

PIPING DESIGN

3-1: Delete COL items 3.12(1), 3.12(3), 3.12(4), 3.12(5), 3.12(6), and 3.12(7), as they describe activities that are actually being performed by KHNP within the scope of the design certification. Detailed design implementation by the COL licensee will be addressed using ASME BPV Code-related inspections, tests, analyses, and acceptance criteria (ITAAC).

Response: The COL items in DCD Tier 2 Section 3.12 and Table 1.8-2 will be updated to delete COL Items 3.12(1), 3.12(3), 3.12(4), 3.12(5), 3.12(6), and 3.12(7).

Impact on DCD

The DCD will be revised as shown in the enclosed DCD Tier 2 and Table 1.8-2 markup MEB AI 3-1.

Impact on PRA

There is no impact on the PRA.

Impact on Technical Specifications

There is no impact on the Technical Specifications.

Impact on Technical/Topical/Environmental Reports

There is no impact on any Technical, Topical and Environmental Reports.

3-2: Confirm the wording in COL item 3.12(2) to focus on a revision to design certification stage analyses performed by KHNP if site-specific design basis loads exceed those assumed in the design.

Response: The COL item will be updated to focus on a revision to the design certification stage analyses should ASME Class 1, 2, or 3 be routed outside of the wind/tornado protected structures.

Impact on DCD

The DCD will be revised as shown in the enclosed DCD Tier 2 markup MEB AI 3-2.

Impact on PRA

There is no impact on the PRA.

Impact on Technical Specifications

There is no impact on the Technical Specifications.

Impact on Technical/Topical/Environmental Reports

There is no impact on any Technical, Topical and Environmental Reports.

3-3: Delete the DAC ITAAC associated with EAF analyses, as they will be performed at the design certification stage.

Response: The DAC ITAAC in DCD Tier 1 and associated descriptions in section 14.3 in DCD Tier 2 pertinent to Environmental Assisted Fatigue analyses will be deleted.

Impact on DCD

The DCD will be revised as shown in the enclosed DCD Tier 1 and Tier 2 markup MEB AI 3-3.

Impact on PRA

There is no impact on the PRA.

Impact on Technical Specifications

There is no impact on the Technical Specifications.

Impact on Technical/Topical/Environmental Reports

There is no impact on any Technical, Topical and Environmental Reports.

3-9: KHNP clarified that the APR1400 design does not use stiff pipe clamps and clamps of the type identified in NRC Information Notice 83-80, "Use of Specialized 'Stiff' Pipe Clamps," and Generic Safety Issue 89, "Stiff Pipe Clamps" (described in NUREG-0933, "Resolution of Generic Safety Issues"), and voiced its intent to providing this clarification in writing.

Response: The DCD will be updated to clearly identify that stiff pipe clamps of the types identified in IN 83-80 and GSI 89 are not used.

Impact on DCD

The DCD will be revised as shown in the enclosed DCD Tier 2 markup MEB AI 3-9.

Impact on PRA

There is no impact on the PRA.

Impact on Technical Specifications

There is no impact on the Technical Specifications.

Impact on Technical/Topical/Environmental Reports

There is no impact on any Technical, Topical and Environmental Reports.

3-10: In a follow-up discussion, the NRC staff clarified that an acceptable audit scope would include samples from these categories of documents, with a "crosswalk" or process document available to show how procurement specifications would be prepared from detailed design documents.

To support the future audit, KHNP voiced its intent to provide a list of the design and technical specifications for all safety-related structures, systems, and components (SSCs) in the NSSS and other plant systems for the APR1400 design. The NRC staff will select a sample of the safety-related SSCs for audit of their specifications in accordance with 10 CFR 52.47. In addition, the NRC staff might conduct an audit of the specifications for a sample of non safety-related SSCs with high safety significance.

Response: KHNP has prepared a list of the purchase and design specifications for safety-related structures, systems, and components in the NSSS and other plant systems for APR1400 design; refer to Attachments 1 Safety-Related PO Specification List (for Reference Plant), 2 List of Piping System Design Specifications (for APR1400 DC), and 3 List of Safety Related Design Specifications for NSSS system (for APR1400 DC).

Impact on DCD

There is no impact on the DCD.

Impact on PRA

There is no impact on the PRA.

Impact on Technical Specifications

There is no impact on the Technical Specifications.

Impact on Technical/Topical/Environmental Reports

There is no impact on any Technical, Topical and Environmental Reports.

Functional Design, Qualification, and IST of Pumps, Valves, and Dynamic Restraints

3-11: Add commitments to incorporate the guidance of NUREG-1482, "Guidelines for Inservice Testing at Nuclear Power Plants," Revision 2, Generic Letter 96-05, "Periodic Verification of Design-Basis capability of Safety-Related Power-Operated Valves," and the Joint Owners Group (JOG) Motor-Operated Valve (MOV) Periodic Verification Program.

Add implementation of ASME Operation and Maintenance of Nuclear Power Plants (OM Code) cases OMN-1 and OMN-13, as accepted in Regulatory Guide 1.192, "Operation and Maintenance Code Case Acceptability, ASME OM Code," Revision 1.

Specify functional qualification of safety-related active pumps, valves, and dynamic restraints in accordance with ASME QME-1-2007, as accepted in Regulatory Guide 1.100, "Seismic Qualification of Electric and Mechanical Equipment for Nuclear Power Plants," Revision 3.

Include a COL item for the COL applicant to provide a full description of the IST program.

Response: The DCD will be updated to incorporate the above four NRC comments.

Impact on DCD

The DCD will be revised as shown in the enclosed DCD Tier 2 markup MEB AI 3-11,12,13.

Impact on PRA

There is no impact on the PRA.

Impact on Technical Specifications

There is no impact on the Technical Specifications.

Impact on Technical/Topical/Environmental Reports

There is no impact on any Technical, Topical and Environmental Reports.

3-12: Review section 3.9.6 and verify adequate referencing of Pre-Service Testing (PST) in generic or overview sections.

Response: The DCD will be updated to incorporate Pre-Service Testing into the overview section of section 3.9.6.

Impact on DCD

The DCD will be revised as shown in the enclosed DCD Tier 2 markup MEB AI 3-11,12,13.

Impact on PRA

There is no impact on the PRA.

Impact on Technical Specifications

There is no impact on the Technical Specifications.

Impact on Technical/Topical/Environmental Reports

There is no impact on any Technical, Topical and Environmental Reports.

3-13: The NRC staff's slides (referenced above) provided multiple suggestions and proposed changes to the DCD to clarify information, correct inconsistencies and outdated information, and (if KHNP chooses to) complete the full description of the IST program. [1] KHNP voiced its intent to consider these additional items and provide appropriate changes to the DCD.

Response: KHNP has considered the suggested and proposed changes to the DCD and will update the appropriate changes to the IST program.

Impact on DCD

The DCD will be revised as shown in the enclosed DCD Tier 2 markup MEB AI 3-11,12,13.

Impact on PRA

There is no impact on the PRA.

Impact on Technical Specifications

There is no impact on the Technical Specifications.

Impact on Technical/Topical/Environmental Reports

There is no impact on any Technical, Topical and Environmental Reports.

ADDITIONAL MECHANICAL ENGINEERING TOPICS

3-19: References should be checked as some references to other DCD sections are not valid (e.g., Section 3.7.1.1 and 3.7.2.8 on p. 3.2-4).

Response: KHNP has performed a review of the references in Section 3.2 of the DCD and will correct the references to invalid subsections.

Impact on DCD

The DCD will be revised as shown in the enclosed DCD Tier 2 markup MEB AI 3-19 & 3-20.

Impact on PRA

There is no impact on the PRA.

Impact on Technical Specifications

There is no impact on the Technical Specifications.

Impact on Technical/Topical/Environmental Reports

There is no impact on any Technical, Topical and Environmental Reports.

3-20: Several SSCs listed in Table 3.2-1 have quality assurance (QA) provisions of smaller scope than the statement on p. 3.2-4 that "Seismic Category I SSCs meet the QA requirements of 10 CFR 50, Appendix B," This overstatement should be corrected. RG 1.29 indicates that pertinent QA requirements of Appendix B should apply to all activities affecting safety-related functions of SSCs within scope of Regulatory Positions C.1 through C.3. Examples of Seismic Category I SSCs that receive only augmented Appendix B requirements are:

- ECSBS piping and valves from external Siamese hose connection to V1013 (excluding V1013)
- QIAS-N (p. 3.2-68)
- Seismic Monitoring
- Valves and piping of spent fuel pool external makeup and spray lines

- Fire protection equipment - Seismic Category I fire protection subsystem

Response: The DCD will be updated to clearly identify QA requirements.

Impact on DCD

The DCD will be revised as shown in the enclosed DCD Tier 2 markup MEB AI 3-19 & 3-20.

Impact on PRA

There is no impact on the PRA.

Impact on Technical Specifications

There is no impact on the Technical Specifications.

Impact on Technical/Topical/Environmental Reports

There is no impact on any Technical, Topical and Environmental Reports.

3-29: P. 3.9-57 includes the phrase “design pressure, temperature, and other loading conditions that provide the bases for design”

P. 3.9-57 states that “stress analysis is also performed by methods outlined in the code appendices or by other methods by reference to analogous codes or other published literature”

COL items 3.9(2) (and references in the text) should be deleted based on the level of detail necessary at the application stage

Response: The DCD will be updated to delete COL item 3.9(2) and the associated references.

Impact on DCD

The DCD will be revised as shown in the enclosed DCD Tier 2 markup MEB AI 3-29.

Impact on PRA

There is no impact on the PRA.

Impact on Technical Specifications

There is no impact on the Technical Specifications.

Impact on Technical/Topical/Environmental Reports

There is no impact on any Technical, Topical and Environmental Reports.

3-30: Section 3.10.1.3 states “With the elimination of OBE, analysis checks for fatigue effects can be performed at a fraction of the SSE (such as 50 cycles at one-half of the SSE peak amplitude, or 150 cycles at one-third of the SSE peak amplitude).” How were these numbers of

cycles selected? They appear to be different from those listed in Sections 3.9.2.2.3 and 3.7.3.1, as well as SRP 3.10.

Response:

In DCD Section 3.9.2.2.3, it is described that “Alternatively, an equivalent number of fractional vibratory cycles to that of 20 full SSE vibratory cycles may be used (but with an amplitude not less than one-third of the maximum SSE amplitude) when derived in accordance with Annex D of IEEE Standard 344.”

In DCD Section 3.7.3.1.2 it reads “The total or cumulative usage factor can also be specified in terms of a finite number of cycles of the maximum or peak motion. Based on this consideration, seismic Category I subsystems, components, and equipment are designed for a total of two SSE events with 10 maximum stress cycles per event (20 full cycles of the maximum SSE stress range). Alternatively, an equivalent number of fractional vibratory cycles to that of 20 full SSE vibratory cycles may be used (but with an amplitude not less than one-third [1/3] of the maximum SSE amplitude) when derived in accordance with Annex D of IEEE Std.344-2004 (Reference 23).”

In SECY-93-087, to account for earthquake cycles in the fatigue analyses of piping systems, the staff proposes using two SSE events with 10 maximum stress cycles per event (20 full cycles of the maximum SSE stress range). This is equivalent to the cyclic load basis of one SSE and five OBE events.

This background in SECY-93-087 accords to the description in Section 3.9.2.2.3 and Section 3.7.3.1.2.

To have 1 SSE event, 10 maximum stress cycles per event are required (i.e., for a total of two SSE events with 10 maximum stress cycles per event (20 full cycles of the maximum SSE stress range)).

In SECY 93-087, it is suggested that with the elimination of OBE, analysis checks for fatigue effects can be performed at a fraction of the SSE (such as 50 cycles at one-half of the SSE peak amplitude, or 150 cycles at one-third of the SSE peak amplitude).

When half SSE is applied for the fraction of an SSE, 5 fractional cycles are needed to have an equivalent fatigue effect corresponding to one SSE (Refer to Figure D.1 in Annex D of IEEE 344, below). Since one SSE event requires 10 maximum stress cycles, a total of 50 cycles (5 x 10) shall be applied to the analysis.

In the case of applying one-third SSE for the fraction of SSE, 15 fractional cycles are needed to have an equivalent fatigue effect corresponding to 1 SSE (Refer to Figure D.1 in Annex D of IEEE 344). As one SSE event requires 10 maximum stress cycles, a total of 150 cycles (15 x 10) shall be applied to the analysis.

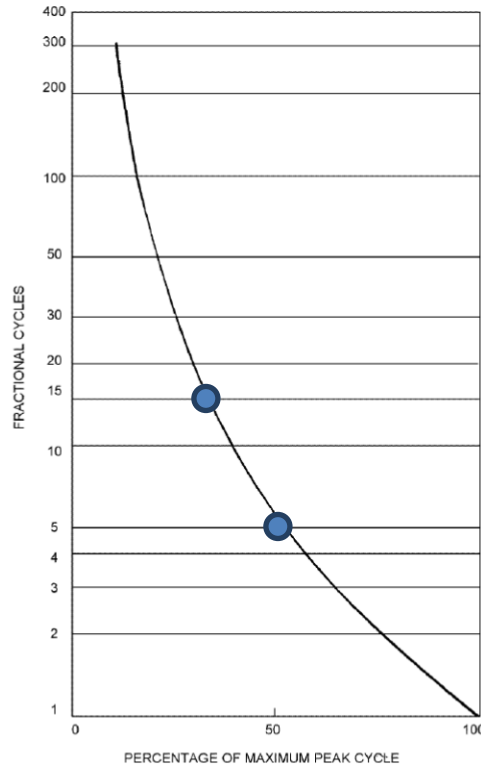


Figure D.1—Fractional cycles to obtain one equipment maximum peak cycle

In conclusion, 20 full cycles appeared in Section 3.9.2.2.3 and 3.7.3.12 is for two SSE events; whereas, 50 cycles at one-half of the SSE peak amplitude or 150 cycles at one-third of the SSE peak amplitude in Section 3.10.1.3 is for one SSE event with fractional cycles. Therefore, since the cycles in Section 3.9.2.2.3 or 3.7.3.1.2 have a different basis for the number of events than those in Section 3.10.1.3, it is not necessary to change the number of cycles, nor the associated description pertaining to this question.

Impact on DCD

There is no impact on the DCD.

Impact on PRA

There is no impact on the PRA.

Impact on Technical Specifications

There is no impact on the Technical Specifications.

Impact on Technical/Topical/Environmental Reports

There is no impact on any Technical, Topical and Environmental Reports.

3-31: Section 3.10.2.2.d states “A 10 percent margin is added on RRS during testing in accordance with Subsection 6.3.2.5 of IEEE-323.” However, IEEE Std 323-2003 does not have Section 6.3.2.5. The reference should be corrected.

Response: The DCD will be updated to correct the reference to Subsection 6.3.1.6.

Impact on DCD

The DCD will be revised as shown in the enclosed DCD Tier 2 markup MEB AI 3-31.

Impact on PRA

There is no impact on the PRA.

Impact on Technical Specifications

There is no impact on the Technical Specifications.

Impact on Technical/Topical/Environmental Reports

There is no impact on any Technical, Topical and Environmental Reports.

3-33: The NRC staff identified a potential gap because no transient events were classified as Service Level C conditions. KHNP clarified that the same events have been addressed, but were generally re-categorized in a conservative fashion. The applicant expressed its intent to update the DCD description to clarify and justify any differences from previous NRC guidance.

Response: The DCD will be updated to clarify and justify differences from previous NRC guidance on Service Level C conditions.

Impact on DCD

The DCD will be revised as shown in the enclosed DCD Tier 2 markup MEB AI 3-33.

Impact on PRA

There is no impact on the PRA.

Impact on Technical Specifications

There is no impact on the Technical Specifications.

Impact on Technical/Topical/Environmental Reports

There is no impact on any Technical, Topical and Environmental Reports.

Attachment 1.

Safety-Related PO Specification List (for Reference Plant)

Doc. No.	TITLE	SAFETY CLASS
9-184-J232B	SPECIFICATION FOR CONTROL VALVES FOR SAFETY RELATED AND SEVERE SERVICES	2, 3 & NNS
9-184-J233	BUTTERFLY VALVES FOR NUCLEAR SERVICES	2&3
9-184-J237A	SPECIFICATION FOR MAIN STEAM SAFETY VALVES	2
9-184-J237B	SAFETY/RELIEF VALVES	2, 3, NNS
9-184-J239	SOLENOID VALVES	1,2,3
9-521-M243	MAIN STEAM ISOLATION VALVES AND MAIN FEEDWATER ISOLATION VALVES	2
9-132-M214	DIESEL FUEL OIL & LUBE OIL TRANSFER PUMPS	3 & NNS
9-132-M227	SAFETY-RELATED CHILLERS	3
9-135-M231	SAFETY RELATED STRAINERS	3
9-152-M251	SAFETY-RELATED AHU'S, CUBICLE COOLERS, AND NON-SAFETY-RELATED RCFC'S	3&NNS
9-152-M252	SAFETY RELATED ACU'S AND DUCT HEATERS	3
9-152-M255B	FANS	3, NNS
9-154-M254	DUCTWORK DAMPERS AND ACCESSORIES	3 & NNS
9-159-M273	FLOW RESTRICTION ELEMENTS AND VENTURIES	1, 2, 3 & NNS
9-542-M206	AUXILIARY FEEDWATER PUMPS AND DRIVERS	2&3
9-553-M241	TRAVELING SCREENS AND INTAKE STRUCTURE ACCESSORIES	3, NNS
9-591-M263	ALTERNATE AC DIESEL GENERATOR & EMERGENCY DIESEL GENERATORS	3 & NNS
9-132-N201	ESSENTIAL SERVICE WATER PUMPS AND SCREEN WASH PUMPS	3
9-132-N202	SAFETY RELATED CENTRIFUGAL PUMPS	3
9-133-N204	SAFETY RELATED HEAT EXCHANGERS	2, 3
9-134-N205	SHOP FABRICATED PRESSURE VESSELS & TANKS (SAFETY-RELATED)	3
9-135-N223	ESSENTIAL SERVICE WATER DEBRIS FILTERS	3, NNS
9-431-N231	SDVS SPARGER	3
9-442-N203	CONTAINMENT SPRAY PUMP	2,3
9-442-N215	CONTAINMENT SPRAY NOZZLES	2
9-443-N229	PASSIVE AUTOCATALYTIC RECOMBINERS	3, NNS
9-447-N206	IRWST SUMP STRAINERS	3
9-451-N222	POSITIVE DISPLACEMENT PUMP SUCTION STABILIZER AND PULSATION DAMPENERS	3,NNS
9-135-P216	STRAINERS	3 & NNS
9-144-P202A	SAFETY RELATED SHOP FABRICATED PIPING	1,2 & 3
9-145-P204	SR MANUAL STEEL GATE, GLOBE & CHECK VALVES, 2-1/2" & LARGER	2&3

Doc. No.	TITLE	SAFETY CLASS
9-145-P206A	SAFETY RELATED STEEL GATE AND GLOBE VALVES WITH ACTURATOR	2 & 3
9-145-P206C	SAFETY RELATED CONTROLLED CLOSURE CHECK VALVES	2
9-145-P206D	SAFETY & NON SAFETY RELATED TILTING DISC CHECK VALVES	3
9-145-P207	SAFETY & NON-SAFETY RELATED MANUAL STEEL GATE, GLOBE & CHECK VALVES, 2" AND SMALLER	1,2 & NNS
9-145-P208	DIAPHRAGM VALVES	2, 3 & NNS
9-148-P223	CONTAINMENT PIPING PENETRATIONS	2&NNS
9-147-C215C	SNUBBERS	1,2,3,NNS
9-147-C215A	SAFETY RELATED SHOP FABRICATED PIPE SUPPORTS	1,2 & 3

Attachment 2.

List of Piping System Design Specifications (for APR1400 DC)

Document No.	Title	Safety Class
1-521-M407-001	MSS PIPING DESIGN SPEC.	2
1-541-M407-001	FWS PIPING DESIGN SPEC.	2
1-481-N407-001	RDS PIPING DESIGN SPEC.	2
1-491-N407-001	PSS PIPING DESIGN SPEC.	2
1-471-N407-001	GRS PIPING DESIGN SPEC.	2
1-037-N407-001	GENERAL PIPING DESIGN SPEC.	1,2,3
1-431-N407-001	RCS PIPING DESIGN SPEC.	1,2,3
1-433-N407-001	RCGVS PIPING DESIGN SPEC.	1,2
1-441-N407-001	SI/SC PIPING DESIGN SPEC	2
1-442-N407-001	CSS PIPING DESIGN SPEC	2
1-447-N407-001	IRWSS PIPING DESIGN SPEC	2
1-455-N407-001	SGBDS PIPING DESIGN SPEC.	2
1-462-N407-001	ESWS PIPING DESIGN SPEC.	3
1-451-N407-001	CVCS PIPING DESIGN SPEC	1,2,3
1-461-N407-001	CCWS PIPING DESIGN SPEC.	2, 3
1-463-N407-001	SFPCS PIPING DESIGN SPEC.	2,3

Attachment 3.

List of Safety Related Design Specifications for NSSS System (for APR1400 DC)

Document No.	Title
9-451-Z-S-404-00	DESIGN SPECIFICATION FOR FILTERS-RADIOACTIVE SERVICE
9-451-Z-S-404-71	DESIGN SPECIFICATION FOR REGENERATIVE HEAT EXCHANGER
9-441-Z-S-404-32	DESIGN SPECIFICATION FOR SHUTDOWN COOLING PUMP MINIFLOW HEAT EXCHANGER
9-441-Z-S-404-31	DESIGN SPECIFICATION FOR SHUTDOWN COOLING HEAT EXCHANGER
9-451-Z-S-404-60	DESIGN SPECIFICATION FOR CHARGING PUMP MINI-FLOW HEAT EXCHANGER
9-451-Z-S-404-31	DESIGN SPECIFICATION FOR CENTRIFUGAL CHARGING PUMP
9-451-Z-S-404-34	DESIGN SPECIFICATION FOR AUXILIARY CHARGING PUMP
9-451-Z-S-404-41	DESIGN SPECIFICATION FOR VOLUME CONTROL TANK
9-451-Z-S-404-32	DESIGN SPECIFICATION FOR BORIC ACID MAKEUP PUMP
9-441-Z-S-404-11	DESIGN SPECIFICATION FOR SAFETY INJECTION PUMP
9-441-Z-S-404-12	DESIGN SPECIFICATION FOR SHUTDOWN COOLING PUMP
9-431-Z-S-404-91	DESIGN SPECIFICATION FOR REACTOR COOLANT PUMPS
9-450-Z-S-404-11	DESIGN SPECIFICATION FOR PRESSURIZER PILOT OPERATED SAFETY RELIEF VALVES
9-430-Z-S-404-30	DESIGN SPECIFICATION FOR FLOW ELEMENTS
9-451-Z-S-404-72	DESIGN SPECIFICATION FOR LETDOWN HEAT EXCHANGER
9-441-Z-S-404-20	DESIGN SPECIFICATION FOR SAFETY INJECTION TANK
9-451-Z-S-404-50	DESIGN SPECIFICATION FOR ORIFICES
9-450-Z-S-404-00	DESIGN SPECIFICATION FOR CHECK VALVES GREATER THAN TWO INCHES
9-450-Z-S-404-18	DESIGN SPECIFICATION FOR SOLENOID OPERATED VALVES
9-450-Z-S-404-14	DESIGN SPECIFICATION FOR MOTOR OPERATED VALVES
9-450-Z-S-404-16	DESIGN SPECIFICATION FOR MANUAL VALVES
9-450-Z-S-404-13	DESIGN SPECIFICATION FOR PNEUMATIC OPERATED VALVES
9-431-Z-S-404-30	DESIGN SPECIFICATION FOR RTD THERMOWELLS
9-450-Z-S-404-17	DESIGN SPECIFICATION FOR NUCLEAR SERVICE ELASTOMERIC SEALED VALVES
9-450-Z-S-404-19	DESIGN SPECIFICATION FOR MISCELLANEOUS SAFETY AND RELIEF VALVES
9-400-Z-S-404-22	DESIGN SPECIFICATION FOR NICKEL-CHROMIUM-IRON ALLOY, ALLOY 690
9-431-Z-S-404-50	DESIGN SPECIFICATION FOR STEAM GENERATOR SINGLE NOZZLE DAMS
9-732-Z-S-404-40	DESIGN SPECIFICATION FOR THE IN-CORE INSTRUMENT ASSEMBLIES

Document No.	Title
9-732-Z-S-404-20	DESIGN SPECIFICATION FOR THE IN-CORE INSTRUMENTATION SEAL TABLE AND SEAL HOUSING
9-431-Z-S-404-10	DESIGN SPECIFICATION FOR REACTOR VESSEL ASSEMBLY
9-431-Z-S-404-20	DESIGN SPECIFICATION FOR PRESSURIZER ASSEMBLY
9-431-Z-S-404-40	DESIGN SPECIFICATION FOR STEAM GENERATOR ASSEMBLY
9-431-Z-S-404-80	DESIGN SPECIFICATION FOR REACTOR COOLANT PIPE AND FITTINGS
9-732-Z-S-404-51	DESIGN SPECIFICATION FOR ICI CABLE TRAY ASSEMBLY
9-422-Z-S-404-32	DESIGN SPECIFICATION FOR FTT PENETRATION SLEEVE BLIND FLANGE
9-732-Z-S-404-30	DESIGN SPECIFICATION FOR THE ICI GUIDE TUBES AND GUIDE TUBE SUPPORTS
9-728-Z-S-404-22	DESIGN SPECIFICATION FOR HEATED JUNCTION THERMOCOUPLE PROBE ASSEMBLY
9-732-Z-S-404-52	DESIGN SPECIFICATION FOR IN-CORE INSTRUMENTATION MINERAL INSULATED CABLE
9-728-Z-S-404-40	DESIGN SPECIFICATION FOR HEATED JUNCTION THERMOCOUPLE INSTRUMENTATION FLANGE ASSEMBLIES
9-431-Z-S-404-A1	DESIGN SPECIFICATION FOR REACTOR COOLANT PUMP SUPPORTS
9-431-Z-S-404-A2	DESIGN SPECIFICATION FOR REACTOR COOLANT PUMP HYDRAULIC SNUBBERS
9-431-Z-S-404-62	DESIGN SPECIFICATION FOR STEAM GENERATOR UPPER SUPPORT SNUBBER
9-431-Z-S-404-61	DESIGN SPECIFICATION FOR STEAM GENERATOR SUPPORT COMPONENTS
9-410-Z-S-404-11	DESIGN SPECIFICATION FOR CONTROL ELEMENT DRIVE MECHANISMS AND CEA EXTENSION SHAFT ASSEMBLIES
9-412-Z-S-404-10	DESIGN SPECIFICATION FOR REACTOR VESSEL CORE SUPPORT AND INTERNAL STRUCTURES
9-431-Z-S-404-C0	DESIGN SPECIFICATION FOR THE INTEGRATED HEAD ASSEMBLY
9-431-Z-S-404-B0	DESIGN SPECIFICATION FOR SURGE LINE SUPPORT
9-430-Z-S-404-40	DESIGN SPECIFICATION FOR REACTOR VESSEL SUPPORT ASSEMBLIES
9-735-Z-S-404-10	DESIGN SPECIFICATION FOR CEDM POWER AND RSPT CABLE SYSTEMS
9-728-Z-S-404-30	DESIGN SPECIFICATION FOR HJTC MINERAL INSULATED CABLE ASSEMBLIES