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December 19, 2014

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555

10 CFR 50.54(f)

Duke Energy Carolina, LLC (Duke Energy)
Oconee Nuclear Station, Units 1, 2 and 3
Docket Numbers 50-269, 50-270, 50-287
Renewed License Numbers DPR-38, DPR-47, and DPR-55

Subject: Oconee Nuclear Station, Submittal of the Expedited Seismic Evaluation Process Report (CEUS Sites)

References:

1. NRC Letter, *Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Recommendations 2.1, 2.3, and 9.3, of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident*, dated March 12, 2012, ADAMS Accession No. ML12053A340
2. NEI Letter, *Proposed Path Forward for NTTF Recommendation 2.1: Seismic Reevaluations*, dated April 9, 2013, ADAMS Accession No. ML13101A379 & ML13102A142
3. NRC Letter, *Electric Power Research Institute Final Draft Report XXXXXX, "Seismic Evaluation Guidance: Augmented Approach for the Resolution of Near-Term Task Force Recommendation 2.1: Seismic," as an Acceptable Alternative to the March 12, 2012, Information Request for Seismic Reevaluations*, dated May 7, 2013, ADAMS Accession No. ML13106A331
4. Duke Energy Letter, *Seismic Hazard and Screening Report (CEUS Sites), Response to NRC 10 CFR 50.54(f) Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) regarding Recommendations 2.1, 2.3 and 9.3 of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident,* dated March 31, 2014 ADAMS Accession No. ML14092A024

Ladies and Gentlemen,

On March 12, 2012, the Nuclear Regulatory Commission (NRC) issued a Request for Information per 10CFR 50.54(f) (Reference 1) to all power reactor licensees. Enclosure 1 of that request, contained guidance for each licensee located in the Central and Eastern United States (CEUS) to perform a Seismic Hazard Evaluation and Screening.

In Reference 2, the Nuclear Energy Institute (NEI) requested NRC agreement for an alternative schedule which delayed the CEUS Seismic Hazard Evaluation and Screening Reports so that an updated ground motion attenuation model could be completed. NEI proposed that descriptions of subsurface materials and properties and base case velocity profiles be submitted to the NRC by September 12, 2013, with the remaining seismic hazard and screening information submitted by March 31, 2014. Duke Energy submitted the Seismic Hazard and Screening Report for the Oconee station (Reference 4) on March 31,2014.

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Reference 1 requested that prior to completion of the risk evaluation, if appropriate due to a higher seismic hazard relative to the design basis, licensees are to provide interim evaluations and identify actions taken or planned. Reference 2 provided the NRC with proposed guidance to address this action, referred to as an Expedited Seismic Evaluation Process (ESEP).

In Reference 3, the NRC agreed with the alternate schedule and the ESEP guidance (EPRI Report 3002000704) submitted by Reference 2 .

The ESEP Report for Oconee Nuclear Station Units 1, 2, and 3 was prepared in accordance with the endorsed guidance and is provided as Attachment 1 to this letter.

There are no regulatory commitments associated with this letter.

Should you have any questions regarding this submittal, please contact David Haile with Oconee Regulatory Affairs, at (864) 873-4742.

I declare under penalty of perjury that the foregoing is true and correct. Executed on December 19, 2014.

Sincerely,

Scott L. Batson
Vice President
Oconee Nuclear Station

Attachment:

1. Oconee Nuclear Station, Expedited Seismic Evaluation Process (ESEP) Report

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ONS Master File (ON02DM, File OS 801.01)

ELL (EC2ZF)

EXPEDITED SEISMIC EVALUATION PROCESS (ESEP) REPORT

November 24, 2014

Revision 1

Duke Energy
Oconee Nuclear Station

EXPEDITED SEISMIC EVALUATION PROCESS REPORT

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1.0 Purpose and Objective

Following the accident at the Fukushima Dai-ichi nuclear power plant resulting from the March 11, 2011, Great Tohoku Earthquake and subsequent tsunami, the Nuclear Regulatory Commission (NRC) established a Near-Term Task Force (NTTF) to conduct a systematic review of NRC processes and regulations and to determine if the agency should make additional improvements to its regulatory system. The NTTF developed a set of recommendations intended to clarify and strengthen the regulatory framework for protection against natural phenomena. Subsequently, the NRC issued a 50.54(f) letter on March 12, 2012 [1], requesting information to assure that these recommendations are addressed by all U.S. nuclear power plants. The 50.54(f) letter requests that licensees and holders of construction permits under 10 CFR Part 50 reevaluate the seismic hazards at their sites against present-day NRC requirements and guidance. Depending on the comparison between the reevaluated seismic hazard and the current design basis, further risk assessment may be required. Assessment approaches acceptable to the staff include a seismic probabilistic risk assessment (SPRA), or a seismic margin assessment (SMA). Based upon the assessment results, the NRC staff will determine whether additional regulatory actions are necessary.

This report describes the Expedited Seismic Evaluation Process (ESEP) undertaken for Oconee Nuclear Station (ONS). The intent of the ESEP is to perform an interim action in response to the NRC's 50.54(f) letter [1] to demonstrate seismic margin through a review of a subset of the plant equipment that can be relied upon to protect the reactor core following beyond design basis seismic events.

The ESEP is implemented using the methodologies in the NRC-endorsed guidance in Electric Power Research Institute (EPRI) 3002000704, *Seismic Evaluation Guidance: Augmented Approach for the Resolution of Fukushima Near-Term Task Force Recommendation 2.1: Seismic* [2].

The objective of this report is to provide summary information describing the ESEP evaluations and results. The level of detail provided in the report is intended to enable NRC to understand the inputs used, the evaluations performed, and the decisions made as a result of the interim evaluations.

2.0 Brief Summary of the FLEX Seismic Implementation Strategies

The ONS FLEX strategies for Reactor Core Cooling and Heat Removal, Reactor Inventory Control/Long-Term Subcriticality, and Containment Function are summarized below. This summary is derived from the ONS Overall Integrated Plan (OIP) in Response to the March 12, 2012, Commission Order EA-12-049 [3] (as supplemented by subsequent six-month updates [22], [23], and [24]), and ONS Calculation OSC-11217, *Augmented Approach for Resolution of Fukushima Near-Term Task Force Recommendation 2.1: Seismic – Determine Expedited Seismic Equipment List (ESEL)* [18].

The strategies described below are typical for Units 1, 2, and 3. During Phase 1, steam generator heat removal is achieved via the existing Standby Shutdown Facility (SSF)

Auxiliary Service Water (ASW) Pump with suction from the buried Condenser Circulating Water system injecting into steam generators. Additionally, the Main Steam (MS) Atmospheric Dump Valves (ADVs) are throttled to control Reactor Coolant System (RCS) cooldown.

The Phase 2 Primary FLEX path employs a tap off of the Station ASW lines via the credited B.5.b connection located in the Auxiliary Building. The Phase 2 Alternate FLEX path employs taps off of the SSF ASW lines via new FLEX mechanical connections located in the Auxiliary Building. During Phase 2 the ADVs are also required for system depressurization to support a portable diesel-driven low-pressure pump with suction from Lake Keowee through the Oconee Intake Canal or from Chemical Treatment Pond 1 (CTP-1) to provide steam generator heat-removal capability. The Phase 3 strategy is to sustain and enhance the Phase 2 strategy with portable National Response Center equipment using the same connections.

RCS borated makeup during Phase 1 is achieved via the existing SSF Reactor Coolant Makeup Pump taking suction from the Spent Fuel Pool (SFP) and injecting into the Reactor Coolant Pump (RCP) Seals. RCS inventory and pressure control relies on isolating RCP seal return and RCS Letdown, operating and isolating SSF Letdown, operating SSF Pressurizer Heaters, and operating Power-Operated Relief Valves.

The Phase 2 strategy supplies RCS borated makeup water with a portable diesel-driven high-pressure pump with suction from a new connection off the Borated Water Storage Tank piping and injecting into existing RCS injection header and/or RCP seal injection header vents and drains. All connection points are located inside the Auxiliary Building. Vents and drains located in the East Penetration Room provide connection points for the Primary FLEX strategy; while West Penetration Room vents and drains provide connection points for the Alternate FLEX strategy.

Also during Phase 2, RCS inventory and pressure control strategies rely on isolating RCP seal return and RCS Letdown, isolation of SSF Letdown, operating Head and High Point Vent Valves if needed, and isolating or venting Core Flood Tanks to prevent nitrogen intrusion into the RCS. The Phase 3 strategy is to sustain the Phase 2 strategy with portable National Response Center equipment using the same connections.

Spent Fuel Pool Make-up is not required during Phase 1. Phase 2 strategy uses a portable diesel-driven low-pressure pump to supply SFP makeup water; taking suction from Lake Keowee via the Oconee Intake Canal or CTP-1 and injecting directly into the pool. The Phase 2 Primary FLEX strategy involves all portable equipment. The Phase 2 Alternate FLEX strategy connects to an existing safety grade SFP fill pipe. The Phase 3 strategy is to sustain and enhance* the Phase 2 strategy with portable National Response Center equipment using the same connections.

Necessary attendant electrical components are outlined in the ONS FLEX OIP submittal [3], as supplemented by subsequent six-month regulatory updates [22], [23], and [24], and primarily entail 600 VAC essential motor control centers, vital batteries, equipment installed to support FLEX electrical connections, and monitoring instrumentation required for core cooling, reactor coolant inventory, and containment integrity.

Flow diagrams showing the Unit 1 FLEX strategy flow paths are included in Appendix E.

3.0 Equipment Selection Process and ESEL

The complete ESELs for Unit 1, Unit 2, and Unit 3 are presented in Appendices A, B, and C, respectively. The ESEL for the SSF is presented in Appendix D.

The selection of equipment for the ESEL followed the guidelines of EPRI 3002000704 [2].

3.1 Equipment Selection Process and ESEL

The selection of equipment to be included on the ESEL was based on installed plant equipment credited in the FLEX strategies during Phase 1, 2, and 3 mitigation of a Beyond Design Basis External Event (BDBEE), as outlined in the ONS OIP in Response to the March 12, 2012, Commission Order EA-12-049 [3], as supplemented by subsequent six-month regulatory updates [22], [23], and [24]. The OIP provides the ONS FLEX mitigation strategy and serves as the basis for equipment selected for the ESEP.

The scope of "installed plant equipment" includes equipment relied upon for the FLEX strategies to sustain the critical functions of core cooling and containment integrity consistent with the ONS OIP [3] and supplemented by subsequent six-month regulatory updates [22], [23], and [24]. FLEX recovery actions are excluded from the ESEP scope per EPRI 3002000704 [2]. The overall list of planned FLEX modifications and the scope for consideration herein is limited to those required to support core cooling, reactor coolant inventory and subcriticality, and containment integrity functions. Portable and pre-staged FLEX equipment (not permanently installed) are excluded from the ESEL per EPRI 3002000704 [2].

The ESEL component selection followed the EPRI guidance outlined in Section 3.2 of EPRI 3002000704.

1. The scope of components is limited to that required to accomplish the core cooling and containment safety functions identified in Table 3-2 of EPRI 3002000704. The instrumentation monitoring requirements for core cooling/containment safety functions are limited to those outlined in the EPRI 3002000704 guidance and are a subset of those outlined in the ONS OIP [3] and subsequent updates [22], [23], and [24].
2. The scope of components is limited to installed plant equipment and FLEX connections necessary to implement the ONS OIP [3] and subsequent updates [22], [23], and [24] as described in Section 2.

3. The scope of components assumes the credited FLEX connection modifications are implemented and are limited to those required to support a single FLEX success path (i.e., either "Primary" or "Back-up/Alternate").
4. The "Primary" FLEX success path is to be specified. Selection of the "Back-up/Alternate" FLEX success path must be justified.
5. Phase 3 coping strategies are included in the ESEP scope, whereas recovery strategies are excluded.
6. Structures, systems, and components (SSCs) excluded per the EPRI 3002000704 [2] guidance are:
   - Structures (e.g., containment, Reactor Building, Control Building, Auxiliary Building, etc.)
   - Piping, cabling, conduit, HVAC, and their supports.
   - Manual valves and rupture disks.
   - Power-operated valves not required to change state as part of the FLEX mitigation strategies.
   - Nuclear steam supply system components (e.g., reactor pressure vessel and internals, RCPs and seals, etc.)
7. For cases in which neither train was specified as a primary or back-up strategy, then only one train component (generally 'A' train) is included in the ESEL.
8. There are no required Phase 1 FLEX actions to maintain containment integrity. Additionally, the scope of components assumes that no Phase 2 or 3 FLEX actions will be required to maintain containment integrity.

3.1.1 ESEL Development

The ESEL was developed by reviewing the ONS OIP [3] and subsequent updates [22], [23], and [24] to determine the major equipment involved in the FLEX strategies. Further reviews of plant drawings (e.g., Process and Instrumentation Diagrams (P&IDs) and Electrical One Line Diagrams) were performed to identify the boundaries of the flow paths to be used in the FLEX strategies and to identify specific components in the flow paths needed to support implementation of the FLEX strategies. Boundaries were established at an electrical or mechanical isolation device (e.g., isolation amplifier, valve, etc.) in branch circuits / branch lines off the defined strategy electrical or fluid flow path. P&IDs were the primary reference documents used to identify mechanical components and instrumentation. The flow paths used for FLEX strategies were selected and specific components were identified using detailed equipment and instrument drawings, piping isometrics, electrical schematics and one-line drawings, system descriptions, design basis documents, etc.

3.1.2 Power-Operated Valves

Page 3-3 of EPRI 3002000704 [2] notes that power-operated valves not required to change state are excluded from the ESEL. Page 3-2 also notes that "... functional failure modes of electrical and mechanical portions of the installed Phase 1 equipment should be considered (e.g., RCIC/AFW trips)." To address this concern, the following guidance is applied in the ONS ESEL for functional failure modes associated with power-operated valves:

- Power-operated valves that remain energized during the Extended Loss of all AC Power (ELAP) events (such as DC powered valves), were included on the ESEL.
- Power-operated valves not required to change state as part of the FLEX mitigation strategies were not included on the ESEL. The seismic event also causes the ELAP event; therefore, the valves are incapable of spurious operation as they would be de-energized.
- Power-operated valves not required to change state as part of the FLEX mitigation strategies during Phase 1 that are re-energized and operated during subsequent Phase 2 and 3 strategies were not evaluated for spurious valve operation as the seismic event that caused the ELAP has passed before the valves are re-powered.

3.1.3 Pull Boxes

Pull boxes were deemed unnecessary to add to the ESELs as these components provide completely passive locations for pulling or installing cables. No breaks or connections in the cabling are included in pull boxes. Pull boxes were considered part of conduit and cabling, which are excluded in accordance with EPRI 3002000704 [2].

3.1.4 Termination Cabinets

Termination cabinets which are necessary for FLEX Phase 2 and Phase 3 connections are included in the ESEL to ensure industry knowledge on panel/anchorage failure vulnerabilities is addressed.

3.1.5 Critical Instrumentation Indicators

Critical indicators and recorders are typically physically located on panels/cabinets and are included as separate components; however, seismic evaluation of the instrument indication may be included in the panel/cabinet seismic evaluation (rule-of-the-box).

3.1.6 Phase 2 and Phase 3 Piping Connections

Item 2 in Section 3.1 above notes that the scope of equipment in the ESEL includes "... FLEX connections necessary to implement the ONS OIP [3] and subsequent updates [22], [23], and [24] as described in Section 2." Item 3 in

Section 3.1 also notes that "The scope of components assumes the credited FLEX connection modifications are implemented, and are limited to those required to support a single FLEX success path (i.e., either 'Primary' or 'Back-up/Alternate')."

Item 6 in Section 3 above goes on to explain that "Piping, cabling, conduit, HVAC, and their supports ..." are excluded from the ESEL scope in accordance with EPRI 3002000704 [2].

Therefore, piping and pipe supports associated with FLEX Phase 2 and Phase 3 connections are excluded from the scope of the ESEP evaluation. However, any active valves in the FLEX Phase 2 and Phase 3 connection flow paths are included in the ESEL.

3.2 Justification for Use of Equipment that is not the Primary Means for FLEX Implementation

The ESEL was developed based upon a success path which has been identified to minimize the reliance on installed equipment and infrastructure following a beyond design basis (BDB) seismic event. Reliance on fewer components and infrastructure reduces the number of components exposed to the BDB seismic event that must function to accomplish the strategy and therefore increases the confidence of success. The chosen success path is comprised of components from the primary FLEX strategy, the alternate FLEX strategy, or pieces from both for each safety function identified.

4.0 Ground Motion Response Spectrum (GMRS)

4.1 Plot of GMRS Submitted by the Licensee

The ONS GMRS used to select the ESEP Review Level Ground Motion (RLGM) was included in the ONS Seismic Hazard and Screening Report [4]. Digitized GMRS frequency and acceleration values from the ONS Seismic Hazard and Screening Report [4] are shown in Figure 4-1, which is Table 2.4-1 from [4]. The ONS GMRS is plotted in Figure 4-2.

The ONS Control Point is located at Elevation 753', which is at the base of the mat foundation of the Reactor Buildings for each Unit.

Table 2.4-1. UHRS and GMRS for Oconee.

Freq. (Hz)	10^{-4} UHRS (g)	10^{-5} UHRS (g)	GMRS (g)
100	2.55E-01	8.37E-01	3.96E-01
90	2.56E-01	8.46E-01	4.00E-01
80	2.61E-01	8.66E-01	4.09E-01
70	2.73E-01	9.18E-01	4.32E-01
60	3.05E-01	1.05E+00	4.92E-01
50	3.81E-01	1.34E+00	6.24E-01
40	4.78E-01	1.67E+00	7.79E-01
35	5.17E-01	1.78E+00	8.34E-01
30	5.46E-01	1.85E+00	8.68E-01
25	5.58E-01	1.85E+00	8.74E-01
20	5.54E-01	1.82E+00	8.60E-01
15	5.10E-01	1.65E+00	7.81E-01
12.5	4.75E-01	1.52E+00	7.22E-01
10	4.32E-01	1.36E+00	6.50E-01
9	4.01E-01	1.26E+00	6.00E-01
8	3.71E-01	1.15E+00	5.51E-01
7	3.39E-01	1.04E+00	4.99E-01
6	3.03E-01	9.22E-01	4.43E-01
5	2.62E-01	7.88E-01	3.79E-01
4	2.11E-01	6.19E-01	2.99E-01
3.5	1.88E-01	5.41E-01	2.63E-01
3	1.58E-01	4.48E-01	2.18E-01
2.5	1.29E-01	3.59E-01	1.76E-01
2	1.17E-01	3.13E-01	1.54E-01
1.5	9.48E-02	2.40E-01	1.20E-01
1.25	7.96E-02	1.95E-01	9.79E-02
1	6.91E-02	1.62E-01	8.21E-02
0.9	6.73E-02	1.57E-01	7.96E-02
0.8	6.53E-02	1.51E-01	7.68E-02
0.7	6.22E-02	1.43E-01	7.27E-02
0.6	5.71E-02	1.30E-01	6.61E-02
0.5	4.93E-02	1.11E-01	5.66E-02
0.4	3.94E-02	8.87E-02	4.53E-02
0.35	3.45E-02	7.76E-02	3.96E-02
0.3	2.96E-02	6.65E-02	3.39E-02
0.25	2.46E-02	5.55E-02	2.83E-02
0.2	1.97E-02	4.44E-02	2.26E-02
0.15	1.48E-02	3.33E-02	1.70E-02
0.125	1.23E-02	2.77E-02	1.41E-02
0.1	9.85E-03	2.22E-02	1.13E-02

Figure 4-1. ONS GMRS (5% Damping) – Tabular Form [4].

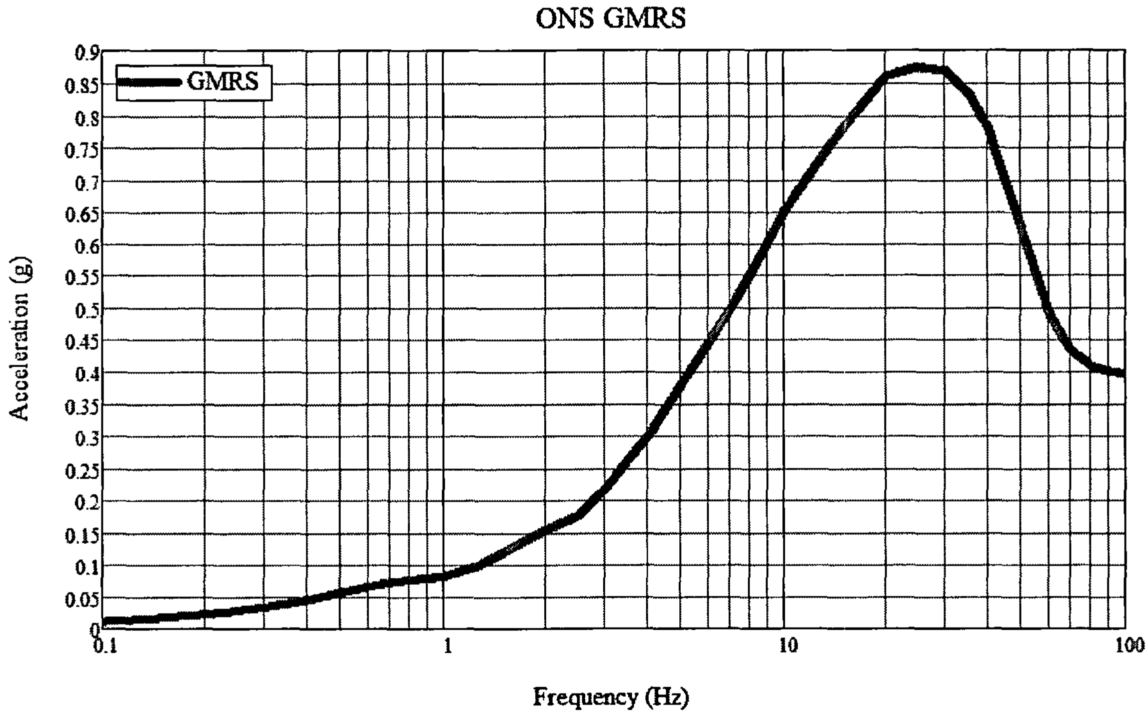


Figure 4-2. ONS GMRS (5% Damping) – Graphical Form [4].

4.2 Comparison to Safe Shutdown Earthquake (SSE)

ONS has two distinct spectra for structures founded on rock; one for the SSF and one for the remainder of the plant (hereinafter referred to as SSF-SSE and SSE, respectively). Digitized SSE frequency and acceleration values from the ONS Seismic Hazard and Screening Report [4] are shown in Figure 4-3, which is Table 3.1-1 from [4]. Digitized SSF-SSE frequency and acceleration values from the ONS Specification OSS-027B.00-00-0002, Figure 5 [21] are shown in Table 4-1. The SSF-SSE and SSE are plotted in Figures 4-4 and 4-5, respectively.

A comparison of the ONS GMRS plotted against the SSF-SSE and SSE is shown in Figure 4-6.

Table 3.1-1. SSE for Oconee (AMEC, 2012)

Freq (Hz)	SSE (g)	Freq (Hz)	SSE (g)	Freq (Hz)	SSE (g)	Freq (Hz)	SSE (g)
0.2	0.02	3.38	0.1421	8.6	0.1157	15.4	0.1018
0.27	0.028	3.48	0.1411	8.8	0.1151	15.6	0.1015
0.37	0.0379	3.58	0.1402	9	0.1145	15.8	0.1012
0.47	0.0452	3.6	0.14	9.2	0.114	16	0.1009
0.57	0.0521	3.7	0.1392	9.4	0.1134	16.2	0.1007
0.67	0.0587	3.8	0.1384	9.6	0.1129	16.4	0.1004
0.69	0.06	3.9	0.1376	9.8	0.1124	16.6	0.1001
0.79	0.0673	4	0.1368	10	0.1119	16.7	0.1
0.89	0.0744	4.1	0.1361	10.2	0.1114	100	0.1
0.99	0.0813	4.2	0.1353	10.4	0.1109		
1.09	0.0882	4.3	0.1347	10.6	0.1105		
1.19	0.095	4.4	0.134	10.8	0.11		
1.29	0.1017	4.5	0.1333	11	0.1096		
1.39	0.1083	4.6	0.1327	11.2	0.1092		
1.49	0.1148	4.7	0.132	11.4	0.1087		
1.57	0.12	4.8	0.1314	11.6	0.1083		
1.67	0.1248	4.9	0.1308	11.8	0.1079		
1.77	0.1295	5.2	0.1292	12	0.1075		
1.87	0.1341	5.4	0.1281	12.2	0.1071		
1.97	0.1387	5.6	0.1271	12.4	0.1067		
2	0.14	5.8	0.1261	12.6	0.1064		
2.1	0.1416	6	0.1252	12.8	0.106		
2.2	0.1432	6.2	0.1243	13	0.1056		
2.3	0.1447	6.4	0.1234	13.2	0.1053		
2.4	0.1461	6.6	0.1226	13.4	0.1049		
2.5	0.1476	6.8	0.1218	13.6	0.1046		
2.6	0.1489	7	0.121	13.8	0.1043		
2.68	0.15	7.2	0.1203	14	0.1039		
2.78	0.1487	7.4	0.1195	14.2	0.1036		
2.88	0.1475	7.6	0.1188	14.4	0.1033		
2.98	0.1463	7.8	0.1182	14.6	0.103		
3.08	0.1452	8	0.1175	14.8	0.1027		
3.18	0.1441	8.2	0.1169	15	0.1024		
3.28	0.1431	8.4	0.1163	15.2	0.1021		

Figure 4-3. ONS SSE (5% Damping) [4].

Table 4-1. ONS SSF-SSE (5% Damping) [21].

Frequency (Hz)	Spectral Acceleration (g)
0.25	0.05
2.5	0.32
9	0.27
33/PGA	0.10

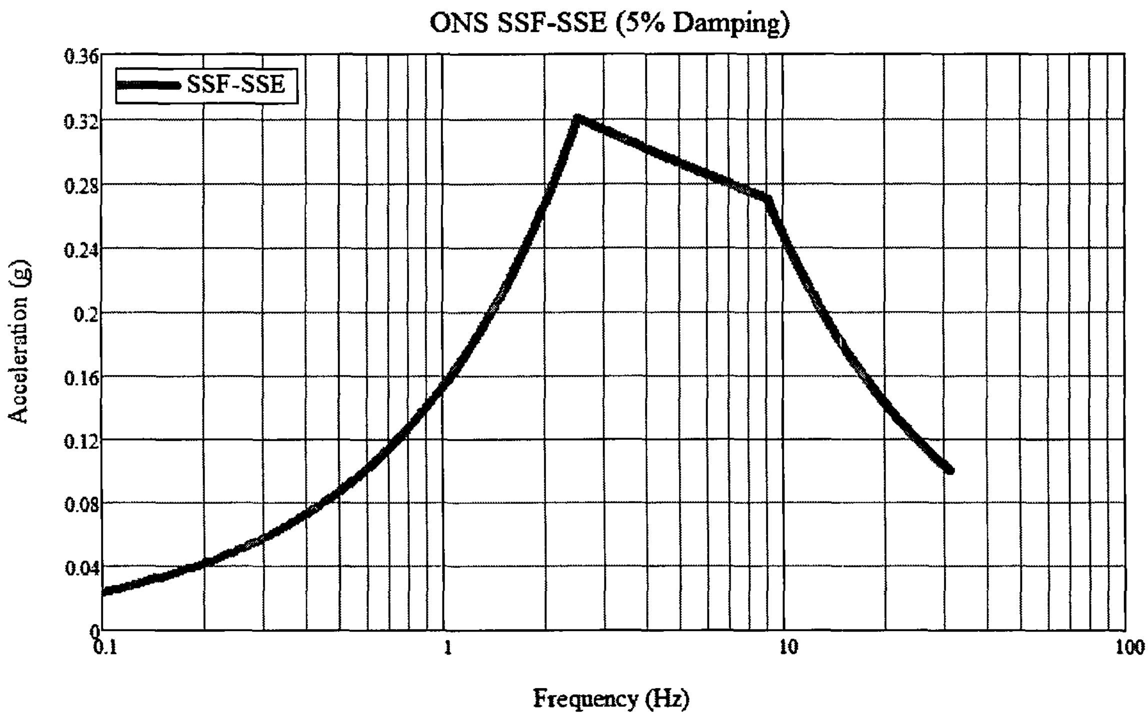


Figure 4-4. ONS SSF-SSE (5% Damping).

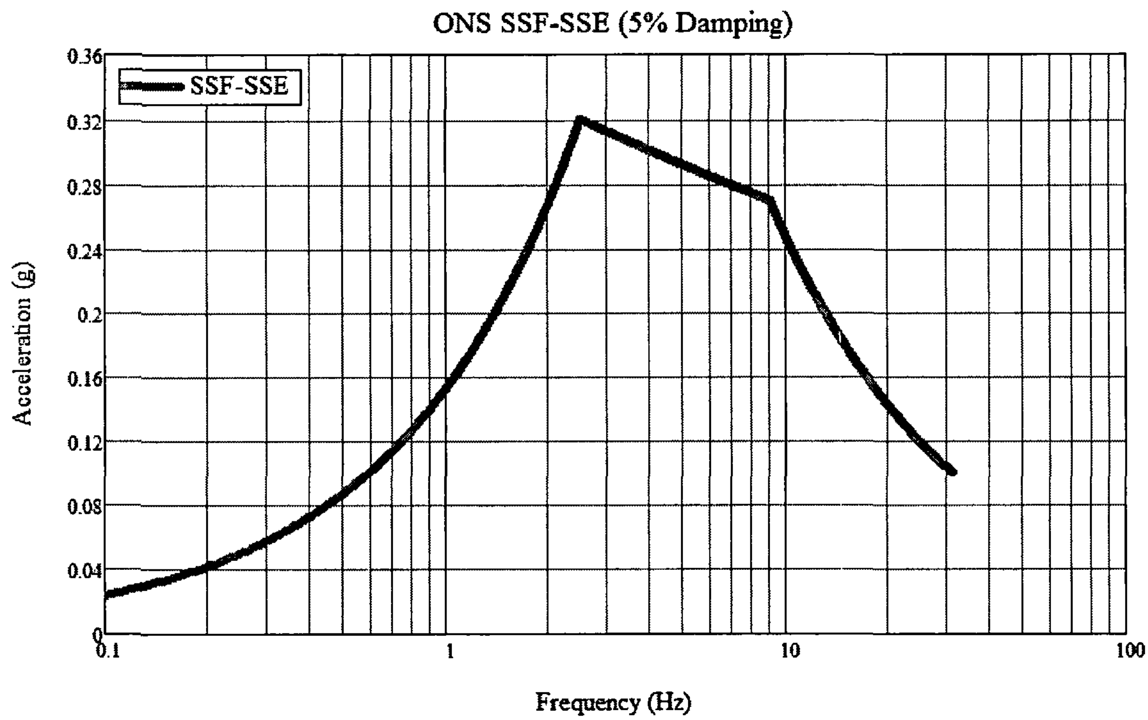


Figure 4-5. ONS SSE (5% Damping).

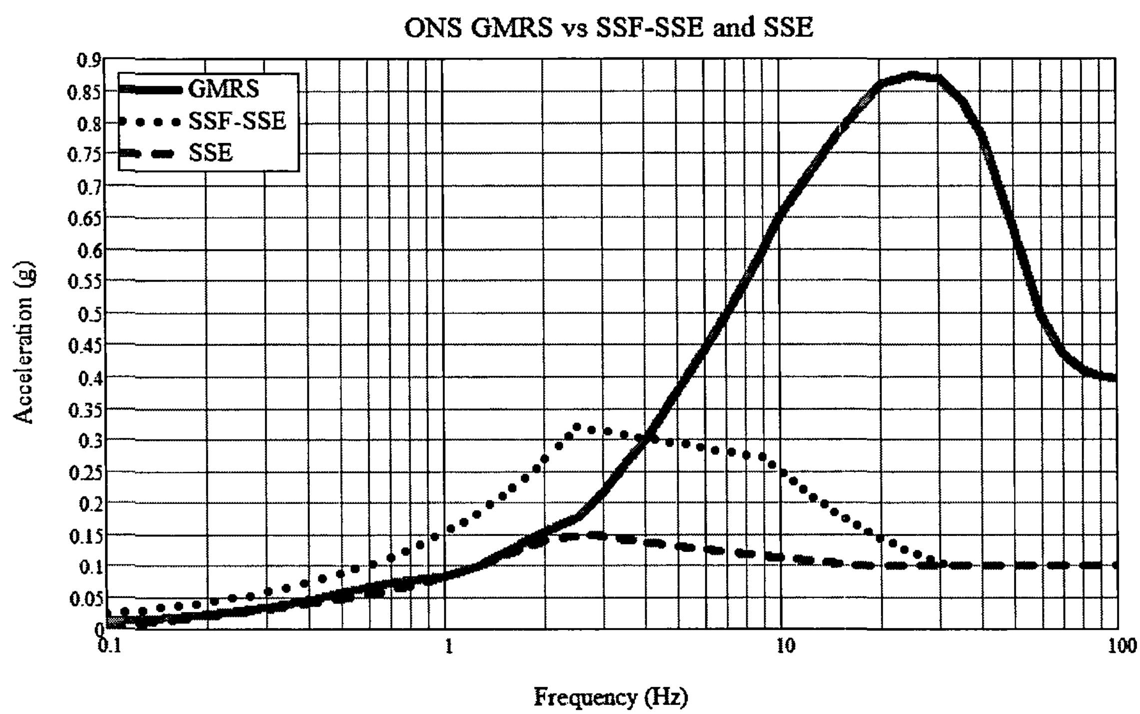


Figure 4-6. Comparison of ONS GMRS, SSF-SSE, and SSE (5% Damping).

5.0 Review Level Ground Motion (RLGM)

5.1 Description of RLGM Selected

The procedure for determining the RLGM for the ESEP is described in Section 4 of EPRI 3002000704 [2]. The RLGM is determined by multiplying the spectral acceleration values for the 5%-damped SSE horizontal ground response spectrum by a scale factor. The scale factor is the largest ratio of spectral accelerations between the 5%-damped GMRS and the 5%-damped SSE ground response spectrum at frequencies from 1 Hz to 10 Hz, but not to exceed 2.0.

The ratios of the GMRS to the SSF-SSE and SSE over the 1 to 10 Hz frequency range are shown in Table 5-1. The largest ratios of the GMRS to the SSF-SSE and SSE in the 1 to 10 Hz range are at 10 Hz. The spectral acceleration ratio is 2.62 for the SSF and 5.80 for the remainder of the plant. The RLGM is therefore determined by multiplying the SSE ground response spectrum by 2.0, as limited per EPRI 3002000704 [2]. Digitized SSF-RLGM and balance of plant RLGM frequency and acceleration values are shown in Table 5-2. The ONS SSF-RLGM and RLGM are plotted in Figure 5-1.

Table 5-1. Ratio of the GMRS to the SSF-SSE and SSE (1 to 10 Hz Range, 5% Damping).

Frequency (Hz)	GMRS (g)	SSF-SSE (g)	Ratio GMRS/SSF-SSE	SSE (g)	Ratio GMRS/SSE
1	0.082	0.153	0.536	0.081	1.012
2	0.154	0.267	0.577	0.14	1.100
3	0.218	0.312	0.699	0.146	1.493
4	0.299	0.301	0.993	0.137	2.182
5	0.379	0.292	1.298	0.13	2.915
6	0.443	0.285	1.554	0.125	3.544
7	0.499	0.279	1.789	0.121	4.124
8	0.551	0.274	2.011	0.118	4.669
9	0.6	0.27	2.222	0.115	5.217
10	0.65	0.248	2.621	0.112	5.804

Table 5-2. ONS SSF-RLGM and Balance of Plant RLGM (5% Damping).

Frequency (Hz)	Acceleration SSF-RLGM (g)	Acceleration RLGM (g)
0.333	0.126	0.069
0.5	0.175	0.095
1	0.306	0.164
2	0.535	0.280
3	0.625	0.292
4	0.601	0.274
5	0.584	0.261
6	0.570	0.250
7	0.558	0.242
8	0.549	0.235
9	0.540	0.229
10	0.496	0.224
11	0.460	0.219
12	0.429	0.215
13	0.402	0.211
14	0.379	0.208
15	0.358	0.205
17.5	0.317	0.200
20	0.284	0.200
22.5	0.259	0.200
25	0.238	0.200
27.5	0.220	0.200
30	0.205	0.200
31	0.200	0.200
100	0.200	0.200

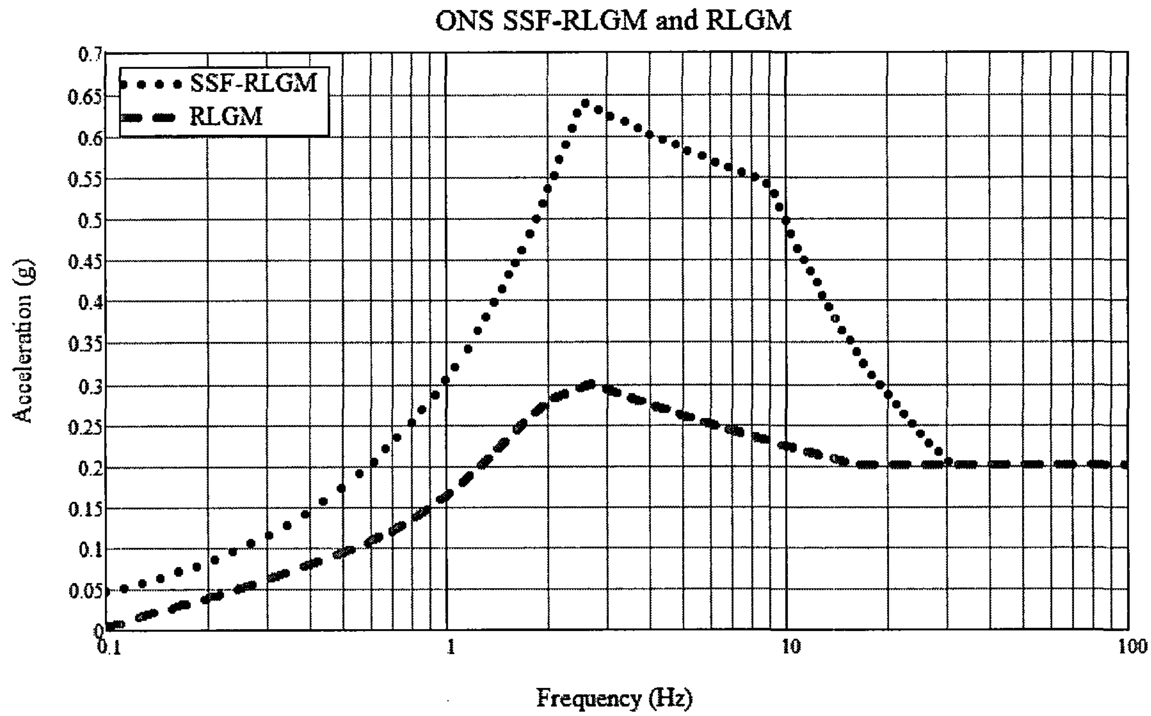


Figure 5-1. ONS SSF-RLGM and RLGM (5% Damping).

5.2 Method to Estimate In-Structure Response Spectra (ISRS)

ISRS for ESEP evaluation of components located outside the SSF were estimated by scaling the ONS design-basis SSE ISRS by the RLGM scale factor of 2.0.

Components inside the SSF were previously evaluated to the demand in ONS Calculation OSC-11188 [10], Attachment 3. The SSF component evaluations were performed to a higher demand than the SSF-RLGM and the existing evaluations meet the intent of the ESEP requirements and methodology.

6.0 Seismic Margin Evaluation Approach

It is necessary to demonstrate that ESEL items have sufficient seismic capacity to meet or exceed the demand characterized by the RLGM and SSF-RLGM. The seismic capacity is characterized as the peak ground acceleration (PGA) for which there is a high confidence of a low probability of failure (HCLPF). The PGA is associated with a specific spectral shape, in this case the 5%-damped RLGM spectral shape and SSF-RLGM special shape. The HCLPF capacity must be equal to or greater than the RLGM or SSF-RLGM PGA. The criteria for seismic capacity determination are given in Section 5 of EPRI 3002000704 [2].

There are two basic approaches for developing HCLPF capacities:

1. Deterministic approach using the conservative deterministic failure margin (CDFM) methodology of EPRI NP-6041-SL, A Methodology for Assessment of Nuclear Power Plant Seismic Margin (Revision 1) [7].
2. Probabilistic approach using the fragility analysis methodology of EPRI TR-103959, Methodology for Developing Seismic Fragilities [8].

6.1 Summary of Methodologies Used

Seismic capacity screening was done using information from the ONS Individual Plant Examination of External Events (IPEEE) submittal [9].

ONS used a SPRA to address the IPEEE. The SPRA is described in the IPEEE submittal.

ONS also performed a SMA in support of the SPRA and to comply with NUREG-1407 [5] and GL 88-20 Supplement 4 [6]. The SMA is described in ONS Calculation OSC-10225, Seismic PRA/IPEEE Backup Calculations [19]. The SMA consisted of screening walkdowns and anchorage calculations. As summarized in OSC-10225 [19], the SMA was based on the median spectral shape for rock sites from NUREG/CR-0098, Development of Criteria for Seismic Review of Selected Nuclear Power Plants [11]. The screening for the SMA was completed using the EPRI NP-6041-SL [7] screening criteria for 0.80g spectral acceleration relative to the ground motion spectrum. For a NUREG/CR-0098 [11] median spectral shape for rock sites, 0.80g peak spectral acceleration corresponds to 0.38g PGA. The components included in the SMA were also checked for anchorage HCLPF capacity exceeding 0.38g PGA using the CDFM methodology of EPRI NP-6041-SL [7]. A relay review was included in the Oconee Supplemental IPEEE Submittal Report [20]. Thus any component meeting the IPEEE SMA screening criteria has a HCLPF capacity exceeding 0.38g PGA based on the median NUREG-0098 [11] spectrum.

Figure 6-1 shows the mean NUREG/CR-0098 ground response spectrum (anchored at 0.38g) used as the RLE for the SMA, compared to the RLGM response spectrum. It is seen that the RLE envelopes the SSF-RLGM and RLGM at all frequencies greater than about 0.4 Hz. The RLE is slightly less than the RLGM at frequencies below about 0.4 Hz. This may be disregarded as there are no ONS ESEL items with natural frequencies in this frequency range. Component anchorages for ESEL components in the IPEEE which were not evaluated to the median NUREG/CR-0098 [11] rock site response spectrum anchored at 0.38g (e.g., Auxiliary Building Surrogate, Steam Generator Logic Cabinets) are also shown to have HCLPFs greater than the RLGM per ONS Calculation OSC-10225 [19], Attachment 2. Therefore, all of the ESEL components which were evaluated for IPEEE can be screened out from ESEP seismic capacity determination.

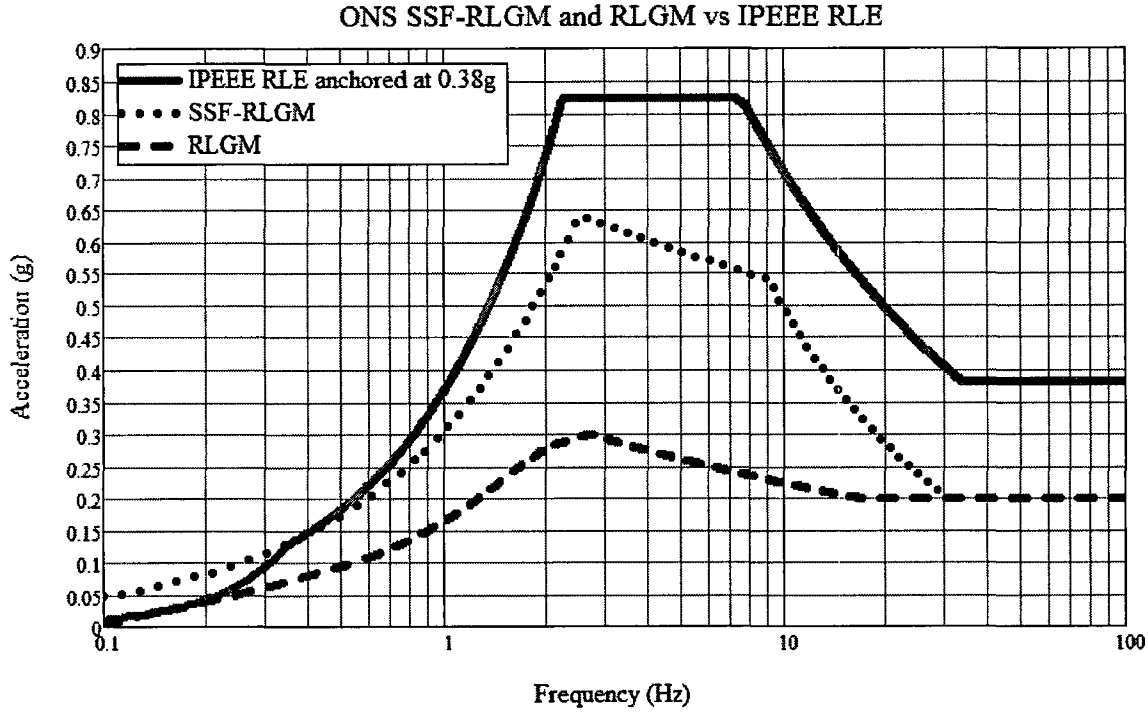


Figure 6-1. Comparison of ONS SSF-RLGM and RLGM vs. IPEEE RLE.

Duke Energy previously performed a seismic evaluation documented in ONS Calculation OSC-11188 [10], Attachment 3 for ONS. The seismic capacity evaluation used the CDFM HCLPF methodology of EPRI NP-6041-SL [7]. Included in the evaluation are all of the SSF ESEL components and several of the Auxiliary Building and Reactor Building ESEL components.

The seismic capacity evaluation [10] assesses the components to higher demands than the RLGM. Review of the evaluations for all of the components screened using the seismic capacity evaluation [10] were performed in order to verify that the SSF-RLGM and RLGM demands are bounded by the existing evaluation. Therefore, all of the ESEL components which were evaluated in the OSC-11188 [10], Attachment 3 are screened out from ESEP seismic capacity determination.

6.2 HCLPF Screening Process

The SMA was based on the RLE, which was anchored to 0.38g PGA. The RLE is equal to the SSF-RLGM and RLGM at frequencies above about 0.4 Hz. Therefore, any components whose SMA-based HCLPF exceeds the RLE can be screened out from HCLPF calculations. The screening tables in EPRI NP-6041-SL [7] are based on ground peak spectral accelerations of 0.8g and 1.2g. These both exceed the RLGM and SSF-RLGM peak spectral accelerations. The SMA anchorage capacity calculations were based on SSE floor response spectra scaled to the RLE, except for equipment in the Auxiliary Building for which new floor response spectra were generated for the RLE per ONS Calculation OSC-10225 [19]. Therefore ESEL components which were evaluated in the IPEEE SMA, met the screening caveats, and had anchorage capacity exceeding the RLE can be screened out from ESEP seismic capacity determination because the HCLPF capacity exceeds the RLGM.

The seismic capacity evaluation [10] assesses the components to higher demands than the RLGM. Based upon the explanation provided in Section 6.1, all of the ESEL components which were evaluated in OSC-11188 [10], Attachment 3 are screened out from ESEP seismic capacity determination.

The results of the existing evaluation capacity screening are noted in Appendix A for the Unit 1 ESEL, in Appendix B for the Unit 2 ESEL, in Appendix C for the Unit 3 ESEL, and Appendix D for the SSF ESEL. HCLPF capacities were determined for the components that were not screened out using the deterministic EPRI NP-6041-SL [7] CDFM methodology and RLGM/SSF-RLGM spectral shape and/or anchorage evaluations. HCLPF values for these components are included in Appendices A through D.

6.3 HCLPF Capacity Determination

HCLPF capacities were determined by evaluating the function, anchorage, and seismic interaction failure modes. HCLPF functional capacities were determined using the screening tables in EPRI NP-6041-SL [7]. HCLPF anchorage capacities were determined using the CDFM methodology in EPRI NP-6041-SL. HCLPF seismic interaction capacities were determined by walkdown screening.

6.4 Functional Capacity Screening Using EPRI NP-6041-SL

Components were screened against EPRI NP-6041-SL [7], Table 2 4. For components not located on the basemat of the Auxiliary Building or Reactor Buildings, the ISRS were used for the screening; therefore, the screening levels of EPRI NP-6041-SL were increased by a factor of 1.5 per EPRI 1019200, Seismic Fragility Applications Guide Update [17]. Thus, the accelerations for the screening levels were 1.2g and 1.8g instead of 0.8g and 1.2g.

The SSE ISRS were amplified by a factor of 2.0 throughout the frequency range and were then clipped (per EPRI 1019200), using the methodology in EPRI NP-6041-SL, Appendix Q, and the North-South and East-West clipped peaks were averaged.

6.5 Seismic Walkdown Approach

6.5.1 Walkdown Approach

Walkdowns were performed in accordance with the criteria provided in Section 5 of EPRI 3002000704 [2], which refers to EPRI NP-6041-SL [7] for the

SMA process. Pages 2-26 through 2-30 of EPRI NP-6041-SL describe the seismic walkdown criteria, including the following key criteria.

> *"The SRT [Seismic Review Team] should "walk by" 100% of all components which are reasonably accessible and in non-radioactive or low radioactive environments. Seismic capability assessment of components which are inaccessible, in high-radioactive environments, or possibly within contaminated containment, will have to rely more on alternate means such as photographic inspection, more reliance on seismic reanalysis, and possibly, smaller inspection teams and more hurried inspections. A 100% "walk by" does not mean complete inspection of each component, nor does it mean requiring an electrician or other technician to de-energize and open cabinets or panels for detailed inspection of all components. This walkdown is not intended to be a QA or QC review or a review of the adequacy of the component at the SSE level.*
>
> *If the SRT has a reasonable basis for assuming that the group of components are similar and are similarly anchored, then it is only necessary to inspect one component out of this group. The "similarity-basis" should be developed before the walkdown during the seismic capability preparatory work (Step 3) by reference to drawings, calculations or specifications. The one component or each type which is selected should be thoroughly inspected which probably does mean de-energizing and opening cabinets or panels for this very limited sample. Generally, a spare representative component can be found so as to enable the inspection to be performed while the plant is in operation. At least for the one component of each type which is selected, anchorage should be thoroughly inspected.*
>
> *The walkdown procedure should be performed in an ad hoc manner. For each class of components the SRT should look closely at the first items and compare the field configurations with the construction drawings and/or specifications. If a one-to-one correspondence is found, then subsequent items do not have to be inspected in as great a detail. Ultimately the walkdown becomes a "walk by" of the component class as the SRT becomes confident that the construction pattern is typical. This procedure for inspection should be repeated for each component class; although, during the actual walkdown the SRT may be inspecting several classes of components in parallel. If serious exceptions to the drawings or questionable construction practices are found then the system or component class must be inspected in closer detail until the systematic deficiency is defined.*
>
> *The 100% "walk by" is to look for outliers, lack of similarity, anchorage which is different from that shown on drawings or prescribed in*

criteria for that component, potential SI [Seismic Interaction[1]] problems, situations that are at odds with the team members' past experience, and any other areas of serious seismic concern. If any such concerns surface, then the limited sample size of one component of each type for thorough inspection will have to be increased. The increase in sample size which should be inspected will depend upon the number of outliers and different anchorages, etc., which are observed. It is up to the SRT to ultimately select the sample size since they are the ones who are responsible for the seismic adequacy of all elements which they screen from the margin review. Appendix D gives guidance for sampling selection."

6.5.2 Walkdowns and Walk-Bys

Many of the components were walked down previously during IPEEE evaluations and have documented Screening Evaluation Work Sheets (SEWS) recording the results. Credit is given to these walkdowns since they were performed by qualified Seismic Review Teams. A walk-by of these components was performed and documented. The primary objective of a walk-by is to verify that the component and/or anchorage has not degraded since the original walkdown and to verify that the component is free of interaction issues that may have developed since the original walkdown.

Walkdowns were performed on all ESEL components which were not previously walked down during the IPEEE and for some ESEL items which did not have a specific SEWS in the IPEEE documentation.

Masonry walls were evaluated as part of IPEEE and shown to meet the RLE demand; therefore, they also meet the RLGM demand. Proximity of masonry walls to ESEL components were noted on the SEWS forms. Masonry walls in proximity to ESEL equipment were verified to have been included in the IPEEE evaluation and determined to not be a credible failure mode for the ESEP.

6.5.3 Significant Walkdown Findings

All of the ESEL components were determined to have an existing capacity greater than the RLGM. No significant walkdown findings were observed.

6.6 HCLPF Calculation Process

ESEL items not included in the previous ONS IPEEE evaluations were evaluated using the criteria in EPRI NP-6041-SL [7]. The evaluations included the following steps:

[1] EPRI 3002000704 [2], page 5-4 limits the ESEP seismic interaction reviews to "nearby block walls" and "piping attached to tanks" which are reviewed "... to address the possibility of failures due to differential displacements." Other potential seismic interaction evaluations are "... deferred to the full seismic risk evaluations performed in accordance with EPRI 1025287 [15]."

- Performing seismic capability walkdowns for equipment not included in previous seismic walkdowns to evaluate the equipment installed plant conditions;
- Performing screening evaluations using the screening tables in EPRI NP-6041-SL as described in Section 6.2; and
- Performing HCLPF calculations considering various failure modes that include both structural failure modes (e.g., anchorage, load path, etc.) and functional failure modes.

All HCLPF calculations were performed using the CDFM methodology and are documented in ONS Calculation OSC-11188 [10], Attachment 6. HCLPF results and key failure modes for ESEL items not included in the previous ONS IPEEE evaluations are included in the ESEL tables in Appendices A, B, C, and D.

6.7 Functional Evaluations of Relays

Twenty-one relays in the ESEL associated with the FLEX Phase 1 response required functional evaluations. Each relay was evaluated using the SMA relay evaluation criteria in Section 3 of EPRI NP-6041-SL [7].

Specific seismic qualification test-based capacities were available for the relays in existing plant documentation. Relay capacity to demand evaluations were performed by comparing the test-based relay seismic capacities with the in-cabinet seismic demand. The in-cabinet demand was determined by scaling the ISRS by the in-cabinet amplification factors from EPRI NP-6041-SL [7], Appendix Q. In each case, the capacity exceeded the demand.

The relay functional evaluations are documented in ONS Calculation OSC-11188 [10], Attachment 3.

6.8 Tabulated ESEL HCLPF Values (Including Key Failure Modes)

Tabulated ESEL HCLPF values are provided in Appendix A for Unit 1, Appendix B for Unit 2, Appendix C for Unit 3, and Appendix D for the SSF. The following notes apply to the information in the tables:

- For items screened out using the IPEEE evaluations, the HCLPF value is provided as >RLGM and the failure mode is listed as "Screened per IPEEE."
- For items screened out using OSC-11188 [10], Attachment 3, the HCLPF value is provided as >RLGM and the failure mode is listed as "Screened per OSC-11188." The functional failure mode (as determined in OSC-11188 [10]) is also provided.
- For items screened out using EPRI NP-6041-SL [7] screening tables, the screening levels are provided as >RLGM and the failure mode is listed as "Screened per EPRI NP-6041."

- For items where interaction with masonry walls controls the HCLPF value, the HCLPF value is listed in the table and the failure mode is noted as "Interaction – Block Walls."
- For items where anchorage controls the HCLPF value, the HCLPF value is listed in the table and the failure mode is noted as "Anchorage."
- For items where component function controls the HCLPF value, the HCLPF value is listed in the table and the failure mode is noted as "Functional Failure."
- For items where relay function controls the HCLPF value, the HCLPF value is listed in the table and the failure mode is noted as "Relay Chatter."

7.0 Inaccessible Items

7.1 Identification of ESEL Items Inaccessible for Walkdowns

All ESEL items in Unit 1 were accessible for walkdowns.

All ESEL items in Unit 2 were accessible for walkdowns with the exception of three transmitters (2FDWLT0066, 2FDWLT0067, and 2RCLT0072). These three components were evaluated in OSC-11188 [10], Attachment 3 and meet the RLGM demand. However, these components were not walked down during the most recent Unit 2 outage. Based upon similarity to Units 1 and 3 and based upon the general lack of interaction issues found with transmitters in the Reactor Buildings, these components are judged as adequate without walkdown. Additionally, 2FDWLT0066 and the general area around it were included in the NTTF 2.3 seismic walkdowns.

All ESEL items in Unit 3 were accessible for walkdowns.

7.2 Planned Walkdown / Evaluation Schedule / Close Out

There are no additional components remaining to be walked down in Unit 1, Unit 2, Unit 3, or the SSF.

8.0 ESEP Conclusions and Results

8.1 Supporting Information

ONS has performed the ESEP as an interim action in response to the NRC's 50.54(f) letter [1]. It was performed using the methodologies in the NRC-endorsed guidance in EPRI 3002000704 [2].

The ESEP provides an important demonstration of seismic margin and expedites plant safety enhancements through evaluations and potential near-term modifications of plant equipment that can be relied upon to protect the reactor core following beyond design basis seismic events.

The ESEP is part of the overall ONS response to the NRC's 50.54(f) letter [1]. On March 12, 2014, Nuclear Energy Institute (NEI) submitted to the NRC results of a study [12] of seismic core damage risk estimates based on updated seismic hazard information as it applies to operating nuclear reactors in the Central and Eastern United States (CEUS). The study concluded that "... site-specific seismic hazards show that there [...] has not been an overall increase in seismic risk for the fleet of U.S. plants..." based on the re-evaluated seismic hazards. As such, the "... current seismic design of operating reactors continues to provide a safety margin to withstand potential earthquakes exceeding the seismic design basis."

The NRC's May 9, 2014, NTTF 2.1 Screening and Prioritization letter [14] concluded that the "... fleetwide seismic risk estimates are consistent with the approach and results used in the GI-199 safety/risk assessment." The letter also stated that "As a result, the staff has confirmed that the conclusions reached in GI-199 safety/risk assessment remain valid and that the plants can continue to operate while additional evaluations are conducted."

An assessment of the change in seismic risk for ONS was included in the fleet risk evaluation submitted in the March 12, 2014, NEI letter [12]; therefore, the conclusions in the NRC's May 9 letter [14] also apply to ONS.

In addition, the March 12, 2014, NEI letter [12] provided an attached "Perspectives on the Seismic Capacity of Operating Plants," which (1) assessed a number of qualitative reasons why the design of SSCs inherently contain margin beyond their design level, (2) discussed industrial seismic experience databases of performance of industry facility components similar to nuclear SSCs, and (3) discussed earthquake experience at operating plants.

The fleet of currently operating nuclear power plants was designed using conservative practices, such that the plants have significant margin to withstand large ground motions safely. This has been borne out for those plants that have actually experienced significant earthquakes. The seismic design process has inherent (and intentional) conservatisms which result in significant seismic margins within SSCs. These conservatisms are reflected in several key aspects of the seismic design process, including:

- Safety factors applied in design calculations;
- Damping values used in dynamic analysis of SSCs;
- Bounding synthetic time histories for ISRS calculations;
- Broadening criteria for ISRS;
- Response spectra enveloping criteria typically used in SSC analysis and testing applications;
- Response spectra based frequency domain analysis rather than explicit time history based time domain analysis;
- Bounding requirements in codes and standards;

- Use of minimum strength requirements of structural components (concrete and steel);
- Bounding testing requirements; and
- Ductile behavior of the primary materials (that is, not crediting the additional capacity of materials such as steel and reinforced concrete beyond the essentially elastic range, etc.).

These design practices combine to result in margins such that the SSCs will continue to fulfill their functions at ground motions well above the SSE.

The intent of the ESEP is to perform an interim action in response to the NRC's 50.54(f) letter [1] to demonstrate seismic margin through a review of a subset of the plant equipment that can be relied upon to protect the reactor core following beyond design basis seismic events. In order to complete the ESEP in an expedited amount of time, the RLGM used for the ESEP evaluation is a scaled version of the plant's SSE rather than the actual GMRS. To more fully characterize the risk impacts of the seismic ground motion represented by the GMRS on a plant specific basis, a more detailed seismic risk assessment (SPRA or risk-based SMA) is to be performed in accordance with EPRI 1025287 [15]. As identified in the ONS Seismic Hazard and GMRS submittal [4], ONS screens in for a risk evaluation. The complete risk evaluation will more completely characterize the probabilistic seismic ground motion input into the plant, the plant response to that probabilistic seismic ground motion input, and the resulting plant risk characterization. ONS will complete that evaluation in accordance with the schedule identified in NEI's letter dated April 9, 2013 [13] and endorsed by the NRC in their May 7, 2013 letter [16].

8.2 Identification of Planned Modifications

There are no required modifications at ONS to be made for components reviewed to date to enhance the seismic capacity of the plant.

8.3 Modification Implementation Schedule

There are no required modifications at ONS to be made for components reviewed to date to enhance the seismic capacity of the plant.

8.4 Summary of Planned Actions

There are no planned actions as a result of the ESEP.

9.0 References

1) Letter from NRC (E Leeds and M Johnson) to All Power Reactor Licensees et al., "Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Recommendations 2.1, 2.3 and 9.3 of the Near-Term Task Force Review of Insights from the Fukushima Dai-Ichi Accident," March 12, 2012.

2) Seismic Evaluation Guidance: Augmented Approach for the Resolution of Fukushima Near-Term Task Force Recommendation 2.1 – Seismic. EPRI, Palo Alto, CA, May 2013, 3002000704.

3) Letter from Scott L. Batson to U.S. Nuclear Regulatory Commission, "Duke Energy Carolinas, LLC (Duke Energy); Oconee Nuclear Station (ONS), Units 1, 2, and 3 Docket Nos. 50-269, 50-270, and 50-287, Renewed License Nos. DPR-38, DPR-47, and DPR-55; Response to March 12, 2012, Commission Order to Modify Licenses With Regard To Requirements for Mitigation Strategies for Beyond Design Basis External Events (Order EA-12-049)," dated February 28, 2013, Duke Energy, Seneca, SC.

4) Letter from Scott L. Batson to U.S. Nuclear Regulatory Commission, "Duke Energy Carolinas, LLC (Duke Energy); Oconee Nuclear Station (ONS), Units 1 and 2, Docket Nos. 50-269, 50-270, and 50-287, Renewed License Nos. DPR-38, DPR-47, and DPR-55; Seismic Hazard and Screening Report (CEUS Sites), Response to NRC 10 CFR 50.54(f) Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) regarding Recommendations 2.1, 2.3 and 9.3 of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident," dated March 31, 2014, Duke Energy, Seneca, SC.

5) Procedural and Submittal Guidance for the Individual Plant Examination of External Events (IPEEE) for Severe Accident Vulnerabilities, June 1991, Nuclear Regulatory Commission, NUREG-1407.

6) Nuclear Regulatory Commission, Generic Letter No. 88-20 Supplement 4, Individual Plant Examination of External Events (IPEEE) for Severe Accident Vulnerabilities – 10 CFR 50.54(f), June 1991.

7) A Methodology for Assessment of Nuclear Power Plant Seismic Margin, Rev. 1, August 1991, Electric Power Research Institute, Palo Alto, CA, EPRI NP-6041-SL.

8) Methodology for Developing Seismic Fragilities, August 1991, Electric Power Research Institute , Palo Alto, CA, 1994, EPRI TR-103959.

9) Oconee Nuclear Station Individual Plant Examination of External Events (IPEEE) Submittal Report, dated December 21, 1995, Duke Power, Seneca, SC.

10) Duke Energy Calculation OSC-11188, *ONS Fukushima NTTF 2.1 Seismic Vendor Support Documents for GMRS*, Revision 2, Duke Energy, Seneca, SC.

11) Development of Criteria for Seismic Review of Selected Nuclear Power Plants, published May 1978, Nuclear Regulatory Commission, NUREG/CR-0098.

12) Letter from A. Pietrangelo, Nuclear Energy Institute to D. Skeen of the USNRC, "Seismic Core Damage Risk Estimates Using the Updated Seismic Hazards for the Operating Nuclear Plants in the Central and Eastern United States," March 12, 2014.

13) Letter from A. Pietrangelo, Nuclear Energy Institute to D. Skeen of the USNRC, "Proposed Path Forward for NTTF Recommendation 2.1: Seismic Reevaluations," April 9, 2013.

14) Letter from NRC (E Leeds) to All Power Reactor Licensees, et al., "Screening and Prioritization Results Regarding Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(F) Regarding Seismic Hazard Re-Evaluations for Recommendation 2.1 of the Near-Term Task Force Review of Insights From the Fukushima Dai-Ichi Accident," May 9, 2014.

15) Seismic Evaluation Guidance: Screening, Prioritization and Implementation Details (SPID) for the Resolution of Fukushima Near-Term Task Force Recommendation 2.1: Seismic, EPRI, Palo Alto, CA, February 2013, 1025287.

16) Letter from NRC (E Leeds) to NEI (J Pollock), "Electric Power Research Institute Final Draft Report XXXXXX, "Seismic Evaluation Guidance: Augmented Approach for the Resolution of Fukushima Near-Term Task Force Recommendation 2.1: Seismic," as an Acceptable Alternative to the March 12, 2012, Information Request for Seismic Reevaluations," May 7, 2013.

17) Seismic Fragility Applications Guide Update, Electric Power Research Institute, Palo Alto, CA, December 2009, EPRI 1019200.

18) Augmented Approach for Resolution of Fukushima Near-Term Task Force Recommendation 2.1: Seismic – Determine Expedited Seismic Equipment List (ESEL), Duke Energy, Seneca, SC, Revision 0, OSC-11217.

19) Seismic PRA/IPEEE Backup Calculations, Duke Energy, Seneca, SC, Rev. 0, 2011, OSC-10225.

20) Letter from W. R. McCollum Jr. to U. S. Nuclear Regulatory Commission, "Oconee Nuclear Station, Docket Nos.: 50-269, -270, -287; Oconee Supplemental IPEEE Submittal Report," dated December 15, 1997, Duke Power, Seneca, SC.

21) Specification for the Seismic Displacements and Response Spectra for the Turbine, Auxiliary, Reactor, and Standby Shutdown Facility Buildings, Duke Energy, Seneca, SC, Rev. 8, 2005, OSS-027B.00-00-0002,

22) Letter from Scott L. Batson, Duke Energy to U.S. Nuclear Regulatory Commission, "Duke Energy Carolinas, LLC (Duke Energy); Oconee Nuclear Station (ONS), Unit Nos. 1, 2, and 3, Docket Nos. 50-269, 50-270, and 50-287, Renewed License Nos. DPR-38, DPR-47, and DPR-55; First Six-Month Status Report in Response to March 12, 2012 Commission Order Modifying Licenses With Regard to Requirements for Mitigation Strategies for Beyond-Design-basis External Events (Order Number EA-12-049)," dated August 29, 2013, Duke Energy, Seneca, SC.

23) Letter from Scott L. Batson, Duke Energy to U.S. Nuclear Regulatory Commission, "Duke Energy Carolinas, LLC (Duke Energy); Oconee Nuclear Station (ONS), Unit Nos. 1, 2, and 3, Docket Nos. 50-269, 50-270, and 50-287, Renewed License Nos. DPR-38, DPR-47, and DPR-55; "Second Six-Month Status Report in Response to March 12, 2012 Commission Order Modifying Licenses With Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049)," dated February 28, 2014, ONS-2014-029, Duke Energy, Seneca, SC.

24) Letter from Scott L. Batson, Duke Energy to U.S. Nuclear Regulatory Commission, "Duke Energy Carolinas, LLC (Duke Energy); Oconee Nuclear Station (ONS), Unit Nos. 1, 2, and 3, Docket Nos. 50-269, 50-270, and 50-287, Renewed License Nos. DPR-38, DPR-47, and DPR-55; Third Six-Month Status Report in Response to March 12, 2012 Commission Order Modifying Licenses With Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049)," dated August 27, 2014, Duke Energy, Seneca, SC.

Appendix A

ONS Unit 1 ESEL and HCLPF Results

ONS Unit 1 ESEL and HCLPF Results

ESEL ID	SYS	TYPE	NUMBER	EQUIPMENT NAME	BLDG	LOCATION	NORMAL STATE	DESIRED STATE	WALKDOWN OR WALK-BY	SEWS	HCLPF*	KEY FAILURE MODE**
1	BAG	BD	1UB1	U1 CONTROL RM UNIT BOARD 1UB1	AB	EL.822, COL.N73	Available	Available	Walk-by	OSC-8377, pg 2273-2277	0.25	Anchorage
2	BAG	BD	1UB2	U1 CONTROL RM UNIT BOARD 1UB2	AB	EL.822, COL.N73	Available	Available	Walk-by	OSC-8377, pg 2273-2277	0.25	Anchorage
3	BAG	BD	1VB2	CONTROL BOARD 1VB2	AB	EL.822, COL.P72	Available	Available	Walk-by	OSC-8377, pg 2281-2285	0.25	Anchorage
4	BAG	BD	1VB3	CONTROL BOARD 1VB3	AB	EL.822, COL.P72	Available	Available	Walk-by	OSC-8377, pg 2281-2285	0.25	Anchorage
5	BS	PT	0230	RB PRESSURE (POST-ACCIDENT MONITORING)	AB	EL.809, COL.Qa66	Available	Available	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
6	BS	PT	0231	RB PRESSURE (POST-ACCIDENT MONITORING)	AB	EL.809, COL.S70	Available	Available	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
7	CCW	FT	0225	SSF ASW FLOW	AB	EL.796, COL.X69A	Available	Available	Walk-by	OSC-8443, pg 191-195	>RLGM	Screened per OSC-11188 Interaction - Block Walls
8	EL	CA	SGLC1	STEAM GEN A & B LEVEL CONTROL CABINET SGLC-1	AB	EL.809, COL.S72	Available	Available	Walk-by	OSC-8377, pg 2102-2106	>RLGM	Screened per IPEEE
9	EL	MX	1XO	600/208 VOLT MOTOR CONTROL CENTER 1XO	AB	EL.796, COL.P72	Available	Available	Walk-by	OSC-8377, pg 2457-2461	>RLGM	Screened per IPEEE
10	EL	MX	1XP	600/208 VOLT MOTOR CONTROL CENTER 1XP	AB	EL.796, COL.Q72	Available	Available	Walk-by	OSC-8377, pg 2467-2470	>RLGM	Screened per IPEEE
11	EL	PL	1KVIA	120VAC VITAL INSTRUMENTATION PWR PANEL BOARD #1KVIA	AB	EL.809, COL.P72	Available	Available	Walk-by	OSC-8377, pg 1251-1254	>RLGM	Screened per IPEEE
12	EL	PL	1KVIB	120VAC VITAL INSTRUMENTATION PWR PANEL BOARD #1KVIB	AB	EL.809, COL.Q72	Available	Available	Walk-by	OSC-8377, pg 1255-1258	>RLGM	Screened per IPEEE
13	EL	PL	1KVIC	120VAC VITAL INSTRUMENTATION PWR PANEL BOARD #1KVIC	AB	EL.809, COL.Qa72	Available	Available	Walk-by	OSC-8377, pg 1259-1262	>RLGM	Screened per IPEEE
14	ICC	CA	0001A	ICC MONITORING SYSTEM TRAIN A CABINET	AB	EL.822, COL.Qa71	Available	Available	Walk-by	OSC-8377, pg 1141-1145	>RLGM	Screened per IPEEE

ONS Unit 1 ESEL and HCLPF Results

ESEL ID	SYS	TYPE	NUMBER	EQUIPMENT NAME	BLDG	LOCATION	NORMAL STATE	DESIRED STATE	WALKDOWN OR WALK-BY	SEWS	HCLPF*	KEY FAILURE MODE**
15	ICC	CA	0001B	ICC MONITORING SYSTEM TRAIN B CABINET	AB	EL.822, COL.Qa71	Available	Available	Walk-by	OSC-8377, pg 1146-1149	>RLGM	Screened per IPEEE
16	ICC	MI	ICCA	ICC TRAIN A ELECTRONICS PACKAGE	AB	EL.822, COL.Q72 (IN 1VB3)	Available	Available	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
17	ICC	MI	ICCB	ICC TRAIN B ELECTRONICS PACKAGE	AB	EL.822, COL.P72 (IN 1VB3)	Available	Available	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
18	LPI	TK	0001	BWST	AB	EL.796, YARD	Available	Available	Walk-by	OSC-8377, pg 1343-1345	>RLGM	Screened per OSC-11188 Anchorage
19	PPS	CA	0002	RPS A/ES A1	AB	EL 822, COL.R73	Available	Available	Walkdown	OSC-11188, Att. 6	0.21	Anchorage
20	PPS	CA	0006	RPS C/ES C1	AB	EL 822, COL.R73	Available	Available	Walkdown	OSC-11188, Att. 6	0.21	Anchorage
21	PSW	MX	1XPSW	1XPSW	AB	EL.783, COL.P63	Standby	Operating	Walkdown	OSC-11188, Att. 6	0.27	Anchorage
22	RC	PS	0453	HOT LEG A LVL TRANS HYD ISOLATOR 2	AB	EL.809, COL.R69	Available	Available	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
23	RC	PS	0457	RV HEAD B LVL TRANS HYD ISOLATOR 3	AB	EL.809, COL.R69	Available	Available	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
24	RC	PT	0244	WR RCS PRESSURE TRAIN A	AB	EL.809, COL.Q71	Available	Available	Walk-by	OSC-8377, pg 1934-1938	>RLGM	Screened per IPEEE
25	RC	PT	0245	WR RCS PRESSURE TRAIN B	AB	EL.809, COL.Q71	Available	Available	Walk-by	OSC-8377, pg 1939-1943	>RLGM	Screened per IPEEE
26	RPS	AF	NI1	NI-1 PRE AMPLIFIER	AB	EL.809, COL.Q72	Available	Available	Walkdown	OSC-11188, Att. 6	0.35	Anchorage
27	RPS	AF	NI2	RPS NI-2 PRE AMPLIFIER	AB	EL.809, COL.Q72	Available	Available	Walkdown	OSC-11188, Att. 6	0.35	Anchorage
28	CCW	VA	0269	A S/G FDW CONTROL	RB	EL.777, 350°, R45'	Closed	Throttled	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
29	CF	VA	0001	1A CFT OUTLET	RB	EL.777, 135°, R50'	Open	Closed	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
30	CF	VA	0002	1B CFT OUTLET	RB	EL.797, 35°, R50'	Open	Closed	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
31	FDW	LT	0066	S/G 1A LEVEL	RB	EL.777, 290°, R50'	Available	Available	Walkdown	OSC-11188, Att. 3	>RLGM	Screened per OSC-11188 Functional Failure

ONS Unit 1 ESEL and HCLPF Results

ESEL ID	SYS	TYPE	NUMBER	EQUIPMENT NAME	BLDG	LOCATION	NORMAL STATE	DESIRED STATE	WALKDOWN OR WALK-BY	SEWS	HCLPF*	KEY FAILURE MODE**
32	FDW	LT	0067	S/G 1B LEVEL	RB	EL.777, 100°, R50'	Available	Available	Walkdown	OSC-11188, Att. 3	>RLGM	Screened per OSC-11188 Functional Failure
33	FDW	VA	0347	1B S/G INLET BLOCK ON EMERG HDR	RB	EL.825, 90°, R40'	Open	Throttled	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
34	HP	VA	0003	1A L/D COOLER OUTLET (PENE #6)	RB	EL.777, 165°, R45'	Open	Closed	Walk-by	OSC-8377, pg 1094-1096	>RLGM	Screened per IPEEE
35	HP	VA	0004	1B L/D COOLER OUTLET (PENE #6)	RB	EL.777, 165°, R45'	Open	Closed	Walk-by	OSC-8377, pg 1097-1099	>RLGM	Screened per IPEEE
36	HP	VA	0020	RCP SEAL RETURN (PENE #7)	RB	EL.797, 300°, R55'	Open	Closed	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
37	HP	VA	0398	RC MAKEUP PUMP TO RCP SEALS BLOCK	RB	EL.777, 320°, R30'	Closed	Open	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
38	HP	VA	0426	RC LETDOWN TO SPENT FUEL POOL	RB	EL.777, 65°, R50'	Closed	Open	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
39	HP	VA	0428	RC LETDOWN RETURN ISO VLV	RB	EL.777, 15°, R50'	Closed	Open	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
40	HPI	PU	0005	U-1 SSF RC MAKEUP PUMP	RB	EL.777, 315°, R35'	Off	On	Walk-by	OSC-8377, pg 1038-1041	>RLGM	Screened per OSC-11188 Anchorage
41	MS	PT	0277	S/G B OUTLET STEAM PRESSURE TRAIN A	RB	EL.825, 110°, R50'	Available	Available	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
42	MS	PT	0278	S/G B OUTLET STEAM PRESSURE LOOP B	RB	EL.825, 70°, R50'	Available	Available	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
43	MS	PT	0279	S/G A OUTLET STEAM PRESSURE TRAIN A	RB	EL.825, 270°, R50'	Available	Available	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
44	MS	PT	0280	S/G A OUTLET STEAM PRESSURE LOOP B	RB	EL.825, 270°, R50'	Available	Available	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
45	RC	LT	0004P1	PZR LEVEL 1, TRAIN A HI/LO	RB	EL.797, 290°, R50'	Available	Available	Walk-by	OSC-8377, pg 1874-1878	>RLGM	Screened per IPEEE
46	RC	LT	0004P2	PZR LEVEL 2, TRAIN A HI/LO	RB	EL.797, 270°, R50'	Available	Available	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041

ONS Unit 1 ESEL and HCLPF Results

ESEL ID	SYS	TYPE	NUMBER	EQUIPMENT NAME	BLDG	LOCATION	NORMAL STATE	DESIRED STATE	WALKDOWN OR WALK-BY	SEWS	HCLPF*	KEY FAILURE MODE**
47	RC	LT	0004P3	PZR LEVEL 3, TRAIN B HI/LO	RB	EL.797, 250°, R50'	Available	Available	Walk-by	OSC-8377, pg 1879-1883	>RLGM	Screened per IPEEE
48	RC	LT	0072	U1 SSF PRESSURIZER LEVEL	RB	EL.797, 270°, R50'	Available	Available	Walkdown	OSC-11188, Att. 3	>RLGM	Screened per OSC-11188 Functional Failure
49	RC	PT	0225	U1 RC LOOP A PRESSURE	RB	EL.825, 270°, R50'	Available	Available	Walkdown	OSC-11188, Att. 3	>RLGM	Screened per OSC-11188 Functional Failure
50	RC	PT	0226	U1 RC LOOP B PRESSURE	RB	EL.825, 90°, R50'	Available	Available	Walkdown	OSC-11188, Att. 3	>RLGM	Screened per OSC-11188 Functional Failure
51	RC	RD	0005B	REACTOR COLD LEG 1A WR TEMP 2	RB	EL.797, 310°, R35'	Available	Available	Walkdown	OSC-11188, Att. 3	>RLGM	Screened per OSC-11188 Functional Failure
52	RC	RD	0006A	U1 REACTOR COLD LEG A WR TEMP 1	RB	EL.797, 260°, R30'	Available	Available	Walkdown	OSC-11188, Att. 3	>RLGM	Screened per OSC-11188 Functional Failure
53	RC	RD	0007B	REACTOR COLD LEG 1B WR TEMP 2	RB	EL.797, 50°, R35'	Available	Available	Walkdown	OSC-11188, Att. 3	>RLGM	Screened per OSC-11188 Functional Failure
54	RC	RD	0008A	REACTOR COLD LEG 1B WR TEMP 1	RB	EL.797, 100°, R30'	Available	Available	Walkdown	OSC-11188, Att. 3	>RLGM	Screened per OSC-11188 Functional Failure
55	RC	RD	0084A	REACTOR COOLANT LOOP A	RB	EL.844, 290°, R20'	Available	Available	Walkdown	OSC-11188, Att. 3	>RLGM	Screened per OSC-11188 Functional Failure
56	RC	RD	0084B	REACTOR COOLANT LOOP A	RB	EL.844, 290°, R20'	Available	Available	Walkdown	OSC-11188, Att. 3	>RLGM	Screened per OSC-11188 Functional Failure
57	RC	RD	0085A	REACTOR OUTLET LOOP B	RB	EL.844, 70°, R20'	Available	Available	Walkdown	OSC-11188, Att. 3	>RLGM	Screened per OSC-11188 Functional Failure
58	RC	RD	0085B	REACTOR OUTLET LOOP B	RB	EL.844, 70°, R20'	Available	Available	Walkdown	OSC-11188, Att. 3	>RLGM	Screened per OSC-11188 Functional Failure
59	RC	VA	0004	PZR POWER RELIEF BLOCK	RB	EL.844, 250°, R30'	Open	Closed	Walk-by	OSC-8377, pg 1980-1982	>RLGM	Screened per IPEEE
60	RC	VA	0066	PZR POWER RELIEF VALVE	RB	EL.844, 250°, R30'	Closed	Open	Walk-by	OSC-8377, pg 1992-1994	>RLGM	Screened per IPEEE
61	RC	VA	0155	1A OTSG HOT LEG VENT VALVE	RB	EL.825, 270°, R50'	Closed	Open	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041

ONS Unit 1 ESEL and HCLPF Results

ESEL ID	SYS	TYPE	NUMBER	EQUIPMENT NAME	BLDG	LOCATION	NORMAL STATE	DESIRED STATE	WALKDOWN OR WALK-BY	SEWS	HCLPF*	KEY FAILURE MODE**
62	RC	VA	0156	1A OTSG HOT LEG VENT BLOCK VALVE	RB	EL.825, 270°, R50'	Closed	Open	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
63	RC	VA	0157	1B HOT LEG VENT	RB	EL.825, 90°, R50'	Closed	Open	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
64	RC	VA	0158	1B HOT LEG VENT BLOCK	RB	EL.825, 90°, R50'	Closed	Open	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
65	RC	VA	0159	RX VESSEL HEAD VENT VLV 1RC-159	RB	EL.844, 75°, R50'	Closed	Open	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
66	RC	VA	0160	RX VESSEL HEAD VENT VLV 1RC-160	RB	EL.844, 75°, R50'	Closed	Open	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
67	SF	VA	0082	SFP TO RCMU PUMP BLK	RB	EL.777, 45°, R45'	Closed	Open	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
68	SF	VA	0097	SPENT FUEL POOL TO RC MAKEUP SUPPLY ISOLATION VALVE	RB	EL.777, 0°, R55'	Closed	Open	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041

*** HCLPF values of >RLGM indicate that the HCLPF exceeds the Review Level Ground Motion (0.20g), but that a specific HCLPF value was not calculated since the component was screened out from further evaluation.**

**** Key Failure Modes are defined as follows:**

Screened per IPEEE - Indicates that the component was evaluated in the IPEEE and therefore meets the RLGM demand.

Screened per OSC-11188 - Indicates that the component was evaluated in OSC-11188, Attachment 3 and therefore meets the RLGM demand. For this case, the Key Failure Mode(as determined in OSC-11188) is also reported.

Screened per EPRI NP-6041 - Indicates that the component meets the screening criteria of EPRI NP-6041, Table 2-4 and that neither anchorage, relay chatter, nor interactions limit the reported HCLPF.

Interaction - Block Walls - Indicates that the component is located near a block wall. The block wall was evaluated in IPEEE and therefore the block wall meets the RLGM demand. The functional and anchorage HCLPFs exceed the reported HCLPF value.

Anchorage - Indicates that anchorage is the governing failure mode for the component.

Functional Failure - Indicates that functional failure is the governing failure mode for the component.

Relay Chatter - Indicates that relay chatter is the governing failure mode for the component.

Appendix B

ONS Unit 2 ESEL and HCLPF Results

ONS Unit 2 ESEL and HCLPF Results

ESEL ID	SYS	TYPE	NUMBER	EQUIPMENT NAME	BLDG	LOCATION	NORMAL STATE	DESIRED STATE	WALKDOWN OR WALK-BY	SEWS	HCLPF*	KEY FAILURE MODE**
1	BAG	BD	2UB1	U2 CONTROL RM UNIT BOARD 2UB1	AB	EL.822, COL.N73	Available	Available	Walk-by	OSC-8377, pg 4604-4608	0.25	Anchorage
2	BAG	BD	2UB2	U2 CONTROL RM UNIT BOARD 2UB2	AB	EL.822, COL.N73	Available	Available	Walk-by	OSC-8377, pg 4604-4608	0.25	Anchorage
3	BAG	BD	2VB2	CONTROL BOARD 2VB2	AB	EL.822, COL.P74	Available	Available	Walk-by	OSC-8377, pg 4612-4616	0.25	Anchorage
4	BS	PT	0230	RB PRESSURE (POST-ACCIDENT MONITORING)	AB	EL.809, COL.S76	Available	Available	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
5	BS	PT	0231	RB PRESSURE (POST-ACCIDENT MONITORING)	AB	EL.809, COL.R81	Available	Available	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
6	CCW	FT	0225	SSF ASW FLOW	AB	EL.796, COL X76A	Available	Available	Walk-by	OSC-8443, pg 191-195	>RLGM	Screened per OSC-11188 Interaction - Block Walls
7	EL	CA	SGLC2	STEAM GEN A & B LEVEL CONTROL CABINET SGLC-2	AB	EL.809, COL.S75	Available	Available	Walk-by	OSC-8377, pg 4429-4432	>RLGM	Screened per IPEEE
8	EL	MX	2XO	600/208 VOLT MOTOR CONTROL CENTER 2XO	AB	EL.796, COL.P73	Available	Available	Walk-by	OSC-8377, pg 4754-4758	>RLGM	Screened per IPEEE
9	EL	MX	2XP	600/208 VOLT MOTOR CONTROL CENTER 2XP	AB	EL.796, COL.Q73	Available	Available	Walk-by	OSC-8377, pg 4764-4768	>RLGM	Screened per IPEEE
10	EL	PL	2KVIA	120VAC VITAL INSTRUMENTATION POWER PNLBD 2KVIA	AB	EL.809, COL.P74	Available	Available	Walk-by	OSC-8377, pg 3657-3660	>RLGM	Screened per IPEEE
11	EL	PL	2KVIB	120VAC VITAL INSTRUMENTATION POWER PNLBD 2KVIB	AB	EL.809, COL.Q74	Available	Available	Walk-by	OSC-8377, pg 3661-3664	>RLGM	Screened per IPEEE
12	EL	PL	2KVIC	120VAC VITAL INSTRUMENTATION POWER PNLBD 2KVIC	AB	EL.809, COL.Qa74	Available	Available	Walk-by	OSC-8377, pg 3665-3668	>RLGM	Screened per IPEEE
13	ICC	CA	0001A	ICC MONITORING SYSTEM TRAIN A CABINET	AB	EL.822, COL.P74	Available	Available	Walk-by	OSC-8377, pg 3557-3561	>RLGM	Screened per IPEEE
14	ICC	CA	0001B	ICC MONITORING SYSTEM TRAIN B CABINET	AB	EL.822, COL.P74	Available	Available	Walk-by	OSC-8377, pg 3562-3565	>RLGM	Screened per IPEEE

Attachment 1 to Letter ONS-2014-161

ONS Unit 2 ESEL and HCLPF Results

ESEL ID	SYS	TYPE	NUMBER	EQUIPMENT NAME	BLDG	LOCATION	NORMAL STATE	DESIRED STATE	WALKDOWN OR WALK-BY	SEWS	HCLPF*	KEY FAILURE MODE**
15	LPI	TK	0001	BWST	AB	EL.796, YARD	Available	Available	Walk-by	OSC-8377, pg 3744-3746	>RLGM	Screened per OSC-11188 Anchorage
16	PPS	CA	0002	RPS A/ES A1	AB	EL 822, COL.R73	Available	Available	Walkdown	OSC-11188, Att. 6	0.21	Anchorage
17	PPS	CA	0006	RPS C/ES C1	AB	EL 822, COL.R73	Available	Available	Walkdown	OSC-11188, Att. 6	0.21	Anchorage
18	PSW	MX	2XPSWA	2XPSWA	AB	EL.783, COL.Qa82	Standby	Operating	Walkdown	OSC-11188, Att. 6	0.29	Anchorage
19	RC	PS	0453	HOT LEG A LVL TRANS HYD ISOLATOR 2	AB	EL.809, COL.R77	Available	Available	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
20	RC	PS	0457	RV HEAD B LVL TRANS HYD ISOLATOR 3	AB	EL.809, COL.R77	Available	Available	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
21	RC	PT	0244	WR RCS PRESSURE TRAIN A	AB	EL.809, COL.Qa76	Available	Available	Walk-by	OSC-8377, pg 4272-4276	>RLGM	Screened per IPEEE
22	RC	PT	0245	WR RCS PRESSURE TRAIN B	AB	EL.809, COL.Q76	Available	Available	Walk-by	OSC-8377, pg 4277-4281	>RLGM	Screened per IPEEE
23	RPS	AF	NI1	NI-1 PRE AMPLIFIER	AB	EL.809, COL.P74	Available	Available	Walkdown	OSC-11188, Att. 6	0.35	Anchorage
24	RPS	AF	NI2	RPS NI-2 PRE AMPLIFIER	AB	EL.809, COL.P74	Available	Available	Walkdown	OSC-11188, Att. 6	0.35	Anchorage
25	CCW	VA	0269	A S/G FDW CONTROL	RB	EL.777, 350°, R45'	Closed	Throttled	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
26	CF	VA	0001	2A CFT OUTLET	RB	EL.777, 135°, R50'	Open	Closed	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
27	CF	VA	0002	2B CFT OUTLET	RB	EL.797, 35°, R50'	Open	Closed	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
28	FDW	LT	0066	S/G 2A LEVEL	RB	EL.777, 240°, R45'	Available	Available	Walkdown	None	>RLGM	Screened per OSC-11188 Functional Failure
29	FDW	LT	0067	S/G 2B LEVEL	RB	EL.777, 100°, R50'	Available	Available	Walkdown	None	>RLGM	Screened per OSC-11188 Functional Failure
30	FDW	VA	0347	2B S/G EFDW HDR (PENE #17) INLET BLK	RB	EL.825, 90°, R40'	Open	Throttled	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
31	HP	VA	0003	2A L/D COOLER OUTLET (PENE #6)	RB	EL.777, 165°, R45'	Open	Closed	Walk-by	OSC-8377, pg 3512-3514	>RLGM	Screened per IPEEE
32	HP	VA	0004	2B L/D COOLER OUTLET (PENE #6)	RB	EL.777, 165°, R45'	Open	Closed	Walk-by	OSC-8377, pg 3515-3517	>RLGM	Screened per IPEEE

ONS Unit 2 ESEL and HCLPF Results

ESEL ID	SYS	TYPE	NUMBER	EQUIPMENT NAME	BLDG	LOCATION	NORMAL STATE	DESIRED STATE	WALKDOWN OR WALK-BY	SEWS	HCLPF*	KEY FAILURE MODE**
33	HP	VA	0020	RCP SEAL RETURN (PENE #7)	RB	EL.797, 300°, R55'	Open	Closed	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
34	HP	VA	0398	RC MAKEUP PUMP TO RCP SEALS BLOCK	RB	EL.777, 320°, R30'	Closed	Open	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
35	HP	VA	0426	RC LETDOWN TO SPENT FUEL POOL	RB	EL.777, 65°, R50'	Closed	Open	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
36	HP	VA	0428	RC LETDOWN RETURN ISOLATION	RB	EL.777, 15°, R50'	Closed	Open	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
37	HPI	PU	0005	U-2 SSF RC MAKEUP PUMP	RB	EL.777, 315°, R35'	Off	On	Walk-by	OSC-8377, pg 3457-3460	>RLGM	Screened per OSC-11188 Anchorage
38	MS	PT	0277	S/G B OUTLET STEAM PRESSURE TRAIN A	RB	EL.825, 110°, R50'	Available	Available	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
39	MS	PT	0278	S/G B OUTLET STEAM PRESSURE LOOP B	RB	EL.825, 70°, R50'	Available	Available	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
40	MS	PT	0279	S/G A OUTLET STEAM PRESSURE TRAIN A	RB	EL.825, 240°, R50'	Available	Available	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
41	MS	PT	0280	S/G A OUTLET STEAM PRESSURE LOOP B	RB	EL.825, 270°, R50'	Available	Available	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
42	RC	LT	0004P1	PZR LEVEL TRAIN A HI/LO	RB	EL.797, 115°, R50'	Available	Available	Walk-by	OSC-8377, pg 4211-4215	>RLGM	Screened per IPEEE
43	RC	LT	0004P2	PZR LEVEL TRAIN A HI/LO	RB	EL.797, 90°, R50'	Available	Available	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
44	RC	LT	0004P3	PZR LEVEL TRAIN B HI/LO	RB	EL.797, 75°, R50'	Available	Available	Walk-by	OSC-8377, pg 4216-4220	>RLGM	Screened per IPEEE
45	RC	LT	0072	U2 SSF PRESSURIZER LEVEL	RB	EL.777, 70°, R50'	Available	Available	Walkdown	None	>RLGM	Screened per OSC-11188 Functional Failure
46	RC	PT	0225	U2 RC LOOP A PRESSURE	RB	EL.797, 270°, R50'	Available	Available	Walkdown	OSC-11188, Att. 3	>RLGM	Screened per OSC-11188 Functional Failure
47	RC	PT	0226	U2 RC LOOP B PRESSURE	RB	EL.825, 90°, R50'	Available	Available	Walkdown	OSC-11188, Att. 3	>RLGM	Screened per OSC-11188 Functional Failure
48	RC	RD	0005B	REACTOR COLD LEG 2A WR TEMP 2	RB	EL.797, 310°, R35'	Available	Available	Walkdown	OSC-11188, Att. 3	>RLGM	Screened per OSC-11188 Functional Failure

ONS Unit 2 ESEL and HCLPF Results

ESEL ID	SYS	TYPE	NUMBER	EQUIPMENT NAME	BLDG	LOCATION	NORMAL STATE	DESIRED STATE	WALKDOWN OR WALK-BY	SEWS	HCLPF*	KEY FAILURE MODE**
49	RC	RD	0006A	REACTOR COLD LEG 2A WR TEMP 1	RB	EL.797, 260°, R30'	Available	Available	Walkdown	OSC-11188, Att. 3	>RLGM	Screened per OSC-11188 Functional Failure
50	RC	RD	0007B	REACTOR COLD LEG 2B WR TEMP 2	RB	EL.797, 50°, R35'	Available	Available	Walkdown	OSC-11188, Att. 3	>RLGM	Screened per OSC-11188 Functional Failure
51	RC	RD	0008A	REACTOR COLD LEG 2B WR TEMP 1	RB	EL.797, 100°, R30'	Available	Available	Walkdown	OSC-11188, Att. 3	>RLGM	Screened per OSC-11188 Functional Failure
52	RC	RD	0084A	REACTOR COOLANT LOOP A	RB	EL.844, 290°, R20'	Available	Available	Walkdown	OSC-11188, Att. 3	>RLGM	Screened per OSC-11188 Functional Failure
53	RC	RD	0084B	REACTOR COOLANT LOOP A	RB	EL.844, 290°, R20'	Available	Available	Walkdown	OSC-11188, Att. 3	>RLGM	Screened per OSC-11188 Functional Failure
54	RC	RD	0085A	REACTOR OUTLET LOOP B	RB	EL.844, 70°, R20'	Available	Available	Walkdown	OSC-11188, Att. 3	>RLGM	Screened per OSC-11188 Functional Failure
55	RC	RD	0085B	REACTOR OUTLET LOOP B	RB	EL.844, 70°, R20'	Available	Available	Walkdown	OSC-11188, Att. 3	>RLGM	Screened per OSC-11188 Functional Failure
56	RC	VA	0004	PZR POWER RELIEF BLOCK	RB	EL.844, 110°, R30'	Open	Closed	Walk-by	OSC-8377, pg 4317-4319	>RLGM	Screened per IPEEE
57	RC	VA	0066	PZR POWER RELIEF VALVE	RB	EL.844, 110°, R30'	Open	Closed	Walk-by	OSC-8377, pg 4329-4331	>RLGM	Screened per IPEEE
58	RC	VA	0155	2A HOT LEG VENT	RB	EL.825, 270°, R50'	Closed	Open	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
59	RC	VA	0156	2A HOT LEG VENT BLOCK	RB	EL.825, 270°, R50'	Closed	Open	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
60	RC	VA	0157	2B HOTLEG VENT	RB	EL.825, 90°, R50'	Closed	Open	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
61	RC	VA	0158	2B HOTLEG VENT BLOCK	RB	EL.825, 90°, R50'	Closed	Open	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
62	RC	VA	0159	RX VESSEL HEAD VENT VLV 2RC-159	RB	EL.844, 90°, R50'	Closed	Open	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
63	RC	VA	0160	RX VESSEL HEAD VENT VLV 2RC-160	RB	EL.844, 90°, R50'	Closed	Open	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
64	SF	VA	0082	SFP TO RC M/U PUMP BLOCK	RB	EL.777, 45°, R45'	Closed	Open	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
65	SF	VA	0097	SFP TO RC M/U PUMP BLOCK	RB	EL.777, 0°, R55'	Closed	Open	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041

ONS Unit 2 ESEL and HCLPF Results

ESEL ID	SYS	TYPE	NUMBER	EQUIPMENT NAME	BLDG	LOCATION	NORMAL STATE	DESIRED STATE	WALKDOWN OR WALK-BY	SEWS	HCLPF*	KEY FAILURE MODE**

* HCLPF values of >RLGM indicate that the HCLPF exceeds the Review Level Ground Motion (0.20g), but that a specific HCLPF value was not calculated since the component was screened out from further evaluation.

** Key Failure Modes are defined as follows:

Screened per IPEEE - Indicates that the component was evaluated in the IPEEE and therefore meets the RLGM demand.

Screened per OSC-11188 - Indicates that the component was evaluated in OSC-11188, Attachment 3 and therefore meets the RLGM demand. For this case, the Key Failure Mode(as determined in OSC-11188) is also reported.

Screened per EPRI NP-6041 - Indicates that the component meets the screening criteria of EPRI NP-6041, Table 2-4 and that neither anchorage, relay chatter, nor interactions limit the reported HCLPF.

Interaction - Block Walls - Indicates that the component is located near a block wall. The block wall was evaluated in IPEEE and therefore the block wall meets the RLGM demand. The functional and anchorage HCLPFs exceed the reported HCLPF value.

Anchorage - Indicates that anchorage is the governing failure mode for the component.

Functional Failure - Indicates that functional failure is the governing failure mode for the component.

Relay Chatter - Indicates that relay chatter is the governing failure mode for the component.

Appendix C

ONS Unit 3 ESEL and HCLPF Results

ONS Unit 3 ESEL and HCLPF Results

ESEL ID	SYS	TYPE	NUMBER	EQUIPMENT NAME	BLDG	LOCATION	NORMAL STATE	DESIRED STATE	WALKDOWN OR WALK-BY	SEWS	HCLPF*	KEY FAILURE MODE**
1	BAG	BD	3UB1	U3 CONTROL RM UNIT BOARD 3UB1	AB	EL.822, COL.N89	Available	Available	Walk-by	OSC-8377, pg 6792-6796	0.25	Anchorage
2	BAG	BD	3UB2	U3 CONTROL RM UNIT BOARD 3UB2	AB	EL.822, COL.N89	Available	Available	Walk-by	OSC-8377, pg 6792-6796	0.25	Anchorage
3	BAG	BD	3VB3	CONTROL BOARD 3VB3	AB	EL.822, COL.P89	Available	Available	Walk-by	OSC-8377, pg 6797-6801	0.25	Anchorage
4	BS	PT	0230	RB PRESSURE (POST-ACCIDENT MONITORING)	AB	EL.809, COL.S81	Available	Available	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
5	BS	PT	0231	RB PRESSURE (POST-ACCIDENT MONITORING)	AB	EL.809, COL.R96	Available	Available	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
6	CCW	FT	0225	SSF ASW FLOW	AB	EL.796, COL.X91A	Available	Available	Walk-by	OSC-8443, pg 202-206	>RLGM	Screened per OSC-11188 Interaction - Block Walls
7	EL	CA	SGLC3	STEAM GEN A & B LEVEL CONTROL CABINET SGLC-3	AB	EL.809, COL.N91	Available	Available	Walk-by	OSC-8377, pg 6641-6644	>RLGM	Screened per IPEEE
8	EL	MX	3XO	600/208 VOLT MOTOR CONTROL CENTER 3XO	AB	EL.796, COL.Qa90	Available	Available	Walk-by	OSC-8377, pg 6940-6945	>RLGM	Screened per IPEEE
9	EL	MX	3XP	600/208 VOLT MOTOR CONTROL CENTER 3XP	AB	EL.796, COL.Qa90	Available	Available	Walk-by	OSC-8377, pg 6951-6955	>RLGM	Screened per IPEEE
10	EL	PL	3KVIA	120VAC VITAL INSTRUMENTATION PWR PNLBD	AB	EL.809, COL.P88	Available	Available	Walk-by	OSC-8377, pg 5850-5853	>RLGM	Screened per IPEEE
11	EL	PL	3KVIB	120VAC VITAL INSTRUMENTATION PWR PNLBD	AB	EL.809, COL.Q88	Available	Available	Walk-by	OSC-8377, pg 5854-5857	>RLGM	Screened per IPEEE
12	EL	PL	3KVIC	AC VITAL BUS PWR PNL	AB	EL.809, COL.Qa88	Available	Available	Walk-by	OSC-8377, pg 5858-5861	>RLGM	Screened per IPEEE
13	ICC	CA	0001A	ICC MONITORING SYSTEM TRAIN A CABINET	AB	EL.822, COL.S89	Available	Available	Walk-by	OSC-8377, pg 5739-5742	>RLGM	Screened per IPEEE
14	ICC	CA	0001B	ICC MONITORING SYSTEM TRAIN B CABINET	AB	EL.822, COL.S88	Available	Available	Walk-by	OSC-8377, pg 5743-5746	>RLGM	Screened per IPEEE
15	LPI	TK	0001	BWST	AB	EL.796, YARD	Available	Available	Walk-by	OSC-8377, pg 5928-5930	>RLGM	Screened per OSC-11188 Anchorage

ONS Unit 3 ESEL and HCLPF Results

ESEL ID	SYS	TYPE	NUMBER	EQUIPMENT NAME	BLDG	LOCATION	NORMAL STATE	DESIRED STATE	WALKDOWN OR WALK-BY	SEWS	HCLPF*	KEY FAILURE MODE**
16	PPS	CA	0002	RPS A/ES A1	AB	EL.822, COL.Qa89	Available	Available	Walkdown	OSC-11188, Att. 6	0.21	Anchorage
17	PPS	CA	0006	RPS C/ES C1	AB	EL.822, COL.Qa88	Available	Available	Walkdown	OSC-11188, Att. 6	0.21	Anchorage
18	PSW	MX	3XPSW	3XPSW	AB	EL.783, COL.Qa97	Standby	Operating	Walkdown	OSC-11188, Att. 6	0.27	Anchorage
19	RC	PS	0453	HOT LEG A LVL TRANS HYD ISOLATOR 2	AB	EL.809, COL.R92	Available	Available	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
20	RC	PS	0457	RV HEAD B LVL TRANS HYD ISOLATOR 3	AB	EL.809, COL.R92	Available	Available	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
21	RC	PT	0244	WR RCS PRESSURE TRAIN A	AB	EL.809, COL.R90	Available	Available	Walk-by	OSC-8377, pg 6483-6487	>RLGM	Screened per IPEEE
22	RC	PT	0245	WR RCS PRESSURE TRAIN B	AB	EL.809, COL.Qa90	Available	Available	Walk-by	OSC-8377, pg 6488-6492	>RLGM	Screened per IPEEE
23	RPS	AF	NI1	NI-1 PRE AMPLIFIER CHANNEL A	AB	EL.809, COL.S89	Available	Available	Walkdown	OSC-11188, Att. 6	0.35	Anchorage
24	RPS	AF	NI2	RPS NI-2 PRE AMPLIFIER	AB	EL.809, COL.R88	Available	Available	Walkdown	OSC-11188, Att. 6	0.35	Anchorage
25	CCW	VA	0269	3A S/G FDW CONTROL	RB	EL.777, 350°, R45'	Closed	Throttled	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
26	CF	VA	0001	3A CFT OUTLET	RB	EL.777, 135°, R50'	Open	Closed	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
27	CF	VA	0002	3B CFT OUTLET	RB	EL.797, 35°, R50'	Open	Closed	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
28	FDW	LT	0066	S/G 3A LEVEL	RB	EL.777, 270°, R50'	Available	Available	Walkdown	OSC-11188, Att. 3	>RLGM	Screened per OSC-11188 Functional Failure
29	FDW	LT	0067	S/G 3B LEVEL	RB	EL.777, 100°, R50'	Available	Available	Walkdown	OSC-11188, Att. 3	>RLGM	Screened per OSC-11188 Functional Failure
30	FDW	VA	0347	3B S/G EMERG HDR PENE (#17) INLET BLOCK	RB	EL.825, 90°, R40'	Open	Throttled	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
31	HP	VA	0003	3A L/D COOLER OUTLET (PENE #6)	RB	EL.777, 165°, R45'	Open	Closed	Walk-by	OSC-8377, pg 5697-5699	>RLGM	Screened per IPEEE
32	HP	VA	0004	3B L/D COOLER OUTLET (PENE #6)	RB	EL.777, 165°, R45'	Open	Closed	Walk-by	OSC-8377, pg 5700-5702	>RLGM	Screened per IPEEE
33	HP	VA	0020	RCP SEAL RETURN (PENE #7)	RB	EL.797, 300°, R55'	Open	Closed	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041

ONS Unit 3 ESEL and HCLPF Results

ESEL ID	SYS	TYPE	NUMBER	EQUIPMENT NAME	BLDG	LOCATION	NORMAL STATE	DESIRED STATE	WALKDOWN OR WALK-BY	SEWS	HCLPF*	KEY FAILURE MODE**
34	HP	VA	0398	RC MAKEUP PUMP TO RCP SEALS BLOCK	RB	EL.777, 320°, R30'	Closed	Open	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
35	HP	VA	0426	RC LETDOWN TO SPENT FUEL POOL	RB	EL.777, 65°, R50'	Closed	Open	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
36	HP	VA	0428	RC LETDOWN RETURN ISOLATION	RB	EL.777, 15°, R50'	Closed	Open	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
37	HPI	PU	0005	U-3 SSF RC MAKEUP PUMP	RB	EL.777, 315°, R35'	Off	On	Walk-by	OSC-8377, pg 5683-5687	>RLGM	Screened per OSC-11188 Anchorage
38	MS	PT	0277	SG B OTLT STM PRESS TRAIN A	RB	EL.825, 110°, R50'	Available	Available	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
39	MS	PT	0278	SG B OTLT STEAM PRESSURE LOOP B	RB	EL.825, 70°, R50'	Available	Available	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
40	MS	PT	0279	SG A OTLT STM PRESS TRAIN A	RB	EL.825, 240°, R50'	Available	Available	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
41	MS	PT	0280	SG A OTLT STEAM PRESSURE LOOP B	RB	EL.825, 270°, R50'	Available	Available	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
42	RC	LT	0004P1	PZR LEVEL 1 TRAIN A HI/LO	RB	EL.797, 115°, R50'	Available	Available	Walk-by	OSC-8377, pg 6423-6427	>RLGM	Screened per IPEEE
43	RC	LT	0004P2	PZR LEVEL 2 TRAIN A HI/LO	RB	EL.797, 90°, R50'	Available	Available	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
44	RC	LT	0004P3	PZR LEVEL 3 TRAIN B HI/LO	RB	EL.797, 75°, R50'	Available	Available	Walk-by	OSC-8377, pg 6428-6432	>RLGM	Screened per IPEEE
45	RC	LT	0072	U3 SSF PRESSURIZER LEVEL	RB	EL.777, 70°, R50'	Available	Available	Walkdown	OSC-11188, Att. 3	>RLGM	Screened per OSC-11188 Functional Failure
46	RC	PT	0225	U3 RC LOOP A PRESSURE	RB	EL.797, 270°, R50'	Available	Available	Walkdown	OSC-11188, Att. 3	>RLGM	Screened per OSC-11188 Functional Failure
47	RC	PT	0226	U3 RC LOOP B PRESSURE	RB	EL.825, 90°, R50'	Available	Available	Walkdown	OSC-11188, Att. 3	>RLGM	Screened per OSC-11188 Functional Failure
48	RC	RD	0005B	REACTOR COLD LEG 3A WR TEMP 2	RB	EL.797, 310°, R35'	Available	Available	Walkdown	OSC-11188, Att. 3	>RLGM	Screened per OSC-11188 Functional Failure
49	RC	RD	0006A	U3 REACTOR COLD LEG A WR TEMP 1	RB	EL.797, 260°, R30'	Available	Available	Walkdown	OSC-11188, Att. 3	>RLGM	Screened per OSC-11188 Functional Failure

ONS Unit 3 ESEL and HCLPF Results

ESEL ID	SYS	TYPE	NUMBER	EQUIPMENT NAME	BLDG	LOCATION	NORMAL STATE	DESIRED STATE	WALKDOWN OR WALK-BY	SEWS	HCLPF*	KEY FAILURE MODE**
50	RC	RD	0007B	REACTOR COLD LEG 3B WR TEMP 2	RB	EL.797, 50°, R35'	Available	Available	Walkdown	OSC-11188, Att. 3	>RLGM	Screened per OSC-11188 Functional Failure
51	RC	RD	0008A	REACTOR COLD LEG 3B WR TEMP 1	RB	EL.797, 100°, R30'	Available	Available	Walkdown	OSC-11188, Att. 3	>RLGM	Screened per OSC-11188 Functional Failure
52	RC	RD	0084A	REACTOR COOLANT LOOP A	RB	EL.844, 290°, R20'	Available	Available	Walkdown	OSC-11188, Att. 3	>RLGM	Screened per OSC-11188 Functional Failure
53	RC	RD	0084B	REACTOR COOLANT LOOP A	RB	EL.844, 290°, R20'	Available	Available	Walkdown	OSC-11188, Att. 3	>RLGM	Screened per OSC-11188 Functional Failure
54	RC	RD	0085A	REACTOR OUTLET LOOP B	RB	EL.844, 70°, R20'	Available	Available	Walkdown	OSC-11188, Att. 3	>RLGM	Screened per OSC-11188 Functional Failure
55	RC	RD	0085B	RC HOT LEG B WR TEMP	RB	EL.844, 70°, R20'	Available	Available	Walkdown	OSC-11188, Att. 3	>RLGM	Screened per OSC-11188 Functional Failure
56	RC	VA	0004	PZR POWER RELIEF BLOCK	RB	EL.844, 110°, R30'	Open	Closed	Walk-by	OSC-8377, pg 6529-6531	>RLGM	Screened per IPEEE
57	RC	VA	0066	PZR POWER RELIEF VALVE	RB	EL.844, 110°, R30'	Open	Closed	Walk-by	OSC-8377, pg 6541-6543	>RLGM	Screened per IPEEE
58	RC	VA	0155	3A HOT LEG VENT	RB	EL.825, 270°, R50'	Closed	Open	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
59	RC	VA	0156	3A HOT LEG VENT BLOCK	RB	EL.825, 270°, R50'	Closed	Open	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
60	RC	VA	0157	3B HOT LEG VENT	RB	EL.825, 90°, R50'	Closed	Open	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
61	RC	VA	0158	3B HOT LEG VENT BLOCK	RB	EL.825, 90°, R50'	Closed	Open	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
62	RC	VA	0159	RX VESSEL HEAD VENT	RB	EL.844, 90°, R50'	Closed	Open	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
63	RC	VA	0160	RX VESSEL HEAD VENT	RB	EL.844, 90°, R50'	Closed	Open	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
64	SF	VA	0082	SFP TO RC M/U PUMP BLOCK	RB	EL.777, 45°, R45'	Closed	Open	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041
65	SF	VA	0097	SFP TO RC M/U PUMP BLOCK	RB	EL.777, 0°, R55'	Closed	Open	Walkdown	OSC-11188, Att. 6	>RLGM	Screened per EPRI NP-6041

ONS Unit 3 ESEL and HCLPF Results

ESEL ID	SYS	TYPE	NUMBER	EQUIPMENT NAME	BLDG	LOCATION	NORMAL STATE	DESIRED STATE	WALKDOWN OR WALK-BY	SEWS	HCLPF*	KEY FAILURE MODE**

* *HCLPF values of >RLGM indicate that the HCLPF exceeds the Review Level Ground Motion (0.20g), but that a specific HCLPF value was not calculated since the component was screened out from further evaluation.*

** Key Failure Modes are defined as follows:

Screened per IPEEE - Indicates that the component was evaluated in the IPEEE and therefore meets the RLGM demand.

Screened per OSC-11188 - Indicates that the component was evaluated in OSC-11188, Attachment 3 and therefore meets the RLGM demand. For this case, the Key Failure Mode(as determined in OSC-11188) is also reported.

Screened per EPRI NP-6041 - Indicates that the component meets the screening criteria of EPRI NP-6041, Table 2-4 and that neither anchorage, relay chatter, nor interactions limit the reported HCLPF.

Interaction - Block Walls - Indicates that the component is located near a block wall. The block wall was evaluated in IPEEE and therefore the block wall meets the RLGM demand. The functional and anchorage HCLPFs exceed the reported HCLPF value.

Anchorage - Indicates that anchorage is the governing failure mode for the component.

Functional Failure - Indicates that functional failure is the governing failure mode for the component.

Relay Chatter - Indicates that relay chatter is the governing failure mode for the component.

Appendix D

ONS SSF ESEL and HCLPF Results

ONS SSF ESEL and HCLPF Results

ESEL ID	UNIT	SYS	TYPE	NUMBER	EQUIPMENT NAME	LOCATION	NORMAL STATE	DESIRED STATE	WALKDOWN OR WALK-BY	SEWS	HCLPF*	KEY FAILURE MODE**
1	0	CCW	CD	0001	SSF HVAC CONDENSER 1	EL.817, COL.E16	Off	On	Walk-by	OSC-8377, pg 3-7	>RLGM	Screened per OSC-11188 Anchorage
2	0	CCW	CD	0002	SSF HVAC CONDENSER 2	EL.817, COL.E16	Off	On	Walk-by	OSC-8377, pg 8-11	>RLGM	Screened per OSC-11188 Anchorage
3	0	CCW	FT	0072	SSF HVAC SERV WTR PMP FLOW	EL.797, COL.D16	Available	Available	Walkdown	OSC-11188, Att. 3	>RLGM	Screened per OSC-11188 Screened per EPRI NP-6041
4	0	CCW	PU	0002	SSF ASW PUMP	EL.754, COL.E17	Off	On	Walk-by	OSC-8377, pg 16-19	>RLGM	Screened per OSC-11188 Screened per EPRI NP-6041
5	0	CCW	PU	0004	HVAC SERVICE WTR PUMP 2	EL.754, COL.D16	Off	On	Walk-by	OSC-8377, pg 24-27	>RLGM	Screened per OSC-11188 Screened per EPRI NP-6041
6	0	CCW	PU	0005	DIESEL ENGINE SERVICE WATER PUMP	EL.754, COL.E16	Off	On	Walk-by	OSC-8377, pg 28-31	>RLGM	Screened per OSC-11188 Screened per EPRI NP-6041
7	0	CCW	VA	0277	HVAC CONDENSER 2 3-WAY INLET	EL.817, COL.E16	Throttled	Throttled	Walkdown	OSC-11188, Att. 3	>RLGM	Screened per OSC-11188 Screened per EPRI NP-6041
8	0	CCW	VA	0280	HVAC CONDENSER 1 3-WAY INLET	EL.817, COL.E16	Throttled	Throttled	Walkdown	OSC-11188, Att. 3	>RLGM	Screened per OSC-11188 Screened per EPRI NP-6041
9	0	DA	TK	000A	DIESEL STARTING AIR TANK A	EL.777, COL.F10	Available	Available	Walk-by	OSC-8443, pg 525	>RLGM	Screened per OSC-11188 Screened per EPRI NP-6041
10	0	DA	TK	000B	DIESEL STARTING AIR TANK B	EL.777, COL.F10	Available	Available	Walk-by	OSC-8443, pg 525	>RLGM	Screened per OSC-11188 Screened per EPRI NP-6041
11	0	DA	TK	000C	DIESEL STARTING AIR TANK C	EL.777, COL.F10	Available	Available	Walk-by	OSC-8443, pg 525	>RLGM	Screened per OSC-11188 Screened per EPRI NP-6041
12	0	DA	TK	000D	DIESEL STARTING AIR TANK D	EL.777, COL.F10	Available	Available	Walk-by	OSC-8443, pg 525	>RLGM	Screened per OSC-11188 Screened per EPRI NP-6041
13	0	DJW	HX	000A	A DIESEL ENGINE JACKET WATER COOLER	EL.777, COL.E10	Available	Available	Walk-by	OSC-8377, pg 32-34	>RLGM	Screened per OSC-11188 Screened per EPRI NP-6041
14	0	DJW	HX	000B	B DIESEL ENGINE JACKET WATER COOLER	EL.777, COL.E13	Available	Available	Walk-by	OSC-8377, pg 35-37	>RLGM	Screened per OSC-11188 Screened per EPRI NP-6041
15	0	EL	LX	DCSF	125VDC DISTRIBUTION CENTER DCSF	EL.777, COL.F15	Available	Available	Walkdown	OSC-11188, Att. 3	>RLGM	Screened per OSC-11188 Screened per EPRI NP-6041

ONS SSF ESEL and HCLPF Results

ESEL ID	UNIT	SYS	TYPE	NUMBER	EQUIPMENT NAME	LOCATION	NORMAL STATE	DESIRED STATE	WALKDOWN OR WALK-BY	SEWS	HCLPF*	KEY FAILURE MODE**
16	0	EL	PL	DCSF	125 VDC POWER PNL BRD DCSF	EL.777, COL.E15	Available	Available	Walk-by	OSC-8443, pg 530-533	>RLGM	Screened per OSC-11188 Screened per EPRI NP-6041
17	0	EL	PL	DCSF1	125 VDC DISTRIBUTION CENTER DCSF-1	EL.777, COL.F11	Available	Available	Walk-by	OSC-8443, pg 534-537	>RLGM	Screened per OSC-11188 Screened per EPRI NP-6041
18	0	EL	PL	KSF	208/120VAC SSF VITAL PWR PNL (GRAY)	EL.777, COL.D16	Available	Available	Walk-by	OSC-8443, pg 538-542	>RLGM	Screened per OSC-11188 Screened per EPRI NP-6041
19	0	EL	PL	KSFC	120VAC VITAL CONTROL PWR PNLBD KSFC	EL.777, COL.D14	Available	Available	Walk-by	OSC-8377, pg 7223-26	>RLGM	Screened per OSC-11188 Screened per EPRI NP-6041
20	0	EL	SH	DGSWGR	DIESEL GENERATOR SWITCHGEAR	EL.777, COL.F11	Available	Available	Walk-by	OSC-8443, pg 543-549	>RLGM	Screened per OSC-11188 Relay Chatter
21	0	EL	TF	KSF	FEEDER TO SSF 208/120VAC PANELBOARD KSF	EL.777, COL.D16	Available	Available	Walkdown	OSC-11188, Att. 3	>RLGM	Screened per OSC-11188 Screened per EPRI NP-6041
22	0	FO	PU	0005	SSF DIESEL ENGINE FUEL OIL TRANSFER PUMP	EL.777, COL.E9	Available	Available	Walk-by	OSC-8443, pg 550-553	>RLGM	Screened per OSC-11188 Screened per EPRI NP-6041
23	0	FO	TK	0003	SSF FUEL OIL DAY TANK	EL.777, COL.D9	Available	Available	Walk-by	OSC-8377, pg 38-40	>RLGM	Screened per OSC-11188 Screened per EPRI NP-6041
24	0	FO	TK	0004	SSF DIESEL ENGINE FUEL OIL STORAGE TANK	EL.785, COL.F9 (BELOW GRADE)	Available	Available	Walk-by	OSC-8377, pg 41-43	>RLGM	Screened per OSC-11188 Screened per IPEEE
25	0	NI	CA	0225	SSF NUCLEAR INSTRUMENT RACK	EL.777, COL.F11	Available	Available	Walk-by	OSC-8443, pg. 526-529	>RLGM	Screened per OSC-11188 Screened per EPRI NP-6041
26	0	SSF	BA	DCSF	DCSF SSF NORMAL BATTERY	EL.777, COL.F15	Available	Available	Walkdown	OSC-11188, Att. 3	>RLGM	Screened per OSC-11188 Screened per EPRI NP-6041
27	0	SSF	BA	DCSFS	DCSFS SSF STANDBY BATTERY	EL.777, COL.F13	Available	Available	Walkdown	OSC-11188, Att. 3	>RLGM	Screened per OSC-11188 Screened per EPRI NP-6041
28	0	SSF	BC	CSF	CSF SSF BATTERY CHARGER	EL.777, COL.E16	Available	Available	Walkdown	OSC-11188, Att. 3	>RLGM	Screened per OSC-11188 Screened per EPRI NP-6041
29	0	SSF	BC	CSFS	CSFS 125VDC STBY BATT CHGR	EL.777, COL.E16	Available	Available	Walkdown	OSC-11188, Att. 3	>RLGM	Screened per OSC-11188 Screened per EPRI NP-6041
30	0	SSF	BI	KSF1	KSF1 SSF STATIC INVERTER	EL.777, COL.E15	Available	Available	Walkdown	OSC-11188, Att. 3	>RLGM	Screened per OSC-11188 Screened per EPRI NP-6041

ONS SSF ESEL and HCLPF Results

ESEL ID	UNIT	SYS	TYPE	NUMBER	EQUIPMENT NAME	LOCATION	NORMAL STATE	DESIRED STATE	WALKDOWN OR WALK-BY	SEWS	HCLPF*	KEY FAILURE MODE**
31	0	SSF	BI	KSF2	KSF2 SSF STATIC INVERTER	EL.777, COL.E14	Available	Available	Walkdown	OSC-11188, Att. 3	>RLGM	Screened per OSC-11188 Screened per EPRI NP-6041
32	0	SSF	CA	0002	SSF PZR HEATER CABINET	EL.777, COL.F10	Available	Available	Walk-by	OSC-8377, pg. 7308-7311	>RLGM	Screened per OSC-11188 Screened per EPRI NP-6041
33	0	SSF	CA	0003	SSF PRESSURIZER HEATER CABINET (PHC1)	EL.777, COL.F11	Available	Available	Walkdown	OSC-11188, Att. 3	>RLGM	Screened per OSC-11188 Screened per EPRI NP-6041
34	0	SSF	CA	IC2	SSF IC2 CABINET	EL.797, COL.D15	Available	Available	Walk-by	OSC-8377, pg 7203-7206	>RLGM	Screened per OSC-11188 Screened per EPRI NP-6041
35	0	SSF	CA	MEC	MISC. EQUIPMENT CABINET (MEC) SSF (EOC) SYSTEM	EL.797, COL.E15	Available	Available	Walk-by	OSC-8377, pg 7203-7206	>RLGM	Screened per OSC-11188 Screened per EPRI NP-6041
36	0	SSF	DE	000A	SSF DIESEL ENGINE A (16 CYL)	EL.777, COL.D12	Standby	Operating	Walk-by	OSC-8377, pg 86-90	>RLGM	Screened per OSC-11188 Anchorage
37	0	SSF	LX	OXSF	600V LOAD CENTER OXSF (SSF)	EL.777, COL.D15	Available	Available	Walkdown	OSC-11188, Att. 3	>RLGM	Screened per OSC-11188 Screened per EPRI NP-6041
38	0	SSF	MX	PXSF	SSF 600V MCC PXSF	EL.777, COL.F13	Available	Available	Walkdown	OSC-11188, Att. 3	>RLGM	Screened per OSC-11188 Screened per EPRI NP-6041
39	0	SSF	MX	XSF	600V MCC XSF	EL.777, COL.D15	Available	Available	Walk-by	OSC-8377, pg 7500-7504	>RLGM	Screened per OSC-11188 Screened per EPRI NP-6041
40	0	SSF	PL	SSFCP	SSF CONTROL PANEL	EL.797, COL.D14	Available	Available	Walk-by	OSC-8377, pg 7372-7375	>RLGM	Screened per OSC-11188 Screened per EPRI NP-6041
41	0	SSF	SH	OTS1	OTS1 SSF ESSENTIAL SWGR 4160V	EL.777, COL.E14	Available	Available	Walk-by	OSC-8377, pg 7303-7307	>RLGM	Screened per OSC-11188 Relay Chatter
42	0	SSF	TF	PXSF	SSF 4160/600V TRANSFORMER PXSF	EL.777, COL.E10	Available	Available	Walkdown	OSC-11188, Att. 3	>RLGM	Screened per OSC-11188 Anchorage
43	0	VS	AH	0042	AHU 0-42 HEATING AND A/C SSF BUILDING	EL.817, COL.E16 (ON AHU42)	Available	Available	Walk-by	OSC-8443, pg 562-567	>RLGM	Screened per OSC-11188 Anchorage
44	0	VS	AH	0044EX1	SSF CONST VENT SUPPLY FAN	EL.817, COL.D15	Off	On	Walk-by	OSC-8443, pg 568-571	>RLGM	Screened per OSC-11188 Anchorage
45	0	VS	AH	0044EX3	SSF ON LINE VENT SUPPLY FAN	EL.817, COL.D15	Off	On	Walk-by	OSC-8443, pg 572-575	>RLGM	Screened per OSC-11188 Anchorage

ONS SSF ESEL and HCLPF Results

ESEL ID	UNIT	SYS	TYPE	NUMBER	EQUIPMENT NAME	LOCATION	NORMAL STATE	DESIRED STATE	WALKDOWN OR WALK-BY	SEWS	HCLPF*	KEY FAILURE MODE**
46	0	VS	AH	0044EX4	SSF ENGINE EX FAN	EL.777, COL.E10	Available	Available	Walk-by	OSC-8443, pg 576-579	>RLGM	Screened per OSC-11188 Anchorage
47	0	VS	DA	ID01	SSF INLET DAMPER ID-1 (AH EXHAUST FAN AH0044EX4)	EL.817, COL.D14	Closed	Open	Walk-by	OSC-8443, pg 601-603	>RLGM	Screened per OSC-11188 Functional Failure
48	0	VS	DA	ID01E	ACTUATOR FOR INTAKE DAMPER SSF-ID-A & B	EL.817, COL.D14	Closed	Open	Walk-by	OSC-8443, pg 604-606	>RLGM	Screened per OSC-11188 Functional Failure
49	0	VS	DA	ID01W	ACTUATOR FOR INTAKE DAMPER SSF-ID-C & D	EL.817, COL.D14	Closed	Open	Walk-by	OSC-8443, pg 607-609	>RLGM	Screened per OSC-11188 Functional Failure
50	0	VS	DA	ID02	INLET DAMPER ID-2 (SSF AH EXH FAN AH0044EX3)	EL.817, COL.D14	Closed	Open	Walk-by	OSC-8443, pg 610-612	>RLGM	Screened per OSC-11188 Functional Failure
51	0	VS	DA	ID02A	ACTUATOR FOR INLET DAMPER SSF-ID2 (EXH FAN AH0044EX3)	EL.817, COL.D14	Closed	Open	Walk-by	OSC-8443, pg 613-615	>RLGM	Screened per OSC-11188 Functional Failure
52	0	VS	DA	ID03	SSF INLET DAMPER ID-3 (AH EXHAUST FAN AH0044EX1)	EL.817, COL.D14	Closed	Open	Walk-by	OSC-8443, pg 616-618	>RLGM	Screened per OSC-11188 Functional Failure
53	0	VS	DA	ID03A	ACTUATOR FOR INLET DAMPER SSF-ID3 (EXH FAN AH0044EX1)	EL.817, COL.D14	Closed	Open	Walk-by	OSC-8443, pg 619-621	>RLGM	Screened per OSC-11188 Functional Failure
54	0	VS	DA	XD01	SSF EXH DAMPER XD-1 (AH EXH. FAN AH0044EX4)	EL.817, COL.D9	Available	Available	Walk-by	OSC-8443, pg 628-630	>RLGM	Screened per OSC-11188 Functional Failure
55	0	VS	DA	XD01E	ACTUATOR FOR EXH DAMPER SSF-XD-A&B	EL.817, COL.D9	Closed	Open	Walk-by	OSC-8443, pg 631-633	>RLGM	Screened per OSC-11188 Functional Failure
56	0	VS	DA	XD01W	ACTUATOR FOR EXH DAMPER SSF-XD-C&D	EL.817, COL.D9	Closed	Open	Walk-by	OSC-8443, pg 634-636	>RLGM	Screened per OSC-11188 Functional Failure
57	0	VS	DA	XD03	SSF EXH DAMPER XD-3 (AH EXH FAN AH0044EX1)	EL.817, COL.D9	Available	Available	Walk-by	OSC-8443, pg 640-642	>RLGM	Screened per OSC-11188 Functional Failure
58	0	VS	DA	XD03A	ACTUATOR FOR EXH DAMPER SSF-XD3 (EXH FAN AH0044EX1)	EL.817, COL.D9	Closed	Open	Walk-by	OSC-8443, pg 643-645	>RLGM	Screened per OSC-11188 Functional Failure
59	0	VS	PE	SSFPE01	SSF SUMMER VENT. SYSTEM (VH) EXHAUST FAN (SSF-XF-3)	EL.817, COL.E14	Available	Available	Walk-by	OSC-8443, pg 667-671	>RLGM	Screened per OSC-11188 Functional Failure

ONS SSF ESEL and HCLPF Results

ESEL ID	UNIT	SYS	TYPE	NUMBER	EQUIPMENT NAME	LOCATION	NORMAL STATE	DESIRED STATE	WALKDOWN OR WALK-BY	SEWS	HCLPF*	KEY FAILURE MODE**
60	0	VS	PE	SSFPE02	SSF AIR CONDITIONING SYSTEM (VH) CONTROL PANEL WIRING	EL.817, COL.E16	Available	Available	Walk-by	OSC-8443, pg 667-671	>RLGM	Screened per OSC-11188 Functional Failure
61	0	VS	PL	CP01AH2	CONTROL PNL FOR SSF-AH-42 (CP-1)	EL.817, COL.E16	Available	Available	Walk-by	OSC-8443, pg 663-666	>RLGM	Screened per OSC-11188 Screened per EPRI NP-6041
62	0	VS	PS	SSFPS01	SSF CONSTANT VENTILATION SYSTEM SUPPLY FAN	EL.817, COL.E15	Available	Available	Walk-by	OSC-8443, pg 667-671	>RLGM	Screened per OSC-11188 Functional Failure
63	0	VS	PS	SSFPS02	SSF SUMMER VENTILATION SYSTEM SUPPLY FAN	EL.817, COL.E15	Available	Available	Walk-by	OSC-8443, pg 667-671	>RLGM	Screened per OSC-11188 Functional Failure
64	0	VS	PS	SSFPS03	SSF ON-LINE VENTILATION SYSTEM SUPPLY FAN	EL.817, COL.D15	Available	Available	Walk-by	OSC-8443, pg 667-671	>RLGM	Screened per OSC-11188 Functional Failure
65	0	VS	PS	SSFPS04	SSF CONSTANT VENTILATION SYSTEM EXHAUST FAN	EL.817, COL.E13	Available	Available	Walk-by	OSC-8443, pg 667-671	>RLGM	Screened per OSC-11188 Functional Failure
66	0	VS	PS	SSFPS05	SSF SUMMER VENTILATION SYSTEM EXHAUST FAN	EL.817, COL.E13	Available	Available	Walk-by	OSC-8443, pg 667-671	>RLGM	Screened per OSC-11188 Functional Failure
67	0	VS	PS	SSFPS06	SSF ON-LINE VENTILATION SYSTEM EXHAUST FAN	EL.817, COL.E13	Available	Available	Walk-by	OSC-8443, pg 667-671	>RLGM	Screened per OSC-11188 Functional Failure
68	0	VS	PS	SSFPS07	SSF ENGINE VENTILATION SYSTEM EXHAUST FAN	EL.777, COL.D10	Available	Available	Walk-by	OSC-8443, pg 554-558	>RLGM	Screened per OSC-11188 Functional Failure
69	0	VS	PS	SSFPS08	SSF AIR CONDITIONING SYSTEM (VH) CONTROL PANEL WIRING	EL.817, COL.D16	Available	Available	Walk-by	OSC-8443, pg 667-671	>RLGM	Screened per OSC-11188 Functional Failure
70	0	VS	TT	SSFCT1	HVAC TEMPERATURE CONTROLLER (FOR SSF-AH-42)	EL.817, COL.E16	Available	Available	Walk-by	OSC-8443, pg 672-676	>RLGM	Screened per OSC-11188 Functional Failure
71	0	VS	TT	SSFCT2	HVAC TEMPERATURE CONTROLLER (FOR SSF-CP-1)	EL.817, COL.D14 (AIR INTAKE	Available	Available	Walk-by	OSC-8443, pg 677-681	>RLGM	Screened per OSC-11188 Functional Failure
72	1	CCW	PL	0268	REMOTE STARTER ENCLOSURE FOR 1CCW-268	EL.754, COL.E16	Available	Available	Walk-by	OSC-8443, pg 508-512	>RLGM	Screened per OSC-11188 Screened per EPRI NP-6041

Attachment 1 to Letter ONS-2014-161

ONS SSF ESEL and HCLPF Results

ESEL ID	UNIT	SYS	TYPE	NUMBER	EQUIPMENT NAME	LOCATION	NORMAL STATE	DESIRED STATE	WALKDOWN OR WALK-BY	SEWS	HCLPF*	KEY FAILURE MODE**
73	1	CCW	PL	0287	REMOTE STARTER ENCLOSURE FOR 1CCW-287	EL.754, COL.E16	Available	Available	Walk-by	OSC-8377, pg 2027-2031	>RLGM	Screened per OSC-11188 Screened per EPRI NP-6041
74	1	CCW	VA	0268	SSF ASW PUMP TO SG SUPPLY	EL.754, COL.E17	Closed	Throttled	Walkdown	OSC-11188, Att. 3	>RLGM	Screened per OSC-11188 Screened per EPRI NP-6041
75	1	CCW	VA	0287	SSF ASW PUMP TO SG SUPPLY BLOCK	EL.754, COL.E17	Closed	Open	Walk-by	OSC-8443, pg 517-520	>RLGM	Screened per OSC-11188 Screened per EPRI NP-6041
76	1	EL	MX	1XSF	600V MCC PANEL 1XSF	EL.817, COL.F15	Available	Available	Walk-by	OSC-8377, pg 2522-2526	>RLGM	Screened per OSC-11188 Anchorage
77	1	EL	MX	1XSF1	208V MCC 1XSF-1	EL.797, COL.D16	Available	Available	Walk-by	OSC-8377, pg 7505-7510	>RLGM	Screened per OSC-11188 Anchorage
78	1	EL	MX	1XSFA	208V MCC 1XSFA	EL.817, COL.F15	Available	Available	Walk-by	OSC-8377, pg 2517-2521	>RLGM	Screened per OSC-11188 Screened per EPRI NP-6041
79	1	EL	TF	1XSF	600/208V XFMR 1XSF (30KVA/3PH/60HZ)	EL.817, COL.F15	Available	Available	Walk-by	OSC-8377, pg 2527-2531	>RLGM	Screened per OSC-11188 Screened per EPRI NP-6041
80	1	SSF	TN	TB1XSFG 01	1XSFG01 ENCLOSURE	EL.777, COL.D14	Available	Available	Walkdown	OSC-11188, Att. 3	>RLGM	Screened per OSC-11188 Anchorage
81	2	CCW	PL	0268	REMOTE STARTER ENCLOSURE FOR 2CCW-268	EL.754, COL.E16	Available	Available	Walk-by	OSC-8443, pg 508-512	>RLGM	Screened per OSC-11188 Screened per EPRI NP-6041
82	2	CCW	PL	0287	REMOTE STARTER ENCLOSURE FOR 2CCW-287	EL.754, COL.E16	Available	Available	Walk-by	OSC-8377, pg 4364-4367	>RLGM	Screened per OSC-11188 Screened per EPRI NP-6041
83	2	CCW	VA	0268	SSF ASW PUMP TO SG SUPPLY	EL.754, COL.E17	Closed	Throttled	Walkdown	OSC-11188, Att. 3	>RLGM	Screened per OSC-11188 Screened per EPRI NP-6041
84	2	CCW	VA	0287	SSF ASW PUMP TO SG SUPPLY BLOCK	EL.754, COL.E17	Closed	Open	Walk-by	OSC-8443, pg 521-524	>RLGM	Screened per OSC-11188 Screened per EPRI NP-6041
85	2	EL	MX	2XSF	600V MOTOR CONTROL CENTER	EL.817, COL.F15	Available	Available	Walk-by	OSC-8377, pg 4814-4818	>RLGM	Screened per OSC-11188 Anchorage
86	2	EL	MX	2XSF1	208V MOTOR CONTROL CENTER	EL.797, COL.D16	Available	Available	Walk-by	OSC-8377, pg 7505-7510	>RLGM	Screened per OSC-11188 Anchorage
87	2	EL	MX	2XSFA	208V MOTOR CONTROL CENTER	EL.817, COL.F15	Available	Available	Walk-by	OSC-8377, pg 4809-4813	>RLGM	Screened per OSC-11188 Screened per EPRI NP-6041

ONS SSF ESEL and HCLPF Results

ESEL ID	UNIT	SYS	TYPE	NUMBER	EQUIPMENT NAME	LOCATION	NORMAL STATE	DESIRED STATE	WALKDOWN OR WALK-BY	SEWS	HCLPF*	KEY FAILURE MODE**
88	2	EL	TF	2XSF	600/208V XFMR 2XSF (30KVA/3PH/60HZ)	EL.817, COL.F15	Available	Available	Walk-by	OSC-8377, pg 4819-4823	>RLGM	Screened per OSC-11188 Screened per EPRI NP-6041
89	2	SSF	TN	TB2XSFG 01	2XSFG01 ENCLOSURE	EL.777, COL.D14	Available	Available	Walkdown	OSC-11188, Att. 3	>RLGM	Screened per OSC-11188 Anchorage
90	3	CCW	PL	0268	REMOTE STARTER ENCLOSURE FOR 3CCW-268	EL.754, COL.D17	Available	Available	Walk-by	OSC-8443, pg 508-512	>RLGM	Screened per OSC-11188 Screened per EPRI NP-6041
91	3	CCW	PL	0287	REMOTE STARTER ENCLOSURE FOR 3CCW-287	EL.754, COL.D17	Available	Available	Walk-by	OSC-8377, pg 6569-6572	>RLGM	Screened per OSC-11188 Screened per EPRI NP-6041
92	3	CCW	VA	0268	SSF ASW PUMP TO SG SUPPLY	EL.754, COL.E16	Closed	Throttled	Walkdown	OSC-11188, Att. 3	>RLGM	Screened per OSC-11188 Screened per EPRI NP-6041
93	3	CCW	VA	0287	SSF ASW PUMP TO SG SUPPLY BLOCK	EL.754, COL.E16	Closed	Open	Walk-by	OSC-8443, pg 517-520	>RLGM	Screened per OSC-11188 Screened per EPRI NP-6041
94	3	EL	MX	3XSF	600V MCC 3XSF	EL.817, COL.F15	Available	Available	Walk-by	OSC-8377, pg 7002-7005	>RLGM	Screened per OSC-11188 Anchorage
95	3	EL	MX	3XSF1	208V MCC 3XSF-1	EL.797, COL.D17	Available	Available	Walk-by	OSC-8377, pg 7505-7510	>RLGM	Screened per OSC-11188 Anchorage
96	3	EL	MX	3XSFA	208V MCC 3XSF	EL.817, COL.F15	Available	Available	Walk-by	OSC-8377, pg 6996-7000	>RLGM	Screened per OSC-11188 Screened per EPRI NP-6041
97	3	EL	TF	3XSF	600/208V XFMR 3XSF (30KVA/3PH/60HZ)	EL.817, COL.F15	Available	Available	Walk-by	OSC-8377, pg 7006-7010	>RLGM	Screened per OSC-11188 Screened per EPRI NP-6041
98	3	SSF	TN	TB3XSFG 01	3XSFG01 ENCLOSURE	EL.777, COL.D14	Available	Available	Walkdown	OSC-11188, Att. 3	>RLGM	Screened per OSC-11188 Anchorage

* HCLPF values of >RLGM indicate that the HCLPF exceeds the Review Level Ground Motion (0.20g), but that a specific HCLPF value was not calculated since the component was screened out from further evaluation.

** Key Failure Modes are defined as follows:

Screened per IPEEE - Indicates that the component was evaluated in the IPEEE and therefore meets the RLGM demand.

Screened per OSC-11188 - Indicates that the component was evaluated in OSC-11188, Attachment 3 and therefore meets the RLGM demand. For this case, the Key Failure Mode(as determined in OSC-11188) is also reported.

Screened per EPRI NP-6041 - Indicates that the component meets the screening criteria of EPRI NP-6041, Table 2-4 and that neither anchorage, relay chatter, nor interactions limit the reported HCLPF.

Interaction - Block Walls - Indicates that the component is located near a block wall. The block wall was evaluated in IPEEE and therefore the block wall meets the RLGM demand. The functional and anchorage HCLPFs exceed the reported HCLPF value.

Anchorage - Indicates that anchorage is the governing failure mode for the component.

Functional Failure - Indicates that functional failure is the governing failure mode for the component.

Relay Chatter - Indicates that relay chatter is the governing failure mode for the component.

Appendix E

ONS FLEX Flow Paths (Unit 1 Only)

<u>RCS – Phase 1 – Unit 1</u>
RCMU
1. OFD 104A-1.1
2. OFD 101A-1.5
3. OFD 101A-1.4
4. OFD 100A-1.3

RC Letdown
1. OFD 100A-1.3 (Seal Isolation)
2. OFD 100A-1.1 (Letdown Isolation)
3. OFD 102A-1.1 (Pressure Boundary)
4. OFD 101A-1.4 (Pressure Boundary)
5. OFD 100A-1.2 (Pressure Boundary)
6. OFD 102A-1.3 (Pressure Boundary)
7. OFD 101A-1.1
8. OFD 101A-1.5
9. OFD 104A-1.1

RC Pressure Control
1. OFD 100A-1.2
2. OFD 100A-1.1 (Pressure Boundary)
3. OFD 110A-1.1

<u>RCS – Phase 2 – Unit 1</u>
RCMU (Primary [Train A] & Alternate FLEX Paths [Train B])
1. OFD 102A-1.1
2. OFD 102A-1.2 (Pressure Boundary)
3. OFD 104A-1.2 (Pressure Boundary)
4. OFD 101A-1.3 (Pressure Boundary
5. OFD 101A-1.4
6. OFD 100A-1.3 (Path A for Primary & Alternate FLEX strategies – seal injection lines)
7. OFD 100A-1.1 (Path B for Primary & Alternate FLEX strategies – header injection lines)
8. OFD 101A-1.5 (Pressure Boundary)

<u>SG FEED – Phase 1 – Unit 1</u>
SGMU
1. OFD 133A-2.1
2. OFD 133A-2.5
3. OFD 121D-1.1
4. OFD 121B-1.5 (Pressure Boundary)
5. OFD 121B-1.3

<u>SG FEED – Phase 2 – Unit 1</u>
SGMU Primary FLEX Path
1. OFD 121D-1.2
2. OFD 121D-1.1
3. OFD 121B-1.5 (Pressure Boundary)
4. OFD 121B-1.3

<u>SG FEED – Phase 2 – Unit 1</u>
SGMU Alternate FLEX Path
1. OFD 133A-2.5
2. OFD 121D-1.1
3. OFD 121B-1.5 (Pressure Boundary)
4. OFD 121B-1.3

<u>ADVs to Reduce SG Pressure – Phase 1 & 2 – Unit 1</u>
1. OFD 122A-1.1

<u>Prevent Nitrogen Intrusion from CFTs into the RCS – Phase 2 – Unit 1</u>
1. OFD 102A-1.3

<u>Reduce RCS Pressure – Phase 2 – Unit 1</u>
1. OFD 100A-1.1

<u>SSF Fuel Oil – Phase 1 – Units 1, 2, & 3</u>
1. OFD 135A-1.2

<u>SSF Fuel Oil – Phase 2 – Units 1, 2, & 3</u>
1. OFD 135A-1.2

<u>SSF Diesel Engine Jacket Water System – Phase 1 – Units 1, 2, & 3</u>
1. OFD 138A-1.1

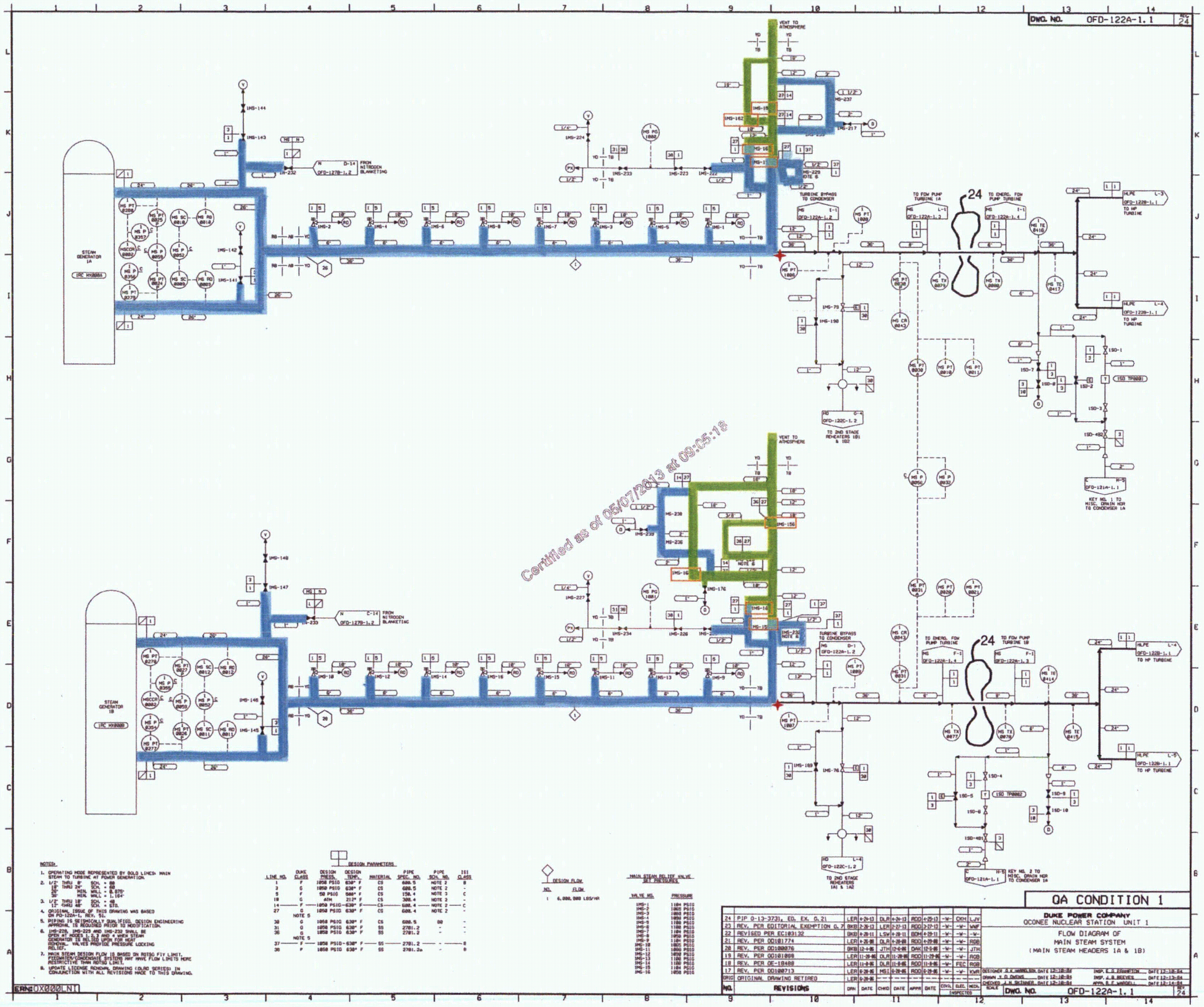
<u>SSF HVAC – Phase 1 – Units 1, 2, & 3</u>
1. OFD 133A-2.5
2. OFD 116N-1.1

<u>SSF Diesel Engine Lube Oil System – Phase 1 – Units 1, 2, & 3</u>
1. OFD 135B-1.4

<u>SSF Diesel Engine Turbo Chargers – Phase 1 – Units 1, 2, & 3</u>
1. OFD 137D-1.3

<u>SSF Starting Air System – Phase 1 – Units 1, 2, & 3</u>
1. OFD 137D-1.1
2. OFD 137D-1.2

<u>SFP – Phase 2 – Units 1 & 2</u>
SFP Primary FLEX Path
1. OFD 104A-1.1



Phase 1 & 2: ADVs to Reduce SG Pressure

Blue Highlights: Safety Related Piping

Green Highlights: Class G Non-Safety Seismically Analyzed Pipe

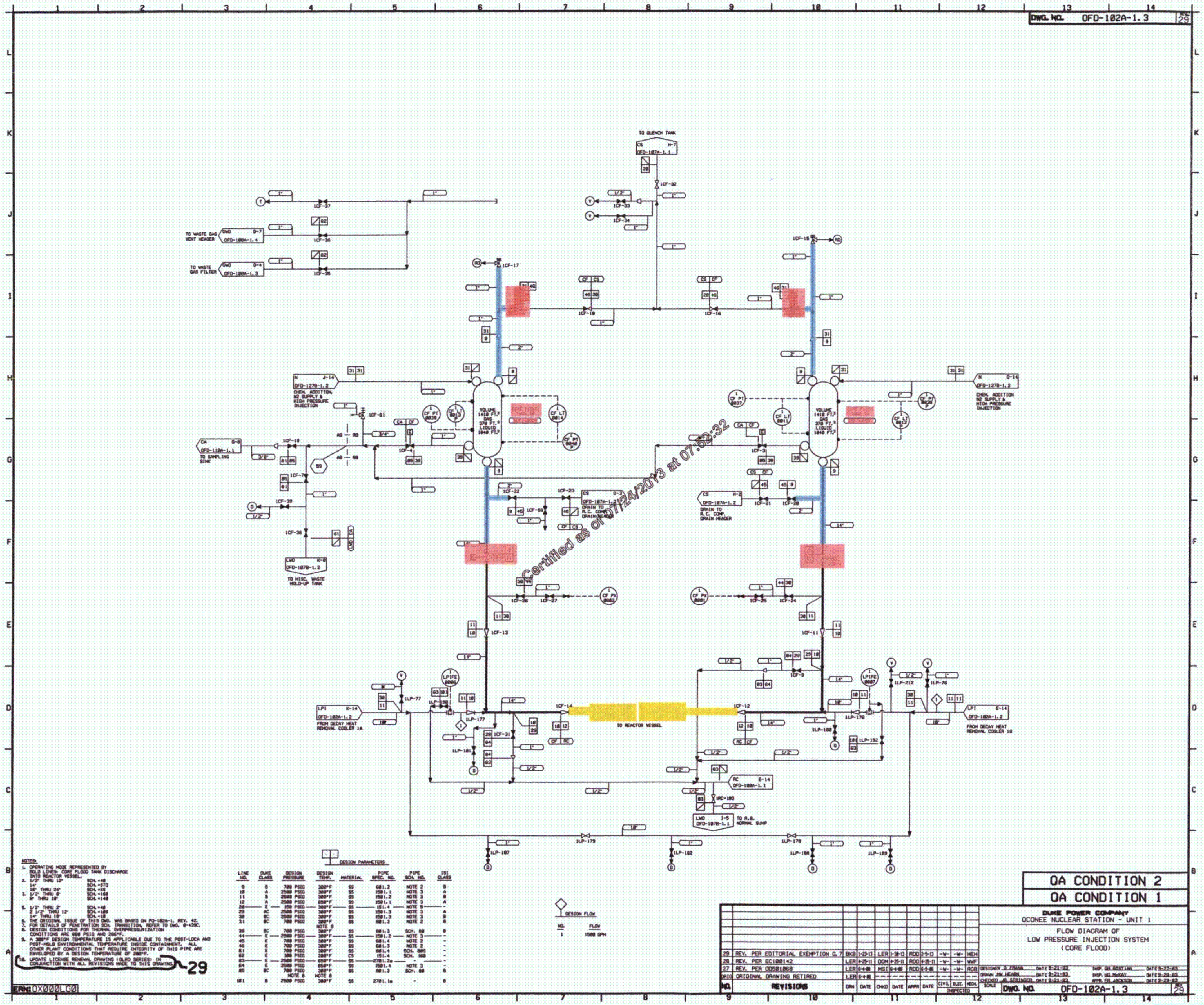
2xSSE Path

Note: No Dwg Components Screen In for ESEL Evaluation

Note: ADVs are active valves, but screen out of the ESEL evaluation because they are operated manually for FLEX strategy implementation. Also, only one set of ADVs is required for FLEX strategy success.

Note: The piping beyond ✦ is not considered critical to the system venting requirements. Therefore, piping beyond this point is not considered part of the FLEX strategy and is not qualified within this report.

☐ denotes ADVs



Phase 1: RC Letdown Pressure Boundary

Phase 2: Prevent Nitrogen Intrusion from CFTs into the RCS

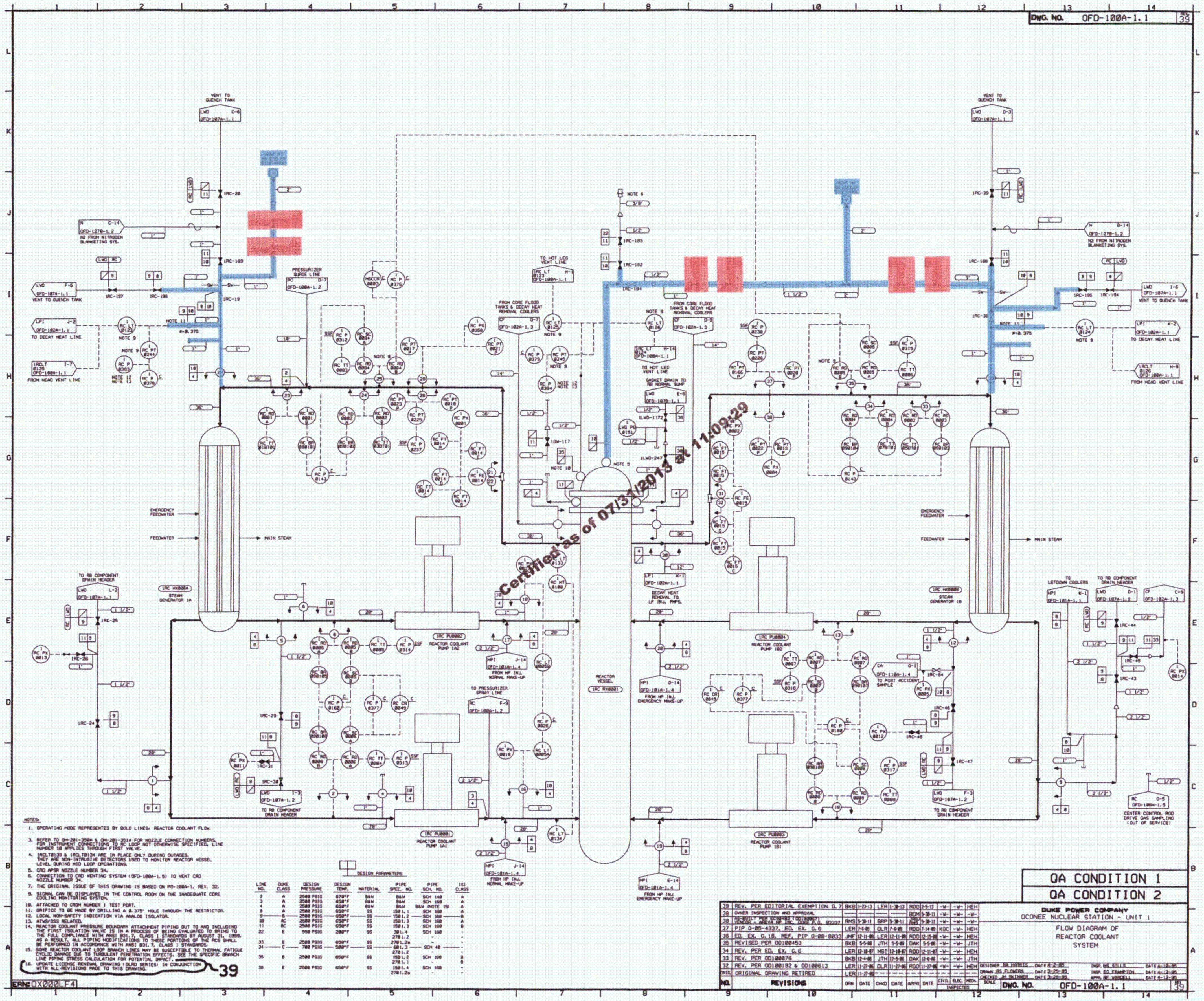
Blue Highlights: Nitrogen Intrusion Safety Related Piping

Yellow Highlights: RC Letdown Safety Related Piping

Pink Highlights: Target Components

2xSSE Path

Note: Only CFT vent valves or CFT isolation valves are required for FLEX strategy implementation (i.e. either CF-1 & CF-2 or CF-5 & CF-6). Therefore, CF-5 & CF-6 MOVs are evaluated at 1xSSE & CF-1 & CF-2 MOVs are evaluated at 2xSSE.

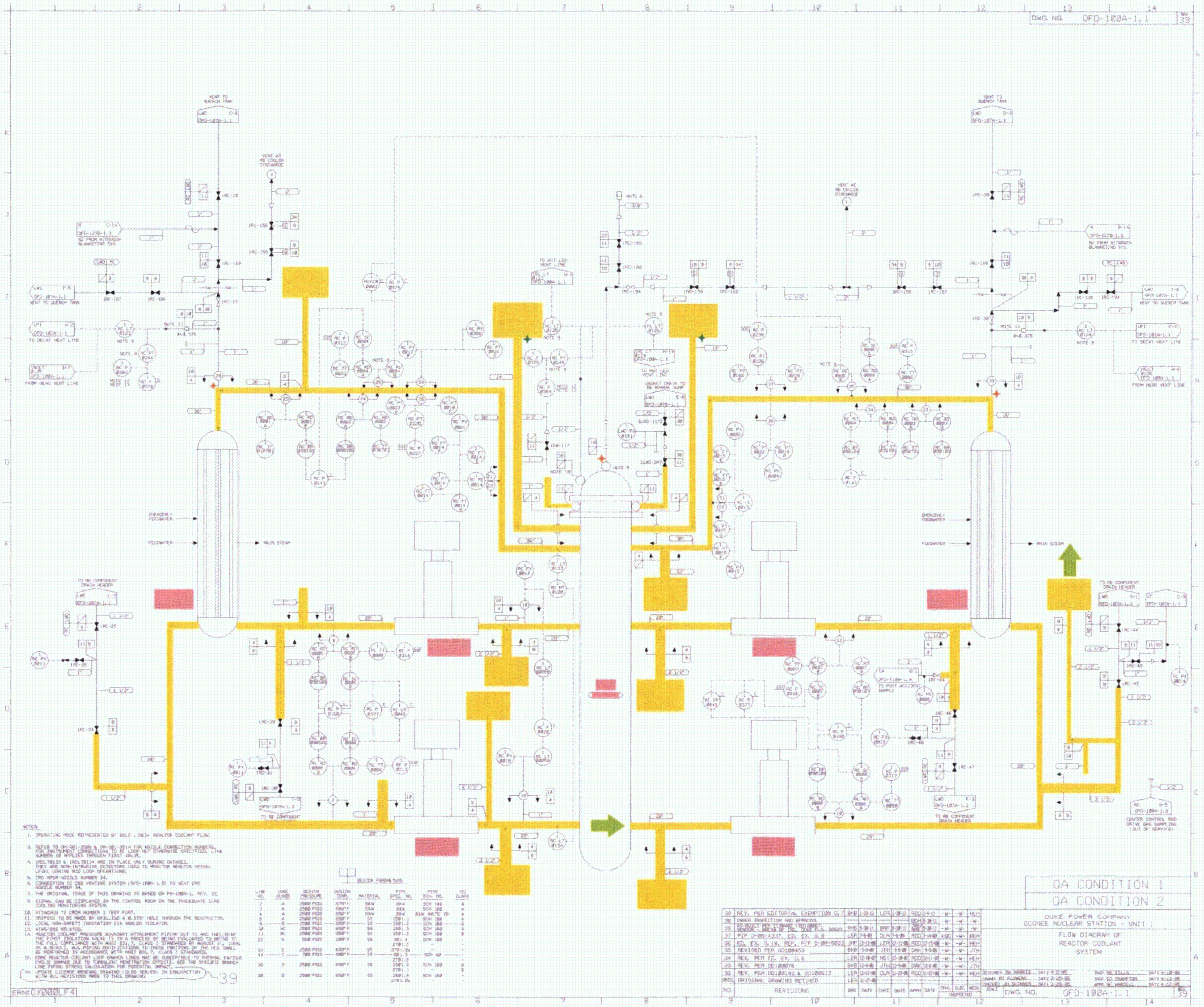


Phase 2: Reduce RCS Pressure via Highpoint & Head Vent Valves

Blue Highlights: Safety Related Piping

Pink Highlights: Target Components

2xSSE Path



Phase 1: RCS Letdown

Yellow Highlights: RCS Safety Related Piping

Pink Highlights: Target Components

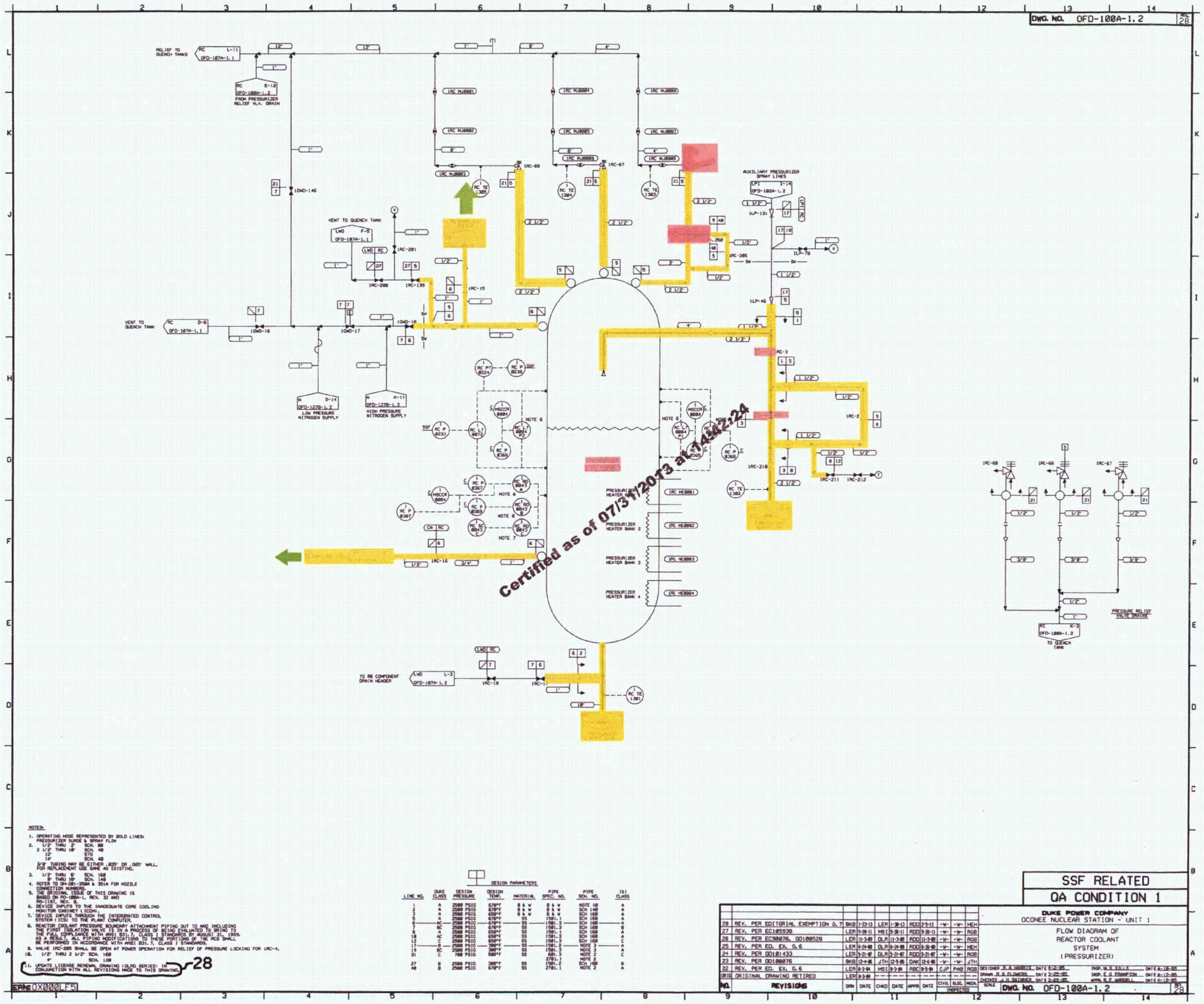
Fluid Flow Path

Piping Path is continued in the "Reduce RCS Pressure via Highpoint & Head Vent Valves" drawings

Piping Path is continued in the "Prevent Nitrogen Intrustion into the RCS" drawings

2xSSE Path

Note: No Dwg Components Screen in for ESEL Evaluation



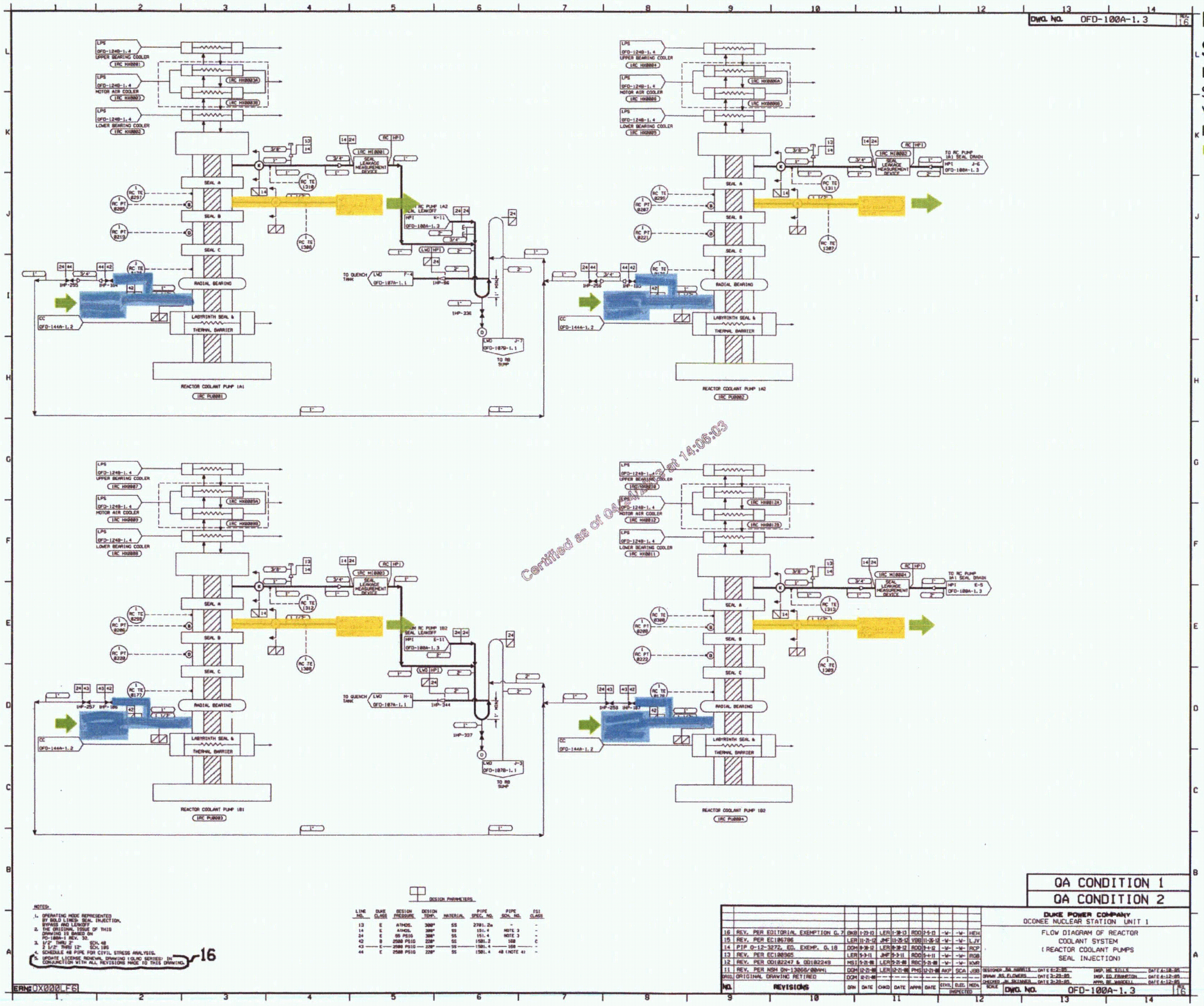
Phase 1: RCS Pressure Control

Yellow Highlights: RCS Pressure Control Safety Related Piping

Pink Highlights: Target Components

Fluid Flow Path

2xSSE Path



Phase 1: RCMU & Seal Isolation

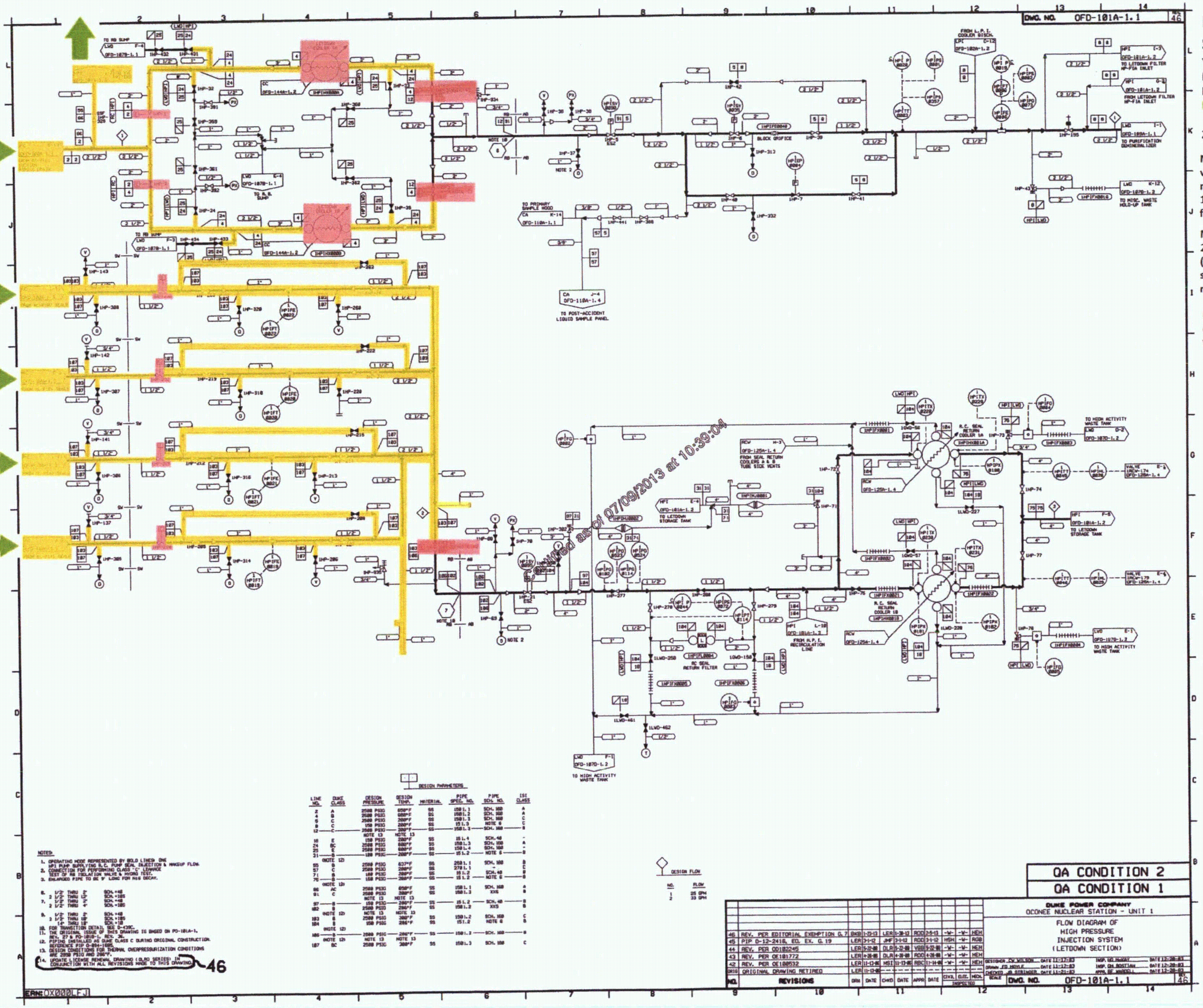
Blue Highlights: RC Make-Up Safety Related Piping

Yellow Highlights: RC Seal Isolation Safety Related Piping

Fluid Flow Path

2xSSE Path

Note: No Dwg Components Screen in for ESEL Evaluation



Phase 1: RCS Letdown & Seal Isolation

Yellow Highlights: RC Letdown & Seal Isolation Safety Related Piping

Pink Highlights: Target Components

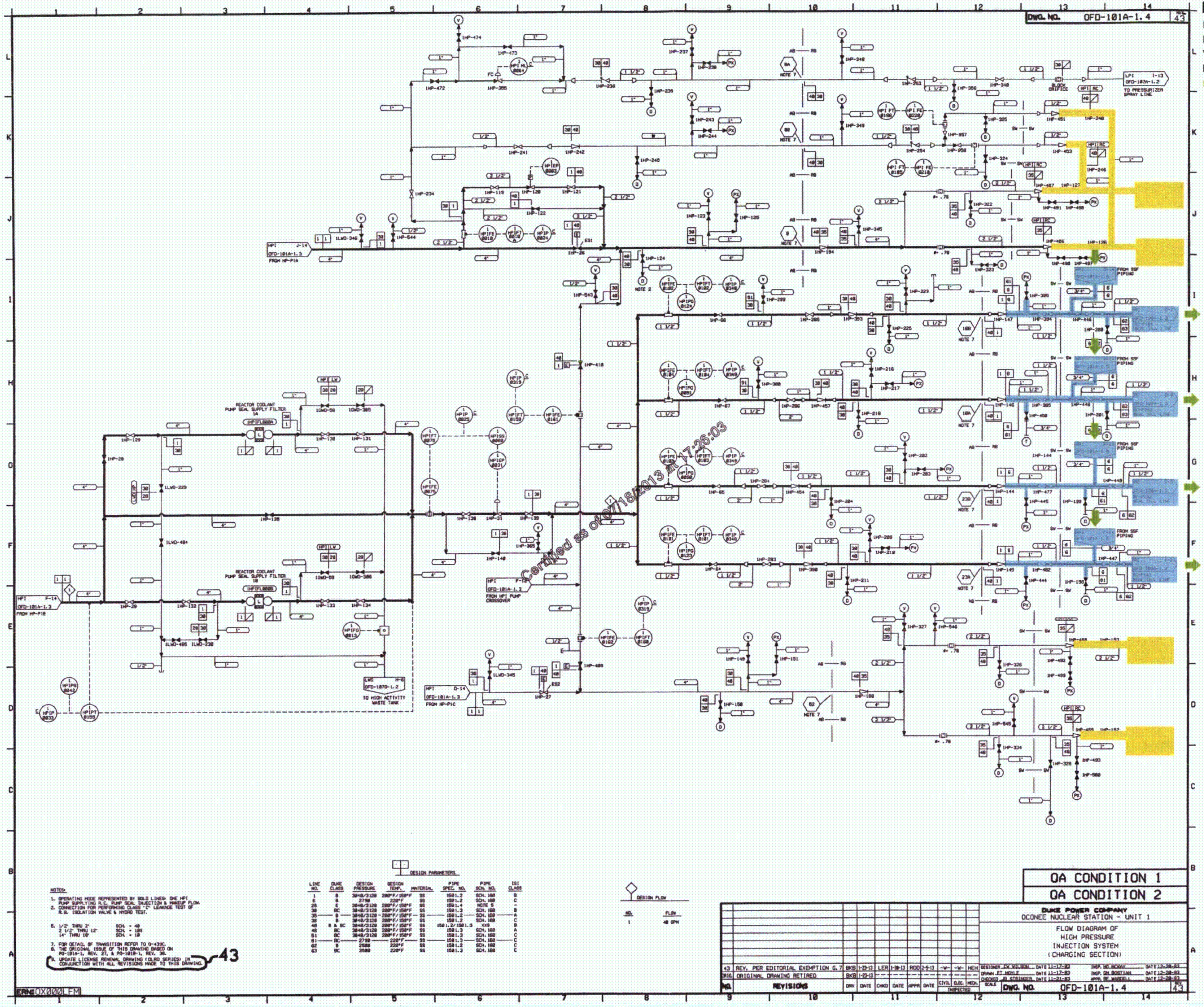
Fluid Flow Path

2xSSE Path

Note: _HP-1 and _HP-2 are EMO opearted valves that fail as is (final valve position does not matter) and subsequently, the FLEX Phase 1 strategy does not rely on EMO as an active feature.

Note: _HP-226, _HP-228, _HP-230, and _HP-232 are EMO operated valves that fail as is (final valve position does not matter) and subsequently, the FLEX Phase 1 strategy does not rely on EMO as an active feature.

Note: _HP-3, _HP-4, and HP-20 are EMO operated valves that can be controlled from the SSF.



Phase 1: RCMU & Letdown

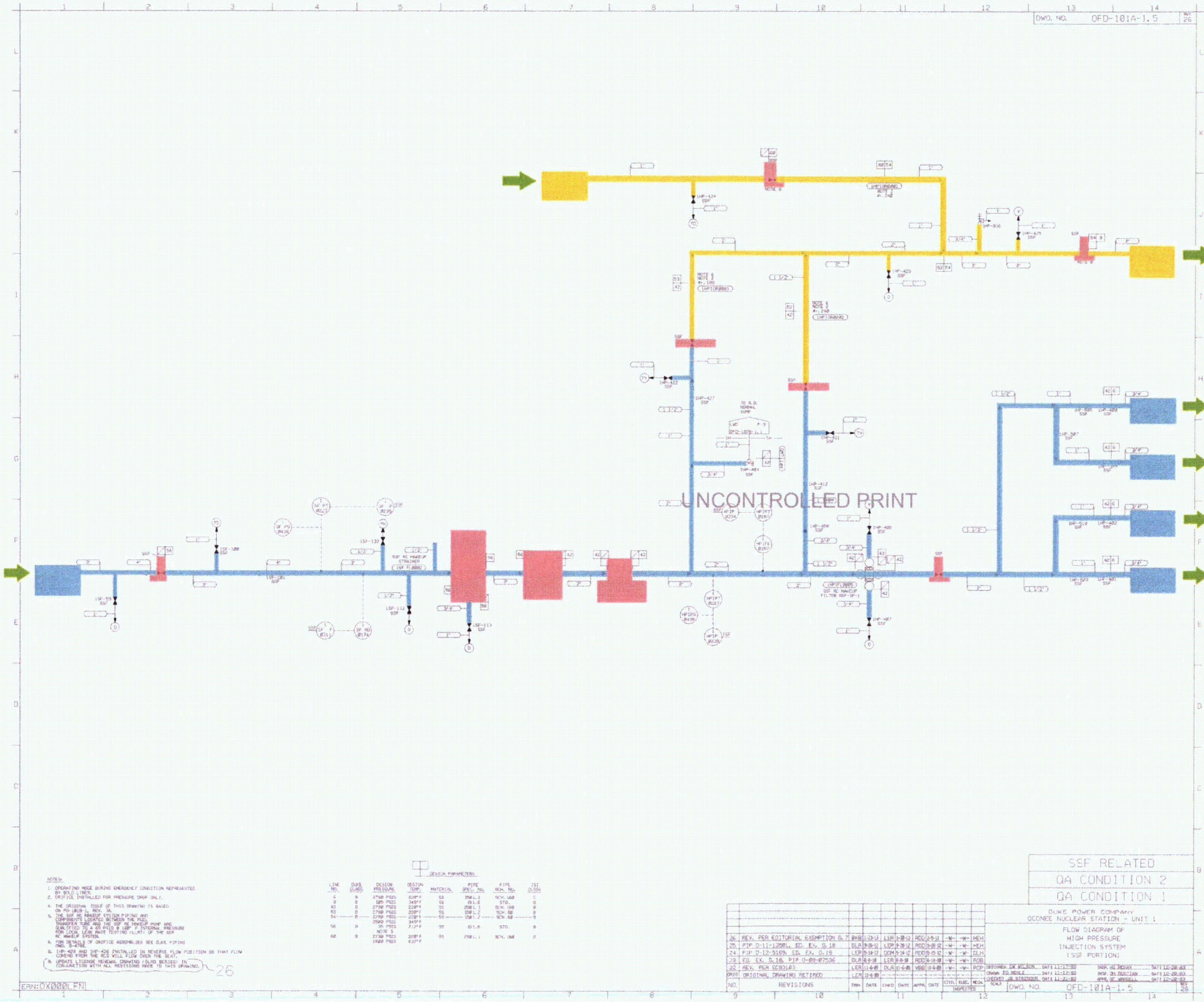
Blue Highlights: RC Make-up Safety Related Piping

Yellow Highlights: RC Letdown Safety Related Piping

Fluid Flow Path

2xSSE Path

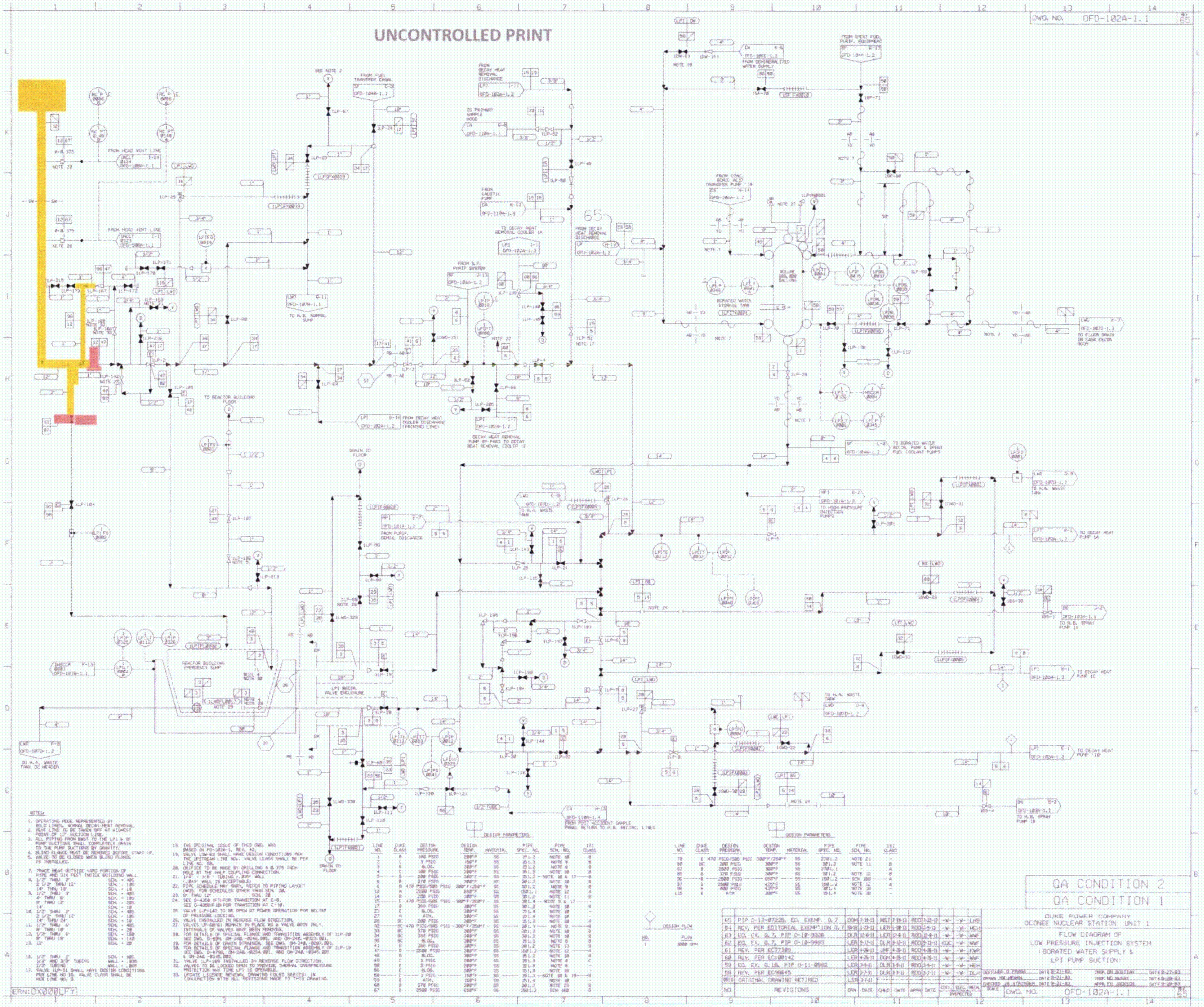
Note: No Dwg Components Screen in for ESEL Evaluation



Phase 1: RCMU & Letdown

Blue Highlights: RC Make-up Safety Related Piping
Yellow Highlights: RC Letdown Safety Related Piping
Pink Highlights: Target Components
Fluid Flow Path

2xSSE Path

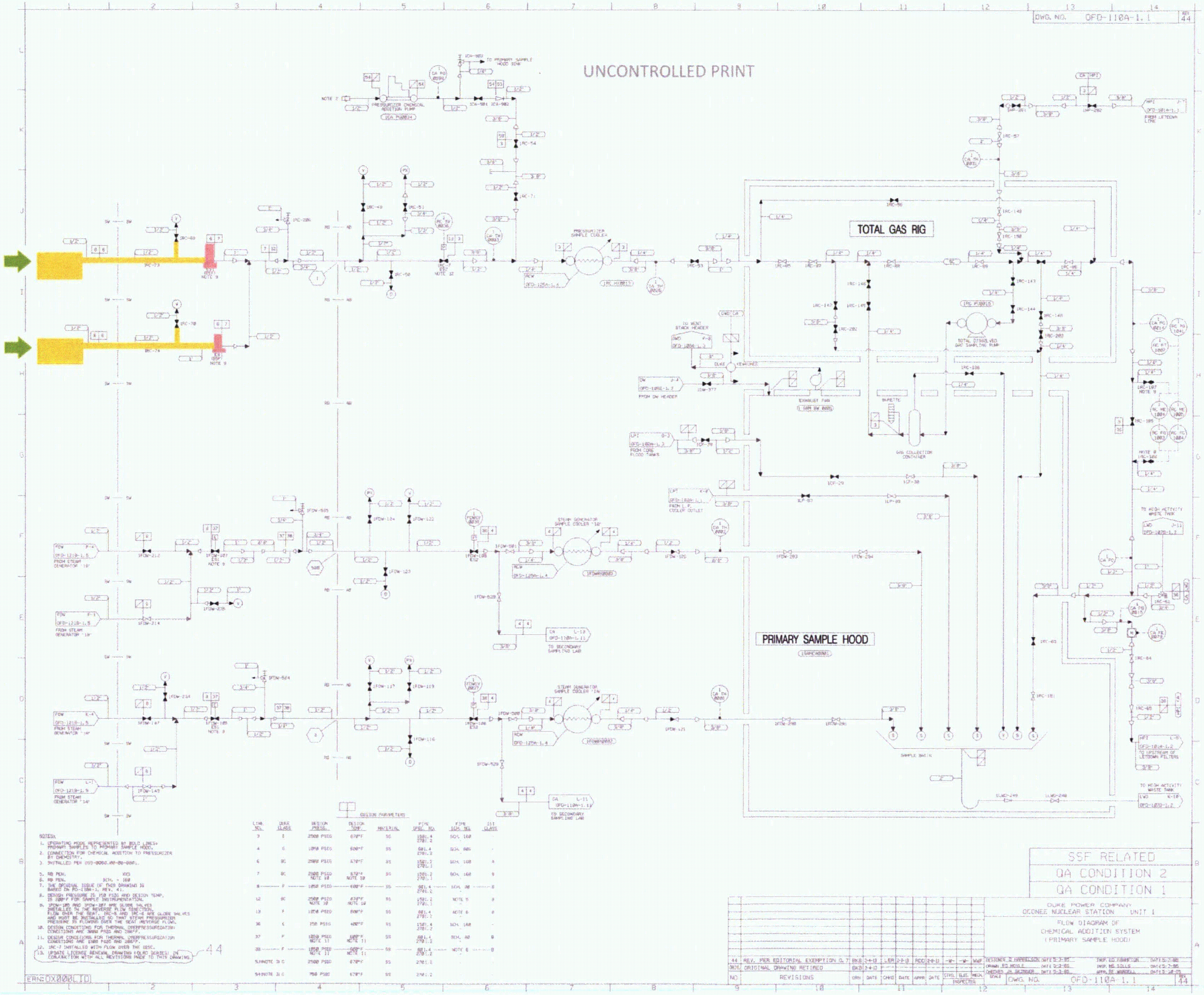


Phase 1: RC Letdown Pressure Boundary

Yellow Highlights: RCS Safety Related Piping

Pink Highlights: Target Components

2xSSE Path



Phase 1: RCS Pressure Control

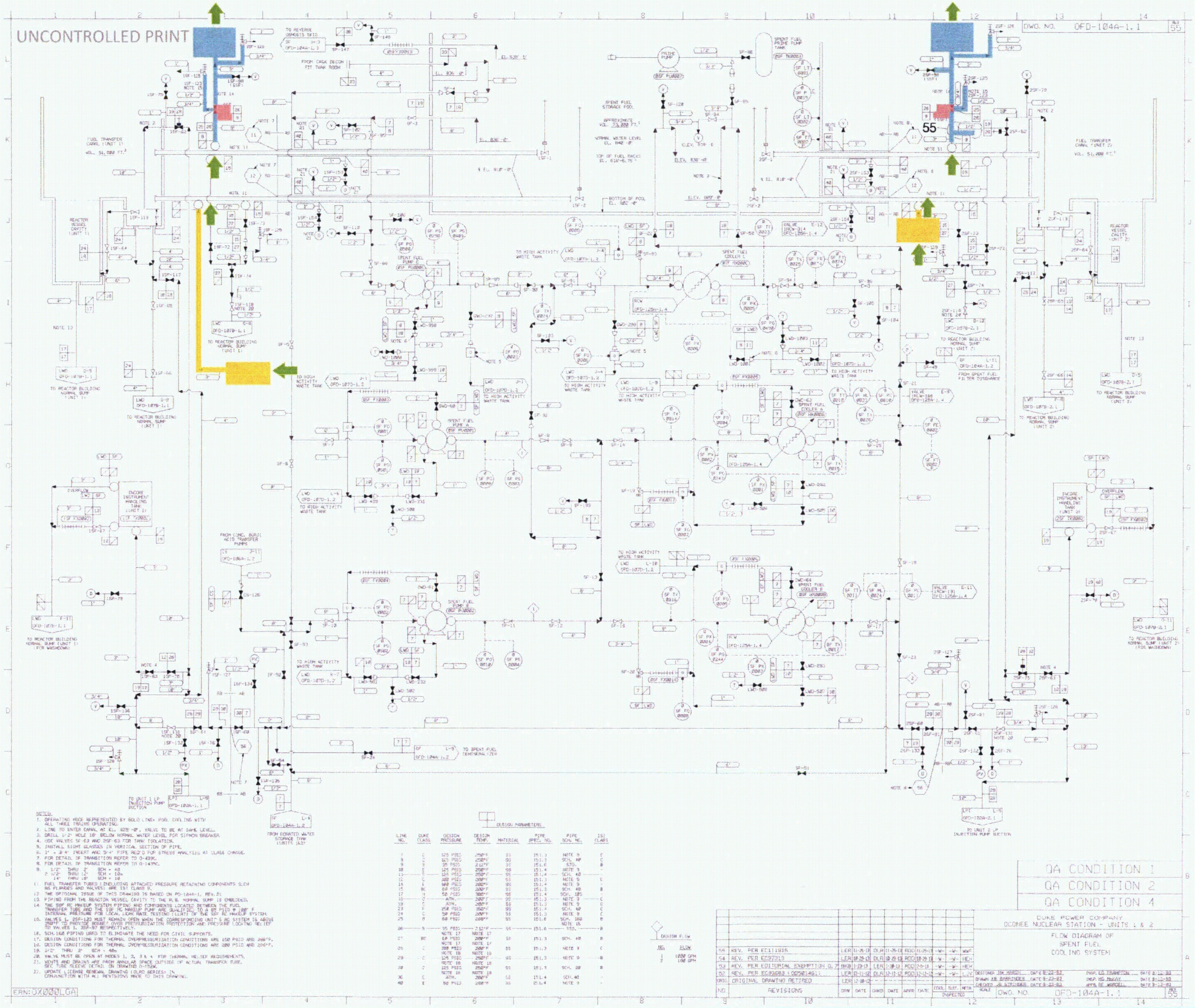
Yellow Highlights: RCS Pressure Control Safety Related Piping

Pink Highlights: Target Components

Fluid Flow Path

2xSSE Path

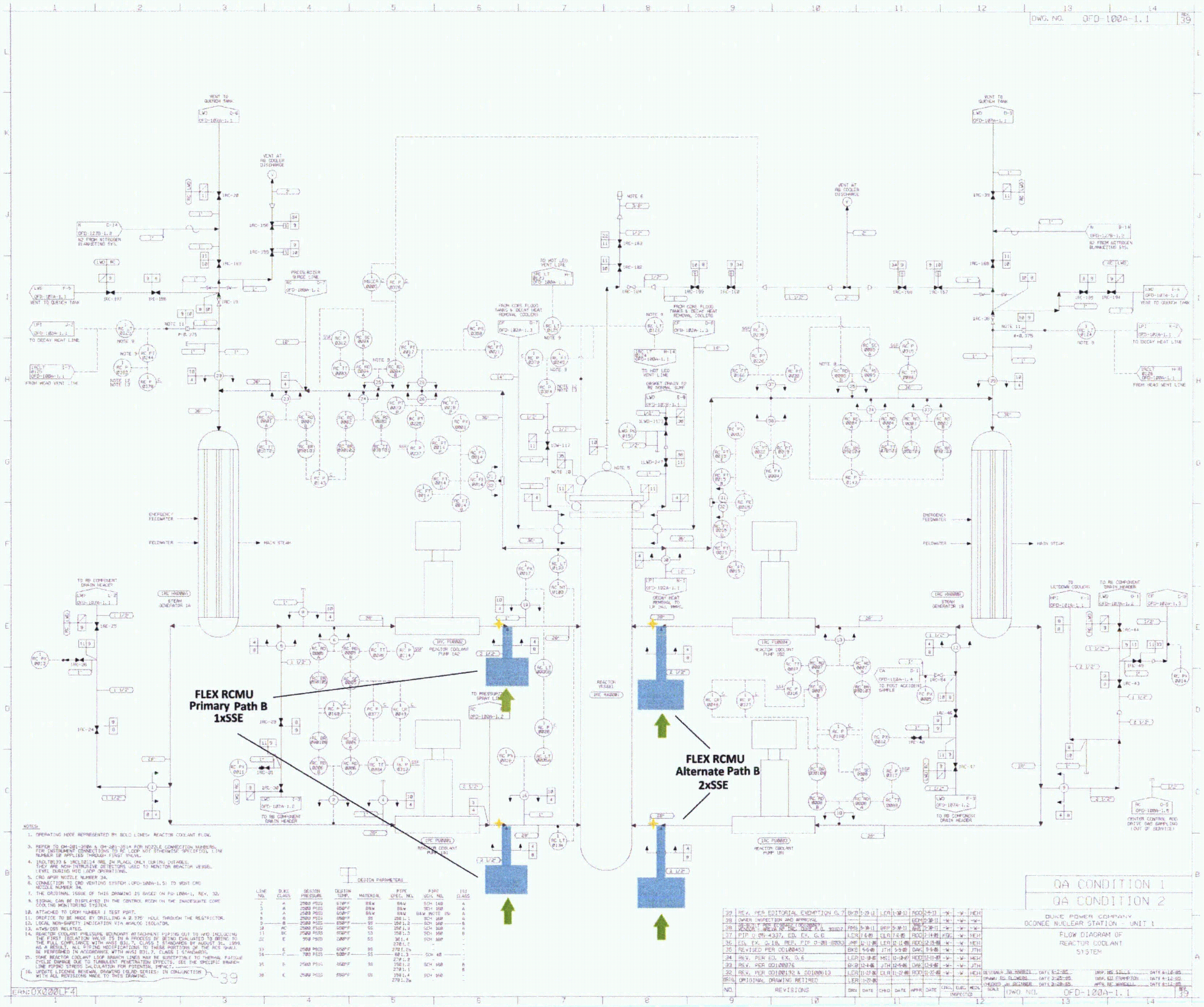
Note: _RC-5 and _RC-6 are EMO opearted valves that can be controlled from the SSF.



Phase 1: RCMU & Letdown

Blue Highlights: RC Make-up Safety Related Piping
Yellow Highlights: RC Letdown Safety Related Piping
Pink Highlights: Target Components
Fluid Flow Path

2xSSE Path



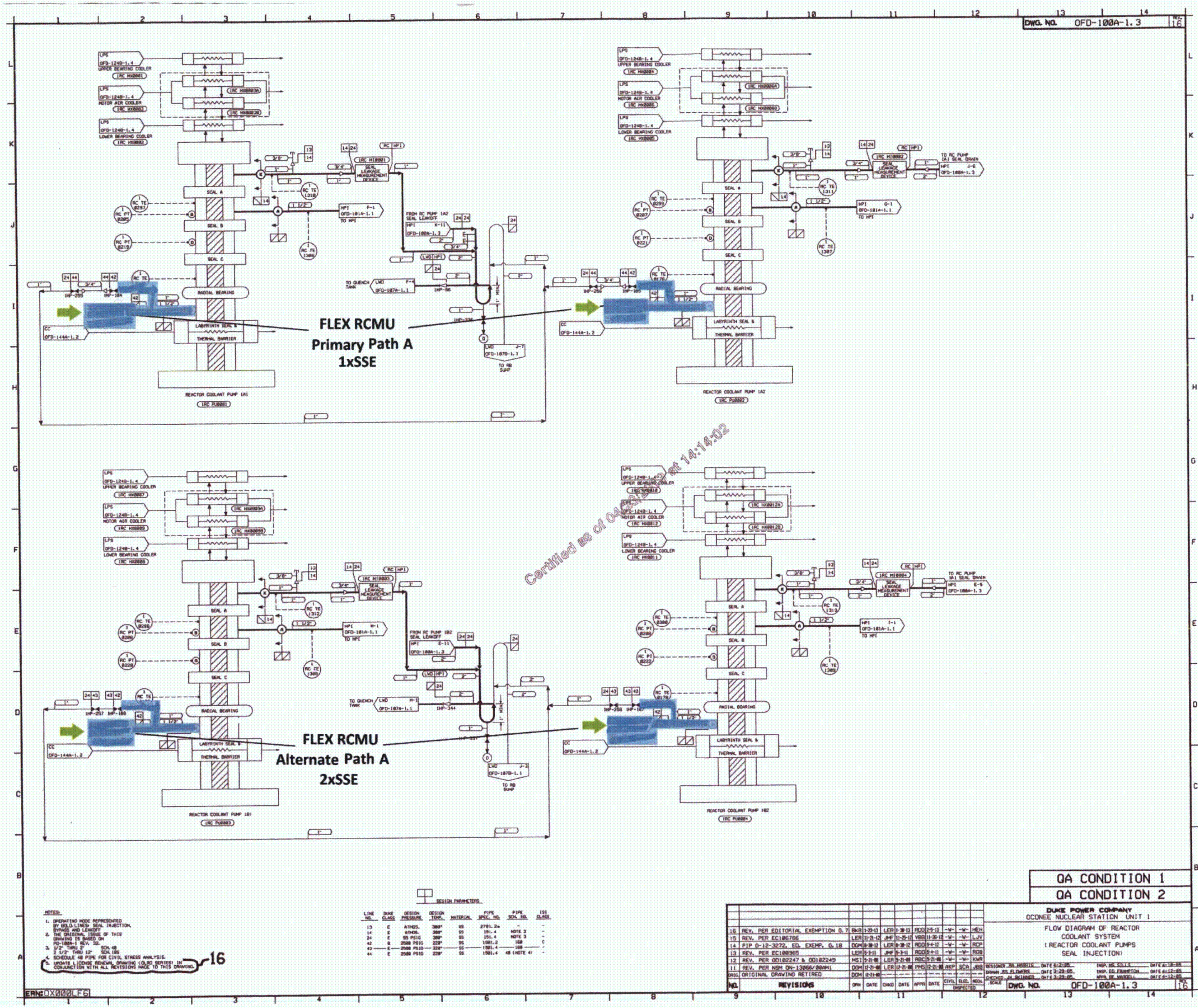
Phase 2: RCMU

Blue Highlights: Safety Related Piping

Fluid Flow Path

See OFD-100A-1.1 Phase 1 Drawing for continuation of the pressure boundary flow path. Note that all components in the pressure boundary path are addressed in Phase 1.

Note: No Dwg Components Screen in for ESEL Evaluation



Phase 2: RCMU

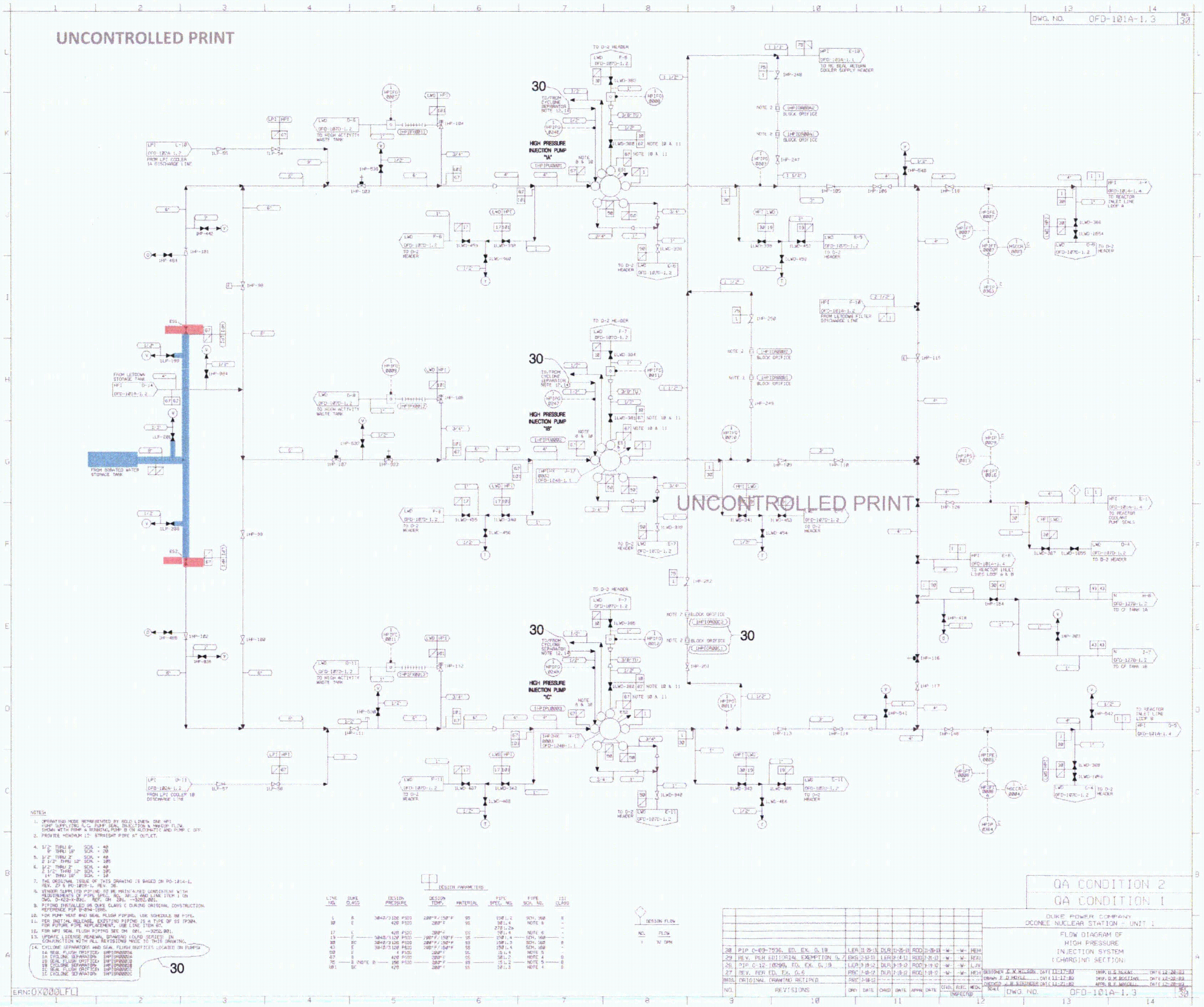
Blue Highlights: Safety Related Piping

Fluid Flow Path

Note: See OFD-100A-1.3 Phase 1 Drawing for seal return flow path. Note that all components within the seal return flow path are addressed in Phase 1.

Note: It is not the intent of this dwg to demonstrate that all branch connections are rugged to create an intact pressure boundry. The assumption is that losses, if any, are minor with respect to the inventory in the RCS.

Note: No Dwg Components Screen in for ESEL Evaluation



Phase 2: RCMU

Pressure Boundary

Blue Highlights: Safety Related Piping

Pink Highlights: Target Components

2xSSE Path (Req'd for both Primary and Alternate FLEX Strategies)

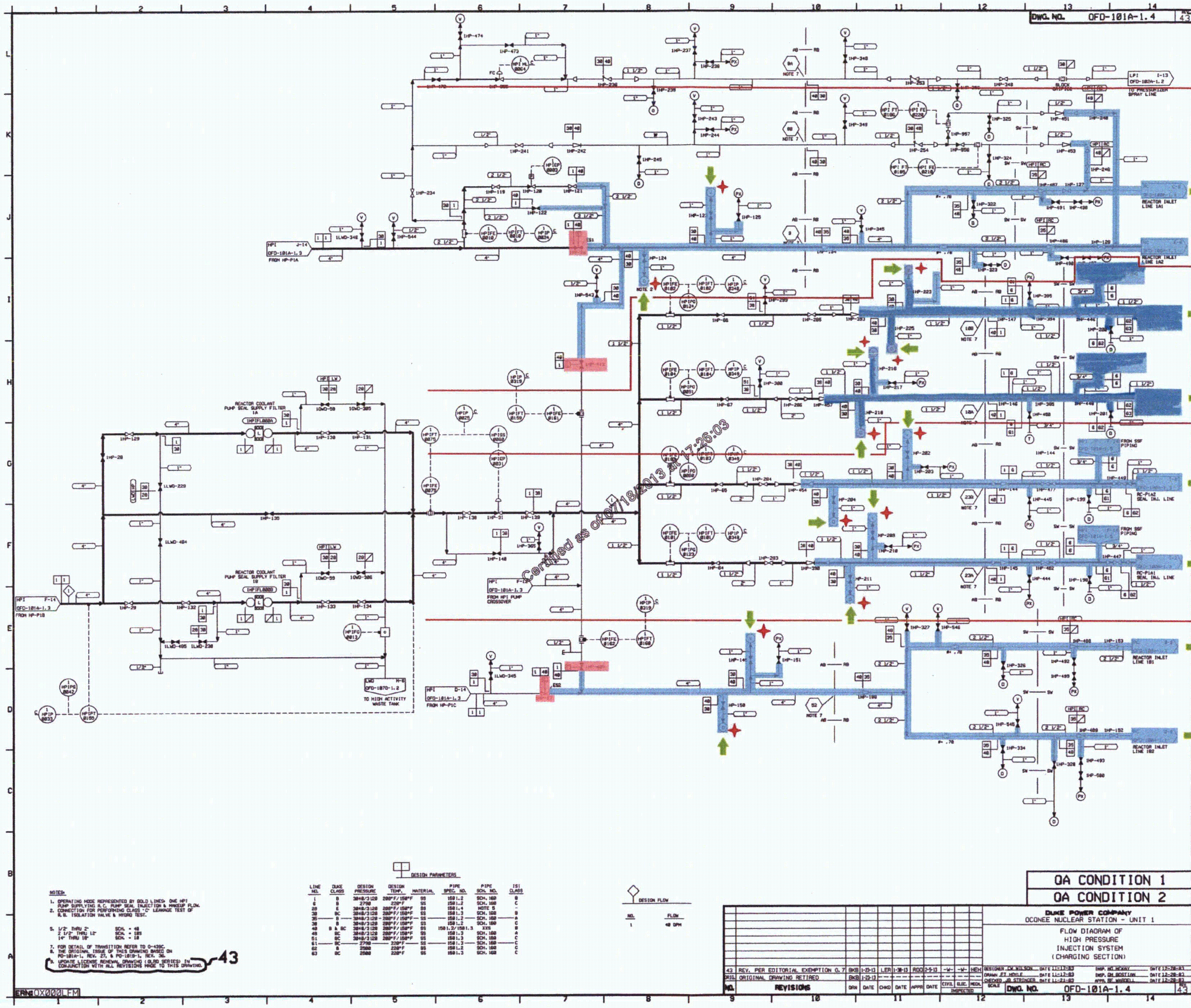
Note: _HP-24 and _HP-25 are EMO operated valves that can be manually closed upon loss of power but the FLEX strategy does not rely on EMO as an active feature.

Phase 2: RCMU

Blue Highlights: Safety Related Piping
Pink Highlights: Target Components
Fluid Flow Path
FLEX Connection Points

Note: 1HP-26, 1HP-27, 1HP-409, and 1HP-410 are EMO operated valves that can be manually closed upon loss of power but the FLEX strategy does not rely on EMO as an active feature

Note: FLEX Path B (Primary & Alternate) may not be required for strategy implementation.

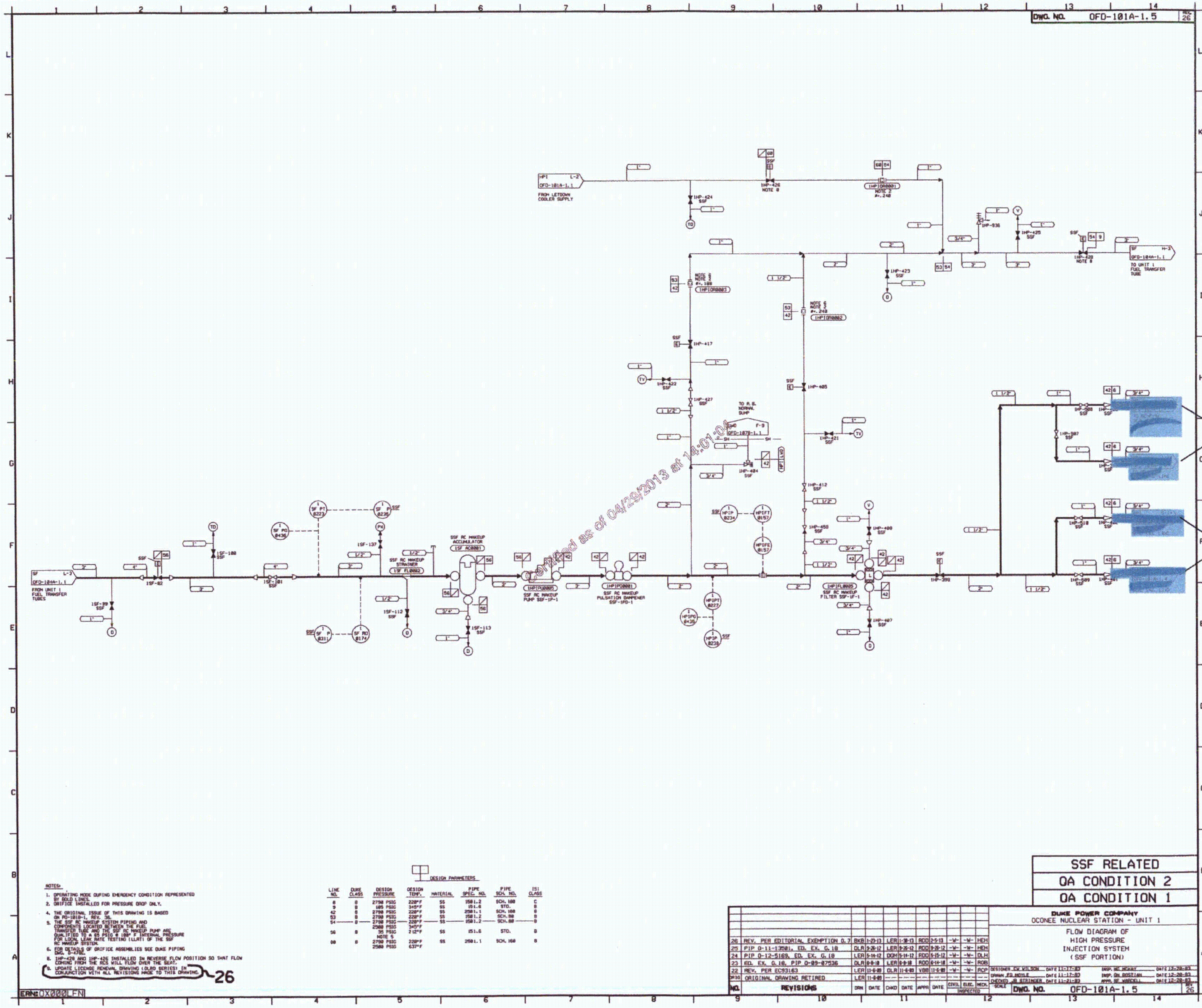


FLEX RCMU Primary Path B - 1xSSE

FLEX RCMU Alternate Path A - 2xSSE

FLEX RCMU Primary Path A - 1xSSE

FLEX RCMU Alternate Path B - 2xSSE



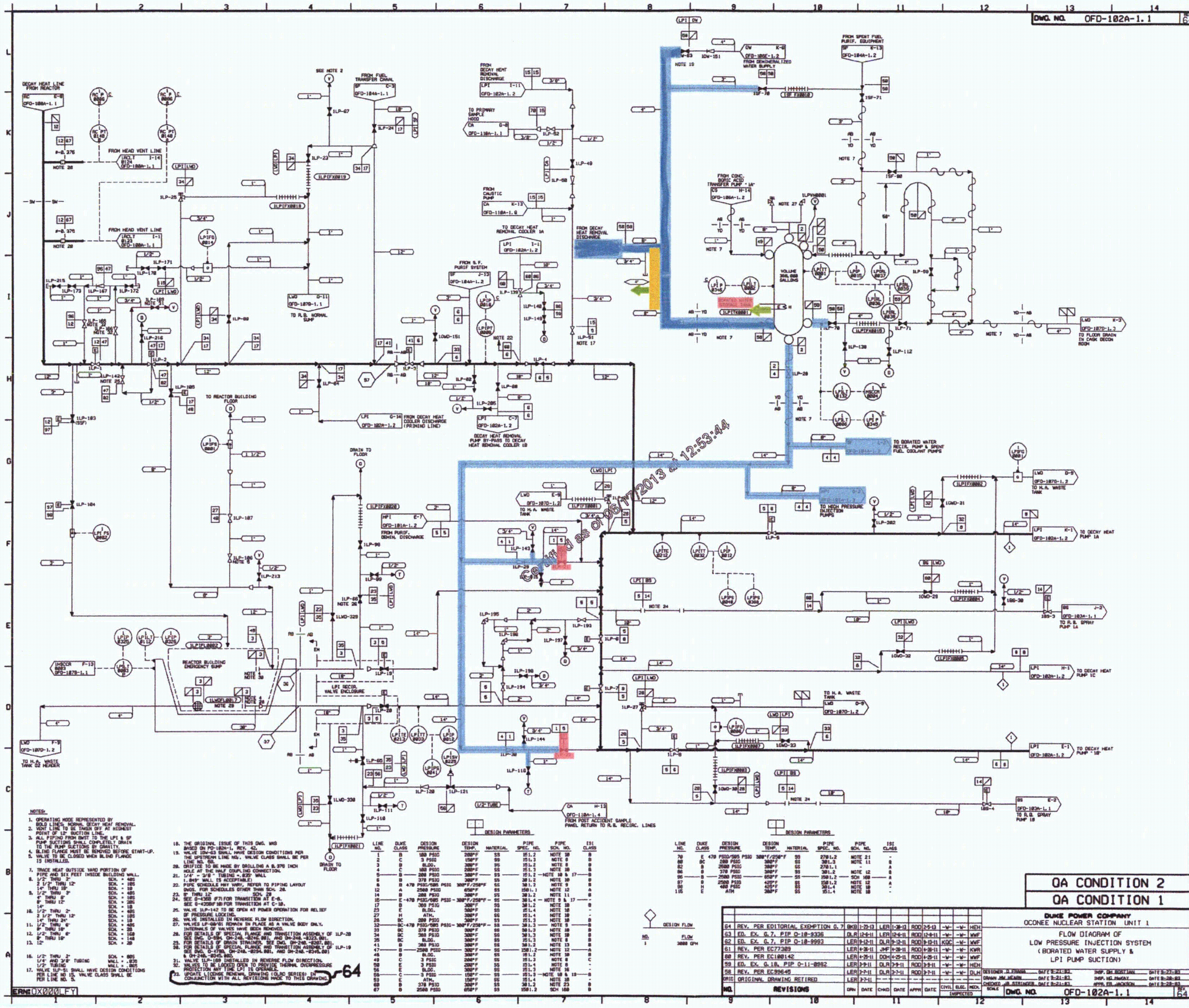
Phase 2: RCMU Pressure Boundary

Blue highlights: Safety Related Piping

Note: No Dwg Components Screen in for ESEL Evaluation

FLEX RCMU Alternate Path A - 2xSSE

FLEX RCMU Primary Path A - 1xSSE



Phase 2: RCMU

Blue Highlights: Safety Related Piping

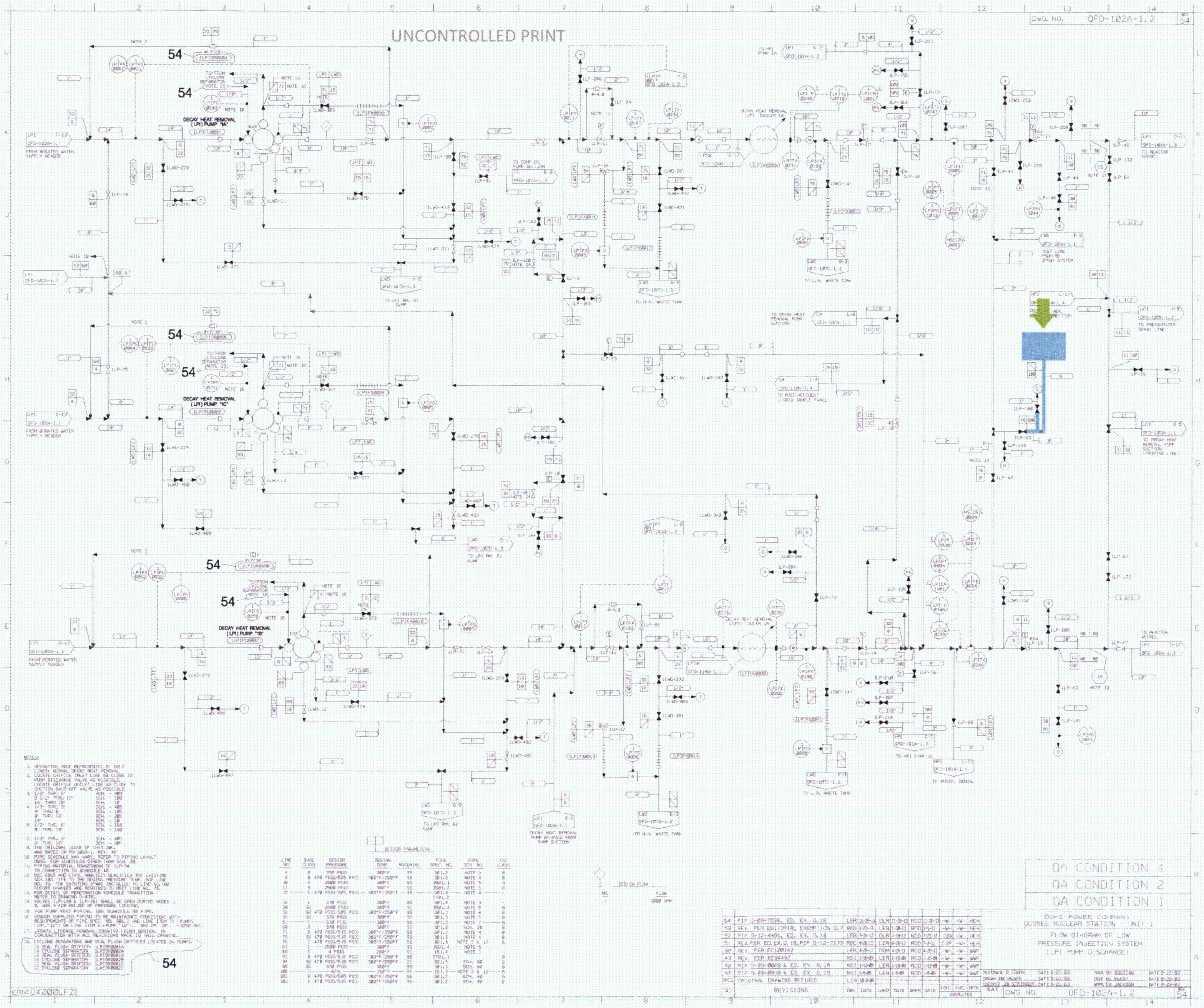
Pink Highlights: Target Components

Yellow Highlights: FLEX Tap off the BWST

Fluid Flow Path

2xSSE Path (Req'd for both Primary and Alternate FLEX Strategies)

Note: _LP-21 and _LP-22 are EMO operated valves that can be manually closed upon loss of power but the FLEX strategy does not rely on EMO as an active feature.



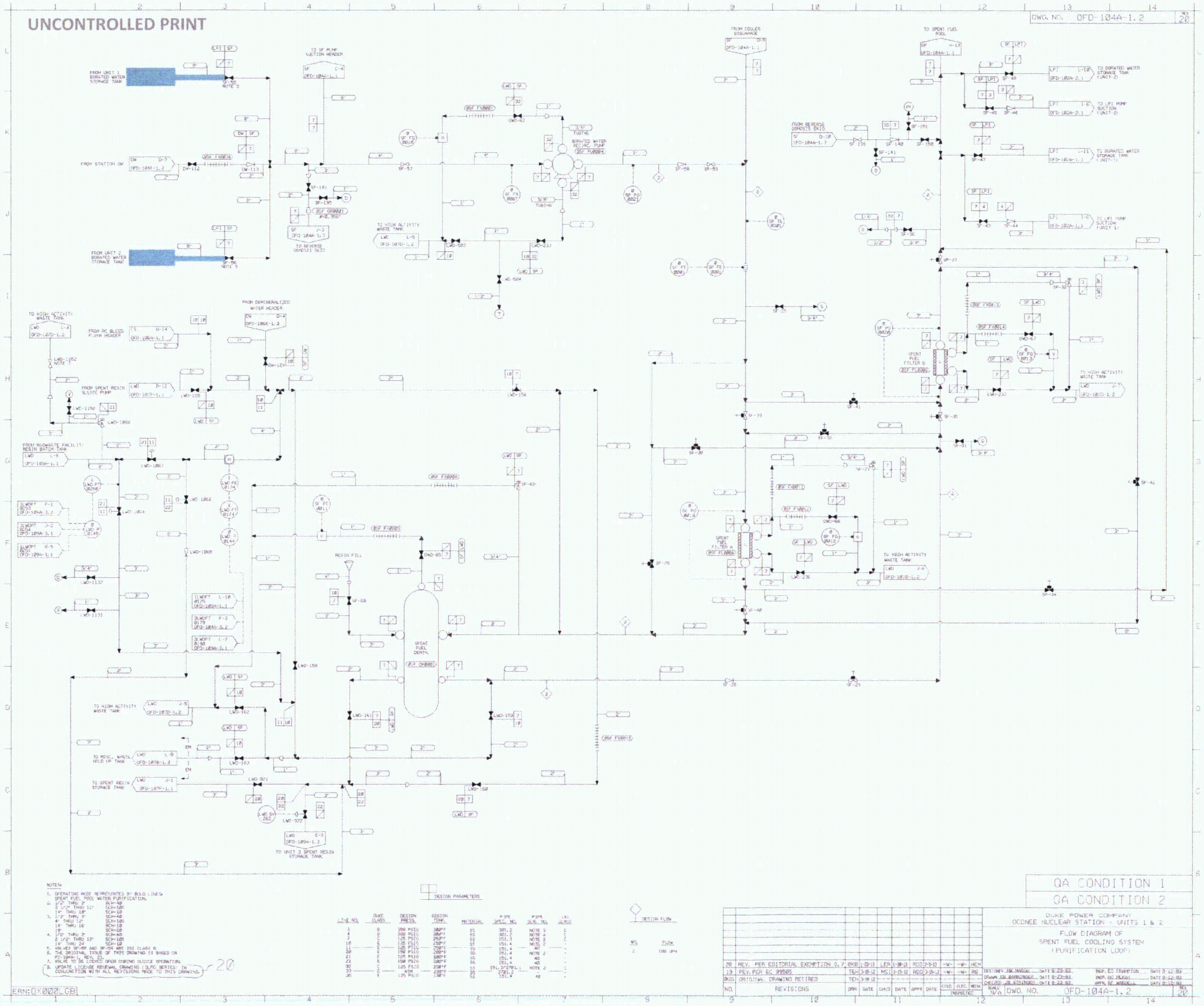
Phase 2: RCMU Pressure Boundary

Blue Highlights: Safety Related Piping

Fluid Flow Path

2xSSE Path (Req'd for both Primary and Alternate FLEX Strategies)

Note: No Dwg Components Screen in For ESEL Evaluation

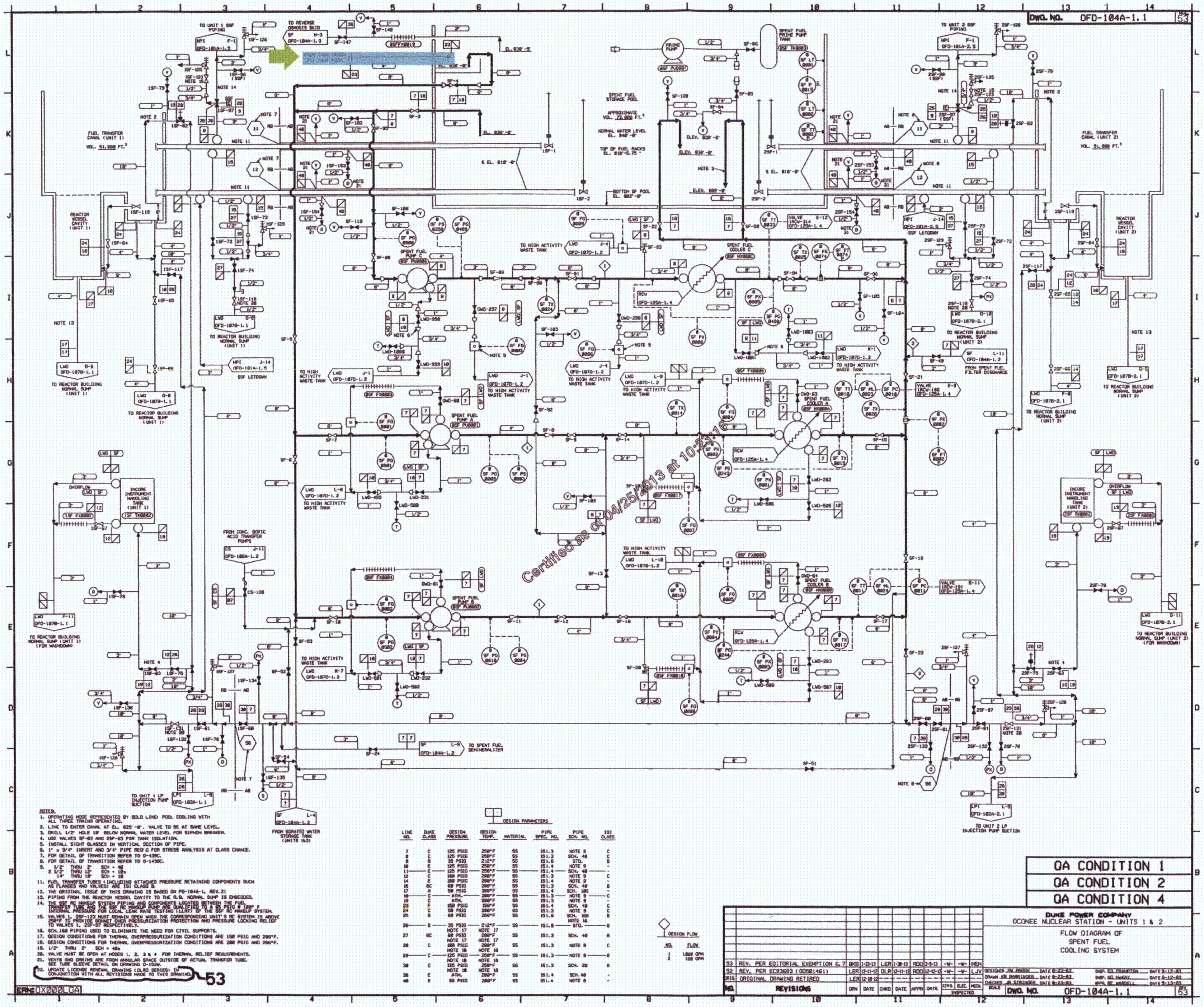


Phase 2: RCMU Pressure Boundary

Blue Highlights: Safety Related Piping

2xSSE Path (Req'd for both Primary and Alternate FLEX Strategies)

Note: No Dwg Components Screen in for ESEL Evaluation



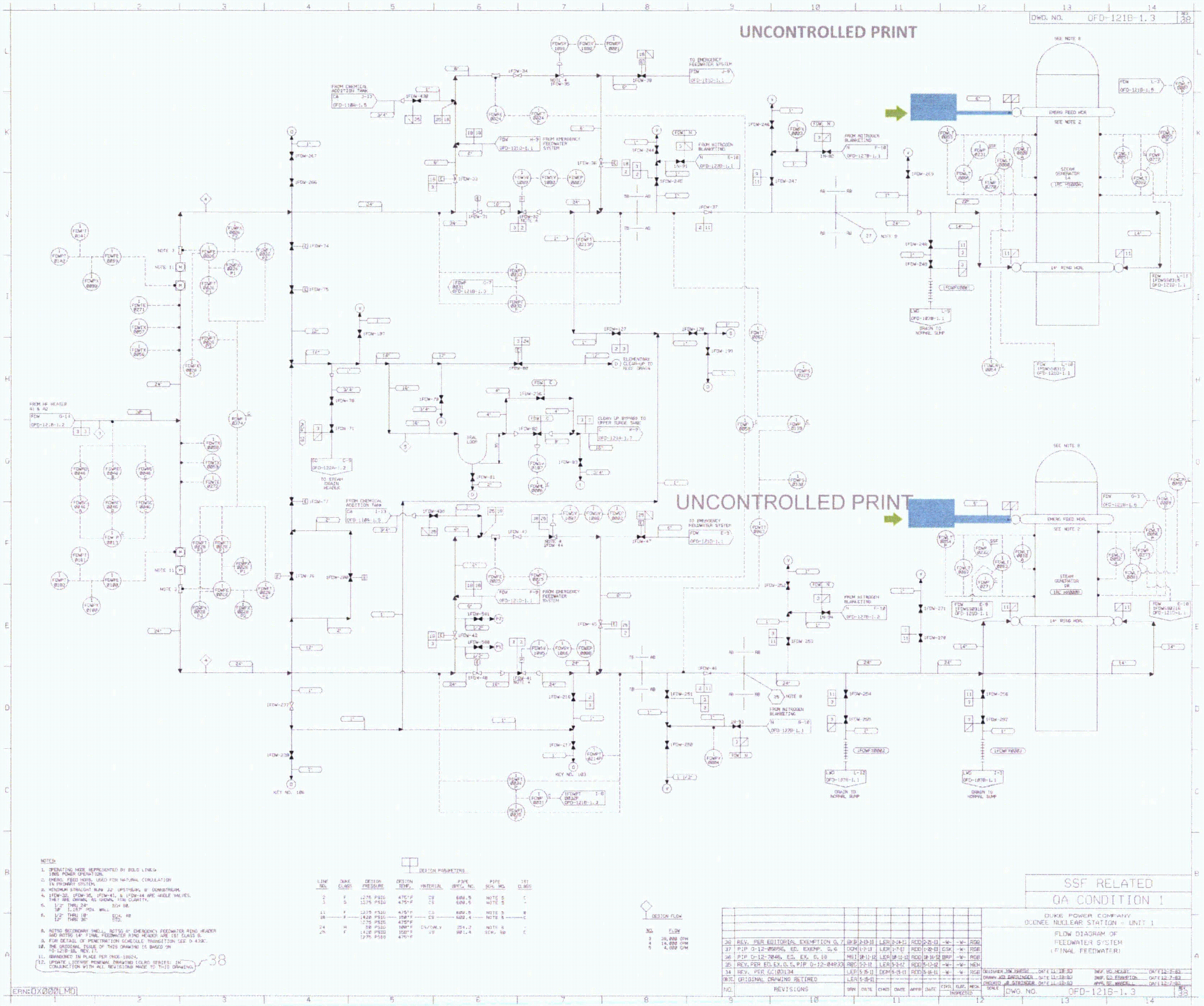
Phase 2: SFP Makeup

Blue Highlights: Safety Related Piping

Fluid Flow Path

1xSSE Path

Note: No Dwg Components Screen in for ESEL Evaluation



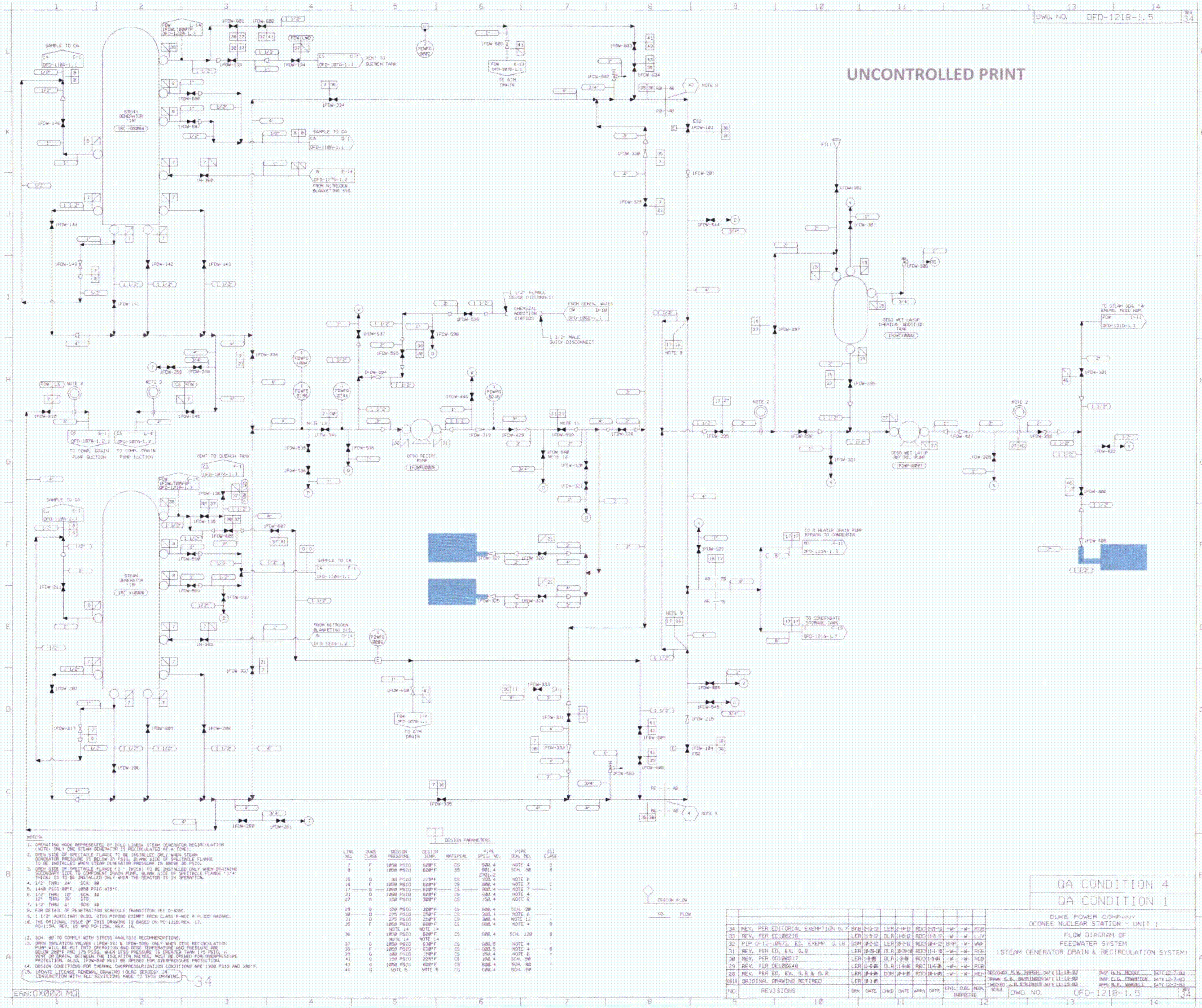
Phase 1: SG Feed

Blue Highlights: Safety Related Piping

Fluid Flow Path

2xSSE Path

Note: No Dwg Components Screen in for ESEL Evaluation

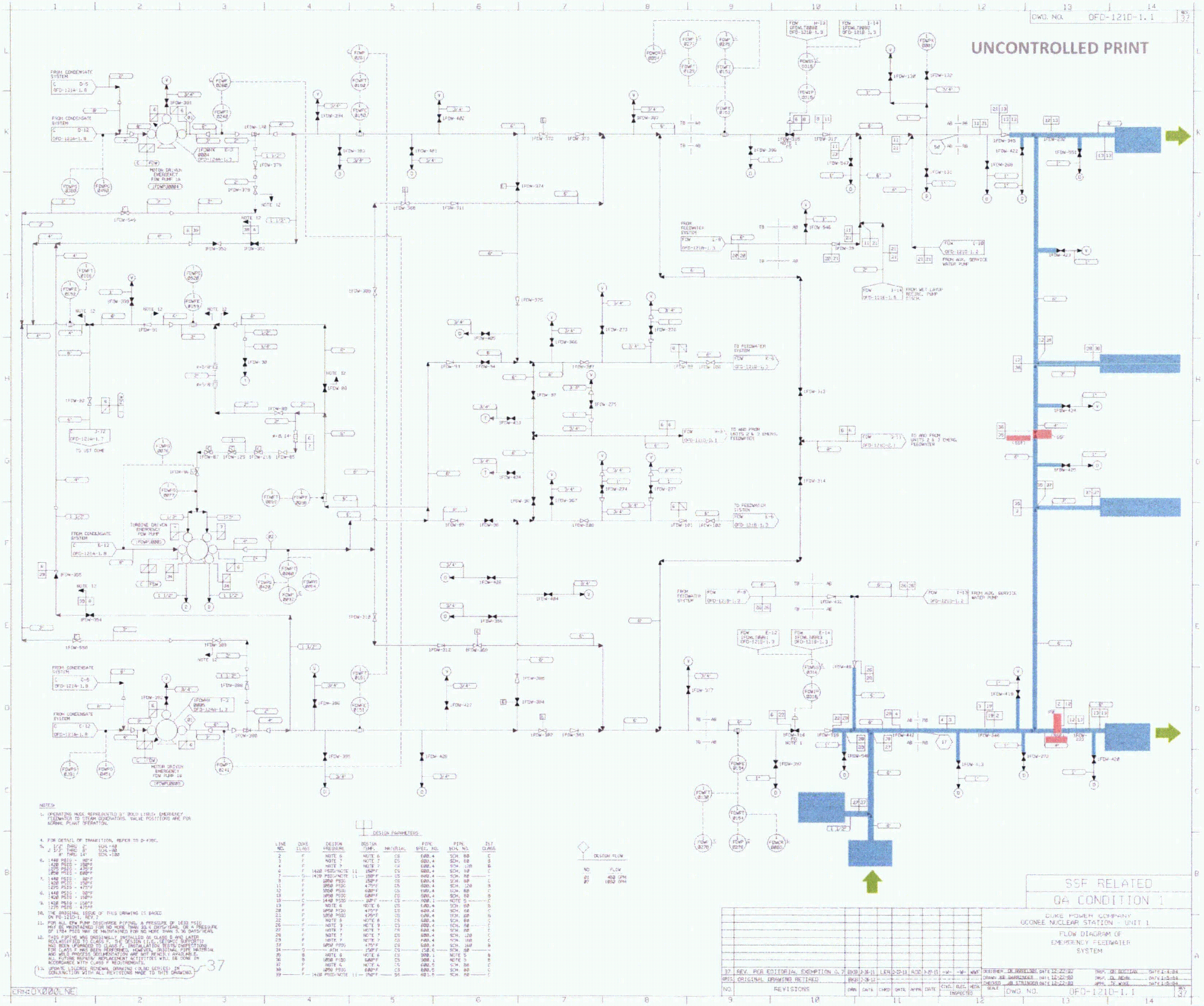


Phase 1: SG Feed Pressure Boundary

Blue Highlights: Safety Related Piping

2xSSE Path

Note: No Dwg Components Screen in for ESEL Evaluation



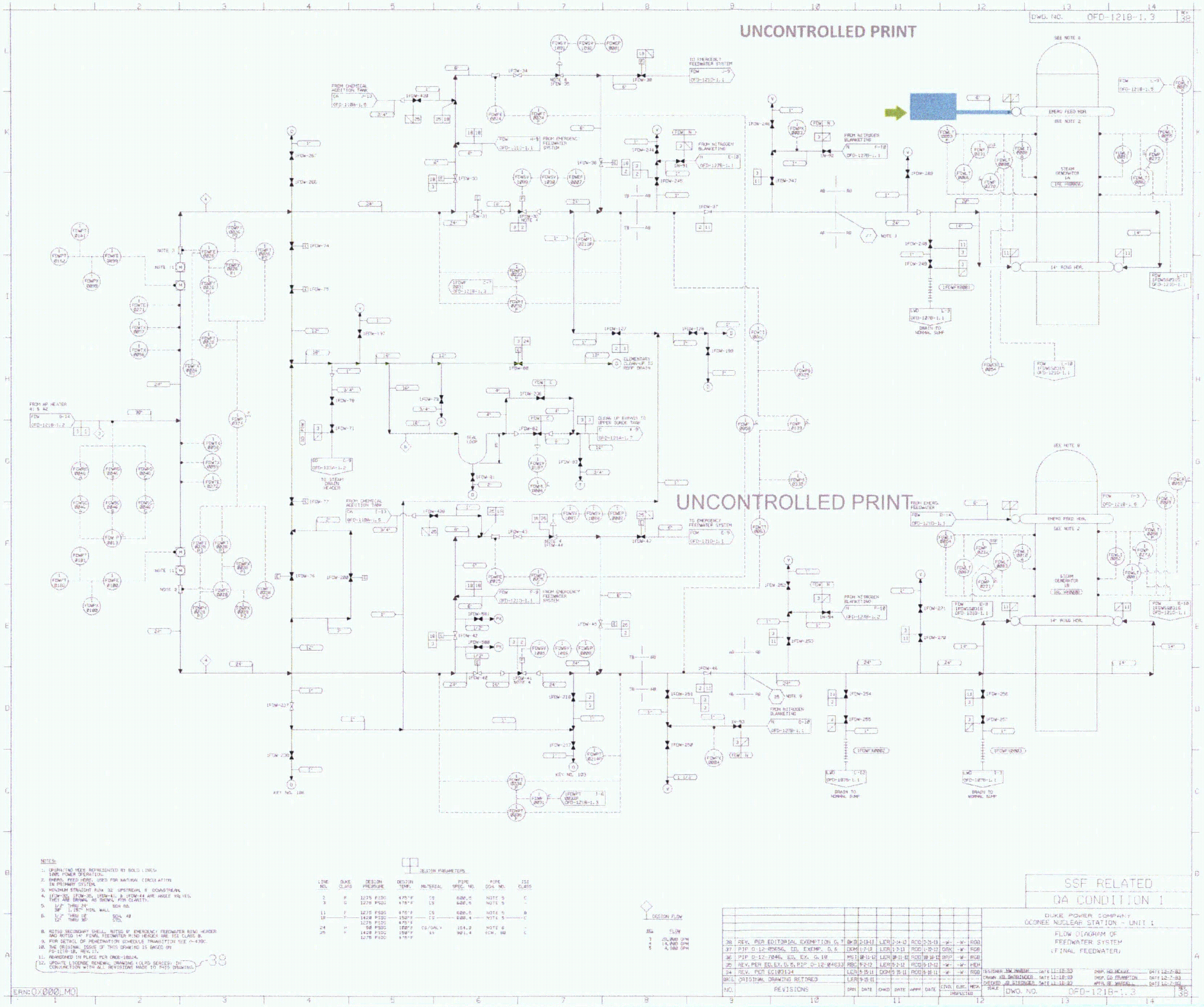
Phase 1: SG Feed

Blue Highlights: Safety Related Piping

Pink Highlights: Target Components

Fluid Flow Path

2xSSE Path



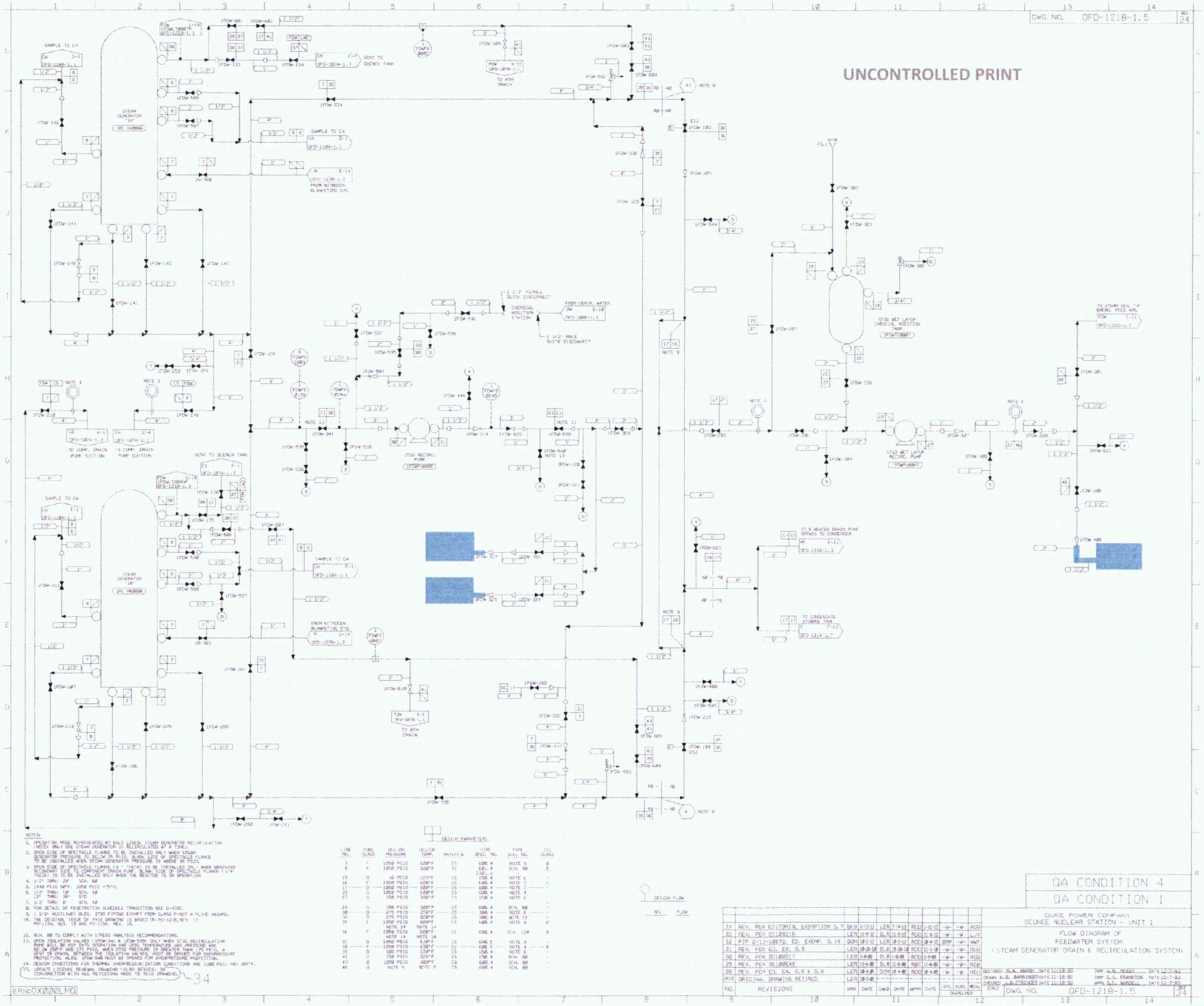
Phase 2: FLEX SG Feed Alternate Path

Blue Highlights: Safety Related Piping

Fluid Flow Path

2xSSE Path

Note: No Dwg Components Screen in for ESEL Evaluation

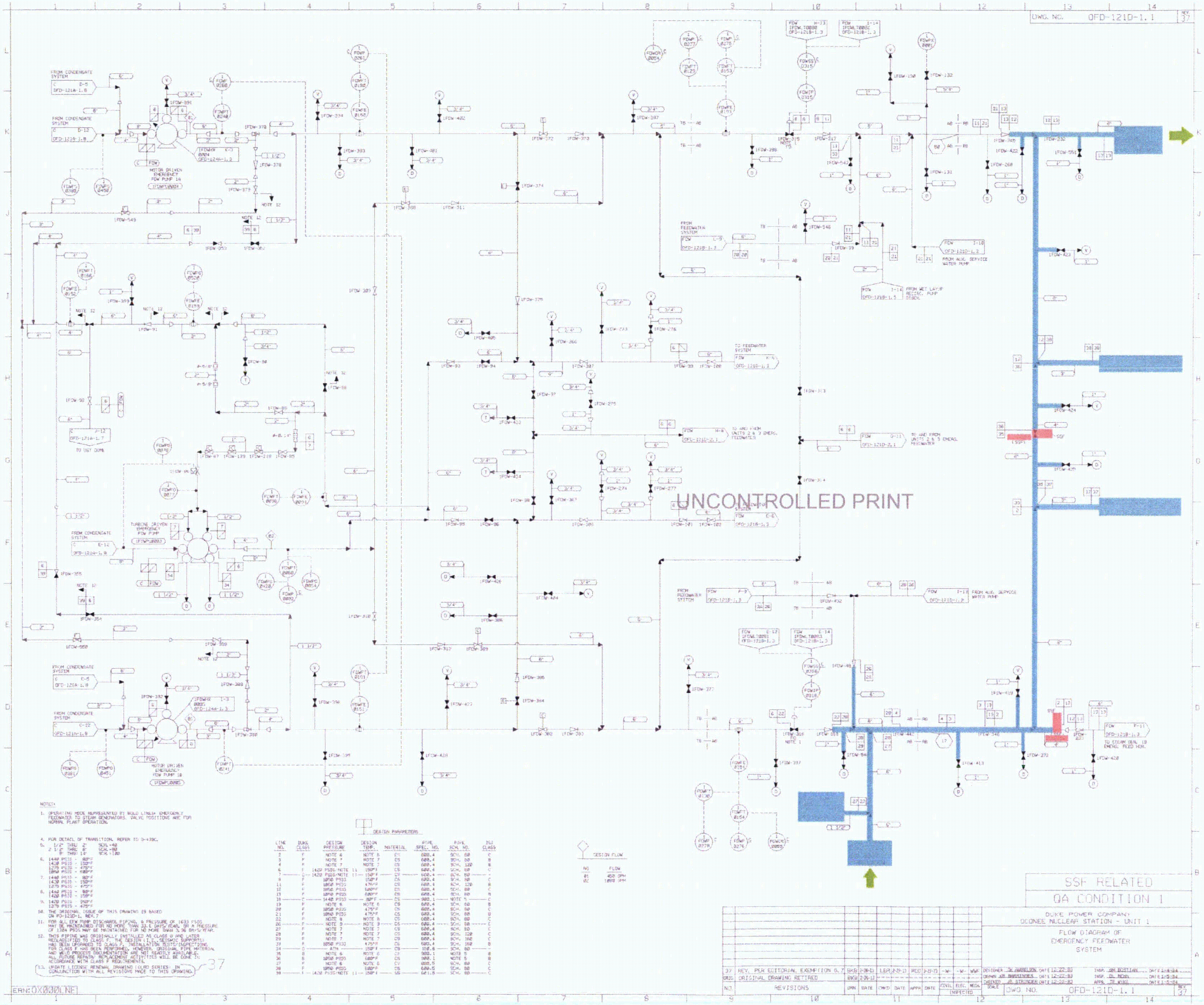


Phase 2: FLEX SG Feed Alternate Path Pressure Boundary

Blue Highlights: Safety Related Piping

2xSSE Path

Note: No Dwg Components Screen in for ESEL Evaluation

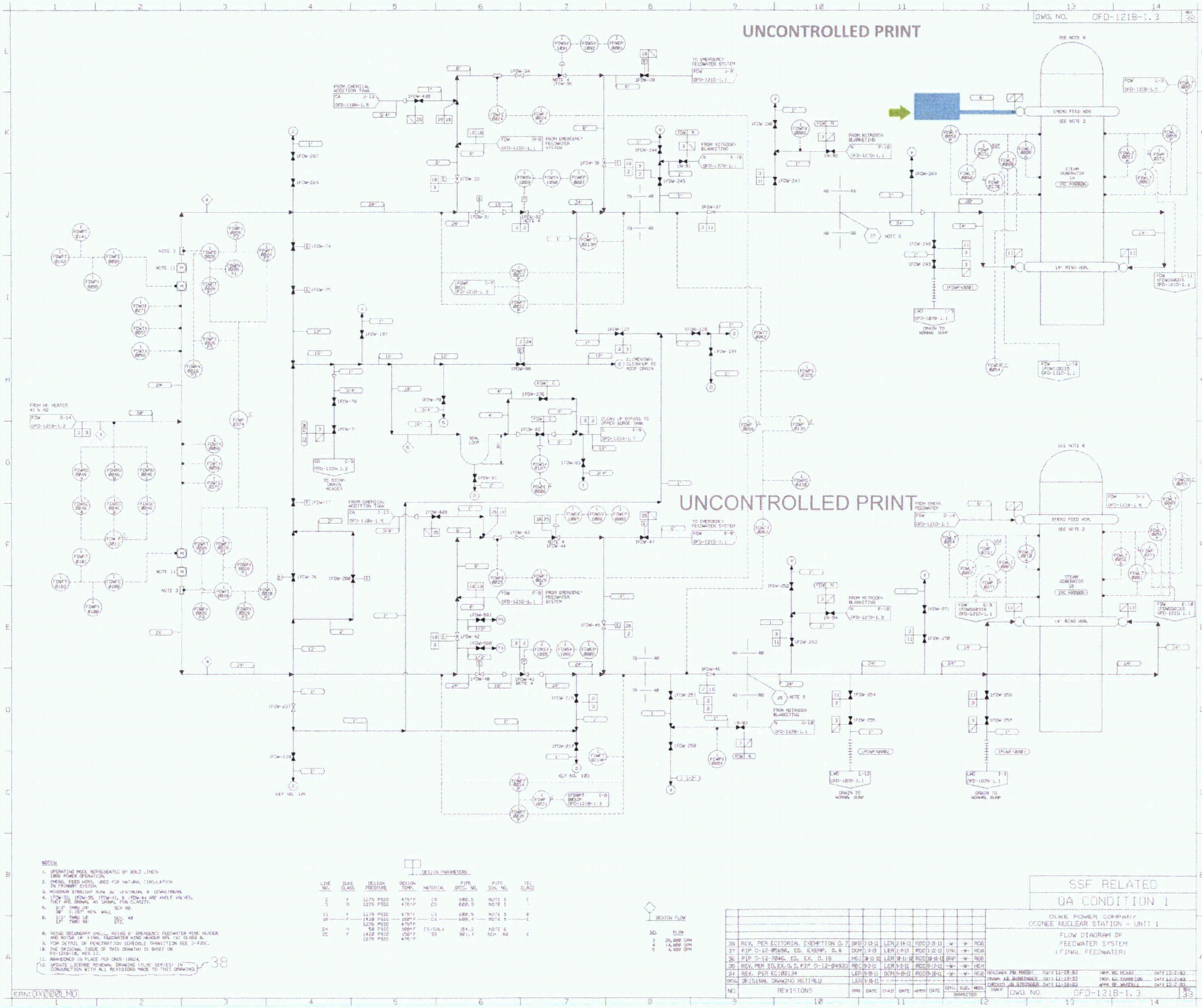


Phase 2: FLEX SG Feed Alternate Path

Blue Highlights: Safety Related Piping
Pink Highlights: Target Components
Fluid Flow Path

2xSSE Path

Note: 1CCW-269 and 1FDW-347 are EMO operated valves that are not repositioned during Phase 2 and subsequently, the FLEX Phase 2 strategy does not rely on EMO as an active feature (Reference FLEX Phase 1 for a strategy which does rely on EMO as an active feature).



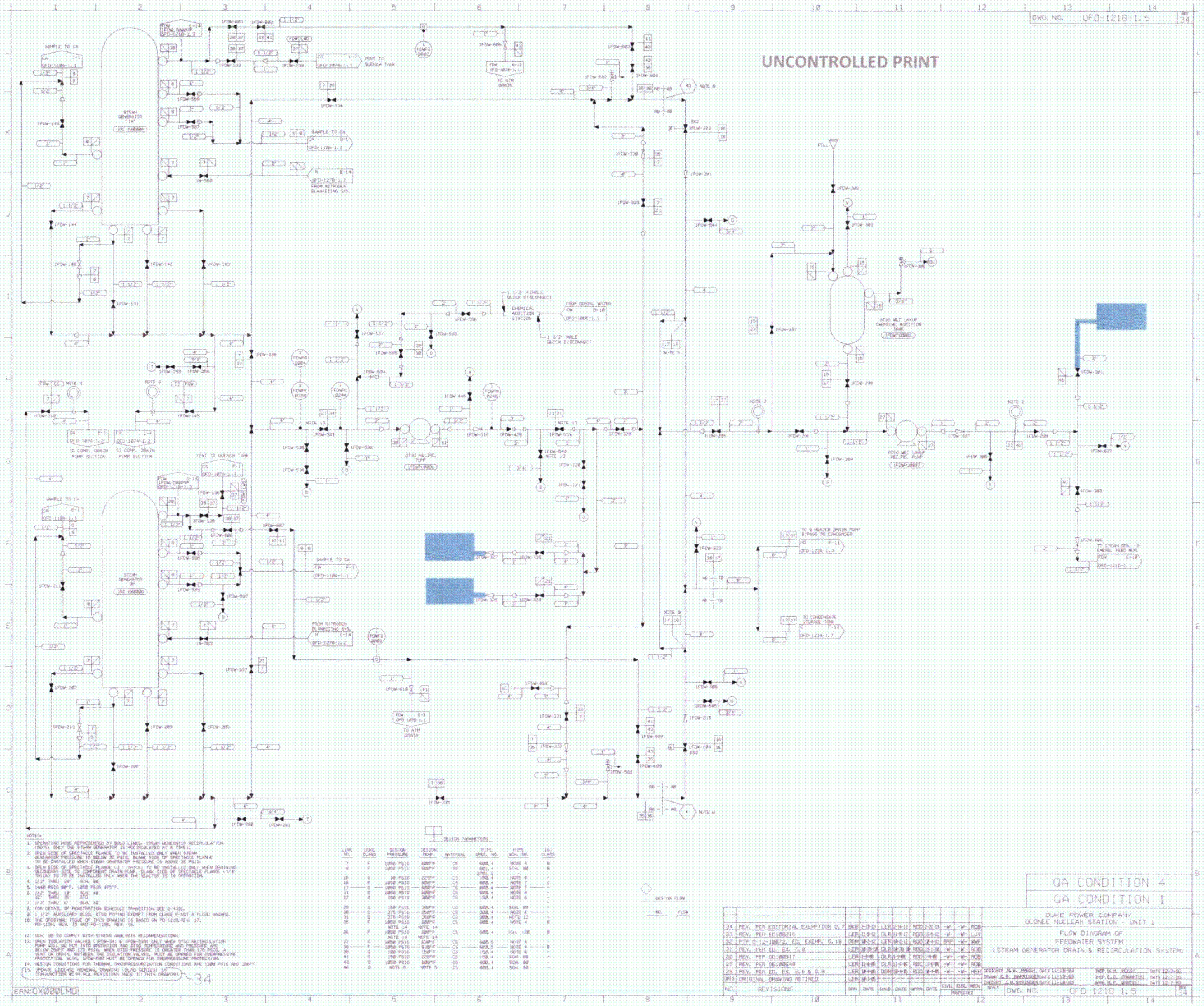
Phase 2: FLEX SG Feed Primary Path

Blue Highlights: Safety Related Piping

Fluid Flow Path

1xSSE Path

Note: No Dwg Components Screen in for ESEL Evaluation

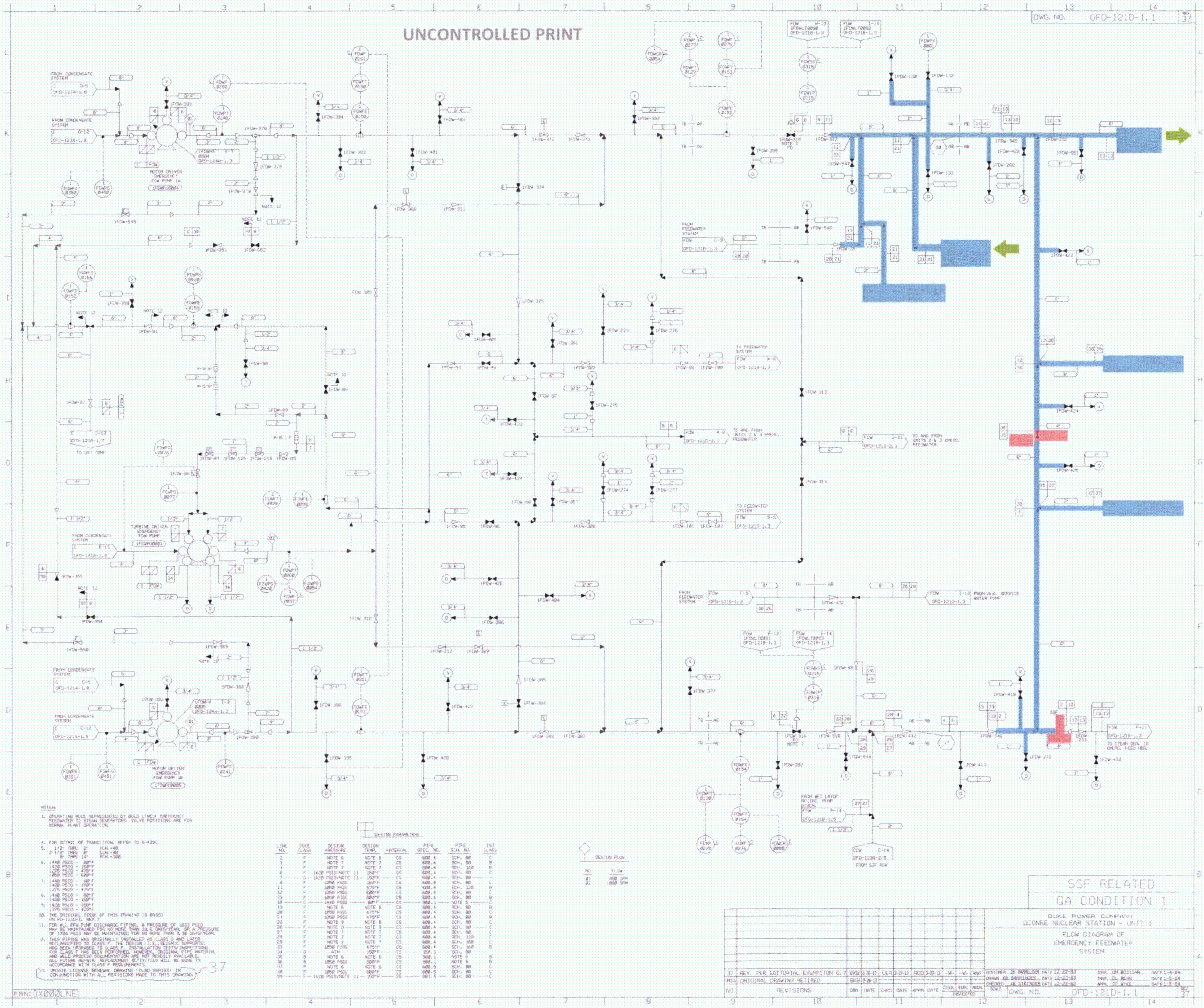


Phase 2: FLEX SG Feed Primary Path Pressure Boundary

Blue Highlights: Safety Related Piping

1xSSE Path

Note: No Dwg Components Screen in for ESEL Evaluation



Phase 2: FLEX SG Feed Primary Path

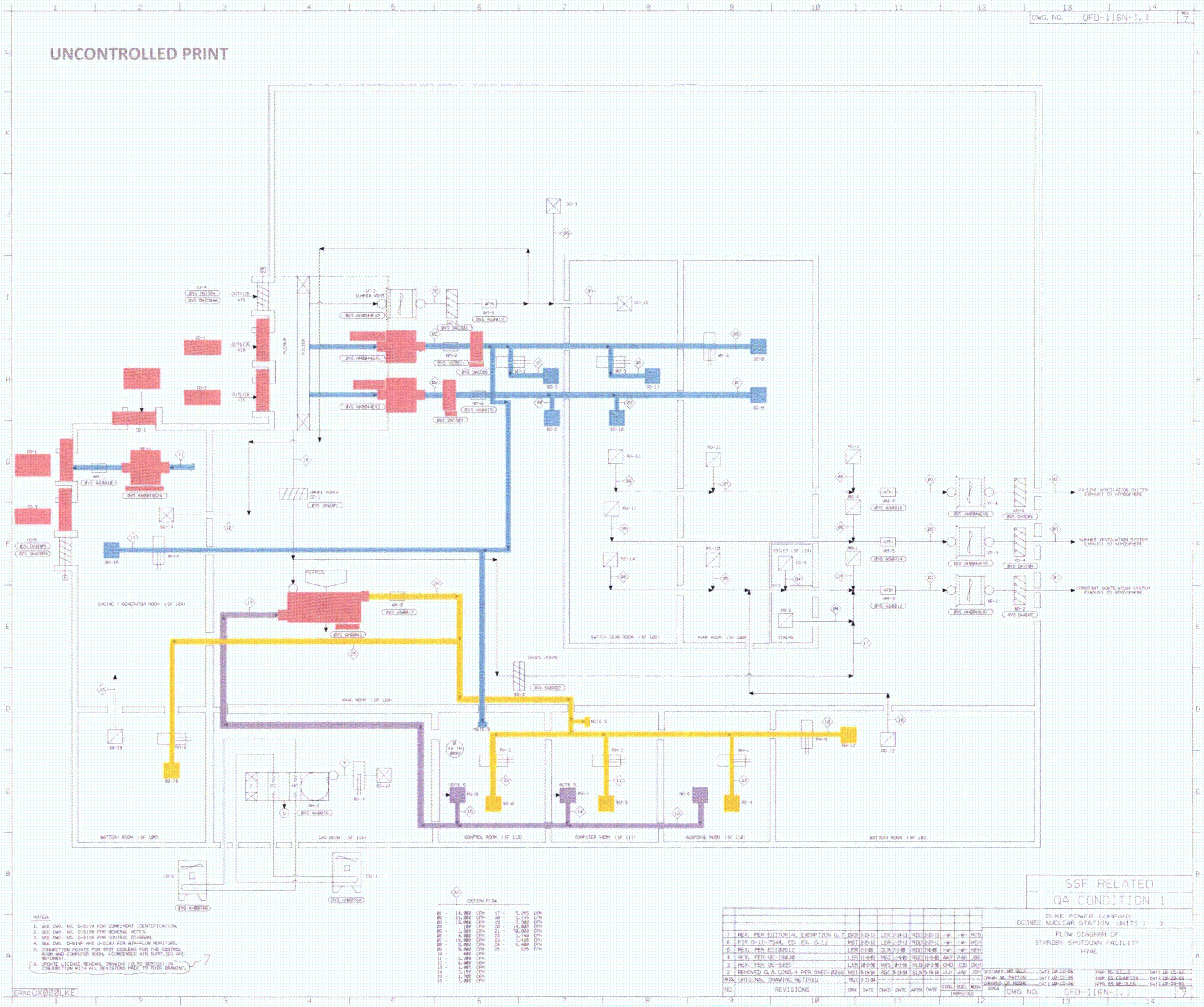
Blue Highlights: Safety Related Piping

Pink Highlights: Target Components

Fluid Flow Path

1xSSE Path

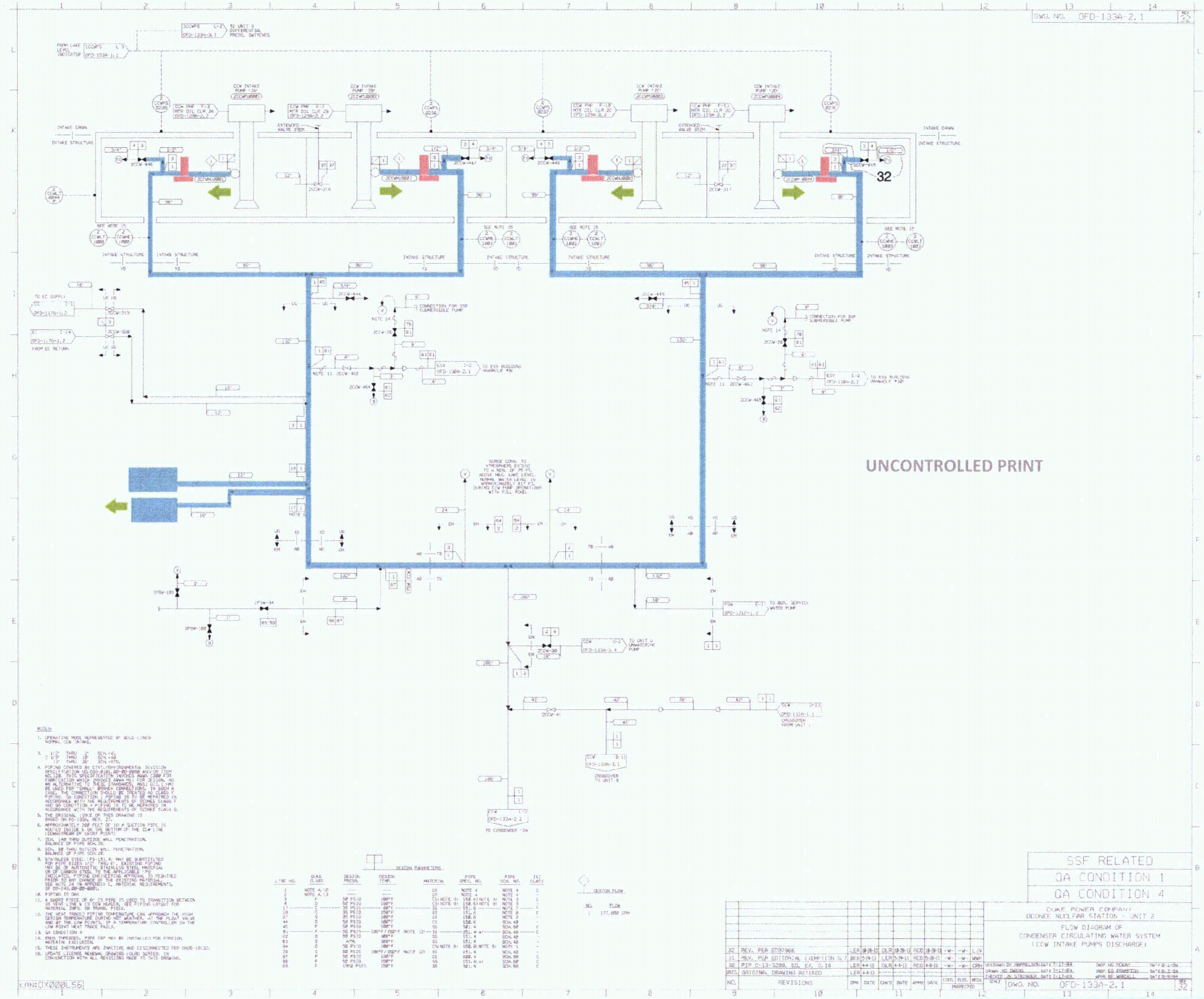
Note: 1CCW-269 and 1FDW-347 are EMO operated valves that are not repositioned during Phase 2 and subsequently, the FLEX Phase 2 strategy does not rely on EMO as an active feature (Reference FLEX Phase 1 for a strategy which does rely on EMO as an active feature).



Phase 1: SSF HVAC

Blue Highlights: Intake Air Path
Yellow Highlights: A/C Supply Air Path
Purple Highlights: A/C Return Air Path
Pink Highlights: Target Components

2xSSE Path



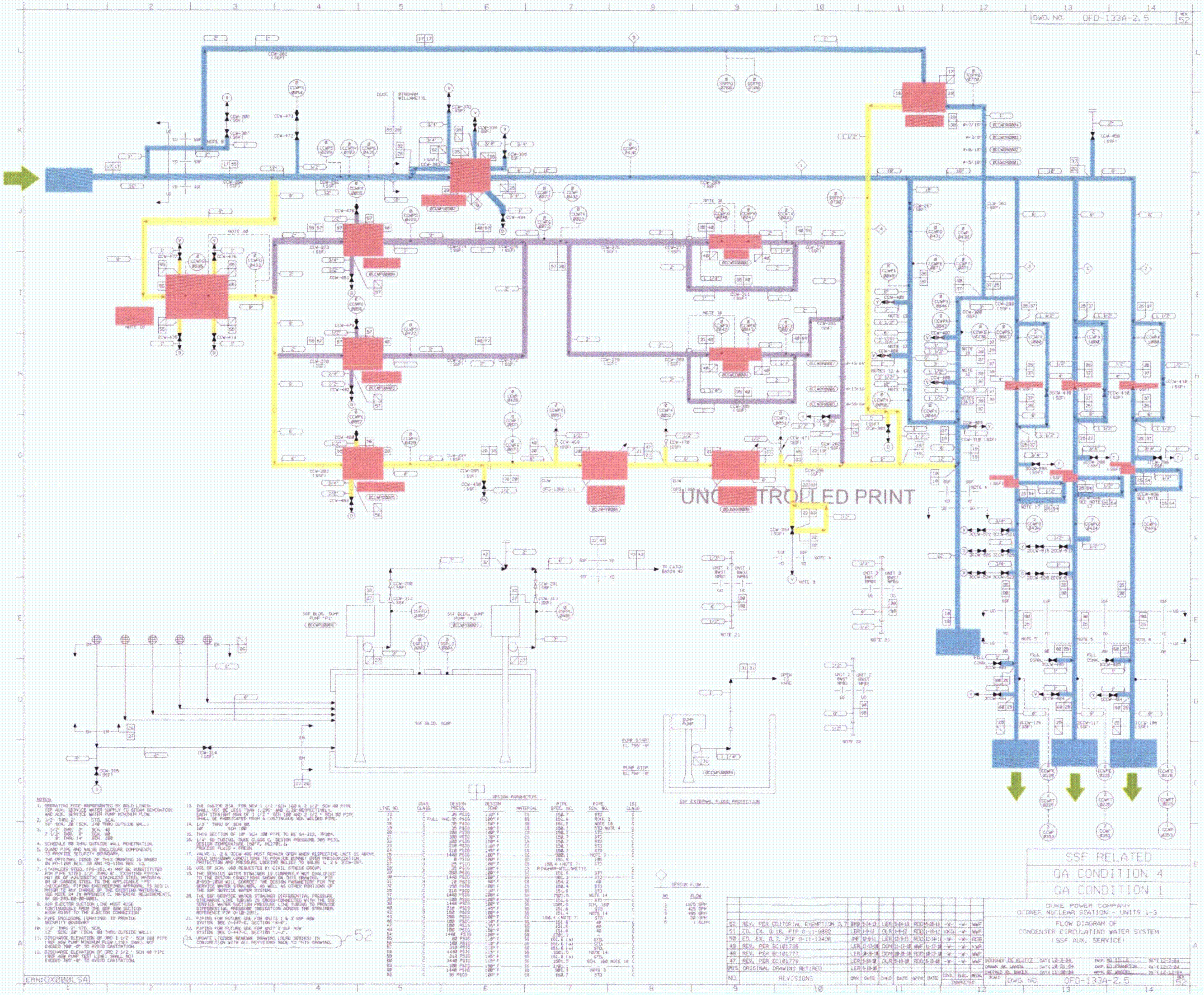
Phase 1: SG Feed

Blue Highlights: Safety Related Piping
Pink Highlights: Target Components
Fluid Flow Path

2xSSE Path

Note: 2CCW-10, 2CCW-11, 2CCW-12, and 2CCW-13 are EMO operated valves that fail as is in the desired position and subsequently, the FLEX Phase 1 strategy does not rely on EMO as an active feature.

Note: It is not the intent of this dwg to demonstrate that branch connections are rugged to create an intact pressure boundary. The assumption is that the inventory from Lake Keowee continues to provide a source to the SSF branch connection until such time as the contents of the lake through the Oconee Intake Canal are depleted.

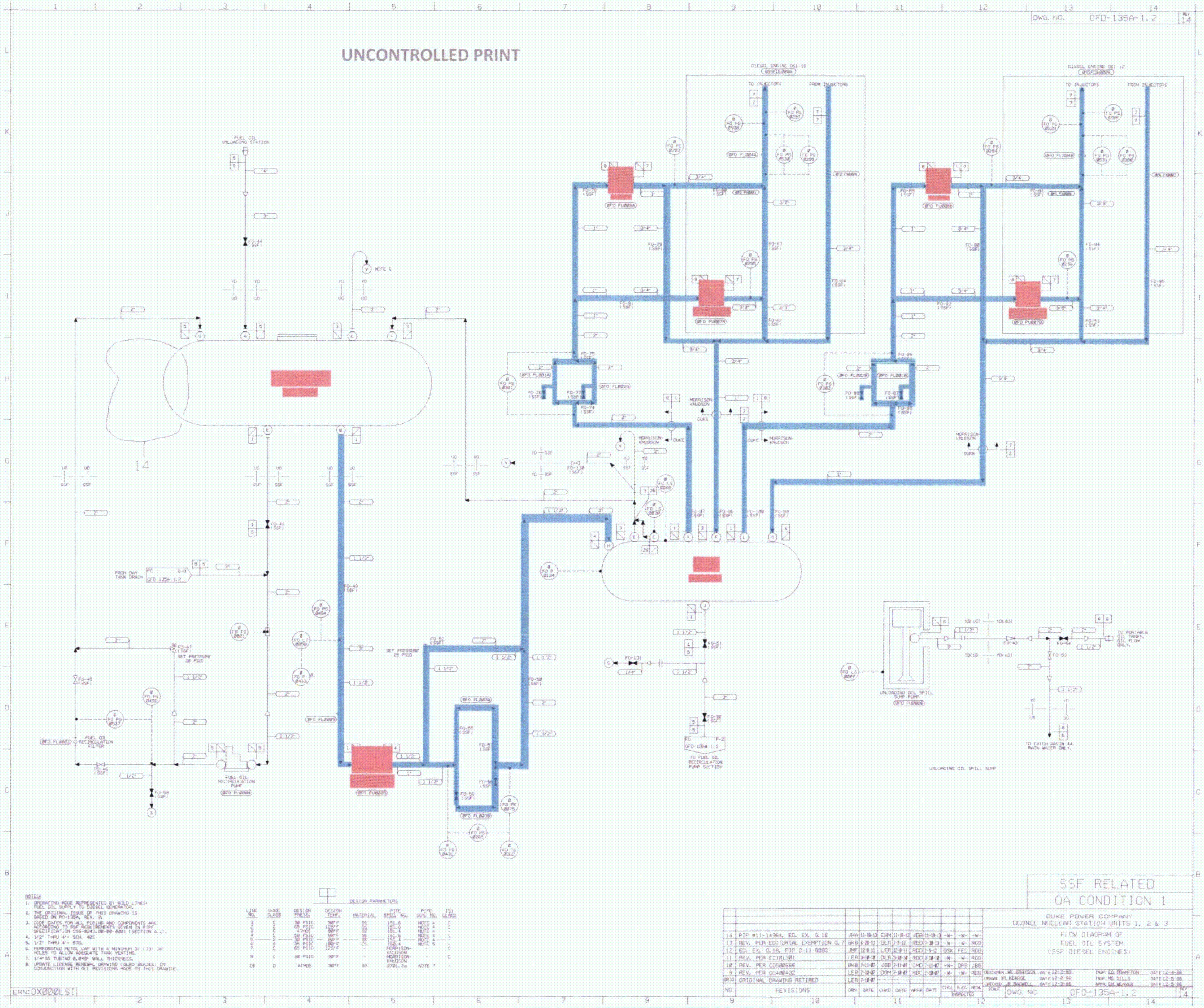


Phase 1: SG Feed, SSF Diesel Engine Service Water, & SSF HVAC Service Water

Blue Highlights: SG Feed Safety Related Piping
Yellow Highlights: SSF Diesel Engine Service Water Safety Related Piping
Purple Highlights: SSF HVAC Service Water Safety Related Piping
Pink Highlights: Target Components
Fluid Flow Path

2xSSE Path

Note: Only one HVAC Service Water Pump is required to be operable.

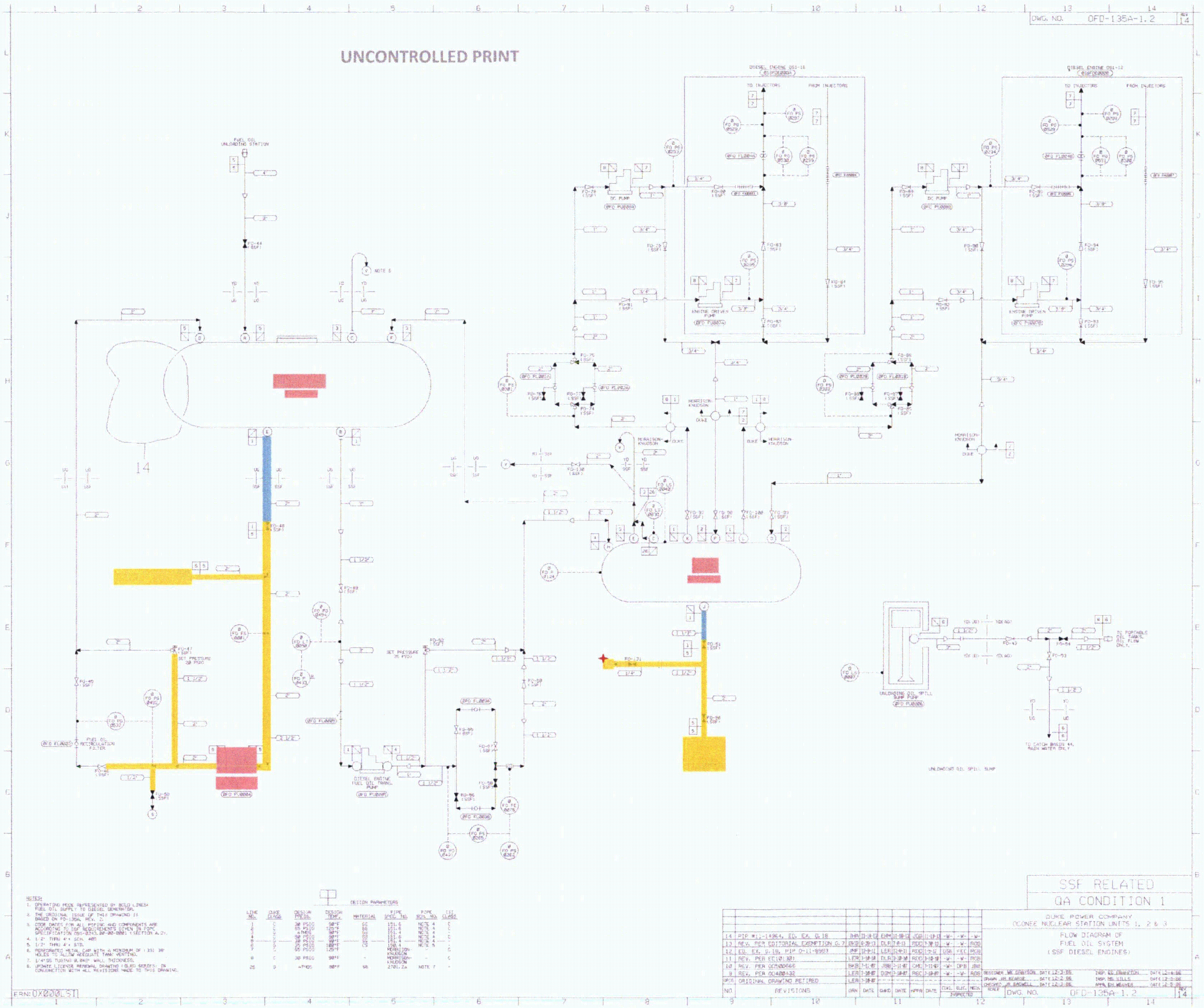


Phase 1: SSF Diesel Engine Fuel Oil System

Blue Highlights: Safety Related Piping

Pink Highlights: Target Components

2xSSE Path



Phase 2: SSF Diesel Engine Fuel Oil System

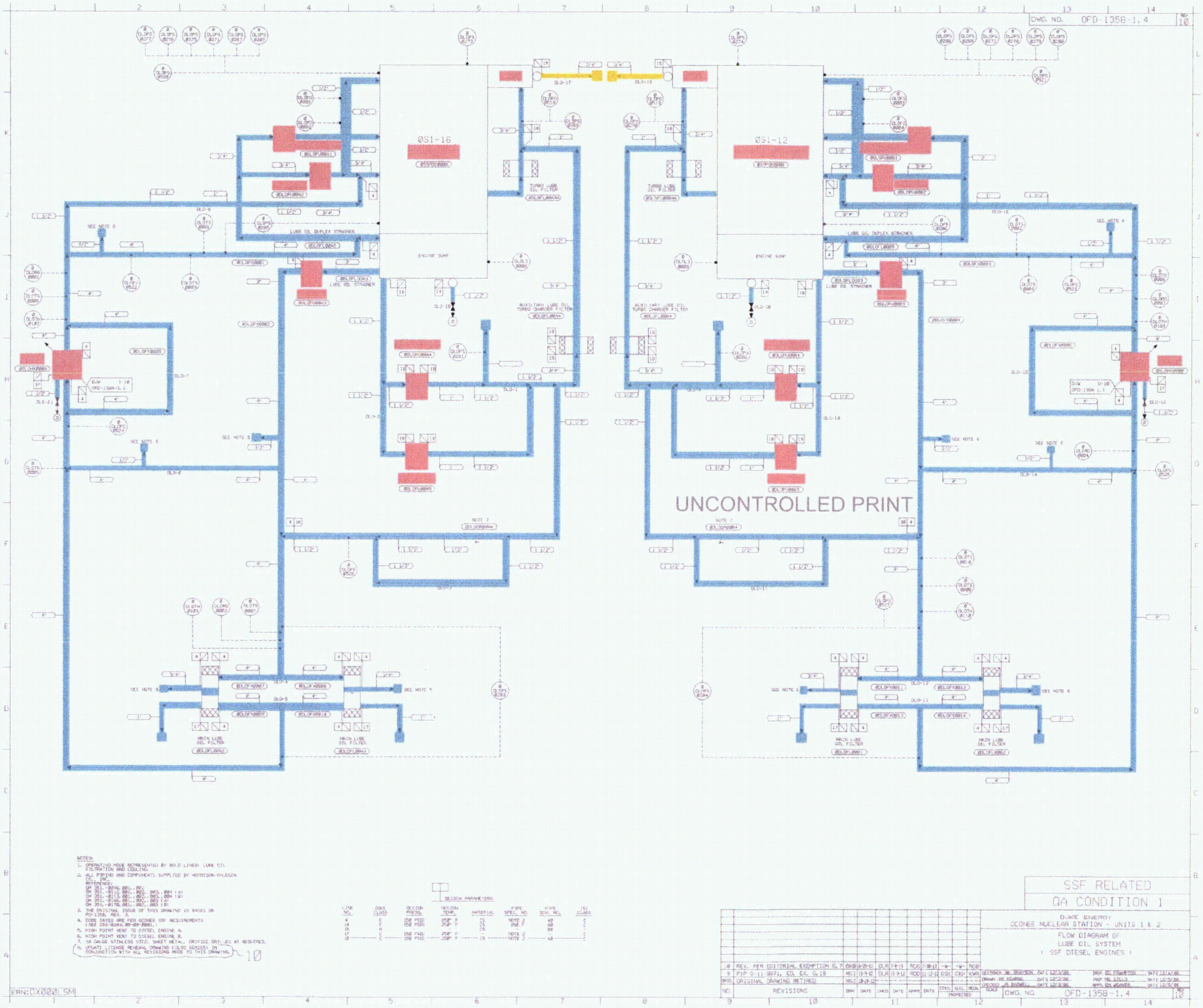
Blue Highlights: Safety Related Piping

Yellow Highlights: Class G Piping

Pink Highlights: Target Components

✦ FLEX Connection Point for Access to Fuel Oil

2xSSE Path

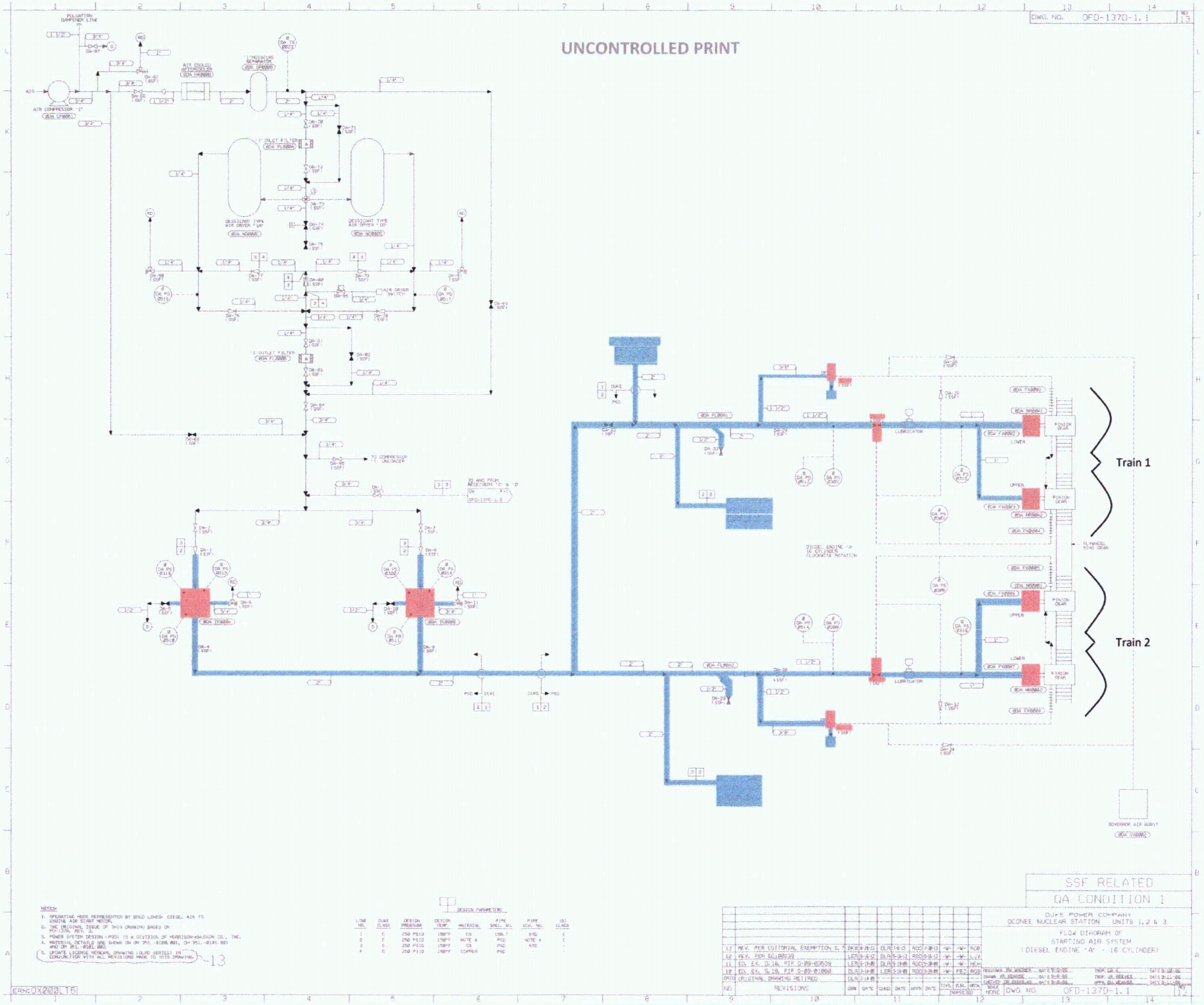


Phase 1: SSF Diesel Engine Lube Oil System

Blue Highlights: Safety Related Piping
Yellow Highlights: Non-Safety Related Piping
Pink Highlights: Target components

2xSSE Path

Note: All equipment is integral to the diesel engine skids.



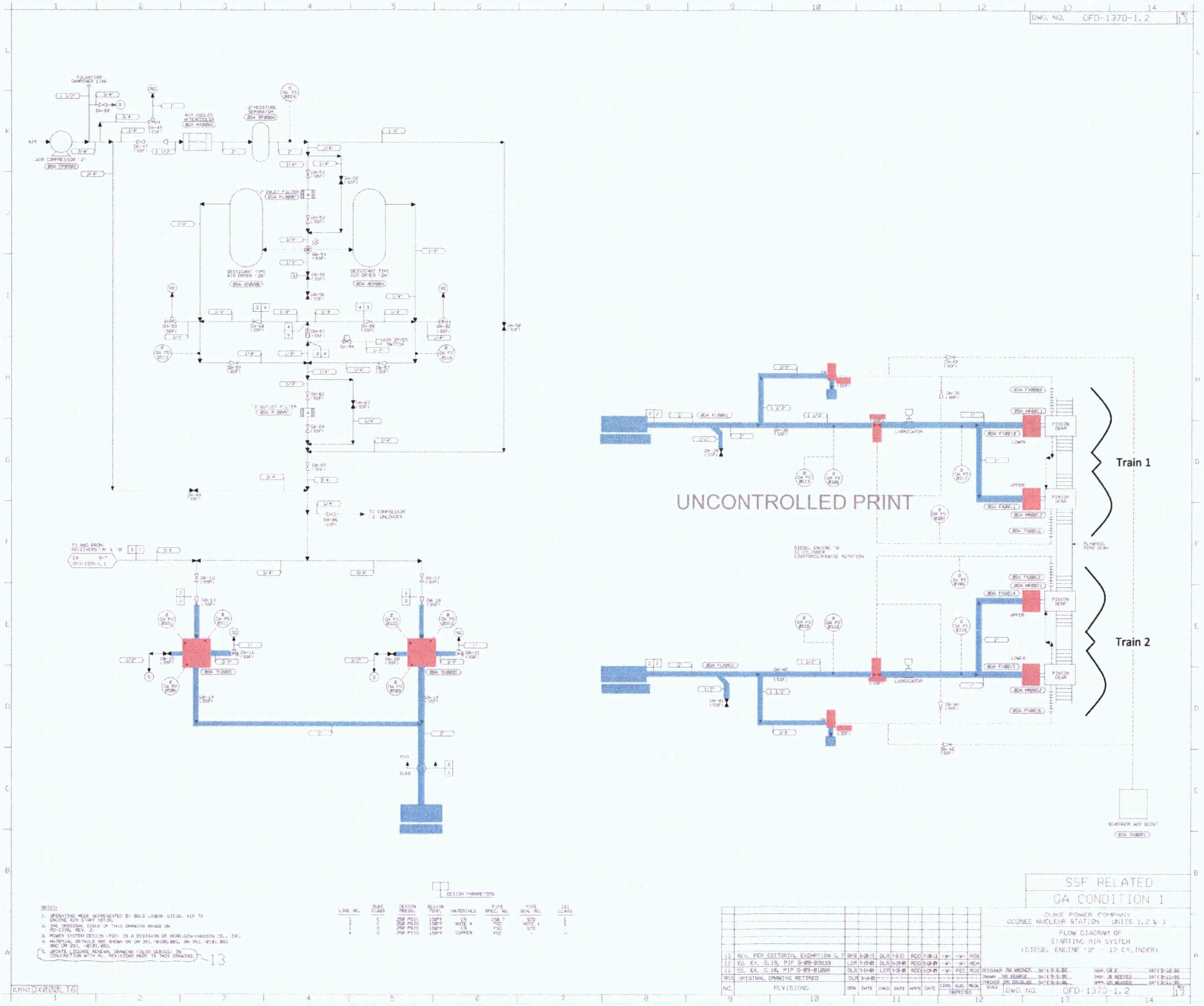
Phase 1: SSF Starting Air System

Blue Highlights: Safety Related Piping
Pink Highlights: Target Components

Train 1 (with the exception of Air Start Motor A2) - 2xSSE Path
Train 2 & Air Start Motor A2 - 1xSSE Path

Note: Only one train and one air start motor on that train is required for successful FLEX strategy implementation. Therefore, only one train and one air start motor is evaluated to 2xSSE.

Note: Only one tank (Receiver Tank "A" or Receiver Tank "B") is required for successful FLEX strategy implementation. Therefore, Receiver Tank "A" is evaluated at 2xSSE and Receiver Tank "B" is evaluated at 1xSSE.



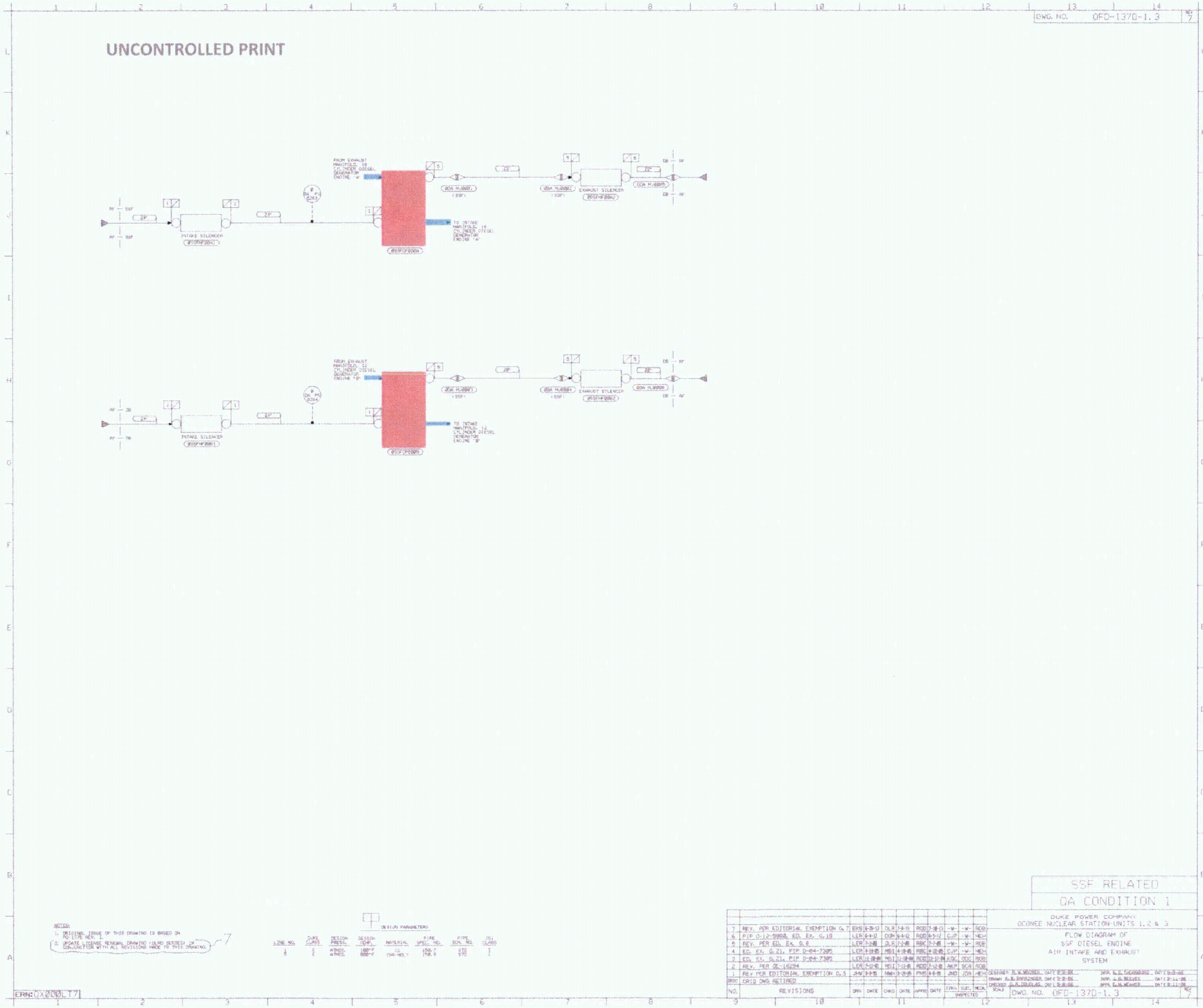
Phase 1: SSF Starting Air System

Blue Highlights: Safety Related Piping
Pink Highlights: Target Components

Train 1 (with the exception of Air Start Motor C2) - 2xSSE Path
Train 2 & Air Start Motor C2 - 1xSSE Path

Note: Only one train and one air start motor on that train is required for successful FLEX strategy implementation. Therefore, only one train and one air start motor is evaluated to 2xSSE.

Note: Only one tank (Receiver Tank "C" or Receiver Tank "D") is required for successful FLEX strategy implementation. Therefore, Receiver Tank "C" is evaluated at 2xSSE and Receiver Tank "D" is evaluated at 1xSSE.

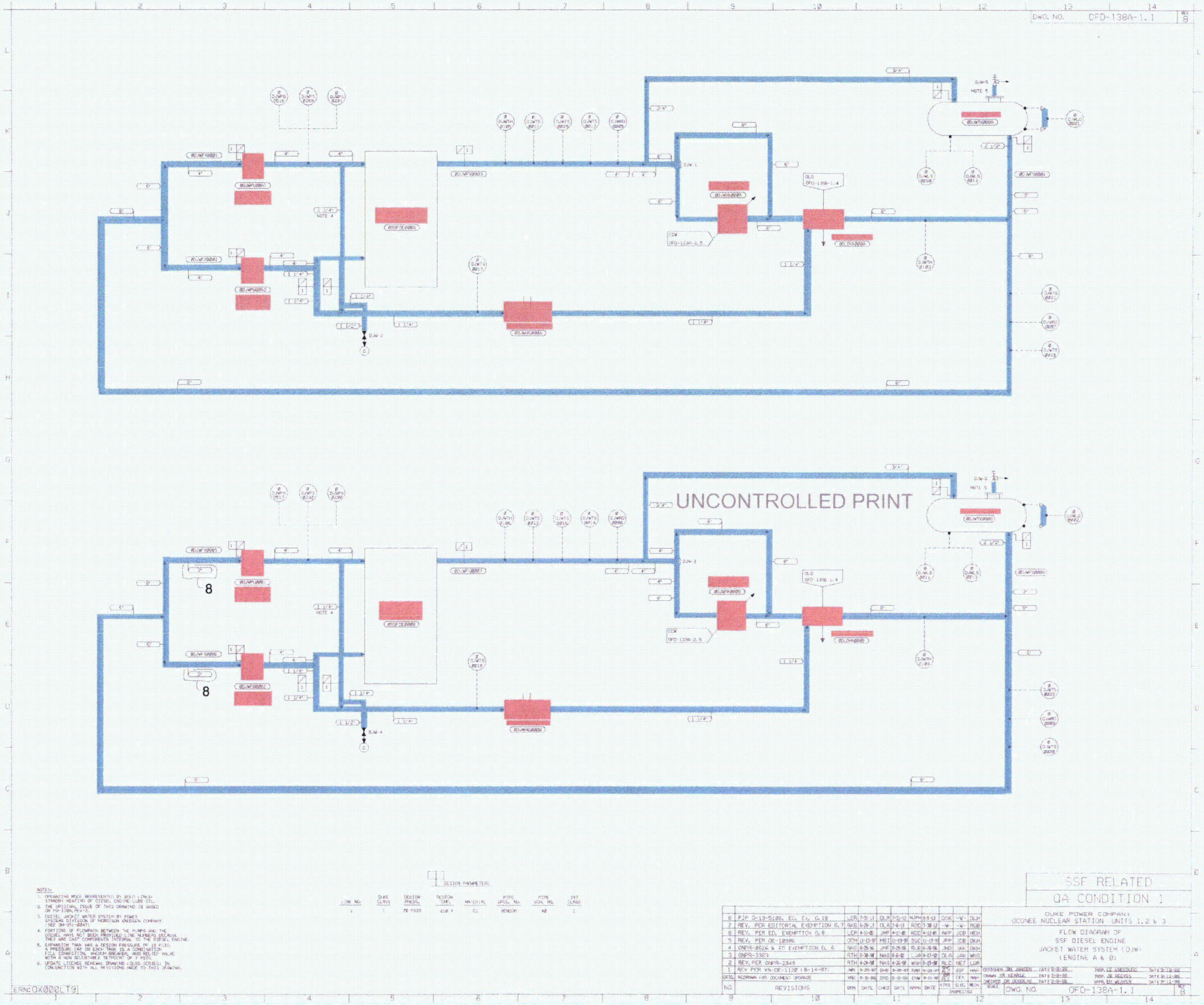


Phase 1: Diesel Engine Turbo Chargers

Blue Highlights: Air Flow Path
Pink Highlights: Target Components

2xSSE Path

Note: Turbochargers are mounted directly to the diesel genrator.



Phase 1: SSF Diesel Engine Jacket Water System

Blue Highlights: Safety Related Piping
Pink Highlights: Target Components

2xSSE Path

Note: All equipment is integral to the diesel engine skids.

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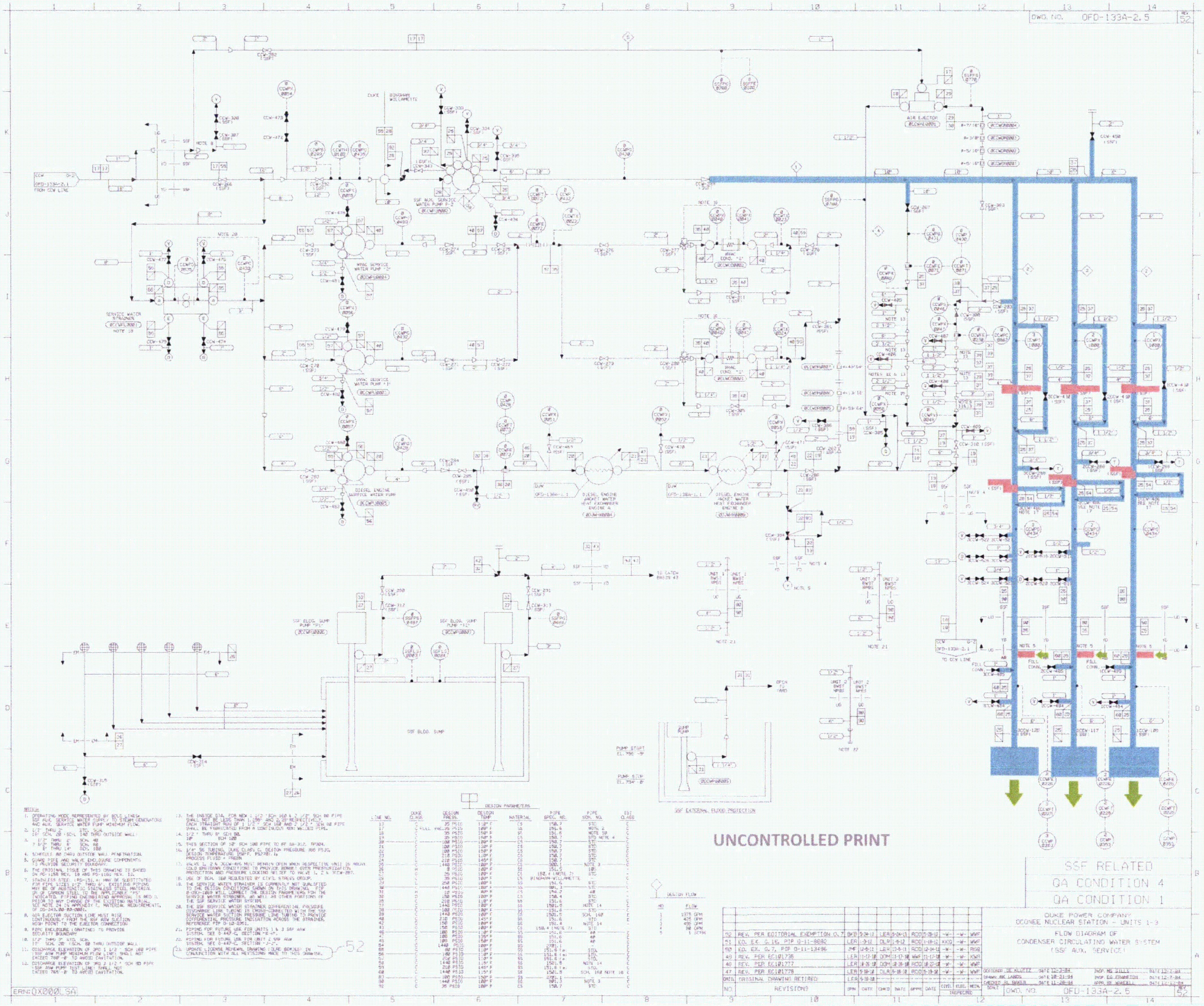
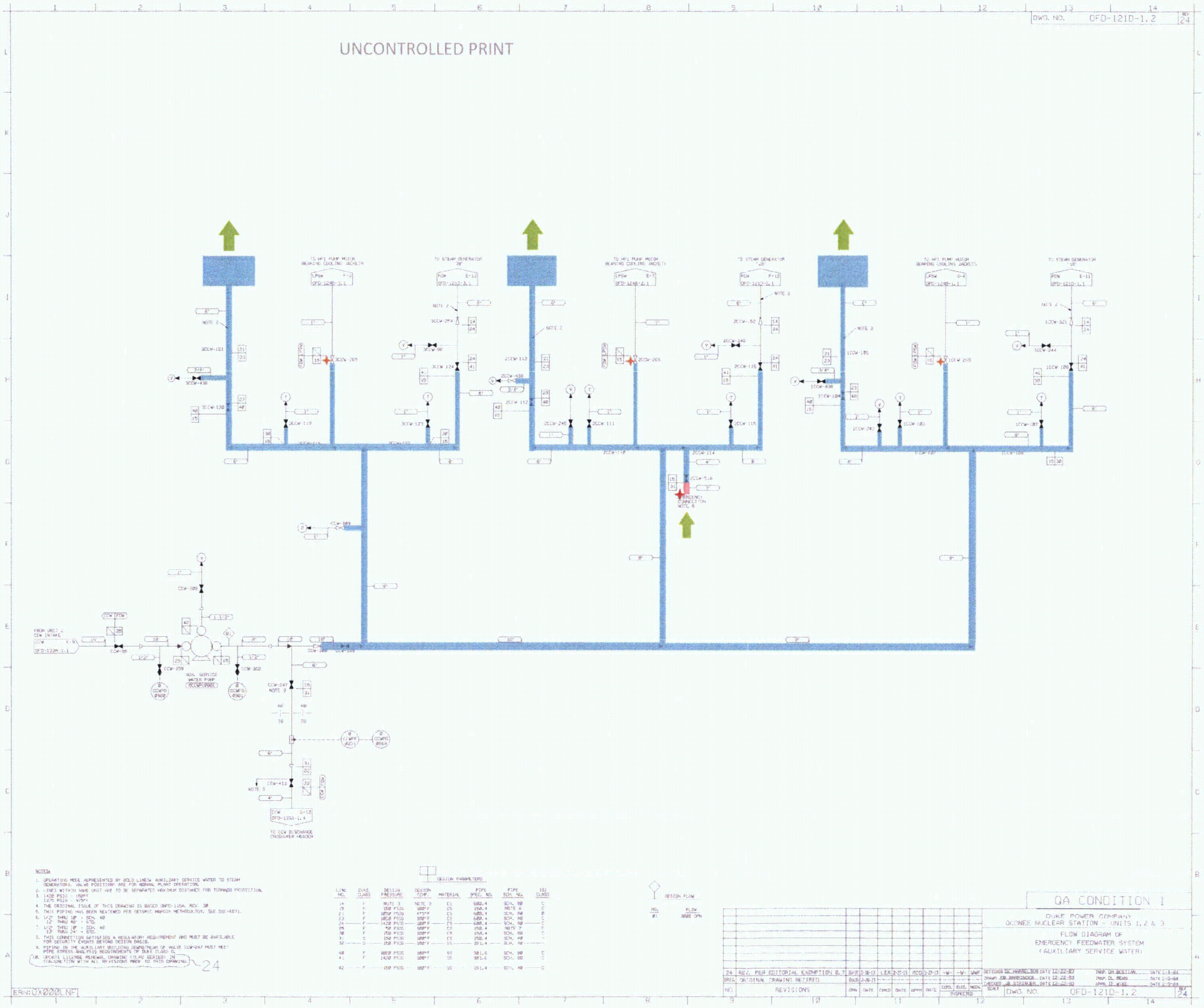


Phase 2: FLEX SG Feed Alternate Path

Blue Highlights: Safety Related Piping
Pink Highlights: FLEX Taps & Target Components
Fluid Flow Path

2xSSE Path

Note: _CCW-268 and _CCW-287 are EMO operated valves that are not repositioned during Phase 2 and subsequently, the FLEX Phase 2 strategy does not rely on EMO as an active feature (Reference FLEX Phase 1 for a strategy which does rely on EMO as an active feature).



Phase 2: FLEX SG Feed Primary Path

Blue Highlights: Safety Related Piping
Pink Highlights: Non-safety Related Piping

Fluid Flow Path
Class G FLEX Connection Point

1xSSE Path

Note: The piping beyond ✦ is not considered critical to the system function. Therefore, piping beyond this point is not considered part of the FLEX strategy and is not qualified within this report.

Note: No Dwg Components Screen in for ESEL Evaluation