steam to and from Dirty and Clean Oil Storage Tanks
2-UH-076	1	A209775	E	EI	Valve shown closed on P&ID.	P&ID	Condensate Receiver Bottom Drain
2-UH-080	6	A209775	E	EI	Valve shown closed on P&ID.	P&ID	PC-5289 Bypass Line

Condensate Return Unit Heater Steam Traps (UHT), Unit 2

Section B: SNM Program Lines

2-UHT-01: Steam Trap Lines from the Condensate Return from Unit Heaters to the Deaerator system

Line Number	Size (In.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-UHT-005	1	A209775	S	NC	Operating conditions unknown.	SD No. 29.01	Steam to UHT-510
2-UHT-006	1	A209775	S	NC	Operating conditions unknown.	SD No. 29.01	Steam to UHT-511
2-UHT-007	2	A209775	S	NS	Operating conditions unknown.	P&ID	Steam trap header to Cond. Receiver from UHT-510.
2-UHT-008	1	A209775	S	NS	Operating conditions unknown.	P&ID	Steam from gland steam supply steam traps
2-UHT-009	2	A209775	S	NS	Operating conditions unknown.	P&ID	Steam to and from 215UHR
2-UHT-010	2	A209775	S	NS	Operating conditions unknown.	P&ID	Steam to and from 217UHR
2-UHT-011	2	A209775	S	NS	Operating conditions unknown.	P&ID	Steam to and from 29UHR
2-UHT-012	2	A209775	S	NS	Operating conditions unknown.	P&ID	Steam to and from 22UHR
2-UHT-013	1	A209775	S	NS	Operating conditions unknown.	P&ID	Steam to and from UHT-2-1
2-UHT-014	2	A209775	S	NS	Operating conditions unknown. Flow direction is unclear and seems to indicate that no outlet exists.	P&ID	Steam to and from 221UHR
2-UHT-015	2	A209775	S	NS	Operating conditions unknown. Flow direction is unclear and seems to indicate that no outlet exists.	P&ID	Steam to and from 219UHR
2-UHT-016	2	A209775	S	NS	Operating conditions unknown. Flow direction is unclear and seems to indicate that no outlet exists.	P&ID	Steam to and from 211UHR
2-UHT-017	2	A209775	S	NS	Operating conditions unknown. Flow direction is unclear and seems to indicate that no outlet exists.	P&ID	Steam to and from 24UHR
2-UHT-018	1	A209775	S	NS	Operating conditions unknown. Flow direction is unclear and seems to indicate that no outlet exists.	P&ID	Steam to and from UHT-2-2

Condensate Return Unit Heater Steam Traps (UHT), Unit 2

Section B: SNM Program Lines

2-UHT-01: Steam Trap Lines from the Condensate Return from Unit Heaters to the Deaerator system

Line Number	Size (In.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-UHT-019	2	A209775	S	NS	Operating conditions unknown.	P&ID	Steam to and from 225UHR
2-UHT-020	2	A209775	S	NS	Operating conditions unknown.	P&ID	Steam to and from 224UHR
2-UHT-021	2	A209775	S	NS	Operating conditions unknown.	P&ID	Steam to and from 223UHR
2-UHT-022	2	A209775	S	NS	Operating conditions unknown.	P&ID	Steam to and from 213UHR
2-UHT-023	2	A209775	S	NS	Operating conditions unknown.	P&ID	Steam to and from 27UHR
2-UHT-024	1	A209775	S	NS	Operating conditions unknown.	P&ID	Steam to and from UHT-1-1
2-UHT-024-A	4	A209775	S	NC	Operating conditions unknown.	P&ID	Steam to UHT-512 and 513
2-UHT-025	1	A209775	S	NS	Operating conditions unknown. Flow direction is unclear and seems to indicate that no outlet exists.	P&ID	Steam to and from Oil Preheater
2-UHT-026	1	A209775	S	NS	Operating conditions unknown. Flow direction is unclear and seems to indicate that no outlet exists.	P&ID	Steam to and from UHT-4-1
2-UHT-027	2	A209775	S	NS	Operating conditions unknown.	P&ID	Steam to and from 24AUHR
2-UHT-028	1.5	A209775	S	NS	Operating conditions unknown.	P&ID	Steam to and from UHT-2-3
2-UHT-029	1	A209775	S	NS	Operating conditions unknown.	P&ID	Steam to and from 248UHR
2-UHT-030	1	A209775	S	NS	Operating conditions unknown.	P&ID	Steam to and from 250UHR
2-UHT-031	1	A209775	S	NS	Operating conditions unknown.	P&ID	Steam to and from 249UHR
2-UHT-032	1	A209775	S	NS	Operating conditions unknown.	P&ID	Steam to and from 252UHR
2-UHT-033	1	A209775	S	NS	Operating conditions unknown.	P&ID	Steam to and from 251UHR
2-UHT-034	1	A209775	S	NS	Operating conditions unknown.	P&ID	Steam to and from UHT-11-3
2-UHT-035	1	A209775	S	NS	Operating conditions unknown.	P&ID	Steam to and from 247UHR

Condensate Return Unit Heater Steam Traps (UHT), Unit 2

Section B: SNM Program Lines

2-UHT-01: Steam Trap Lines from the Condensate Return from Unit Heaters to the Deaerator system

Line Number	Size (In.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-UHT-036	1	A209775	S	NS	Operating conditions unknown.	P&ID	Steam to and from 246UHR
2-UHT-037	1	A209775	S	NS	Operating conditions unknown.	P&ID	Steam to and from 245UHR
2-UHT-038	1	A209775	S	NS	Operating conditions unknown.	P&ID	Steam to and from UHT-11-2
2-UHT-039	2	A209775	S	NS	Operating conditions unknown.	P&ID	UHT-511 outlet
2-UHT-040	2	A209775	S	NS	Operating conditions unknown.	P&ID	Steam to and from 214UHR
2-UHT-041	2	A209775	S	NS	Operating conditions unknown.	P&ID	Steam to and from 216UHR
2-UHT-042	2	A209775	S	NS	Operating conditions unknown.	P&ID	Steam to and from 218UHR
2-UHT-043	2	A209775	S	NS	Operating conditions unknown.	P&ID	Steam to and from 220UHR
2-UHT-044	2	A209775	S	NS	Operating conditions unknown.	P&ID	Steam to and from 222UHR
2-UHT-045	1	A209775	S	NS	Operating conditions unknown.	P&ID	Steam to and from 260UHR
2-UHT-046	1	A209775	S	NS	Operating conditions unknown.	P&ID	Steam to and from UHT-4-2
2-UHT-047	2	A209775	S	NS	Operating conditions unknown.	P&ID	Steam to and from 21UHR
2-UHT-048	2	A209775	S	NS	Operating conditions unknown.	P&ID	Steam to and from 28UHR
2-UHT-049	2	A209775	S	NS	Operating conditions unknown.	P&ID	Steam to and from 23UHR
2-UHT-050	2	A209775	S	NS	Operating conditions unknown.	P&ID	Steam to and from 210UHR
2-UHT-051	2	A209775	S	NS	Operating conditions unknown.	P&ID	Steam to and from 212UHR
2-UHT-052	2	A209775	S	NS	Operating conditions unknown.	P&ID	Steam to and from 25UHR
2-UHT-053	0.75	A209775	S	NS	Operating conditions unknown.	P&ID	Steam to and from UHT-11-1
2-UHT-056	1	A209775	S	NS	Operating conditions unknown.	P&ID	UHT-513 Discharge
2-UHT-057	0.5	A209775	S	NS	Operating conditions unknown.	P&ID	UHT-512 Discharge

Condensate Return Unit Heater Steam Traps (UHT), Unit 2

Section B: SNM Program Lines

2-UHT-01: Steam Trap Lines from the Condensate Return from Unit Heaters to the Deaerator system

Line Number	Size (In.)	P&ID No.	Sus. Cat.	Mod. Ex. Crit.	Comments	Reference	Line Description
2-UHT-060	0.75	A209775	S	NS	Operating conditions unknown.	P&ID	21 Air Tempering Unit Discharge
2-UHT-061	0.75	A209775	S	NS	Operating conditions unknown.	P&ID	22 Air Tempering Unit Discharge
2-UHT-062	1	A209775	S	NS	Operating conditions unknown.	P&ID	Steam to various unit heaters
2-UHT-063	0.75	A209775	S	NS	Operating conditions unknown.	P&ID	Steam to and from UH-TSC-1
2-UHT-064	0.75	A209775	S	NS	Operating conditions unknown.	P&ID	Steam to and from 242UHR
2-UHT-065	0.75	A209775	S	NS	Operating conditions unknown.	P&ID	Steam to and from 243UHR
2-UHT-066	0.75	A209775	S	NS	Operating conditions unknown.	P&ID	Steam to and from 244UHR
2-UHT-067	0.75	A209775	S	NS	Operating conditions unknown.	P&ID	Steam to and from UHT-8-246
2-UHT-068	0.75	A209775	S	NS	Operating conditions unknown.	P&ID	Steam to and from 253UHR
2-UHT-069	2	A209775	S	NS	Operating conditions unknown.	P&ID	Unit Heater Drain to Discharge Tunnel
2-UHT-089	0.75	B227209	S	NS	Operating conditions unknown.	P&ID	Steam to and from UH-1020
2-UHT-090	0.75	B227209	S	NS	Operating conditions unknown.	P&ID	Steam to and from UH-1019
2-UHT-092	0.75	B227209	S	NS	Operating conditions unknown.	P&ID	Steam to and from UH-1021

Section C: Excluded Lines

2-UHT-01: Steam Trap Lines from the Condensate Return from Unit Heaters to the Deaerator system

Line Number	Size (In.)	P&ID No.	Sus. Cat.	FAC Ex. Crit.	Comments	Reference	Line Description
2-UHT-070	0.75	A209775	E	ER	Pipe capped upstream of trap.	P&ID	Line to and from UHT-3-2

MSR Vent Chamber Discharge (VCD), Unit 2**Section C: Excluded Lines****2-VCD-01: Moisture Separator Reheater Vent Chamber Discharge Lines**

Line Number	Size (In.)	P&ID No.	Sus. Cat.	FAC Ex. Crit.	Comments	Reference	Line Description
2-VCD-001	3	A209847	E	EM	Piping replaced with SS.	Previous SSE	MSR 21A Vent Chamber Discharge
2-VCD-002	3	A209847	E	EM	Piping replaced with SS.	Previous SSE	MSR 22A Vent Chamber Discharge
2-VCD-003	3	A209847	E	EM	Piping replaced with SS.	Previous SSE	MSR 23A Vent Chamber Discharge
2-VCD-004	3	A209847	E	EM	Piping replaced with SS.	Previous SSE	MSR 21B Vent Chamber Discharge
2-VCD-005	3	A209847	E	EM	Piping replaced with SS.	Previous SSE	MSR 22B Vent Chamber Discharge
2-VCD-006	3	A209847	E	EM	Piping replaced with SS.	Previous SSE	MSR 23B Vent Chamber Discharge
2-VCD-007	4	A209847	E	EM	Stainless Steel Piping	P&ID	Vent Chamber Discharge Header to FWH 26A
2-VCD-008	4	A209847	E	EM	Stainless Steel Piping	P&ID	Vent Chamber Discharge Header to FWH 26B
2-VCD-009	4	A209847	E	EM	Stainless Steel Piping	P&ID	Vent Chamber Discharge Header to FWH 26C
2-VCD-010-A	3	A209847	E	EM	Stainless Steel Piping	P&ID, Replacement History	MSR 21A VCD through HCV-5067B
2-VCD-010-B	3	A209847	E	EM	Piping replaced with CrMo.	P&ID	MSR 21A VCD downstream of HCV-5067B
2-VCD-011-A	3	A209847	E	EM	Stainless Steel Piping	P&ID, Replacement History	MSR 22A VCD through HCV-5069B
2-VCD-011-B	3	A209847	E	EM	Piping replaced with CrMo.	P&ID	MSR 22A VCD downstream of HCV-5069B
2-VCD-012-A	3	A209847	E	EM	Stainless Steel Piping	P&ID, Replacement History	MSR 23A VCD through HCV-5071B
2-VCD-012-B	3	A209847	E	EM	Piping replaced with CrMo.	P&ID	MSR 23A VCD downstream of HCV-5071B
2-VCD-013-A	3	A209847	E	EM	Stainless Steel Piping	P&ID, Replacement History	MSR 21B VCD through HCV-5068B
2-VCD-013-B	3	A209847	E	EM	Piping replaced with CrMo.	P&ID	MSR 21B VCD downstream of HCV-5068B

MSR Vent Chamber Discharge (VCD), Unit 2

Section C: Excluded Lines

2-VCD-01: Moisture Separator Reheater Vent Chamber Discharge Lines

Line Number	Size (In.)	P&ID No.	Sus. Cat.	FAC Ex. Crit.	Comments	Reference	Line Description
2-VCD-014-A	3	A209847	E	EM	Stainless Steel Piping	P&ID, Replacement History	MSR 22B VCD through HCV-5070B
2-VCD-014-B	3	A209847	E	EM	Piping replaced with CrMo.	P&ID	MSR 22B VCD downstream of HCV-5070B
2-VCD-015-A	3	A209847	E	EM	Stainless Steel Piping	P&ID, Replacement History	MSR 23B VCD through HCV-5072B
2-VCD-015-B	3	A209847	E	EM	Piping replaced with CrMo.	P&ID	MSR 23B VCD downstream of HCV-5072B

Susceptibility Category (Sus. Cat.) Legend:

M	CHECWORKS Modeled
S	Susceptible, not modeled
E	Excluded from the FAC program (non-susceptible)

Model Exclusion Criteria (Mod. Ex. Crit.) Legend:

NC	Not modeled due to unknown or varying operating Conditions
NL	Not to be modeled due to Localized FAC susceptibility
NM	Non-Modelable due to conditions outside CHECWORKS Modeling capabilities
NQ	Not to be modeled due to high steam Quality, CHECWORKS predictions are of little value
NS	Non-modelable due to Socket-welded fittings
NV	Not to be modeled because line is Visually inspected

FAC Exclusion Criteria (FAC Ex. Crit.) Legend:

EC	Excluded due to Combination of infrequent op above temp threshold
EF	Excluded due to low or no Flow
EI	Excluded due to Infrequent operation
EM	Excluded due to FAC-resistant Material
EO	Excluded due to high dissolved Oxygen content
EP	Excluded, does not contain Piping
EQ	Excluded due to high steam Quality
ER	Excluded, Removed from service and "cut" and "capped"
ET	Excluded due to operating Temperature (single phase, < 200 deg F)
EW	Excluded because system, subsystem, or line is non-Water

Appendix D Revision History

Revision 0

Initial Issue of document.

Revision 1

Systems, subsystem names, and line names were updated to incorporate the new system list.

Revision 2

SSE was updated to incorporate line replacements. Tables D.1, D.2, and D.3 below detail the changes:

Table D.1 System Changes

System Number	Change	Reference
MSR Vent Chamber Discharge	System changed to excluded due to non-susceptible material.	Replacement History

Table D.2 Subsystem Changes

Subsystem Number	Change	Reference
2-5EX-03	Subsystem changed to excluded due to non-susceptible material.	SFA Database
2-VCD-01	Subsystem changed to excluded due to non-susceptible material.	Replacement History

Table D.3 Line Changes

Line Number	Change	Reference
2-2EX-001	Split line into 2-2EX-001-A and 2-2EX-001-B to separate CrMo and Carbon Steel sections of line.	SFA Database
2-2EX-002	Split line into 2-2EX-002-A and 2-2EX-002-B to separate CrMo and Carbon Steel sections of line.	SFA Database
2-5EX-031	Line changed to excluded due to non-susceptible material.	SFA Database
2-5EX-033	Line changed to excluded due to non-susceptible material.	SFA Database
2-5EX-034	Line changed to excluded due to non-susceptible material.	SFA Database
2-5EX-035	Line changed to excluded due to non-susceptible material.	SFA Database
2-5EX-036	Line changed to excluded due to non-susceptible material.	SFA Database
2-6EX-001	Line changed to excluded due to non-susceptible material. Renamed to 2-6EX-001-B.	SFA Database
2-6EX-001-A	Added line for susceptible exit nozzle.	SFA Database

Line Number	Change	Reference
2-6EX-002	Line changed to excluded due to non-susceptible material. Renamed to 2-6EX-002-B.	SFA Database
2-6EX-002-A	Added line for susceptible exit nozzle.	SFA Database
2-6EX-003	Line changed to excluded due to non-susceptible material.	SFA Database
2-6EX-004	Line changed to excluded due to non-susceptible material.	SFA Database
2-6EX-005	Line changed to excluded due to non-susceptible material.	SFA Database
2-6EX-006	Line changed to excluded due to non-susceptible material. Renamed to 2-6EX-006-A.	SFA Database
2-6EX-006-B	Added line for susceptible exit nozzle.	SFA Database
2-6EX-007	Line changed to excluded due to non-susceptible material.	SFA Database
2-6EX-008	Line changed to excluded due to non-susceptible material. Renamed to 2-6EX-008-A.	SFA Database
2-6EX-008-B	Added line for susceptible exit nozzle.	SFA Database
2-6EX-009	Line changed to excluded due to non-susceptible material.	SFA Database
2-6EX-010	Line changed to excluded due to non-susceptible material. Renamed to 2-6EX-010-A.	SFA Database
2-6EX-010-B	Added line for susceptible exit nozzle.	SFA Database
2-MS-208	Line changed to excluded due to non-susceptible material.	SFA Database
2-MS-209	Line changed to excluded due to non-susceptible material.	SFA Database
2-MS-210	Line changed to excluded due to non-susceptible material.	SFA Database
2-MS-211	Line changed to excluded due to non-susceptible material.	SFA Database
2-MS-212	Line changed to excluded due to non-susceptible material.	SFA Database
2-MS-213	Line changed to excluded due to non-susceptible material.	SFA Database
2-MS-214	Line changed to excluded due to non-susceptible material.	SFA Database
2-MS-215	Line changed to excluded due to non-susceptible material.	SFA Database
2-MS-216	Line changed to excluded due to non-susceptible material.	SFA Database
2-MS-217	Line changed to excluded due to non-susceptible material.	SFA Database
2-MS-218	Line changed to excluded due to non-susceptible material.	SFA Database
2-MS-219	Line changed to excluded due to non-susceptible material.	SFA Database
2-MS-220	Line changed to excluded due to non-susceptible material.	SFA Database
2-MS-221	Line changed to excluded due to non-susceptible material.	SFA Database
2-MSD-103	Line changed to excluded due to non-susceptible material. Renamed to 2-MSD-103-B.	SFA Database
2-MSD-103-A	Added line for susceptible exit nozzle.	SFA Database
2-MSD-103-C	Added line for susceptible inlet nozzle.	SFA Database
2-MSD-104	Line changed to excluded due to non-susceptible material. Renamed to 2-MSD-104-B.	SFA Database
2-MSD-104-A	Added line for susceptible exit nozzle.	SFA Database
2-MSD-104-C	Added line for susceptible inlet nozzle.	SFA Database
2-MSD-105	Line changed to excluded due to non-susceptible material. Renamed to 2-MSD-105-B.	SFA Database

Line Number	Change	Reference
2-MSD-105-A	Added line for susceptible exit nozzle.	SFA Database
2-MSD-105-C	Added line for susceptible inlet nozzle.	SFA Database
2-MSD-106	Line changed to excluded due to non-susceptible material. Renamed to 2-MSD-106-B.	SFA Database
2-MSD-106-A	Added line for susceptible exit nozzle.	SFA Database
2-MSD-106-C	Added line for susceptible inlet nozzle.	SFA Database
2-MSD-107	Line changed to excluded due to non-susceptible material. Renamed to 2-MSD-107-B.	SFA Database
2-MSD-107-A	Added line for susceptible exit nozzle.	SFA Database
2-MSD-107-C	Added line for susceptible inlet nozzle.	SFA Database
2-MSD-108	Line changed to excluded due to non-susceptible material. Renamed to 2-MSD-108-B.	SFA Database
2-MSD-108-A	Added line for susceptible exit nozzle.	SFA Database
2-MSD-108-C	Added line for susceptible inlet nozzle.	SFA Database
2-PD-009	Line changed to excluded due to non-susceptible material. Renamed to 2-PD-009-B.	SFA Database
2-PD-009-A	Added line for susceptible exit nozzle.	SFA Database
2-PD-010	Line changed to excluded due to non-susceptible material. Renamed to 2-PD-010-B.	SFA Database
2-PD-010-A	Added line for susceptible exit nozzle.	SFA Database

**Attachment A
Industry FAC Experience Table**

Industry experience is an important factor in the identification of systems, subsystems, and lines susceptible to Flow-Accelerated Corrosion (FAC). A table of important industry events and their applicability to Indian Point 2 was compiled using the following sources:

- “Recommendations for an Effective Flow-Accelerated Corrosion Program,” EPRI NSAC 202L-R3, 2006.
- EPRI, *Flow-Accelerated Corrosion in Power Plants*, B. Chexal et al, EPRI TR-106611-R1, 1998.
- CHUG Plant Experience Database, Revision 2, December 1995.
- 26th CHUG Meeting Presentation by Jeff Horowitz "Review and Lessons Learned from Historical FAC Failures".
- 31st CHUG Meeting Presentation by Aaron Kelley "Unit 1 #2 LP Heater ES Nozzles".
- 32th CHUG Meeting Presentation by Doug Munson "Update on Mihama-3".
- 33rd CHUG Meeting Presentation by Aaron Kelley "Results of L2R10 Inspections at LaSalle Unit 2".
- 33rd CHUG Meeting Presentation by Whit Gallman "Unisolable Steam Leak Downstream of Valve 2HM-23".
- CHUG Conference Meeting Minutes, FAC Experience Reports, and Presentations.
- FACnet Email Message Archive.
- Secondary Pipe Rupture (9 August 2004, Mihama Unit 3, Kansai EPC), WANO EAR TYO 04-013, October 8, 2004.
- Information Notice 82-2: Failures in Turbine Exhaust Lines”, U.S. Nuclear Regulatory Commission (NRC), July 9, 1982.
- “Information Notice 86-106: Feedwater Line Break”, U.S. Nuclear Regulatory Commission (NRC), December 16, 1986.
- “Information Notice 86-106, Supplement 1: Feedwater Line Break”, U.S. Nuclear Regulatory Commission (NRC), February 13, 1987.
- “Information Notice 86-106, Supplement 2: Feedwater Line Break”, U.S. Nuclear Regulatory Commission (NRC), March 18, 1987.
- “NRC Bulletin No. 87-01: Thinning of Pipe Walls in Nuclear Power Plants”, U.S. Nuclear Regulatory Commission (NRC), July 9, 1987.
- “Information Notice 87-36, Significant Unexpected Erosion of Feedwater Lines”, U.S. Nuclear Regulatory Commission (NRC), August 4, 1987.
- “Information Notice 88-17, Summary of Responses to NRC Bulletin 87-01, Thinning of Pipe Walls in Nuclear Power Plants”, U.S. Nuclear Regulatory Commission (NRC), April 22, 1988.

- “Information Notice 86-106, Supplement 3: Feedwater Line Break”, U.S. Nuclear Regulatory Commission (NRC), November 10, 1988.
- “Erosion/Corrosion-Induced Pipe Wall Thinning”, Generic Letter 89-08, U.S. Nuclear Regulatory Commission (NRC), May 2, 1989.
- “Investigation into Flow-Accelerated Corrosion at Low Temperatures”, Document 1015070, Electric Power Research Institute (EPRI), November 2007.
- “Flow-Accelerated Corrosion – The Entrance Effect”, Document 1015072, Electric Power Research Institute (EPRI), November 2007.
- “Erosive Attack”, Technical Update 1015071, Electric Power Research Institute (EPRI), November 2007.

Item Number	System	Location/Area	Plant	Plant Type	Year	Notes
1	All	Downstream of Flow Orifices and Flow Meters	Many	BWR, PWR		Failures reported in piping immediately downstream of orifices and flow meters. This is a generic issue applicable to all systems.
2	All	Downstream of Control Valves (level control valves)	Millstone 2&3, Surry	BWR, PWR		Many plants reported instances of FAC degradation and some significant failures (Millstone 2&3, Surry). This is a generic issue applicable to all systems.
3	All	Downstream of Leaking Valves and Steam Traps	Many	All		Leaking valves and steam traps may be found by plant thermal performance evaluation. Downstream piping may experience severe conditions and may have been excluded from FAC Program due to infrequent operation. This is a generic issue applicable to all systems.
4	All	Miscellaneous Drains to Common Headers into Condenser	Many	All		Extensive industry exp in miscellaneous drain headers from steam drains to the condenser. In addition to FAC, these headers are susceptible to liquid impingement erosion and/or flashing/cavitation as explained in EPRI Erosive Attack Technical Update 1015071.
5	Condensate	Feedwater Pump Suction	Surry Unit 2	PWR	1986	Pipe rupture at Surry Unit 2. Occurred in 18" OD, Thom = 0.5" elbow upstream of feedwater pumps (first elbow off header to FWP). T=374 deg F.
6	Condensate	Condensate (between 4th highest pressure FWH and deaerator)	Mihama	PWR	2004	Failure in condensate system at Mihama. Occurred in 22" pipe downstream of flow measuring orifice. 284 deg F
7	Extraction Steam (or Bleed Steam)	Extraction Steam (All stages carrying wet steam)	Oconee, Vermont Yankee, Trojan, Zion, Browns Ferry	BWR, PWR	1982	Failures in steam lines due to FAC. All extraction stages carrying wet steam are susceptible to FAC. In general, all plants have experience with thinning in the extraction steam system (plants listed appeared in NRC Information Notice 82-22)
8	Extraction Steam (or Bleed Steam)	HP Extraction 2nd Stage	ANO 2	PWR	1989	Fishmouth failure at ANO 2. Occurred in 14" OD, 2-phase flow. Failure at Zion (1988), Oconee (1982).
9	Extraction Steam (or Bleed Steam)	HP Extraction	Sequoyah 2	PWR	1993	Fishmouth failure at Sequoyah 2. Occurred in 10" straight pipe downstream of tee in HP extraction.

Item Number	System	Location/Area	Plant	Plant Type	Year	Notes
10	Extraction Steam (or Bleed Steam)	Extraction (4th Stage)	Fort Calhoun	PWR	1997	Fishmouth rupture at Fort Calhoun in third elbow (12" bent pipe R/D = 5) downstream of turbine in extraction steam system. Section of upstream piping had been replaced in 1985 due to FAC; this downstream section was not inspected. 411 deg F, 2 phase
11	Extraction Steam (or Bleed Steam)	Extraction (carbon steel components in Cr-Mo/Stainless/etc line)	LaSalle	BWR	2004	Failure of LP Heater inlet nozzles (carbon steel nozzles in Cr-Mo line). Also through-walls on carbon steel pup piece on bellows assembly in Cr-Mo line (bellows was stainless steel). The conclusion from these events is that to be non-susceptible to FAC the entire line (incl. nozzles, valves, pup pieces, etc.) must be of FAC-resistant material.
12	Feedwater	Feedwater Pump Outlet & DS of CVs	Oyster Creek	BWR	1978	Thinning caused by FAC at Oyster Creek in 1978. Cracking observed at feedwater pump outlet and downstream of flow/level control valves.
13	Feedwater	Feedwater Pump Discharge	Navajo	Fossil	1982	Pipe rupture at Navajo. Occurred in 10" OD, Tnom = 0.365" elbow downstream of boiler feed pump. T=360 deg F.
14	Feedwater	Final Feedwater (Safety-Related)	Trojan	PWR	1987	Extensive thinning to min acceptable wall thickness at Trojan in safety related feedwater (and non-safety related). High velocity and large counterbores exacerbated FAC.
15	Feedwater	Feedwater at Flow Measurement Orifice	Loviisa	PWR	1990	Rupture at Loviisa. Occurred in feedwater system at flow measurement orifice.
16	Feedwater	Feedwater	Pleasant Prairie	Fossil	1995	Instantaneous double-ended pipe break at Pleasant Prairie. Occurred in 12" feedwater line downstream of valve station and upstream of economizer and boiler.
17	Feedwater	Control Valve Bypass Lines	San Onofre and Diablo Canyon	BWR, PWR		Serious thinning at San Onofre and Diablo Canyon (could be valve leakage, left open at full power-high velocity, or infrequent but severe conditions).
18	Feedwater	Feedwater Pump Min Flow (Recirculation) Lines	Many	All		Feedwater pump min flow lines to condenser have experienced significant degradation.
19	Heater Drain	Heater Drain Pump Recirc (Bypass)	Millstone 2	PWR	1995	Failure at Millstone 2. Occurred in 8" recirc line from heater drain pump to heater drain tank. Line operated during startup only (0-30% power).

Item Number	System	Location/Area	Plant	Plant Type	Year	Notes
20	Heater Vents	Feedwater Heater Vents to Condenser	ANO, Kewaunee, McGuire, Point Beach, Waterford	PWR, BWR		Extensive FAC-induced thinning found throughout this system at many plants. Some plants have replaced the entire system with non-susceptible material (stainless steel or Cr-Mo).
21	Main Steam	Cross-Under Piping (also called Cold Reheat, HP Turbine to Moisture Separator)	North Anna, ANO, Point Beach, D.C. Cook	BWR, PWR		Significant FAC in cross-under piping at North Anna, ANO, and Point Beach. Some plants have small amounts of Cu/Cr in this lines which significantly reduces FAC.
22	Moisture Separator Drain	Moisture Separator Drain Tank Drain	Millstone 3	PWR	1990	Catastrophic failure at Millstone 3. Occurred in 6" OD Moisture Sep. Drain Tank drain immediately downstream of level CV. 380 deg F, 0% quality.
23	Reheater Drain	Reheater Drain Tank Drain	Millstone 2	PWR	1991	Rupture at Millstone 2. Occurred in 8" Reheater Drain Tank drain immediately downstream of level CV. 463 deg F, 0% quality.
24	Reheater Drain	First Stage Reheater Drain	Callaway	PWR	1999	Failure at Callaway just downstream of long horizontal section in first stage reheater drain. 417 deg F, 4.5% quality
25	Reheater Drain	Moisture Separator Reheater Drain/Vent to Drain Tank (Scavenging Steam)	McGuire	PWR	2005	Unisolable steam leak occurred in 2" line that vents wet steam from MSR to drain tank. Flashing contributed to wear (pressure drop caused by "tortuous path" through many fittings in line). 540 deg F, wet steam
26	Multiple Systems	Deoxygenated lines operating at 120°F	South Texas Project, Palo Verde, Surry	PWR, BWR		Some plants have experienced Low-Temperature FAC wear in deoxygenated, neutral water at about 120°F as per EPRI Technical Report 1015170 "Investigation into Flow-Accelerated Corrosion at Low Temperatures.
27	Multiple Systems	Multiple Locations	Diablo Canyon, Salem, V. C. Summer	PWR, BWR		Pipes made of corrosive material have shown high corrosion rates downstream of welds connecting non-resistant material to the resistant material.

Attachment B
Referenced Correspondence and Communication

Email from Ryan Doremus (CSI) to Ian Mew (IPEC) regarding a Line Naming Convention, dated 7/27/2009.

Ian,

I'm close to the point where I will have to start assigning line names for categorization purposes. Since the P&IDs seem to be very good at giving line information (size, pipe class, etc.), I want to propose a simple naming convention that consists of Unit #, System Abbreviation, a sequential number, and if needed a sequential letter that would be used if susceptibility changes within a line.

U-SSS-000-A

U = Unit Number

SSS = System Abbreviation

000 = Sequential Number

A = Section of line that is split for susceptibility.

For example: 2-6EX-003 or 2-BFD-002-A

Let me know what you think.

Thank you,

Ryan D. Doremus

Engineer

CSI Technologies, Inc.

(847) 836-3000 x796

rdoremus@csitechnologies.com

Email from Ian Mew (IPEC) to Ryan Doremus (CSI) regarding responses to information requests, dated 8/10/2009.

Ryan,

Answers to item 6, 9 & 10 will be sent shortly.

Jan D. Mew

IPEC FAC Engineer

Phone 914-827-7741

From: Koutsakos, Michael
Sent: Monday, August 10, 2009 7:32 AM
To: Mew, Ian
Cc: Koutsakos, Michael
Subject: RE: IPEC Unit 2 SSE/SNM Information Request

1. Lines actually exist. They should be included in the Checworks model.
2. Under normal operation, all MS trap bypasses are normally closed, unless the trap has been identified as deficient.
3. Under normal operation, less than 2% of the time.
4. Under normal operation, less than 2% of the time.
5. Under normal operation, less than 2% of the time.
6. Talk to James Peters (Chemistry Supervisor)
7. Under normal operation, less than 2% of the time.
8. Under normal operation, less than 2% of the time.
9. Talk to James Peters (Chemistry Supervisor)
10. Talk to James Peters (Chemistry Supervisor)

From: Mew, Ian
Sent: Thursday, August 06, 2009 9:56 AM
To: Koutsakos, Michael
Subject: FW: IPEC Unit 2 SSE/SNM Information Request

Can you answer Questions 1-10 or point me to a person who can.

Jan D. Mew

IPEC FAC Engineer

Phone 914-827-7741

From: Ryan Doremus [mailto:RDoremus@csitechnologies.com]
Sent: Friday, July 24, 2009 4:29 PM
To: Mew, Ian
Subject: IPEC Unit 2 SSE/SNM Information Request

CSI Document No. 0700.104.C.004

Ian,

I completed a cursory review of the SSE/SNM IP2 and have a few pieces of information that would be helpful:

1. Do actual lines exist from the HP Turbine to the Moisture Preseparators or are the Preseparators connected directly to the turbine? If they exist, are they inspected visually or should they be included in the CHECWORKS model?
2. Is it safe to assume that all Main Steam steam trap bypass valves on 9321-F-2041 and 9321-F-2042 are normally closed despite the fact that some are shown open?
3. Does the Feedwater Heater Bypass line (A235307, G-5) operate more or less than 2% of the time?
4. Do the Boiler Feed Pump discharge lines to the Drains Collecting Tank (9321-F-2017, H-6) operate more or less than 2% of the time?
5. Does the 18" HP Feedwater Heater Bypass line (9321-F-2019, F-3) operate more or less than 2% of the time?
6. Do the lines from the Heater Drain Pump Discharge to the HDP Water Chemistry Monitor (9321-F-2022, A2) operate more or less than 2% of the time?
7. Do the level control lines from the Heater Drain Tank to the Condenser (A235304, A-1 C-1 F-1) operate more or less than 2% of the time?
8. Do the Moisture Separator drains to the Drains Collecting Tank (9321-F-2023, H4) operate more or less than 2% of the time?
9. Do the SG Blowdown lines to the sample coolers (9321-F-2729, D-6) operate more or less than 2% of the time?
10. What is the outlet temperature of the SG Blowdown sample coolers (9321-F-2729, E-6)?

Any information on these would be helpful. Feel free to forward these questions on to system engineers or to send me operating procedures that might answer the questions. To maintain the integrity of the project schedule, we will need these answers by Wednesday, August 5.

In addition to the above, please send the Aux. Steam operating procedures (SOP 29.1.1, 29.1.2, and 29.1.3) and the following drawings:

9321-F-2027
9321-F-2028
9321-F-2033
9321-F-2067
9321-F-2720
9321-F-2722
9321-F-2723
9321-F-2745
9321-F-7020
A205957
B237144
192491

If it's possible, I would like to have these drawings and the Aux. Steam OPs by next week, even if they come separately from the questions, to give me time to analyze them. If you have any questions, please feel free to contact me.

Thank you,

Ryan D. Doremus

Engineer

CSI Technologies, Inc.

(847) 836-3000 x796

rdoremus@csitechnologies.com

Email from Ian Mew (IPEC) to Ryan Doremus (CSI) regarding responses to information requests, dated 8/13/2009.

See Answers below.

Ian D. Mew
IPEC FAC Engineer
Phone 914-827-7741

From: Mew, Ian
Sent: Monday, August 10, 2009 7:49 AM
To: Peters, James G
Subject: FW: IPEC Unit 2 SSE/SNM Information Request

Jim,

Can you answer the following questions? I need the answer to develop a System Susceptibility Evaluation for the FAC program for IP2.

11. Do the lines from the Heater Drain Pump Discharge to the HDP Water Chemistry Monitor (9321-F-2022, A2) operate more or less than 2% of the time? **Yes 1 month a year – all material is SS after the root isolation valve which is less than 1 foot long**
12. Do the SG Blowdown lines to the sample coolers (9321-F-2729, D-6) operate more or less than 2% of the time? **Sample lines are all SS from the blowdown lines thru the coolers**
13. What is the outlet temperature of the SG Blowdown sample coolers (9321-F-2729, E-6)? - **from CCW heat exchanger outlet temp is <140F**

Ian D. Mew
IPEC FAC Engineer
Phone 914-827-7741

From: Ryan Doremus [mailto:RDoremus@csitechnologies.com]
Sent: Friday, July 24, 2009 4:29 PM
To: Mew, Ian
Subject: IPEC Unit 2 SSE/SNM Information Request

CSI Document No. 0700.104.C.004

Ian,

I completed a cursory review of the SSE/SNM IP2 and have a few pieces of information that would be helpful:

14. Do actual lines exist from the HP Turbine to the Moisture Preseparators or are the Preseparators connected directly to the turbine? If they exist, are they inspected visually or should they be included in the CHECWORKS model?
15. Is it safe to assume that all Main Steam steam trap bypass valves on 9321-F-2041 and 9321-F-2042 are normally closed despite the fact that some are shown open?
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18. Does the 18" HP Feedwater Heater Bypass line (9321-F-2019, F-3) operate more or less than 2% of the time?
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If it's possible, I would like to have these drawings and the Aux. Steam OPs by next week, even if they come separately from the questions, to give me time to analyze them. If you have any questions, please feel free to contact me.

Thank you,

Ryan D. Doremus

Engineer

CSI Technologies, Inc.

(847) 836-3000 x796

rdoremus@csitechnologies.com

Email from Brian Trudeau (CSI) to Ian Mew (IPEC) regarding report comments, dated 11/23/2009.

CSI Doc. No. 0700.104.C.019

Ian,

This email captures our discussion today concerning your comments on the Unit 2 SSE & SNM. I understand that these two items are the extent of your comments. We will give you a call to go over these and inform you how we have incorporated them prior to sending the final version of the SSE & SNM on or before Dec 4.

- 1) Ian sent new data to CSI's Ryan Doremus on historical inspections and replacements that he would like incorporated. This may impact plant experience for SNM lines and susceptibility if the entire line has been replaced with FAC resistant material. CSI will assess this data, make the appropriate changes, and provide Ian with a list of impacted lines.
- 2) Ian requested that CSI provide comments on why SNM lines were evaluated for high consequence of failure. A reason code is given, such as plant shutdown (FT) or unable to isolate (FI), but Ian would like further comments/discussion of this reason. For example, Ian would like to know why a line would cause the plant to shutdown if it fails. For large bore SNM lines, CSI will add the note "This large bore line is important to plant operation and/or may be a personnel safety issue upon failure."

CSI will apply comment 2, above to applicable lines in the Unit 3 SNM.

Thanks,

Brian Trudeau
CSI Technologies, Inc.
(847) 836-3000 ext. 717