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August 22, 1984

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In the Matter of  
Public Service Electric and Gas Company  
(Hope Creek Generating Station)  
Docket No. 50-354 *DL*

Gentlemen:

Enclosed is a copy of Environmental Qualification Summary Report for Hope Creek Generating Station, Public Service Electric & Gas. This document is being submitted to the NRC in conjunction with its review of the environmental qualification of equipment at the Hope Creek Generating Station. The document describes the manner in which equipment requiring qualification is being identified and the manner in which the qualification will be carried out. As is usual in reviews of this type, this document will be supplemented by specific information relating to qualification of individual components as such qualification is completed, documented and reviewed.

Sincerely,

*Robert M. Rader for*

Troy B. Conner, Jr.  
Counsel for Public Service,  
Electric & Gas Company

cc: Service List

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ENVIRONMENTAL QUALIFICATION  
SUMMARY REPORT

FOR

HOPE CREEK GENERATING STATION

PUBLIC SERVICE ELECTRIC & GAS

REV	DATE	PREPARED	REVIEWED	APPROVED
0	8/2/81	<i>David K. Harding</i>	<i>Richard D. [unclear]</i>	<i>J. [unclear]</i>

ENVIRONMENTAL QUALIFICATION  
SUMMARY REPORT FOR  
HOPE CREEK GENERATING STATION

<u>SECTION</u>	<u>TITLE</u>
I	Purpose
II	Program Synopsis
III	Procedures
IV	Regulatory Compliance
V	Quality Assurance Provisions
VI	Environmental Conditions
VII	System/Component Identification
VIII	Qualification Testing/Analysis
IX	Follow On Program
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1. PURPOSE

The purpose of this HCGS Summary Report is to explain the approach taken to identify and to ensure the operability, under any postulated environmental conditions (normal/abnormal/accident), of the safety related electrical and mechanical components required to bring the plant to, and maintain it in a safe shutdown condition any time during its anticipated forty year life.

In accordance with Item (b) of 10CFR50.49, this report addresses qualification of: (1) safety related electrical equipment, (2) non-safety related electrical equipment whose failure under postulated environmental conditions could prevent satisfactory accomplishment of safety functions, and (3) post accident monitoring equipment located in a harsh environment as delineated in HCGS FSAR Section-1.8.1.97 and FSAR Table 3.11-5. As HCGS is qualifying each of these types of equipment equally in this EQ program, the words "safety related" as applied to electrical components and when used in this report only, are synonymous with the three categories noted. HCGS compliance with 10CFR50.49 is summarized in the attached FSAR Table 3.11-3 (pages I-3 thru I-6).

This Summary Report includes a synopsis of:

(1) The identification of the various parties, (PSE&G, GE, Bechtel, etc.), responsible for the ongoing technical review as well as the establishment and periodic updating of the EQ file and EQ Summary Report (Section III).

(2) The listing of applicable EQ Program related design criteria including Regulatory Guides, IEEE Standards, NUREG's, IE Bulletins, Notices, etc. (Section IV).

(3) The Quality Assurance programs utilized to assure adherence of the EQ program to the requirements of 10CFR50, Appendix B (Section V).

(4) The analysis methods used to determine the environmental design envelopes (radiation, pressure, temperature, humidity) for normal as well as abnormal and Design Basis Accident (DBA) operating conditions (Section VI).

(5) The identification process used to determine (a) the systems required to mitigate and follow the course of any postulated DBA as well as achieve and maintain safe shutdown following a DBA and, (b) the selection process used to identify the individual electrical and mechanical components within each of these systems required to function to ensure required system operation (Section VII).



(6) The review process methods used to ensure the completeness of EQ reports for each of the identified safety related system components to verify compliance with applicable EQ design criteria including HCGS Licensing commitments to IEEE Standards, Regulatory Guides, NUREGS, IE Bulletins/Notices, and Code of Federal Regulations. (Section VIII).

(7) The description and implementation process for a computer based maintenance and surveillance program to document the proper monitoring, and performance of maintenance related repairs and/or replacement of EQ related electrical and mechanical components to ensure operability under any anticipated environmental conditions during the forty year life of the plant (Section IX).

(8) The development method used for the compilation of Equipment Evaluation Summary Sheets (EESS) by system which summarizes the EQ data on a component by component basis (Section X).

In addition to the EQ data contained in this Summary Report, the following sections of the HCGS FSAR contain EQ support documentation:

- (1) Section 1.8 Conformance to NRC Guidelines
- (2) Section 1.10 TMI-2 Related Requirements for New Operating Licenses.
- (3) Section 1.11 Differences from Standard Review Plan.
- (4) Section 1.12 Unresolved Generic Safety Issues.
- (5) Section 3.1 Conformance with NRC General Design Criteria.
- (6) Section 3.2 Classification of Structures, Components, and Systems.
- (7) Section 3.9 Mechanical Systems and Components.
- (8) Section 3.10 Seismic Qualification of Seismic Category 1 Instrumentation and Electrical Equipment.
- (9) Section 3.11 Environmental Design of Mechanical and Electrical Equipment.
- (10) Chapter 6 Engineered Safety Features.
- (11) Chapter 7 Instrumentation and Controls.
- (12) Section 8.3 On-site Power Systems.
- (13) Chapter 15 Accident Analysis.

Various EQ applicable sections of the FSAR are summarized in this EQ Summary Report. These sections of the FSAR were utilized and referenced to determine the environmental design criteria, to identify the systems/components required to achieve and maintain plant shutdown, and to verify the licensing criteria (NUREGS, Reg. Guides, IE Bulletins-Notices, etc.) to which the HCGS EQ Program is committed.

## SUMMARY OF HCGS COMPLIANCE WITH 10 CFR 50.49

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This table represents a summary of Hope Creek Generating Station compliance with 10 CFR 50.49.

1. Paragraph (a) - Requirement incorporated. A program has been established for qualification of electric equipment in a harsh environment that is safety-related. The present program will be discussed in detail by an EQ summary report as referenced in Section 3.11.
2. Paragraph (b)(1) - Requirements incorporated. Safety-related electrical equipment needed to mitigate design basis events has been identified, designed, and will be qualified to function properly in the environmental conditions during normal, abnormal, and design basis events.
3. Paragraph (b)(2) - Requirement incorporated. The methodology used to identify non-safety electric equipment whose failure could affect operation of safety-related equipment will be included in the summary EQ report.
4. Paragraph (b)(3) - Requirement incorporated. The parameters required to be measured by Regulatory Guide 1.97 are included to the extent noted in Section 1.8.1.97.  
  
Equipment required by Regulatory Guide 1.97 to be environmentally qualified has been included in the equipment qualification program.
5. Paragraph (c) - No requirement. This section details items (mild environment, seismic qualification, etc.) that are not included within the scope of this rule.

6. Paragraph (d) - Requirement incorporated. Table 3.11-5 has been developed to identify safety-related electric equipment located in a harsh environment. This table is included in Section 3.11 and will be included in the EQ summary report.
7. Paragraph (d)(1) - Requirement incorporated. The equipment evaluation summary (EES) sheets in the EQ summary report will provide this information.
8. Paragraph (d)(2) - Requirement incorporated. Equipment test reports will provide this information.
9. Paragraph (d)(3) - Requirement incorporated. The EES sheets in the EQ summary report will provide this information.
10. Paragraph (e)(1) - Requirement incorporated. Section 3.11 discusses the design basis including temperature and pressure. A plant specific profile for temperature and pressure vs. time for equipment qualification will be included in the EQ summary report. Temperature and pressure limits are included on the EES's and in Table 3.11-1.
11. Paragraph (e)(2) - Requirement incorporated. Humidity has been considered where it is applicable and is included on the EES's and in Table 3.11-1.
12. Paragraph (e)(3) - Requirement incorporated. Chemical effects are not applicable since demineralized water is used. Effects of demineralized spray are encompassed by testing at 100 percent relative humidity. Equipment subjected to direct spray impingement will be evaluated to determine if testing under spray conditions in addition to 100 percent relative humidity conditions is required.

13. Paragraph (e)(4) - Requirement incorporated. Radiation effects on safety-related electrical equipment have been taken into account, where applicable, including radiation resulting from recirculating fluids. Radiation levels are included on the EES's and in Table 3.11-1.
14. Paragraph (e)(5) - Requirement incorporated. Aging is included as part of equipment qualification except where equipment is not considered to be age sensitive. Qualified life is included on the EES's.
15. Paragraph (e)(6) - Requirement incorporated. Equipment that could be submerged has been identified and demonstrated to be qualified by test for the duration required.
16. Paragraph (e)(7) - Requirement incorporated. Synergistic effects have been considered in the accelerated aging programs. An engineering evaluation will be performed to identify known synergistic effects for materials that are included in the equipment qualified. Any identified synergistic effects are accounted for in the qualification programs. Section 3.11.2.7.4 discusses the design basis for synergistic effects.
17. Paragraph (e)(8) - Requirement incorporated. The equipment technical specification includes the margin in the environmental conditions of the plant and the margin to be applied to service conditions. Section 3.11.2.7.1 discusses margins as part of the design basis.
18. Paragraph (f)  
(1-4) - Requirement incorporated. Section 3.11.6.1 discusses performance of environmental qualification by testing and/or analysis.

## HCGS

TABLE 3.11-3 (Cont'd)

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19. Paragraph (g) - N/A. Pertains to plants receiving operating licenses prior to February 22, 1983.
20. Paragraph (h) - N/A. Pertains to plants receiving operating licenses prior to February 22, 1983.
21. Paragraph (i) - N/A. Pertains to plants receiving operating licenses prior to November 30, 1985.
22. Paragraph (j) - Requirement incorporated. Section 3.11.3 states that environmental qualification documentation for safety-related electrical equipment will be available for NRC audit.
23. Paragraph (k) - No requirement. This section permits applicants for, and holders of, operating licenses exemption for this rule if the Commission previously required qualification of equipment in accordance with DOR guidelines or NUREG-0588.
24. Paragraph (l) - Requirement incorporated. Replacement equipment will be qualified in accordance with 10CFR50.49.



## II. PROGRAM SYNOPSIS

The objective of the EQ program is to ensure that components required to safely shut down the station under any postulated DBA will successfully perform their safety related function. This DBA could occur at any time during the anticipated forty year plant life. This objective is met by:

- (1) Identifying the systems and the components within each system required to safely shut down the station.
- (2) Determining the normal environmental operating conditions that the components will be functioning under.
- (3) Determining the worst case environmental conditions the components will be subject to under abnormal, abnormal, and DBA occurrences.
- (4) Ensuring that the EQ test/analysis data for each component verifies component operability under both these normal and worst case DBA environmental conditions.

These items are performed by comparing the detailed manufacturer or component supplier EQ reports for each identified component to the environmental envelopes calculated for both normal, abnormal, and DBA operating states under which that component will be required to operate.

(1) Identification of the Components Required to Safely Shut Down the Station: These were defined as those system components required to detect, follow and mitigate an accident condition and to maintain the station in a safe shut-down condition following the accident. Each accident scenario was reviewed and the components required to perform detection, monitoring and/or mitigating functions were identified on a system-by-system basis.

These systems and their related components were defined and separated into the following categories:

- (a) Protection Systems - those systems which initiate safety actions to mitigate the consequences of a DBA.
- (b) Engineered Safety Feature Systems - those systems which provide cooling, core protection and isolation of the reactor plant during a DBA.



- (c) Safe Shutdown Control Systems - those control systems used to achieve and maintain the station in a safe shutdown condition following a DBA.
- (d) Safety Related Display Instrumentation - the display instrumentation available to the operator to indicate proper functioning of safety related systems including indication of required operator manual initiation and control of safety systems/components.

(2) Determination of Normal Environmental Conditions

Once the components required for safe shutdown were identified, their physical locations within the station were determined. The architect/engineer (A/E) for HCGS (Bechtel) then calculated the conditions that exist during routine station operation including startup, shutdown, power operation, refueling and maintenance. This data was used as the baseline data in determining normal environmental effects on components required to safely operate and shut down the station.

(3) Determination of Worst Case Environmental Conditions

The A/E then analyzed the effects that abnormal operating conditions would have on the environment of each identified safety related component. This analysis included such conditions as loss of offsite power and loss of ventilation as well as Design Basis Accidents (DBA) such as LOCA, feed-water line break, etc. The resultant worst case environmental conditions postulated were chosen for each plant area. From this analysis, two categories of environmental states were defined:

- (a) Harsh Environment- Components located in these areas would be subjected to worst case DBA anticipated temperatures, pressure, humidity, and/or radiation extremes well above the normal operating environmental conditions.
- (b) Mild Environment- Components located in these areas would at no time (including under worst case DBA) be subjected to environmental conditions significantly more severe than those experienced under normal plant operating conditions.

### III. PROCEDURES

The responsibility for the development and ongoing technical review of the HCGS EQ program, including the creation and updating of the EQ central file, has been undertaken by the Controls and Electrical Division of the PSE&G Engineering and Construction Department. As such, it is responsible for the coordination and monitoring of the efforts of the various participants involved in the EQ program including the A/E (Bechtel), NSSS supplier (GE), as well as associated independent consultants, component suppliers, and testing labs.

The EQ program supervision is under the direction of a PSE&G Principal Engineer and includes a functional engineering staff which is supported by Bechtel, GE, and a consultant. The work activities are applicable to; (1) the NSSS EQ program and (2) the Balance-of-Plant (BOP) EQ program and include the following:

- Direct the efforts of the architect-engineer (A/E) requiring interface with GE and other vendors.
- Verify that all equipment requiring qualification is identified.
- Review specified environmental conditions and qualification plan compliance.
- Review/approve all EQ documents submitted by the vendor including test plans, analyses, and reports.
- Prepare qualification documentation in the form of NRC auditable packages.
- Assure that necessary checklists and equipment evaluation work sheets are prepared and approved.
- Review/approve work done by consultants, GE, or the architect-engineer.
- Participate as a member of Technical Review Committee (TRC) in GE-EQRT program (NSSS EQ Program only).
- Resolve comments generated on plans and reports and provide recommended resolutions of equipment qualification issues.

- Monitor open issues.
- Establish a program to provide documentation for the development of a plant maintenance, surveillance, and replacement program for EQ related components.
- Review of USNRC IE Bulletins/Notices to determine any impact on the EQ program and resolution of any resultant discrepancies.

In addition, PSE&G's engineering personnel involved in EQ are responsible for preparation and updating of this EQ Summary Report. This includes review and resolution of USNRC licensing concerns as they pertain to the EQ program.

#### IV. REGULATORY COMPLIANCE

The HCGS EQ effort for safety related electrical equipment located in a harsh environment is required to comply with Category II of NUREG-0588, "Interim Staff Position on Environmental Qualification of Safety Related Electrical Components" dated December 1979 and IEEE-323-1971 "IEEE Standard for Qualifying Class 1E Equipment for Nuclear Power Generating Stations". However, the EQ program is attempting to meet, wherever possible, and qualify equipment to the Category I requirements of NUREG-0588 and IEEE-323-1974. In addition, the EQ program will conform to the criteria of 10CFR50.49 for safety related electrical equipment located in both harsh and mild environments.

For safety related mechanical equipment located in a harsh environment, the EQ Program establishes, via analysis, the qualified life of the components including proper required operability before, during, and after a DBA. This analysis is performed by identifying significant aging mechanisms within each mechanical component in accordance with IEEE-627-1980, "Design Qualification of Safety Systems Equipment Used in Nuclear Power Generating Stations", Section 4.4.1.

Environmental zones and conditions for which this mechanical equipment is designed to operate is identical to those environments described for the electrical components. However, this adherence to the EQ program is designed to supplement, and, as such, neither replaces nor modifies compliance with other applicable codes and standards prepared by ASME, AISC, ACI or any other governing organization. Additionally, the safety related mechanical components meet the sequential testing, seismic mounting configuration verification, operability assurance criteria, identification of aging mechanism's process, maintenance/surveillance interface requirements and other applicable criteria delineated in the Seismic Qualification Review Team (SQRT) and the Pump and Valve Operability Review Team (PVORT) documentation. This includes, but is not limited to, conformance with the following as described in the FSAR.

- (a) ASME Section III, Class 2 Criteria.
- (b) IEEE Standard 344-1975 - "Recommended Practices for Seismic Qualification of Class 1E Equipment"
- (c) IEEE Standard 323-1971 - "Qualifying Class 1E Equipment for Nuclear Power Generating Stations".

- (d) IEEE Standard 382-1972 - "Type Test of Class 1E Electric Valve Operators".
- (e) IEEE 627-1980 - "Design Qualification of Safety Systems Equipment Used in Nuclear Power Generating Stations".
- (f) ANSI Standard N-278-1 - "Self Operated and Power Operated Safety Related Valves Functional Specification Standard".
- (g) Regulatory Guide 1.148 - "Functional Specification for Active Valve Assemblies in Systems Important to Safety".
- (h) NUREG 0800 - "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants".

As is noted in FSAR Section 3.11, the EQ program is also designed to be in conformance with the following 10CFR Appendix A General Design Criteria and Regulatory Guides:

[The extent of compliance with these guidelines/criteria are delineated in the parenthesized FSAR Chapters/Sections].

- (a) **General Design Criterion 1:**  
Quality Standards and Records (Chapter 17)
- (b) **General Design Criterion 4:**  
Environmental and Missile Design Basis (Sections 3.5, 3.11).
- (c) **General Design Criterion 23:**  
Protection System Failure Modes (Chapter 7)
- (d) **General Design Criterion 50**  
Containment Design Basis (Chapter 6)
- (e) **Regulatory Guide 1.30**  
Quality Assurance Requirements for Instrumentation and Electrical Equipment (Chapter 7)
- (f) **Regulatory Guide 1.33**  
Quality Assurance Program Requirements (Sections 1.8, 3.11)



## V. QUALITY ASSURANCE PROVISIONS

Per the licensing requirements of 10CFR50, Appendix B, the Quality Assurance (QA) programs of both PSE&G and the architect/engineering firm, (Bechtel Power Corporation) for HCGS have been implemented in the establishment as well as the ongoing efforts of the EQ program. PSE&G's QA commitments are described in detail in both Chapter 16 of the HCGS PSAR and in PSE&G's QA Manual. The applicable EQ sections of Bechtel's QA program are delineated in an appendix to its Engineering Procedure Manual.

The purpose of the QA program is to ensure that the documentation required to validate EQ safety related equipment's proper performance over its qualified life is complete, accurate, traceable and auditable. This QA program effort includes:

- Audit of the overall EQ program including the documented selection process for safety related classification. QA ensures that this documentation is traceable, auditable and independently reviewed and approved.
- Audit of the environmental design and accident analysis to ensure that the correct conditions and calculations were utilized and independently verified for correctness.
- Review and approval of vendors to verify that they are qualified to supply the specified safety related equipment. This vendor approval may include vendor subcontractors and may involve vendor/subcontractor site visits to review the in-house QA/QC program and evaluate the objective evidence of the vendor's ability to meet his QA/QC commitments.
- Review and approval of testing laboratories used to perform EQ analysis and/or testing. Site visits to review in-house QA/QC programs, test facilities, test instrumentation calibration documentation, test setups, data collection, analysis and storage, etc., are also performed.



- Verification of proper procedures and practices for the shipment, storage and mounting of safety related equipment including proper signoffs of equipment receipt inspection, and proper signoff of pre-installation/operation tests. Level of storage in accordance with vendor and EQ requirements is verified.
- Audit of the EQ file to verify that the required support documentation is available for review. This includes auditing of the vendor supplied detailed operating, test, and maintenance manuals, noting particular the highlighting of any EQ related requirements, as well as verification of document control for any equipment replacement or modification.
- Audits to ensure proper review and signoff of vendor qualification plans, test procedures and analysis documentation. Witnessing of tests and signoffs at prescheduled hold points is performed.
- Audits of plant surveillance and maintenance program procedures to ensure compliance with vendor's recommendations and in-plant experience. Equipment repair and replacement activities must be verified to be in strict accord with EQ requirements over the qualified life of each piece of equipment. These EQ related programs are audited to verify periodic update based on IE Bulletins, vendor feedback, industry data and the plant's own experience with the equipment.
- Verification of a program to procure qualified spare parts and/or replacement equipment from approved vendors.
- Establishment of a documented process for QA identified deficiency resolution.

## VI. ENVIRONMENTAL CONDITIONS

The development of the abnormal/Design Basis Accident (DBA) environmental envelopes established for each harsh environmental area of the plant in which safety related electrical and mechanical equipment is located was based on accident scenarios described and analyzed in FSAR Chapter 15. In selecting an environmental envelope for any particular component, the DBA which results in the worst case environmental extremes (temperature, pressure, humidity, radiation) was chosen. The analysis to determine the environmental envelopes for the DBA's was performed by Bechtel Power Corporation, the Architect/Engineer for HCGS.

The DBA's identified as causing worst case harsh environment conditions were:

- (1) Loss of Coolant Accident (LOCA) Inside Containment.
- (2) Main Steam Line Break Outside Containment.
- (3) Instrument Line Break Outside Drywell.
- (4) Feedwater Line Break Outside Containment.
- (5) Control Rod Drop Accident.

Based on these analyses, the environmental conditions for each harsh environmental plant area were determined and the resultant parameter excursions are listed in Table 3.11-1 of the FSAR. The plant areas are:

- (1) Reactor Building
- (2) Turbine Building
- (3) Auxiliary Building
- (4) Intake structure
- (5) Inside Drywell
- (6) Inside Suppression Chamber

Each table provides the following information:

- (1) Area description and elevation.
- (2) Normal operating environmental conditions (temperature, pressure, humidity, radiation).
- (3) Abnormal operating environmental conditions.
- (4) DBA environmental conditions (worst case).

The components are qualified to these environmental envelopes with emphasis upon the DBA (worst case) extremes. This worst case environmental envelope approach is conservative in that it ensures that each safety related component located in a harsh environment will perform its required safety function under each DBA condition regardless of whether or not its environment is affected by that DBA.

In addition to determining worst case environmental conditions, margin was added to both the qualification parameters and the analyzed time duration, to increase confidence in the components ability to perform its defined safety function. This margin, added in accordance with IEEE-323, IEEE-627, and NUREG 0588, includes conservatism for analyzed environmental conditions as well as for variations (by the vendor) in production processes, inaccuracies in test equipment and for errors associated with the defining of satisfactory equipment performance.

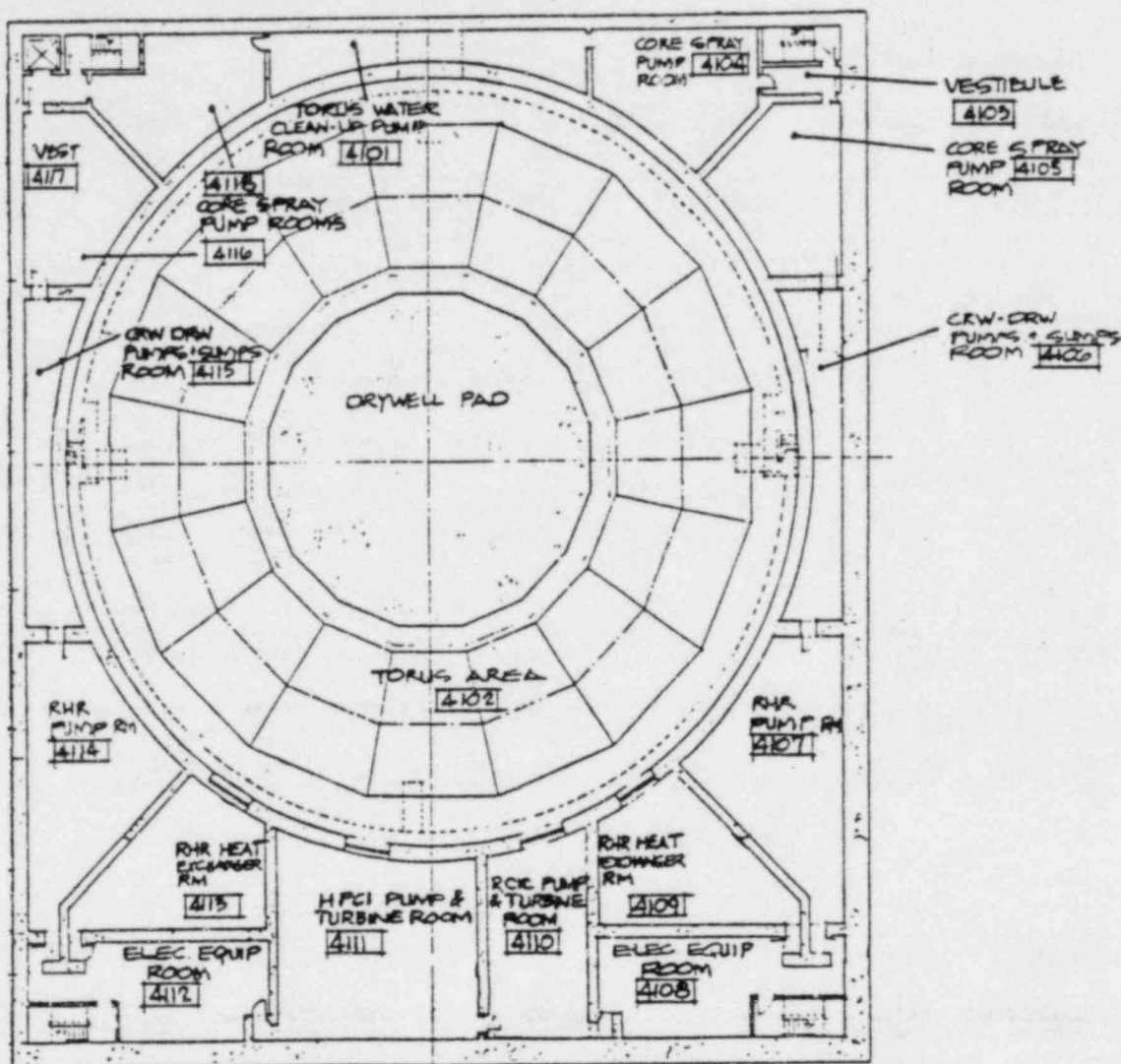
The DBA radiation total integrated doses (TID) and dose rates were established in accordance with NUREG 0588. The TID inside containment was calculated for a period of 180 days after which saturation conditions were assumed. TID levels were based on release to containment of 100% of core noble gas inventory, 50% of core halogen inventory and 1% core solid fission inventory. Enveloping TID conditions outside containment but inside the reactor building, based again on NUREG 0588, were assumed to be from two sources:

- (1) After a DBA, 50% of core halogen inventory and 1% of core solid fission product inventory were introduced to the emergency core cooling system water.
- (2) After a DBA, the airborne cloud has been released to the reactor building from the primary containment.

The TID inside the reactor building, like that inside containment, is assumed for a 180 day period with saturation assumed thereafter. Dose rates were determined based on normally anticipated radiation levels preceding, during and following the DBA.

#### Environmental Maps

The locations given on the component summary sheets for the various defined harsh environmental areas correspond to the various areas of the plant shown in the attached harsh environment zone maps (Figures 1 thru 9) and corresponding "Enveloping Plant Environmental Conditions - Reactor Building", Table 3.11-1a (9 pages).



NOTES

1. ENVIRONMENTAL CONDITIONS FOR ROOMS 4102 THRU 4118 SHOWN ABOVE APPEAR ON FSAR TABLE 3.11-1a. (FIG. 1a)
2. ROOM 4101 DOES NOT HAVE HARSH ENVIRONMENT ESTABLISHED FOR ENVIRONMENTAL QUALIFICATION IN ACCORDANCE WITH FSAR TABLE 3.11-1a. (FIG. 1a)

PUBLIC SERVICE ELECTRIC & GAS COMPANY  
HOPE CREEK GENERATING STATION

DRN	EQUIPMENT QUALIFICATION	
CHK	HARSH ENVIRONMENT	
APPR	REACTOR BLDG. EL. 54'	
DATE		
JOB NO.	DRAWING NUMBER	REV
	FIG. 1	

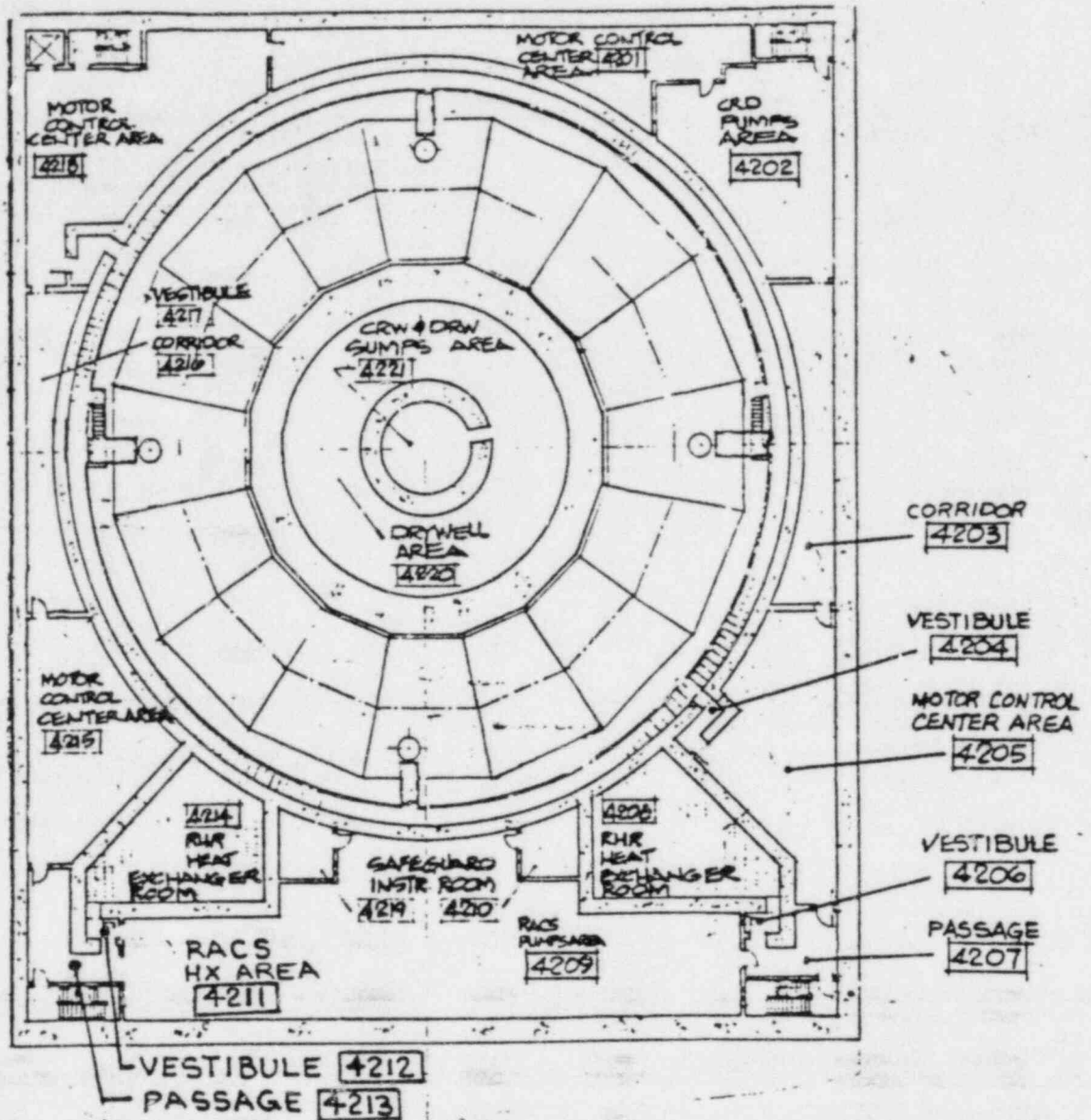
ROCS FSAR  
TABLE 3.11-1a

ENVELOPING PLANT ENVIRONMENTAL CONDITIONS - REACTOR BUILDING

Area Description & Room Number	Normal Operating Conditions					Abnormal Conditions			DBE Conditions				
	Press Max/Min, Mg	Temp, °F Test/Max/Ave/Min	% Rel Humidity Max/Min	Max Dose Rate, Rad/h	Integr Dose, Rad (1)	Press psig	Temp °F	% Rel Humidity Max/Min	Press, psig (2)	Temp °F (2)	% Rel Humidity	Max LOCA Dose Rate, Rad/h (5,7)	LOCA Integr Dose, Rad (6,7)
Reactor Building, el 5d'													
Core spray Pump rooms 4104, 4116, 4105, 4118	1/-0.25	110/78/68/40	90/20	0.01	3.5E3	Atm	113	100/20	3-30 min (3)	148	100	1.1E5	4E4
BCIC pump room 4111	1/-0.25	107/83/72/60	90/20	2.5	9.1E3	Atm	110	100/20	5-30 min (3)	340-30 min (4)	100	1.3E5	2E4
RHR pump rooms 4114, 4107	1/-0.25	111/84/73/40	90/20	10.0	3.5E4	Atm	112	100/20	3-30 min (3)	148	100	1.1E5	3E4
RHR pump & BX rooms 4109, 4113	1/-0.25	111/79/69/40	90/20	10.0	3.5E4	Atm	113	100/20	5-30 min (3)	340-30 min (4)	100	1.6E5	5E4
BCIC pump room 4110	1/-0.25	106/79/69/60	90/20	4.5	9.1E3	Atm	112	100/20	3-30 min (3)	340-30 min (4)	100	8.8E4	2E4
Elect. equipment room 4112, 4108	1/-0.25	-/104/72/40	90/30	0.0025	8.8E2	Atm	108	100/20	3-30 min (3)	148	100	7.9E-1	8E0
CRW/DRW pump room 4106	1/-0.25	-/85/74/40	90/20	0.21	7.4E4	Atm	116	100/20	3-30 min (3)	148	100	1.1E5	4E4
Torus water Stair vestibule 4103, 4117	1/-0.25 1/-0.25	-/113/104/40 -/104/-/40	90/20 90/20	0.015 0.0025	5.25E3 8.8E2	Atm -	142 -	100/20 -	3-30 min 3-30 min (3)	148 148	100	5.9E2	2E4
Torus compartment 4102	1/-0.25	-/88/77/40	90/20	0.100	3.5E4	Atm	108	100/20	3-30 min (3)	340-30 min (4)	100	1.2E1	4E3
CRW/DRW pump room 4115	1/-0.25	-/85/74/40	90/20	0.21	7.4E4	Atm	116	100/20	3-30 min (3)	148	100	2.9E5	2E7
											100	2.6E0	3E1

FIG. 1a





NOTES

1. ENVIRONMENTAL CONDITIONS FOR ROOMS 4201 THRU 4219 SHOWN ABOVE APPEAR ON FSAR TABLE 3.11-1a. (FIG. 2a)
2. ROOMS 4220 AND 4221 DO NOT HAVE HARSH ENVIRONMENTS ESTABLISHED FOR ENVIRONMENTAL QUALIFICATIONS IN ACCORDANCE WITH 10855-D.75 (FIG. 2b & 2c)

PUBLIC SERVICE ELECTRIC & GAS COMPANY  
HOPE CREEK GENERATING STATION

EQUIPMENT QUALIFICATION HARSH ENVIRONMENT REACTOR BUILDING EL. 77'		
DRAWN		
CHECKED		
APPROVED		
DATE		
JOB NO.	DRAWING NUMBER	REV
	FIG. 2	



HCCS FSAR  
TABLE 3.11-1a

ENVOLPING PLANT ENVIRONMENTAL CONDITIONS - REACTOR BUILDING

Area Description & Room Number	Normal Operating Conditions					Abnormal Conditions			DBE Conditions				
	Press Max/Min, Mg	Temp, °F Test/Max/Ave/Min	% Rel Humidity Max/Min	Max Dose Rate, Rad/h	Integr Dose, Rad (1)	Press psig	Temp °F	% Rel Humidity Max/Min	Press, psig (2)	Temp °F (2)	% Rel Humidity	Max LOCA Dose Rate, Rad/h (5,7)	LOCA Integr Dose, Rad (6,7)
Reactor Building, el 77'													
RACS pump rooms 4209,	1/-0.25	-/93/82/40	90/20	0.0025	8.8E2	Atm	124	100/20	3-30 min (3)	148	100	1.2E1	2E2
RACS HX room 4211	1/-0.25	-/93/82/40	90/20	0.0025	8.8E2	Atm	124	100/20	3-30 min (3)	148	100	1.2E1	2E2
RHR HX rooms 4208, 4214	1/-0.25	111/79/69/40	90/20	10.0	3.5E4	Atm	113	100/20	5-30 min (3)	340-30 min (4)	100	1.1E5	3E4
Safeguard inst rooms 4210, 4219	1/-0.25	-/82/77/40	90/20	0.0025	8.8E2	Atm	115	100/20	3-30 min (3)	148	100	1.2E1	2E2
Motor control center 4215	1/-0.25	-/77/70/40	90/20	0.0025	8.8E2	Atm	109	100/20	3-30 min (3)	148	100	1.2E1	2E2
Motor control center 4201	1/-0.25	-/87/79/40	90/20	0.0025	8.8E2	Atm	118	100/20	3-30 min (3)	148	100	2.3E1 at 36 h	2E2
Motor control center 4218	1/-0.25	-/76/67/40	90/20	0.0025	8.8E2	Atm	107	100/20	3-30 min (3)	148	100	1.1E0	2E1
CRD pump room 4202	1/-0.25	-/97/86/40	90/20	0.0025	8.8E2	Atm	130	100/20	3-30 min (3)	148	100	2.3E1 at 36 h	2E2
Corridor 4203	1/-0.25	-/82/77/40	90/20	0.0025	8.8E2	Atm	110	100/20	3-30 min (3)	148	100	1.1E4	4E3
Vestibule 4204	1/-0.25	-/110/-/40	90/20	0.015	5.3E3	-	-	-	3-30 min (3)	340-30 min (3)	100	3.0E0	3E1
Passage 4207, 4213	1/-0.25	-/104/-/40	90/20	0.0025	8.8E2	-	-	-	3-30 min (3)	148	100	3.0E0	3E1
Vestibule 4206, 4212	1/-0.25	-/115/-/40	90/20	0.015	5.3E3	-	-	-	5-30 min (3)	340-30 min (4)	100	3.0E0	3E1
Motor control center 4205	1/-0.25	-/77/70/40	90/20	0.0025	8.8E2	Atm	109	100/20	3-30 min (3)	148	100	2.4E1	4E1
Corridor 4216	1/-0.25	-/82/77/40	90/20	0.0025	8.8E2	Atm	110	100/20	3-30 min (3)	148	100	2.1E0	2E1
Vestibule 4217	1/-0.25	-/104/-/40	90/20	0.015	5.3E3	-	-	-	3-30 min (3)	340-30 min (4)	100	2.1E0	2E1

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TABLE 3.11-1h

ENVELOPING RADIATION CONDITIONS INSIDE PRIMARY CONTAINMENT

Area (7)	Radiation Type	Operating Dose Rate (1)	Design Basis Event		Integrated Dose (1,2)	
			Type	Dose Rate (1,2)	Normal	DBE
Drywell, inside biological shield	Gamma	$2.3 \times 10^4$	LOCA	(8)	$8.1 \times 10^6$	(9)
	Neutron	$8.8 \times 10^3$			$3.1 \times 10^6$	
	Beta	(4)			-----	
Outside biological shield	Gamma	$52.3 \times 10^4$	LOCA	(8)	$58.1 \times 10^6$	(9)
	Neutron	$58.8 \times 10^3$			$53.1 \times 10^6$	
	Beta	(4)			-----	
Zone 1 Above core	Gamma	54.0	LOCA	(8)	$1.9 \times 10^7$	(9)
	Neutron	12			$4.3 \times 10^6$	
	Beta	(4)			-----	
Zone 2 Core region	Gamma	$52.3 \times 10^4$	LOCA	(8)	$58.1 \times 10^6$	(9)
	Neutron	$58.8 \times 10^3$			$53.1 \times 10^6$	
	Beta	(4)			-----	
Zone 3 Under vessel	Gamma	50.0	LOCA	(8)	$1.8 \times 10^7$	(9)
	Neutron	$\leq 12$			$4.3 \times 10^6$	
	Beta	(4)			-----	
Zone 4 Near recirculation	Gamma	50.0	LOCA	(8)	$1.4 \times 10^6$	(9)
	Neutron	$\leq 12$			$4.3 \times 10^6$	
	Beta	(4)			-----	
Zone 5 > 15 feet from recirculation	Gamma	50	LOCA	(8)	$1.8 \times 10^7$	(9)
	Neutron	$\leq 12$			$4.3 \times 10^6$	
	Beta	(4)			-----	
Zone 6 Suppression chamber	Gamma	50	LOCA	(8)	$1.8 \times 10^7$	$6.3 \times 10^6$
	Neutron	$\leq 12$			$4.3 \times 10^6$	$3.5 \times 10^6$
	Beta	(4)			$1.5 \times 10^6$ at 48 h	

(1) The unit of dose rate is Rads/hr,  
The unit of dose is Rads

(2) Normal integrated dose is calculated for 40 years

(3) DBE dose rate is the dose rate immediately following the DBE, unless otherwise specified.

(4) The beta dose is not significant compared to others during normal operation.

(5) Gamma  $1.9 \times 10^7$  (airborne)  
 $1.9 \times 10^6$  (plateout at 1 h)  
Beta  $3.1 \times 10^6$  (airborne)  
 $1.1 \times 10^7$  (plateout at 1 h)

(6) Gamma  $2.6 \times 10^7$  (airborne)  
 $3.4 \times 10^6$  (plateout)  
Beta  $9.5 \times 10^6$  (airborne)  
 $6.7 \times 10^6$  (plateout)

(7) See Figure 3.11-1 for areas inside primary containment.

FIGURE 2b

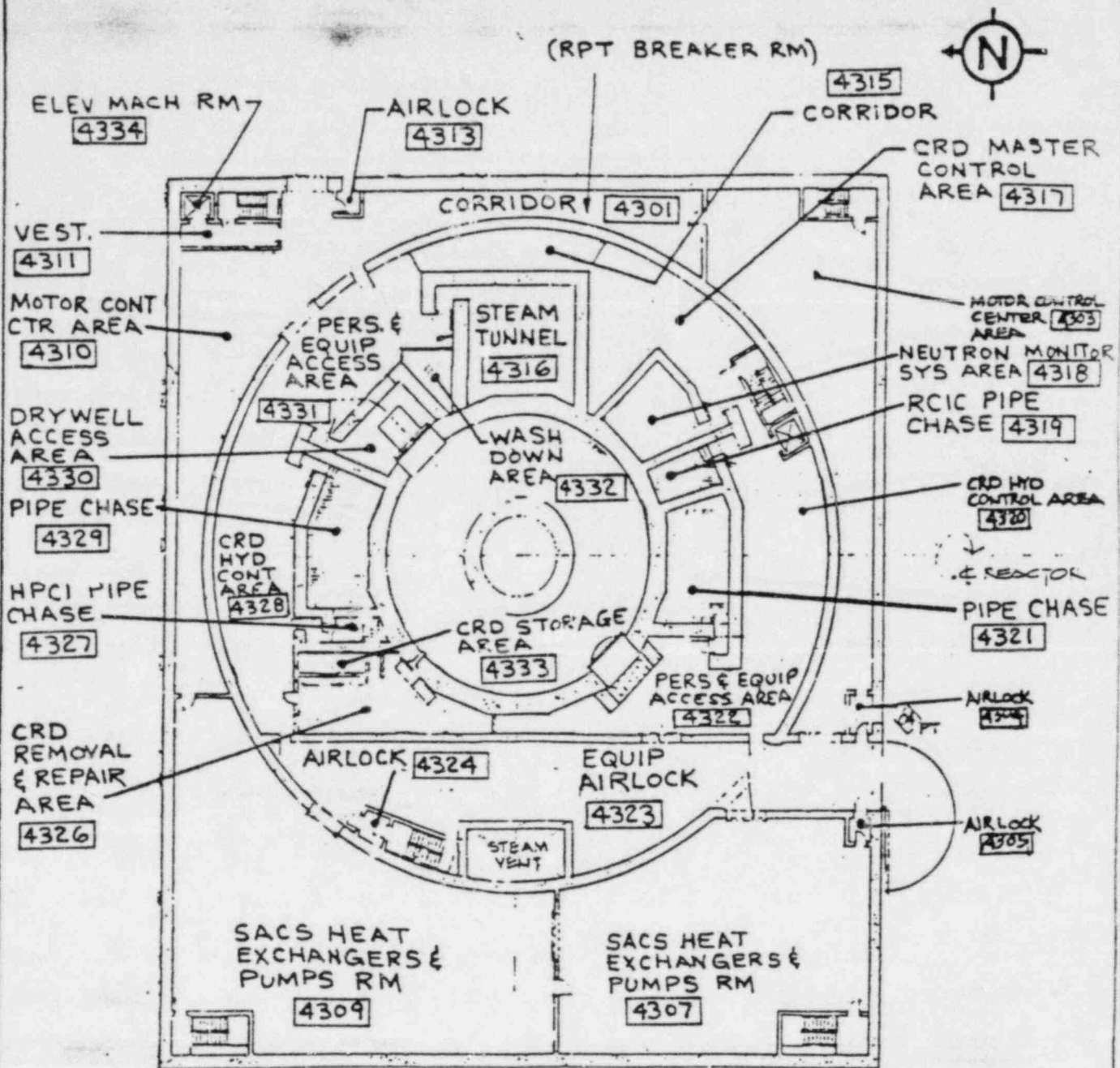
Table 5

Environmental Conditions Inside Primary Containment  
for the Design Basis Event

Drywell

<u>Time</u>	<u>Temperature (Degrees F)</u>	<u>Pressure (psig)</u>	<u>Humidity (%)</u>
0 - 20 sec	340	0 - 62	100
20 sec - 5 min	340	62	100
5 min - 3 hr	340	40	100
3 - 6 hr	320	40	100
6 - 24 hr	250	25	100
1 - 4 days	200	25	100
4 - 180 days	200	10	100

FIG. 2c



NOTE

1. ENVIRONMENTAL CONDITIONS FOR ROOMS 4301, 4303 THRU 4305, 4307, 4309 THRU 4311, 4313, 4315 THRU 4324 AND 4326 THRU 4334 SHOWN ABOVE APPEAR ON FSAR TABLE 3.11-1a (FIG 3a & 3b).

PUBLIC SERVICE ELECTRIC & GAS COMPANY  
HOPE CREEK GENERATING STATION

DRN	EQUIPMENT QUALIFICATION HARSH ENVIRONMENT REACTOR BUILDING EL. 102'	
CHK		
APPR		
DATE		
JOB NO.	DRAWING NUMBER	REV
	FIG. 3	

WCCB PSAR  
TABLE 3.11-1a

ENVOLPING PLANT ENVIRONMENTAL CONDITIONS - REACTOR BUILDING

Area Description & Room Number	Normal Operating Conditions					Abnormal Conditions			DBE Conditions				
	Press Max/Min, Wg	Temp, °F Test/Max/Ave/Min	% Rel Humidity Max/Min	Max Dose Rate, Rad/h	Integr Dose, Rad (1)	Press psig	Temp °F	% Rel Humidity Max/Min	Press, psig (2)	Temp °F (2)	% Rel Humidity	Max LOCA Dose Rate, Rad/h (5,7)	LOCA Integr Dose, Rad (6,7)
Reactor Building, el 102'													
Steam tunnel 4316	1/-0.25	-/97/86/40	90/20	10.0	3.3E6	Atm	129	100/20	10-30 min (3)	340-30 min (4)	100 gamma beta	1.9E7 3.1E8	3E7 1E9
North pipe chase 4329	1/-0.25	-/103/94/40	90/20	0.715	2.5E5	Atm	129	100/20	3-30 min (3)	340-30 min (4)	100	1.1E5	4E6
South pipe chase 4321	1/-0.25	-/91/81/40	90/20	1.0	1.3E6	Atm	119	100/20	3-30 min (3)	340-30 min (4)	100	1.1E5	4E6
WPCI pipe chase 4327	1/-0.25	-/71/62/40	90/20	2.5	9.1E3	Atm	106	100/20	5-30 min (3)	340-30 min (4)	100	7.7E4	6E4 24 h
WCIC pipe chase 4319	1/-0.25	-/71/62/40	90/20	1.5	6.5E3	Atm	105	100/20	3-30 min (3)	340-30 min (4)	100	3.5E4	6E4 24 h
Personnel & equip- ment access area 4322, 4331	1/-0.25	-/92/82/40	90/20	0.0025	8.8E2	Atm	115	100/20	3-30 min (3)	148	100	1.2E1	4E3
Neutron monitoring system 4318	1/-0.25	-/99/90/40	90/20	250.0	1.1E6	Atm	118	100/20	3-30 min (3)	148	100	1.8E2	3E2
CRD hydraulic 4320	1/-0.25	-/92/82/40	90/20	0.0025	8.8E2	Atm	115	100/20	3-30 min (3)	148	100	8.4E2 at 36 h	6E4
CRD master control area & corridor 4317, 4315	1/-0.25	-/92/82/40	90/20	0.0025	8.8E2	Atm	115	100/20	3-30 min	148	100	9.6E0	4E3
Washdown area 4332	1/-0.25	-/92/82/40	90/20	0.0025	8.8E2	Atm	115	100/20	3-30 min (3)	148	100	1.2E1	4E3
Equipment air lock 4304, 4305, 4313	1/-0.25	-/104/-/40	90/20	0.0025	8.8E2	-	-	-	3-30 min (3)	148	100	1.5E-2	2E1
Motor control center 4310	1/-0.25	-/91/77/40	90/20	0.0025	8.8E2	Atm	122	100/20	3-30 min (3)	148	100	1.5E	5E0
Motor control center 4303	1/-0.25	-/85/74/40	90/20	0.0025	8.8E2	Atm	115	100/20	3-30 min (3)	148	100	6.3E2	3E3
BAC6 pump & BX rooms 4307, 4309	1/-0.25	-/94/87/40	90/20	0.0025	8.8E2	Atm	95	100/20	3-30 min (3)	148	100	2.7E1	5E2



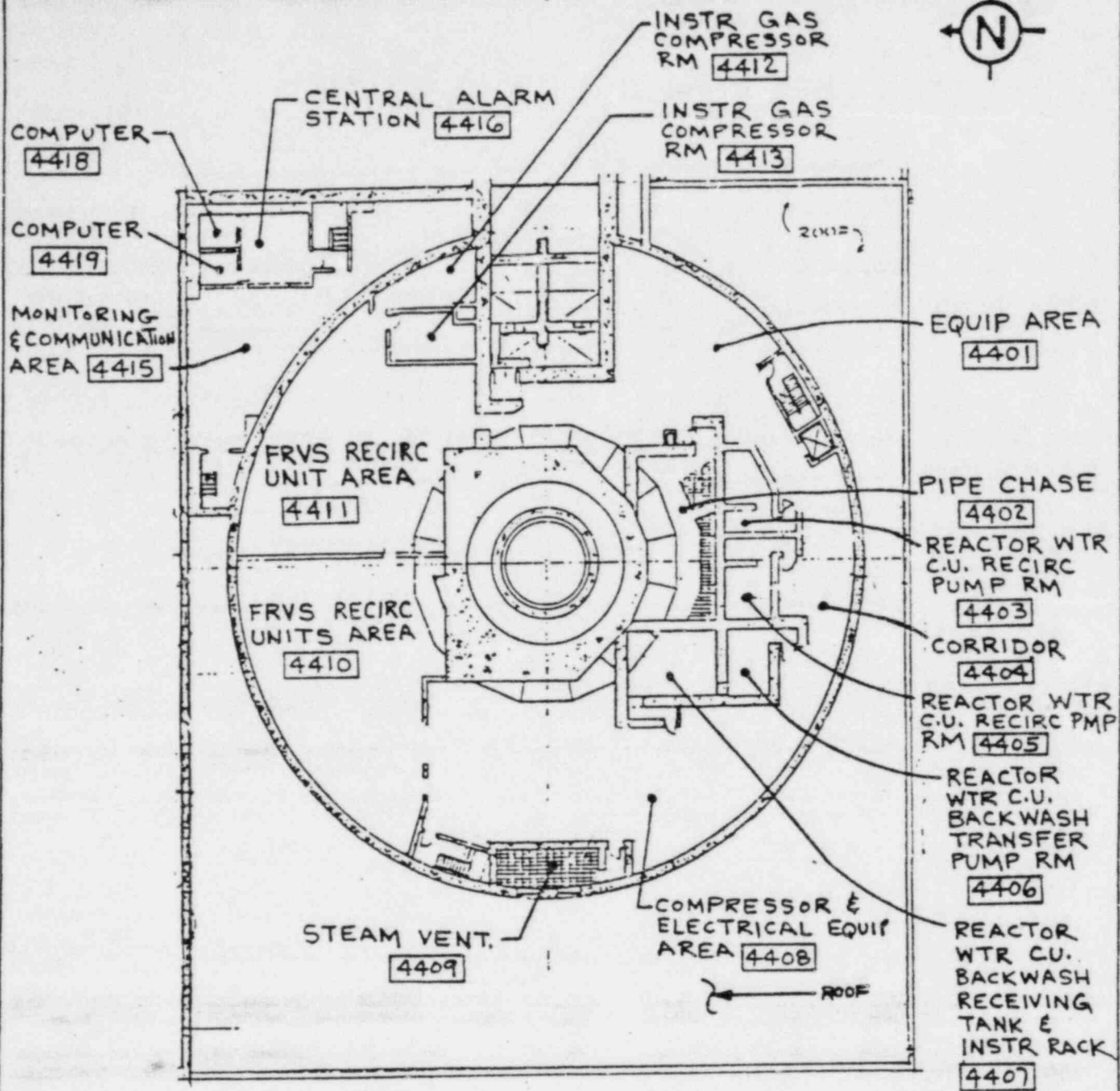
ECGS FBAR  
TABLE 3.11-1a

ENVELOPING PLANT ENVIRONMENTAL CONDITIONS - REACTOR BUILDING

Area Description & Room Number	Normal Operating Conditions					Abnormal Conditions			DBE Conditions				
	Press Max/Min, Wg	Temp, °F Test/Max/Ave/Min	% Rel Humidity Max/Min	Max Dose Rate, Rad/h	Integr Dose, Rad (1)	Press psig	Temp °F	% Rel Humidity Max/Min	Press, psig (2)	Temp °F (2)	% Rel Humidity	Max LOCA Dose Rate, Rad/h (5,7)	LOCA Integr Dose, Rad (6,7)
CRD removal & repair 4336	1/-0.25	-/104/-/40	90/20	0.0025	8.8E2	-	-	-	3-30 min (3)	148	100	9.6E1	4E3
CRD storage 4333	1/-0.25	-/104/-/40	90/20	0.10	3.5E4	-	-	-	3-30 min (3)	148	100	9.6E1	4E3
Vestibule & elev machine room 4311, 4334	1/-0.25	-/104/-/40	90/20	0.0025	8.8E2	-	-	-	3-30 min (3)	148	100	1.5E2	2E1
Drywell access room 4330	1/-0.25	-/104/-/40	90/20	2.5	8.8E5	-	-	-	3-30 min (3)	148	100	gamma 1.9E7 beta 3.1E8	3E7 1E9
RPT breaker room 4301	1/-0.25	-/91/77/40	90/20	0.0025	8.8E2	Atm	122	100/20	3-30 min (3)	148	100	1.5E-2	3E1
Equipment air lock, 4323	1/-0.25	-/84/74/40	90/20	0.0025	8.8E2	Atm	107	100/20	3-30 min (3)	144	100	9.6E0	4E3
Equipment air lock, 4324	1/-0.25	-/104/-/40	90/20	0.0025	8.8E2	-	-	-	3-30 min (3)	148	100	9.6E0	4E3
CRD hydraulic 4328	1/-0.25	-/93/82/40	90/20	0.02	7.0E3	Atm	115	100/20				1.1E5	4E6

FIG. 3b





NOTES

1. ENVIRONMENTAL CONDITIONS FOR ROOMS 4401 THRU 4413, 4415 AND 4416 SHOWN ABOVE APPEAR ON FSAR TABLE 3.11-1a. (FIG. 4a)
2. ROOMS 4418 AND 4419 DO NOT HAVE HARSH ENVIRONMENTS ESTABLISHED FOR ENVIRONMENTAL QUALIFICATIONS IN ACCORDANCE WITH FSAR TABLE 3.11-1a. (FIG. 4a)

PUBLIC SERVICE ELECTRIC & GAS COMPANY  
HOPE CREEK GENERATING STATION

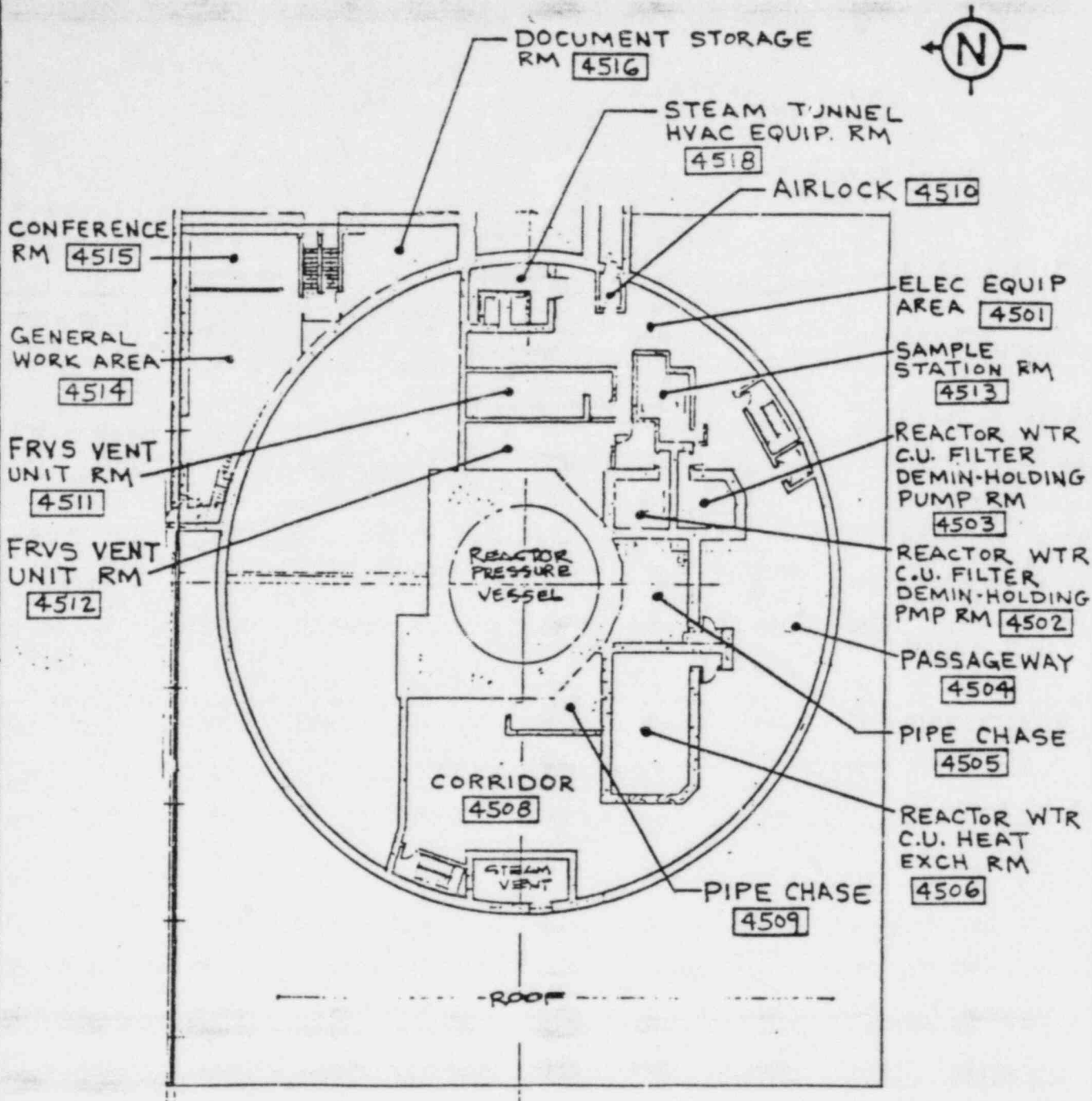
DRN	EQUIPMENT QUALIFICATION	
CHK	HARSH ENVIRONMENT	
APPR	REACTOR BUILDING EL. 132'	
DATE		
JOB NO.	DRAWING NUMBER	REV
	FIG. 4	

MOSE PSAR  
TABLE 3.11-1a

DEVELOPING PLANT ENVIRONMENTAL CONDITIONS - REACTOR BUILDING

Area Description & Room Number	Normal Operating Conditions					Abnormal Conditions			DBE Conditions				
	Press Max/Min, Mg	Temp, °F Test/Max/Avg/Min	% Rel Humidity Max/Min	Max Dose Rate, Rad/h	Integr Dose, Rad (1)	Press psig	Temp °F	% Rel Humidity Max/Min	Press, psig (2)	Temp °F (2)	% Rel Humidity	Max LOCA Dose Rate, Rad/h (5,7)	LOCA Integr Dose, Rad (6,7)
Reactor Building, el 132'													
RMCU recirc pump room 4403, 4405	1/-0.25	-/104/-/40	90/20	92.0	1.1E6	-	-	-	6-30 min (3)	250-30 min (4)	100	1.5E-2	2E1
RMCU backwash pump room 4406	1/-0.25	-/104/-/40	90/20	55.0	1.1E6	-	-	-	6-30 min (3)	250-30 min (4)	100	1.5E-2	2E1
RMCU backwash recirc tank 4407	1/-0.25	-/104/-/40	90/20	1.19E2	4.2E7	-	-	-	6-30 min (3)	250-30 min (4)	100	1.5E-2	2E1
South pipe chase 4402	1/-0.25	-/91/79/40	90/20	89.0	2.0E6	Atm	119	100/20	6-30 min (3)	340-30 min (4)	100	8.4E2 at 36 h	6E4
FRVS recirc 4410, 4411	1/-0.25	-/80/69/40	90/20	0.0025	8.8E2	Atm	110	100/20	0	140	100	3.1E3 at 10 days	2E6
Equipment area 4401	1/-0.25	-/76/65/40	90/20	0.0025	8.8E2	Atm	105	100/20	3-30 min (3)	140	100	1.5E-2	2E1
Corridor 4404	1/-0.25	-/104/-/40	90/20	0.0025	8.8E2	Atm	105	100/20	3-30 min (3)	140	100	1.5E-2	2E1
Compressor & elect equip area 4408	1/-0.25	-/104/-/40	90/20	0.0025	8.8E2	Atm	105	100/20	3-30 min (3)	140	100	4.7E-2 at 10 days	7E1
Instrument gas compressor room 4412, 4413	1/-0.25	-/80/67/40	90/20	0.0025	8.8E2	Atm	110	100/20	3-30 min (3)	140	100	2.0E0 at 10 days	3E3
Entrance to steam vent 4409	1/-0.25	-/88/75/40	90/20	0.0025	8.8E2	Atm	108	100/20	3-30 min (3)	340-30 min (4)	100	2.0E2	6E3
Central alarm station 4416	.25/-0.25	-/104/-/40	90/20	0.0005	2E2				-	-		-	-
Monitoring and com- munication area 4415	.25/-0.25	-/104/-/40	90/20	0.0005	2E2				-	-		-	-

FIG. 4a



NOTE

- ENVIRONMENTAL CONDITIONS FOR ROOMS 4501 THRU 4506 AND 4508 THRU 4513, 4515, 4516 AND 4518 SHOWN ABOVE APPEAR ON FSAR TABLE 3.11-1a. (FIG. 5a)

PUBLIC SERVICE ELECTRIC & GAS COMPANY  
HOPE CREEK GENERATING STATION

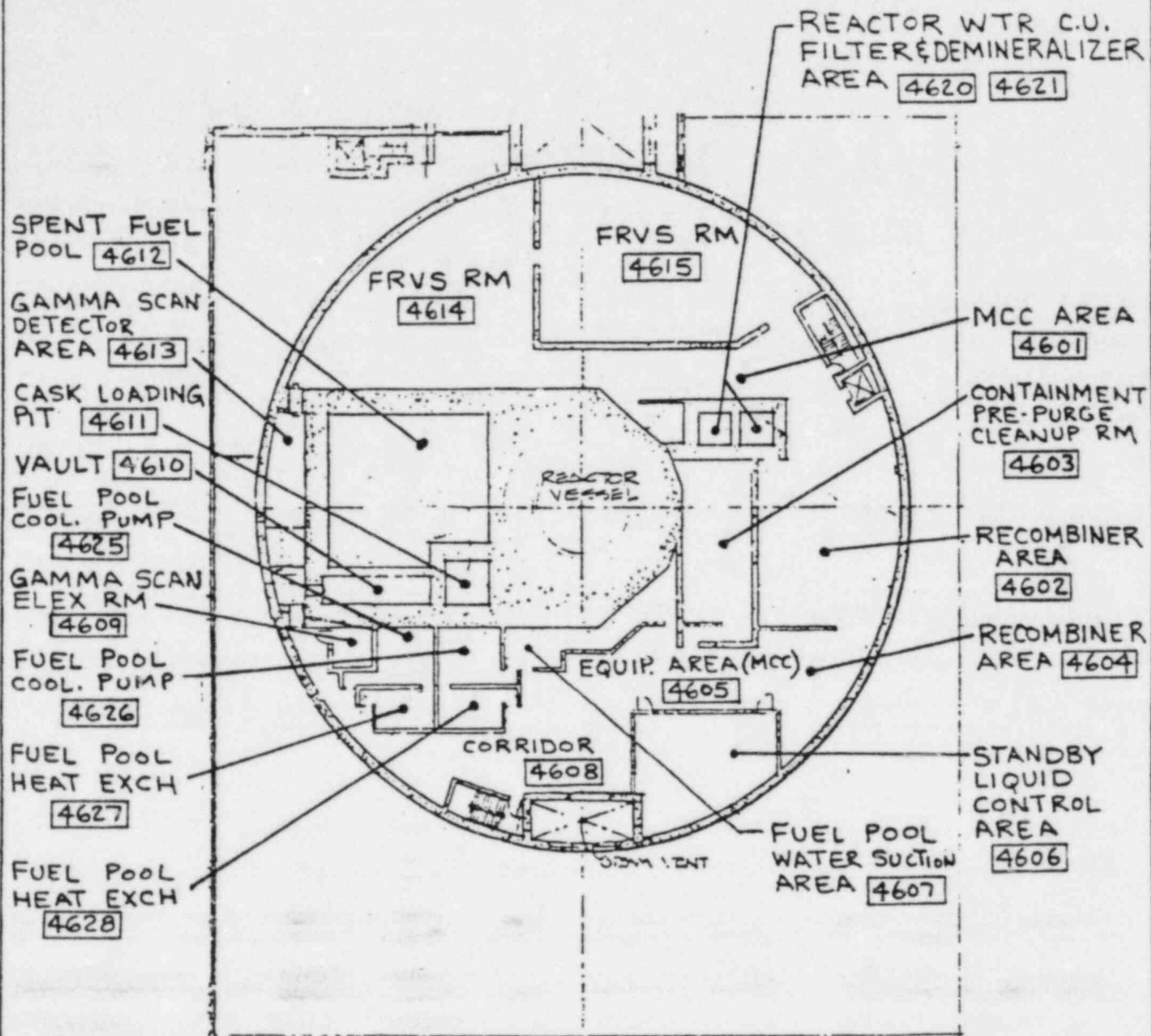
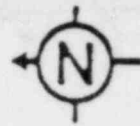
DRAW	EQUIPMENT QUALIFICATION HARSH ENVIRONMENT REACTOR BUILDING EL. 145'	
CHK		
APPR		
DATE		
JOB NO.	DRAWING NUMBER	REV
	FIG. 5	

RCGS PSAR  
TABLE 3.11-1a

DEVELOPING PLANT ENVIRONMENTAL CONDITIONS - REACTOR BUILDING

Area Description & Room Number	Normal Operating Conditions					Abnormal Conditions			DRE Conditions				
	Press Max/Min, Wg	Temp, °F Test/Max/Ave/Min	% Rel Humidity Max/Min	Max Dose Rate, Rad/h	Integr Dose, Rad (1)	Press psig	Temp °F	% Rel Humidity Max/Min	Press, psig (2)	Temp °F (2)	% Rel Humidity	Max LOCA Dose Rate, Rad/h (5,7)	LOCA Integ Dose, Rad (6,7)
Reactor Building, el 145'													
RMCU RX 4506	1/-0.25	-/110/-/40	90/20	5.7	286	Atm	148	100/20	6.25-30 min (3)	100-30 min (4)	100	8.4E2 at 36 h	6E4
South pipe chase 4505	1/-0.25	-/91/79/40	90/20	55.0	2.0E6	Atm	119	100/20	6-30 min (3)	250-30 min (4)	100	8.4E2 at 36 h	6E4
Cleanup filter & holdup pump room 4502, 4503	1/-0.25	-/94/83/40	90/20	0.0025	8.8E2	Atm	126	100/20	6-30 min (3)	250-30 min (4)	100	1.5E-2	2E1
Corridor 4508	1/-0.25	-/94/83/40	90/20	0.0025	8.8E2	Atm	126	100/20	0	148	100	4.7E-2 at 10 days	7E1
West pipe chase 4509	1/-0.25	-/94/83/40	90/20	0.015	5.5E3	Atm	126	100/20	0	148	100	8.4E2 at 36 h	6E4
Electrical equip- ment area 4501	1/-0.25	-/94/83/40	90/20	0.0025	8.8E2	Atm	126	100/20	0	148	100	5.2E-2 at 10 days	7E1
Airlock 4510	1/-0.25	-/104/91/40	90/20	0.0025	8.8E2	Atm	122	100/20	0	148	100	1.5E-2	2E1
FRVB vent room 4511, 4512	1/-0.25	-/100/90/40	90/20	0.0025	8.8E2	Atm	128	100/20	0	148	100	1.4E0 at 10 days	1E3
Sample station room 4513	1/-0.25	-/104/91/40	90/20	0.0025	8.8E2	Atm	122	100/20	0	148	100		
General work area 4514	1/-0.25	-/78/73/68	90/20	0.0025	8.8E2	Atm	104	100/20	0	148	100		
Conference room 4515	1/-0.25	-/78/73/68	90/20	0.0025	8.8E2	Atm	95	100/20	0	148	100		
Document storage room 4516	1/-0.25	-/78/73/68	90/20	0.0025	8.8E2	Atm	99	100/20	0	148	100	-	-
Stairwell 4517 area 4514	1/-0.25	-/78/73/68	90/20	0.0025	8.8E2	Atm	195	100/20	0	148	100	-	-
HVAC duct 4518 space	1/-0.25	-/104/90/60	90/20	0.0025	8.8E2	Atm	109	100/20	0	148	100		
Corridor 4504	1/-0.25	-/94/83/40	90/20	0.0025	8.8E2	Atm	126	100/20	0	148	100	8.4E2 at 36 h	6E4





NOTE

- ENVIRONMENTAL CONDITIONS FOR ROOMS 4601 THRU 4615, 4620, 4621 AND 4625 THRU 4628 SHOWN ABOVE APPEAR ON FSAR TABLE 3.11-1a. (FIG. 6a & 6b)

PUBLIC SERVICE ELECTRIC & GAS COMPANY  
HOPE CREEK GENERATING STATION

DRN	EQUIPMENT QUALIFICATION HARSH ENVIRONMENT REACTOR BUILDING EL. 162'	
CHK		
APPR		
DATE		
JOB NO.	DRAWING NUMBER	REV
	FIG. 6	



NCCS FSAR  
TABLE 3.11-1a

DEVELOPING PLANT ENVIRONMENTAL CONDITIONS - REACTOR BUILDING

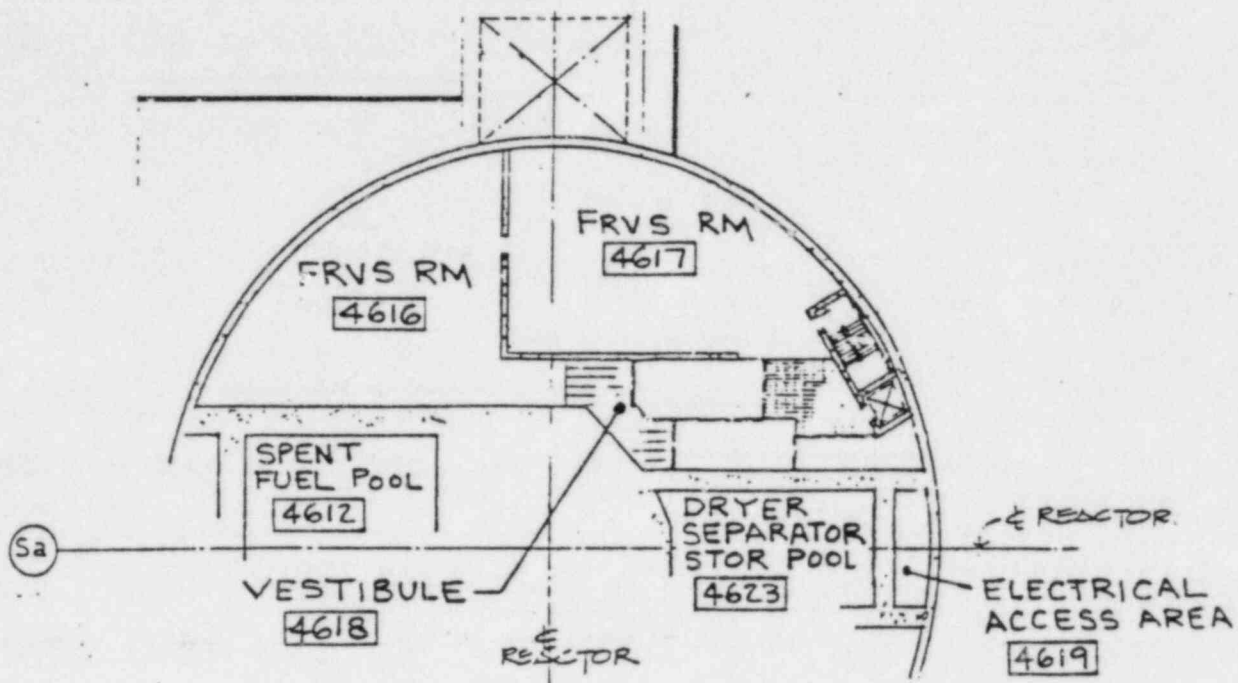
Area Description & Room Number	Normal Operating Conditions					Abnormal Conditions			DBE Conditions				
	Press Max/Min, Wg	Temp, °F Test/Max/Ave/Min	% Rel Humidity Max/Min	Max Dose Rate, Rad/h	Integr Dose, Rad (1)	Press psig	Temp °F	% Rel Humidity Max/Min	Press, psig (2)	Temp °F (2)	% Rel Humidity	Max LOCA Dose Rate, Rad/h (5,7)	LOCA Integr Dose, Rad (6,7)
Reactor Building, at 162' & 178'													
Gamma scan detector area 4613	1/-0.25	-/100/93/40	90/20	0.001	3.5E2	Atm	119	100/20	0	148	100	1.5E-2	2E1
Cask loading area 4611	1/-0.25	-/104/-/40	90/20	0.10	3.5E4	-	-	-	0	148	100	1.5E-2 at 10 days	2E1
Containment pre- purge cleanup rm 4603	1/-0.25	-/104/91/40	90/20	0.10	3.5E4	-	-	-	0	148	100	4.8E3	7E3
Motor control center 4601	1/-0.25	-/101/89/40	90/20	0.0025	8.8E2	Atm	124	100/20	0	148	100	2.3E1 at 10 days	2E4
Recombiner (Post LOCA) 4602,4604	1/-0.25	-/104/74/40	90/20	0.0025	8.8E2	Atm	109	100/20	0	148	100	8.4E2 at 36 h	6E4
FWVB units 4615, 4617	1/-0.25	-/83/73/40	90/20	0.0025	8.8E2	Atm	108	100/20	0	148	100	2.1E3 at 10 days	2E6
Corridor 4608	1/-0.25	-/100/93/40	90/20	0.0025	8.8E2	Atm	119	100/20	0	148	100	5.5E-1 at 36 h	4E1
New fuel vault 4610	1/-0.25	-/104/91/40	90/20	0.10	3.5E4	-	-	-	0	148	100	1.5E-2	2E1
Cask loading area 4611	1/-0.25	-/104/91/40	90/20	0.10	3.5E4	-	-	-	0	148	100	1.5E-2	2E1
Gamma scan electronics rm 4609	1/-0.25	-/100/93/40	90/20	0.001	3.5E2	Atm	119	100/20	0	148	100	1.5E-2	2E1
Spent fuel pool 4612	1/-0.25	-/104/91/40	90/20	0.0025	8.8E2	-	-	-	0	148	100	1.5E-2	2E1
Bottom of spent fuel pool 4612	1/-0.25	-/212/125/60	100	3.07E4	1.0E10	-	-	-	0	148	100	1.5E-2	2E1
Spent fuel pool gate 4612	1/-0.25	-/212/125/60	100	3.07E4	1.7E7	-	-	-	0	148	100	1.5E-2	2E1
Motor control center, 4605	1/-0.25	-/101/91/40	90/20	0.0025	8.8E2	Atm	124	100/20	0	148	100	8.4E2 at 36 h	6E4

RCGS PSAR  
TABLE 3.11-1a

DEVELOPING PLANT ENVIRONMENTAL CONDITIONS - REACTOR BUILDING

Area Description & Room Number	Normal Operating Conditions					Abnormal Conditions			DRE Conditions				
	Press Max/Min, Wg	Temp, °F Test/Max/Ave/Min	% Rel Humidity Max/Min	Max Dose Rate, Rad/h	Integr Dose, Rad (1)	Press psig	Temp °F	% Rel Humidity Max/Min	Press, psig (2)	Temp °F (2)	% Rel Humidity	Max LOCA Dose Rate, Rad/h (5,7)	LOCA Integr Dose, Rad (6,7)
Elect access area 4619	1/-0.25	-/104/91/40	90/20	0.0025	8.8E2	Atm	122	100/20	0	140	100	1.5E-2	2E1
SIC room 4606	1/-0.25	-/101/91/60	90/20	0.0025	8.8E2	Atm	124	100/20	0	140	100	6.9E-2	5E0
RMCU F/D rm 4620, 4621	1/-0.25	-/104/91/40	90/20	7.3E2	2.6E8	Atm	122	100/20	6.7-30 min (3)	225-30 min (4)	100	1.5E-2	2E1
Fuel pool cooling pump room 4625, 4626	1/-0.25	-/100/93/40	90/20	0.15	5.3E4	Atm	119	100/20	0	140	100	1.5E-2	2E1
Dryer separator pool 4623	1/-0.25	-/104/91/40	90/20	0.0025	8.8E2	Atm	122	100/20	0	140	100	1.5E-2	2E1
Bottom of dryer separator pool	1/-0.25	-/115/-/40	100	10	3.2E5	Atm	122	100/20	0	140	100	1.5E-2	2E1
Fuel pool HX room 4627, 4628	1/-0.25	-/100/93/40	90/20	0.5	1.8E5	Atm	119	100/20	3	250-30 min (4)	100	1.5E-2	2E1
Isolation valve room 4624	1/-0.25	-/110/90/40	90/20	0.0025	8.8E2	Atm	122	100/20	0	140	100	4.7E-2 at 10 days	7E1
FRVS recirc unit room 4614, 4616	1/-0.25	-/104/91/40	90/20	0.0025	8.8E2	Atm	108	100/20	0	140	100	2.1E3 at 10 days	2E6
Fuel pool water suction area 4607	1/-0.25	-/104/91/40	90/20	0.140	5.26E4	Atm	122	100/20	0	140	100	1.5E-2	2E1
Vestibule 4618				0.0025	8.8E2							2.1E3 at 10 days	2E6

FIG. 6b



NOTE

1. ENVIRONMENTAL CONDITIONS FOR ROOMS 4616 THRU 4619, AND 4623 SHOWN ABOVE APPEAR ON FSAR TABLE 3.11-1a. (FIG. 7a & 7b)

PUBLIC SERVICE ELECTRIC & GAS COMPANY  
HOPE CREEK GENERATING STATION

DRW	EQUIPMENT QUALIFICATION	
CHK	HARSH ENVIRONMENT	
APPR	REACTOR BUILDING EL. 178'-6"	
DATE		
JOB NO.	DRAWING NUMBER	REV
	FIG. 7	

HCGR PSAR  
TABLE 3.11-1a

ENVELOPING PLANT ENVIRONMENTAL CONDITIONS - REACTOR BUILDING

Area Description & Room Number	Normal Operating Conditions					Abnormal Conditions			DRE Conditions				
	Press Max/Min, Wg	Temp, °F Test/Max/Ave/Min	% Rel Humidity Max/Min	Max Dose Rate, Rad/h	Integr Dose, Rad (1)	Press psig	Temp °F	% Rel Humidity Max/Min	Press, psig (2)	Temp °F (2)	% Rel Humidity	Max LOCA Dose Rate, Rad/h (5,7)	LOCA Integr Dose, Rad (6,7)
Reactor Building, el 162' & 178'													
Gamma scan detector area 4613	1/-0.25	-/100/93/40	90/20	0.001	3.5E2	Atm	119	100/20	0	148	100	1.5E-2	2E1
Cask loading area 4611	1/-0.25	-/104/-/40	90/20	0.10	3.5E4	-	-	-	0	148	100	1.5E-2 at 10 days	2E1
Containment pre- purge cleanup rm 4603	1/-0.25	-/104/91/40	90/20	0.10	3.5E4	-	-	-	0	148	100	4.4E3	7E3
Motor control center 4601	1/-0.25	-/101/89/40	90/20	0.0025	8.8E2	Atm	124	100/20	0	148	100	2.3E1 at 10 days	2E4
Recombiner (Post LOCA) 4602,4604	1/-0.25	-/104/74/40	90/20	0.0025	8.8E2	Atm	109	100/20	0	148	100	8.4E2 at 36 h	6E4
FKVS units 4615, 4617	1/-0.25	-/83/73/40	90/20	0.0025	8.8E2	Atm	108	100/20	0	148	100	3.1E3 at 10 days	2E6
Corridor 4608	1/-0.25	-/100/93/40	90/20	0.0025	8.8E2	Atm	119	100/20	0	148	100	5.5E-1 at 36 h	4E1
New fuel vault 4610	1/-0.25	-/104/91/40	90/20	0.10	3.5E4	-	-	-	0	148	100	1.5E-2	2E1
Cask loading area 4611	1/-0.25	-/104/91/40	90/20	0.10	3.5E4	-	-	-	0	148	100	1.5E-2	2E1
Gamma scan electronics rm 4609	1/-0.25	-/100/93/40	90/20	0.001	3.5E2	Atm	119	100/20	0	148	100	1.5E-2	2E1
Spent fuel pool 4612	1/-0.25	-/104/91/40	90/20	0.0025	8.8E2	-	-	-	0	148	100	1.5E-2	2E1
Bottom of spent fuel pool 4612	1/-0.25	-/212/125/60	100	3.07E4	1.0E10	-	-	-	0	148	100	1.5E-2	2E1
Spent fuel pool gate 4612	1/-0.25	-/212/125/60	100	3.07E4	1.7E7	-	-	-	0	148	100	1.5E-1	2E1
Motor control center, 4605	1/-0.25	-/101/91/40	90/20	0.0025	8.8E2	Atm	124	100/20	0	148	100	8.4E2 at 36 h	6E4

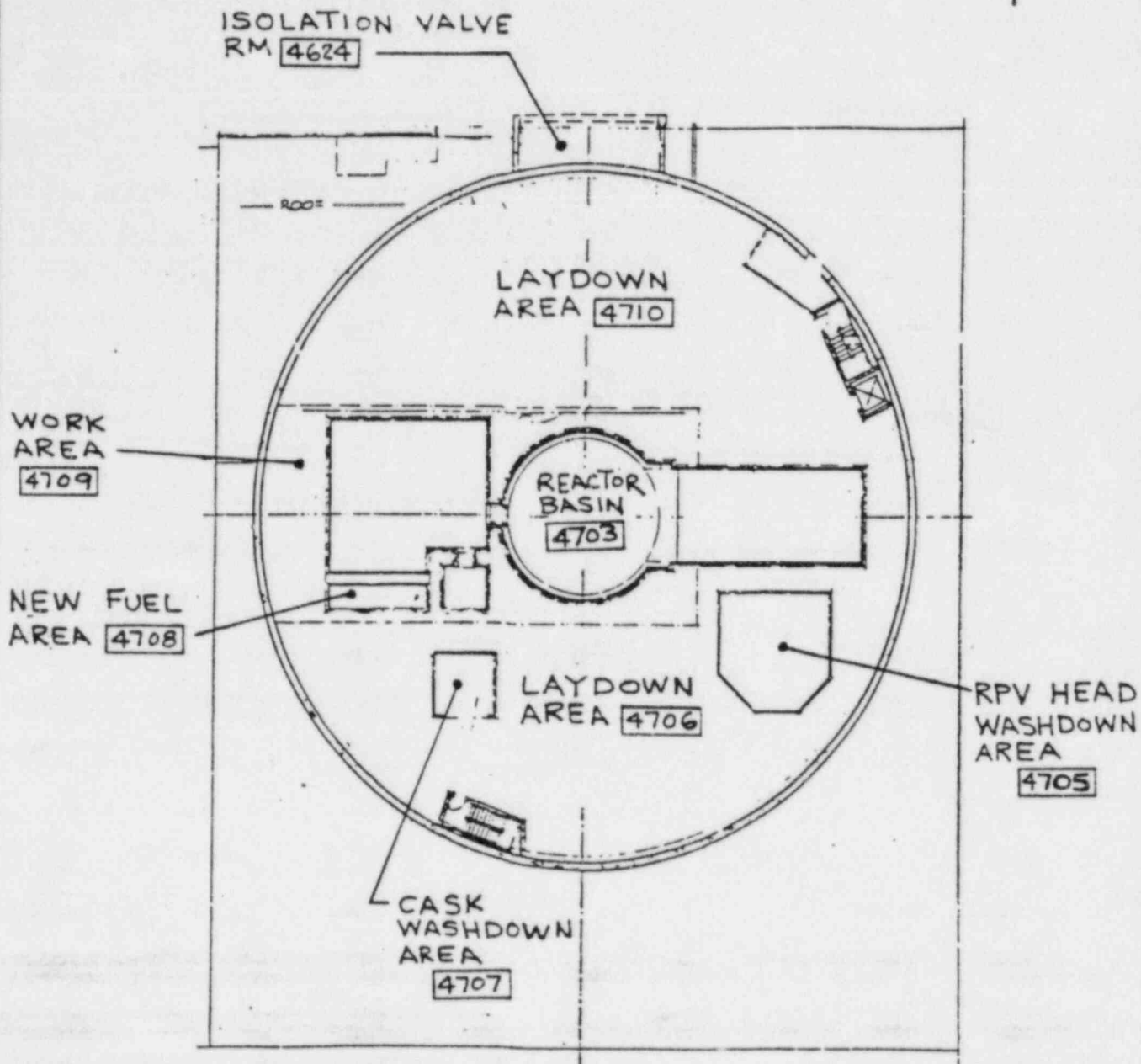
RCOS PSAR  
TABLE 3.11-1a

DEVELOPING PLANT ENVIRONMENTAL CONDITIONS - REACTOR BUILDING

Area Description & Room Number	Normal Operating Conditions					Abnormal Conditions			DRE Conditions				
	Press Max/Min, Wg	Temp, °F Test/Max/Ave/Min	% Rel Humidity Max/Min	Max Dose Rate, Rad/h	Integr Dose, Rad (1)	Press psig	Temp °F	% Rel Humidity Max/Min	Press, psig (2)	Temp °F (2)	% Rel Humidity	Max LOCA Dose Rate, Rad/h (5,7)	LOCA Integr Dose, Rad (6,7)
Elect access area 4619	1/-0.25	-/104/91/40	90/20	0.0025	8.8E2	Atm	122	100/20	0	148	100	1.5E-2	2E1
SIC room 4606	1/-0.25	-/101/91/60	90/20	0.0025	8.8E2	Atm	124	100/20	0	148	100	6.9E-2	5E0
MFCU F/D rm 4620, 4621	1/-0.25	-/104/91/40	90/20	7.3E2	2.6E8	Atm	122	100/20	6.7-30 min (3)	225-30 min (4)	100	1.5E-2	2E1
Fuel pool cooling pump room 4625, 4626	1/-0.25	-/100/93/40	90/20	0.15	5.3E4	Atm	119	100/20	0	148	100	1.5E-2	2E1
Dryer separator pool 4623	1/-0.25	-/104/91/40	90/20	0.0025	8.8E2	Atm	122	100/20	0	148	100	1.5E-2	2E1
Bottom of dryer separator pool	1/-0.25	-/115/-/40	100	10	3.2E5	Atm	122	100/20	0	148	100	1.5E-2	2E1
Fuel pool RX room 4627, 4628	1/-0.25	-/100/93/40	90/20	0.5	1.8E5	Atm	119	100/20	3	250-30 min (4)	100	1.5E-2	2E1
Isolation valve room 4624	1/-0.25	-/110/90/40	90/20	0.0025	8.8E2	Atm	122	100/20	0	148	100	4.7E-2 at 10 days	7E1
FRVB recirc unit room 4614, 4616	1/-0.25	-/104/91/40	90/20	0.0025	8.8E2	Atm	108	100/20	0	148	100	2.1E3 at 10 days	2E6
Fuel pool water suction area 4607	1/-0.25	-/104/91/40	90/20	0.140	5.26E4	Atm	122	100/20	0	148	100	1.5E-2	2E1
Vestibule 4618				0.0025	8.8E2							2.1E3 at 10 days	2E6

FIG. 7b





1. ENVIRONMENTAL CONDITIONS FOR ROOMS 4624, AND 4705 THRU 4710 SHOWN ABOVE APPEAR ON FSAR TABLE 3.11-1a. (FIG. 8a)
2. ROOM 4703 DOES NOT HAVE HARSH ENVIRONMENT ESTABLISHED FOR ENVIRONMENTAL QUALIFICATION IN ACCORDANCE WITH FSAR TABLE 3.11-1a. (FIG. 8a)

PUBLIC SERVICE ELECTRIC & GAS COMPANY  
HOPE CREEK GENERATING STATION

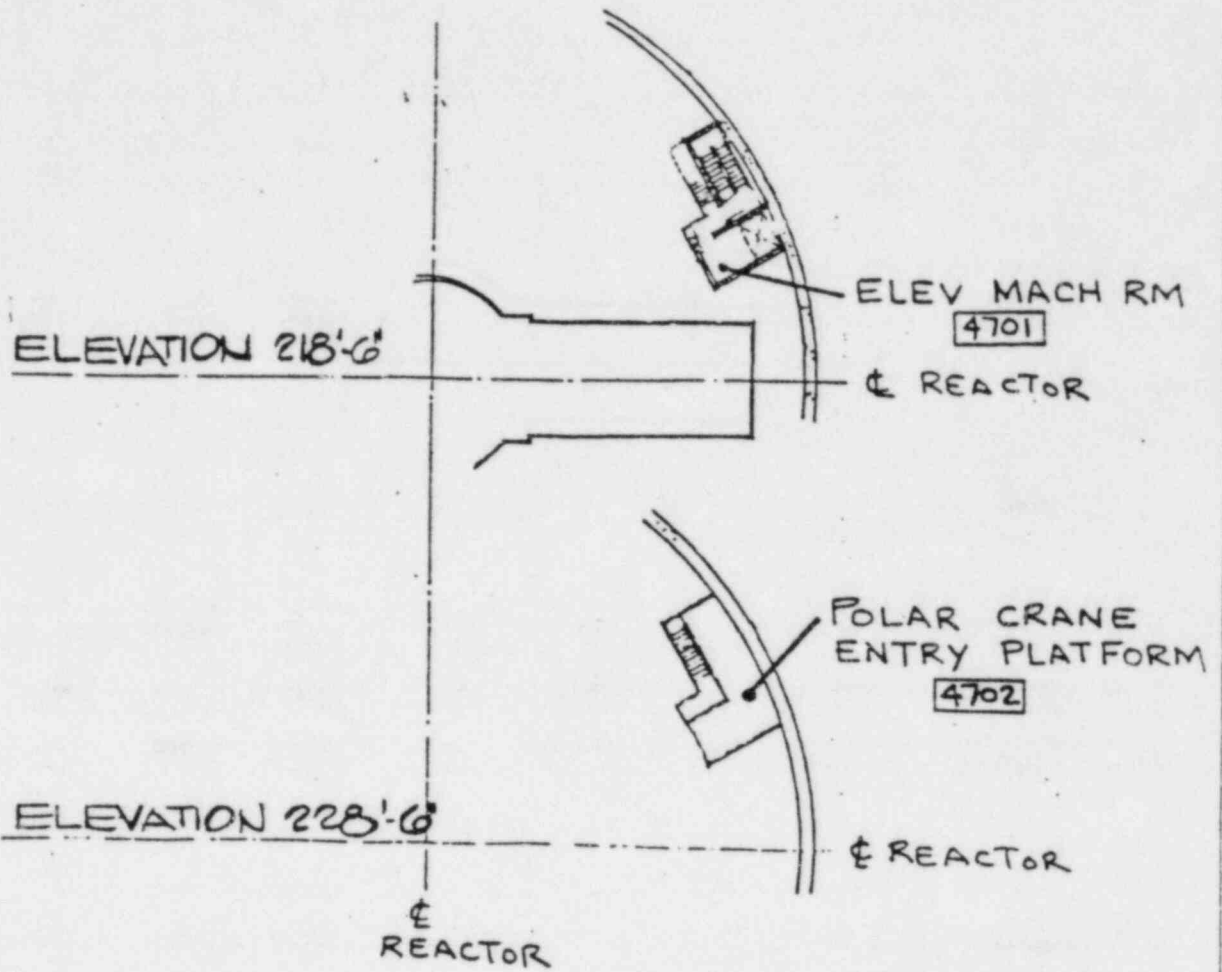
DRW	EQUIPMENT QUALIFICATION HARSH ENVIRONMENT REACTOR BUILDING EL. 201'	
CHK		
APPR		
DATE		
JOB NO.	DRAWING NUMBER	REV
	FIG. 8	

HCCB PSAR  
TABLE 3.11-1a

ENVOLPING PLANT ENVIRONMENTAL CONDITIONS - REACTOR BUILDING

Area Description & Room Number	Normal Operating Conditions					Abnormal Conditions			DBE Conditions				
	Press Max/Min, Wg	Temp, °F Test/Max/Ave/Min	% Rel Humidity Max/Min	Max Dose Rate, Rad/h	Integr Dose, Rad (1)	Press psig	Temp °F	% Rel Humidity Max/Min	Press, psig (2)	Temp °F (2)	% Rel Humidity	Max LOCA Dose Rate, Rad/h (5,7)	LOCA Integr Dose, Rad (6,7)
Reactor Building, el 241'													
Elevator machine 4701	1/-0.25	-/105/92/40	90/20	0.0025	8.8E2	Atm	122	100/20	0	148	100	1.5E-2	2E1
Polar crane entry platform 4702	1/-0.25	-/105/92/40	90/20	0.0025	8.8E2	Atm	122	100/20	0	148	100	1.5E-2	2E1
RPV head washdown area 4705	1/-0.25	-/105/92/40	90/20	0.025	1.6E3	Atm	122	100/20	0	148	100	1.5E-2	2E1
Laydown area 4706	1/-0.25	-/105/92/40	90/20	0.0025	8.8E2	Atm	120	100/20	0	148	100	1.5E-2	2E1
Cask washdown area 4707	1/-0.25	-/105/92/40	90/20	0.0025	8.8E2	Atm	122	100/20	0	148	100	1.5E-2	2E1
New fuel storage 4708	1/-0.25	-/105/92/40	90/20	0.0025	8.8E2	Atm	120	100/20	0	148	100	1.5E-2	2E1
Work area 4709	1/-0.25	-/105/92/40	90/20	0.0025	8.8E2	Atm	122	100/20	0	148	100	1.5E-2	2E1
Laydown area 4710	1/-0.25	-/105/92/40	90/20	0.0025	8.8E2	Atm	120	100/20	0	148	100	4.7E-2 at 10 days	7E1

FIG. 8a



NOTE

- ENVIRONMENTAL CONDITIONS FOR ROOMS 4701 AND 4702 SHOWN ABOVE APPEAR ON PSAR TABLE 3.11-1a. (FIG. 9a)

PUBLIC SERVICE ELECTRIC & GAS COMPANY  
HOPE CREEK GENERATING STATION

DRN	EQUIPMENT QUALIFICATION HARSH ENVIRONMENT REACTOR BUILDING EL. 218'-6" & 228'-6"	
CHK		
APPR		
DATE		
JOB NO.	DRAWING NUMBER	REV
FIG. 9		

MCGR PSAR  
TABLE 3.11-1a

DEVELOPING PLANT ENVIRONMENTAL CONDITIONS - REACTOR BUILDING

Area Description & Room Number	Normal Operating Conditions				Abnormal Conditions			DBE Conditions					
	Press. Max/Min, Wg	Temp. Dry Test/Max/Ave/Min	% Rel Humidity Max/Min	Max Dose Rate, Rad/h	Integr. Dose, Rad (1)	Press. psig	Temp. °C	% Rel Humidity Max/Min	Press. psig (2)	Temp. Dry (2)	% Rel Humidity	Max LOCA Dose Rate, Rad/h (5,7)	LOCA Integ. Dose, Rad (6,7)
Reactor Building, el. 201													
Elevator machine 4701	1/-0.25	-/105/92/40	90/20	0.0025	8.882	Atm	122	100/20	0	148	100	1.5E-2	2E1
Polar crans entry platform 4702	1/-0.25	-/105/92/40	90/20	0.0025	8.882	Atm	122	100/20	0	148	100	1.5E-2	2E1
RPV head washdown area 4705	1/-0.25	-/105/92/40	90/20	0.025	1.623	Atm	122	100/20	0	148	100	1.5E-2	2E1
Laydown area 4706	1/-0.25	-/105/92/40	90/20	0.0025	8.882	Atm	120	100/20	0	148	100	1.5E-2	2E1
Cask washdown area 4707	1/-0.25	-/105/92/40	90/20	0.0025	8.882	Atm	122	100/20	0	148	100	1.5E-2	2E1
New fuel storage 4708	1/-0.25	-/105/92/40	90/20	0.0025	8.882	Atm	120	100/20	0	148	100	1.5E-2	2E1
Work area 4709	1/-0.25	-/105/92/40	90/20	0.0025	8.882	Atm	122	100/20	0	148	100	1.5E-2	2E1
Laydown area 4710	1/-0.25	-/105/92/40	90/20	0.0025	8.882	Atm	120	100/20	0	148	100	6.7E-2 at 10 days	2E1

FIG. 9a

## VII. SYSTEM/COMPONENT IDENTIFICATION

The systems determined to be required to operate during and following a DBA to mitigate the consequences of and follow the course of the DBA, as well as to maintain the plant in a safe shutdown condition, were those safety related systems defined in Section 7, "Instrumentation and Controls", and Section 8, "Electric Power", of the HCGS FSAR.

Specifically, these systems were defined and separated into the following categories and are inclusive of the electrical power systems that supply them:

- **Protection Systems** - the protection systems initiate safety actions to mitigate the consequences of a DBA and include the Reactor Protection System (RPS) and the initiation functions of the Engineered Safety Features (ESF).
- **Engineered Safety Features** - the ESF includes both the operational and control elements which ensure proper cooling of the reactor plant as well as core protection and isolation of the reactor plant during and following a DBA.
- **Safe Shutdown Systems** - the safe shutdown systems are those operational and control systems used to achieve and maintain the plant in a safe shutdown condition following a DBA and include core cooling, remote shutdown capability and required support systems.
- **Safety Related Display Instrumentation** - this display instrumentation provides the operator with information critical in determining the status and proper functioning of safety related systems to enable the operator to initiate manual action to mitigate operational transients and/or anomalies. This display includes the status of bypassed or inoperable systems important to safety as well as Post Accident Monitoring Instrumentation as delineated in HCGS FSAR Section 1.8.1.97.



As is noted in FSAR Sections 7 and 8, these safety systems are designed to meet the criteria for design, fabrication, construction, testing and performance as delineated in the HCGS applicable CFR's, Reg. Guides, NUREG, IEEE Standards, BIP's, SRP's, etc. Included in these criteria are the EQ requirements for these safety related systems.

The HCGS EQ program is designed to ensure that the systems and related components listed in the applicable aforementioned FSAR sections are qualified to correctly perform their defined safety functions in their anticipated worst case environmental conditions during and following a DBA.

#### A. System List

The HCGS project "Q" list (maintained throughout the project life) was established in accordance with the requirements of Appendix B to 10CFR50 as the controlling document identifying the safety-related structures, systems, and components required to assure:

- Integrity of the reactor coolant boundary.
- Capability to achieve and maintain a safe shut-down.
- Capability to prevent or mitigate the consequences of an accident which could result in potential off-site exposure comparable to the guidelines of 10CFR Part 100.
- Retaining of fuel temperature within design limits by maintaining fuel coolant inventory and temperature within design limits.
- Control the concentration of combustible gases in the containment system within established limits.

All structures, systems and components are evaluated by PSE&G and Bechtel Power Corporation to determine those which are required to achieve the above safety functions in accordance with the criteria listed in 10CFR50, Appendix A. The Q-list is updated as required to reflect design changes and is thoroughly reviewed by both engineering organizations to ensure that structures, systems and components have been correctly classified.

The following is a listing of the safety related systems determined to be required to operate during and/or after a DBA as a result of the analyses. This listing includes the system designators (in parenthesis).

1. PROTECTION SYSTEMS

- 1.1 Reactor Protection System (RPS).
- 1.2 Engineered Safety Feature System (ESF)-Initiation.

2. ENGINEERED SAFETY FEATURE SYSTEMS (ESF)

- 2.1 Emergency Core Cooling System (ECCS).
  - 2.1.1 High Pressure Coolant Injection System (HPCI).
  - 2.1.2 Automatic Depressurization System (ADS).
  - 2.1.3 Core Spray System (CS).
  - 2.1.4 Residual Heat Removal System (RHR) Low Pressure Coolant Injection (LPCI) Mode.
- 2.2 Primary Containment and Reactor Vessel Isolation Control System (PCRVICES).
- 2.3 Residual Heat Removal (RHR) -Containment Spray Cooling Mode (CSCM).
- 2.4 Residual Heat Removal (RHR) - Suppression Pool Cooling Mode (SPCM).
- 2.5 Primary Containment Isolation System(PCIS).
- 2.6 Containment Atmosphere Control System(CACS).
  - 2.6.1 Containment Hydrogen Recombination System (CHRS).
  - 2.6.2 Vacuum Relief Valve System(VRVS).
- 2.7 Main Control Room Habitability and Isolation System (MCRHIS).
- 2.8 Main Steam Isolation Valve Sealing System-(MSIVSS).
- 2.9 Filtration, Recirculation, and Ventilation System (FRVS).
- 2.10 Reactor Building Ventilation Isolation System (RBVIS).

2.11 Essential Auxiliary Supporting Systems(EASS).

- 2.11.1 Station Service Water System(SSWS).
- 2.11.2 Safety Auxiliaries Cooling System (SACS).
- 2.11.3 Class 1E Power Systems.
- 2.11.4 Primary Containment Instrument Gas System (PCIGS).
- 2.11.5 Engineered Safety Feature- Equipment Area Cooling System (ESF-EACS).
- 2.11.6 Control Area Chilled Water System (CACWS).

3. SAFE SHUTDOWN SYSTEMS

- 3.1 Reactor Core Isolation Cooling System (RCIC).
- 3.2 Standby Liquid Control System (SLC).
- 3.3 Residual Heat Removal - Reactor Shutdown Cooling Mode (RHR-RSCM).
- 3.4 Remote Shutdown Facility (RSF).
- 3.5 Essential Auxiliary Supporting Systems -Safe Shutdown (EASS-SS).
  - 3.5.1 Station Service Water System (SSWS).
  - 3.5.2 Safety Auxiliary Cooling System (SACS).
  - 3.5.3 Class 1E Power Systems.
  - 3.5.4 Safe Shutdown Equipment Ventilation Systems (SSVS).

4. SAFETY-RELATED DISPLAY INSTRUMENTATION

- 4.1 Bypassed and Inoperable Status Indication System (BISIS).
  
- 4.2 Post Accident Monitoring Instrumentation (PAMI).

5. OTHER INSTRUMENTATION SYSTEMS REQUIRED FOR SAFETY

- 5.1 Process Radiation Monitoring System (PRMS).
- 5.2 High Pressure/Low Pressure System Interlocks (HPLPSI).
- 5.3 Leak Detection System (LDS).
- 5.4 Neutron Monitoring System (NMS).
- 5.5 Recirculation Pump Trip (RPT) Controls and Instruments.
- 5.6 Main Steam Safety/Relief Valves (SRV) -Relief Function.
- 5.7 Redundant Reactivity Control System (RRCS).
- 5.8 Safety System/Non Safety System Isolation (SSNSSI).

8. Functional System Reviews

HCGS has established a comprehensive, systematic program identifying electrical equipment required to be environmentally qualified. Safety-related equipment is identified according to the safety function objectives of 10CFR50.49(b)(1), and is placed on the HCGS project Q-list.

For non-safety-related electrical equipment whose failure could prevent achieving these safety objectives (paragraph (b)(2) of 10CFR50), a review of systems interactions had been performed to ascertain which components fall into this category. This systems interactions review took into account the following studies and analyses:

- 1. Separation Review Program
  - (a) High Energy Break Analysis (safe shutdown mode developed).

- (b) Moderate Energy Line Break and Flooding Study.
  - (c) Fire Hazard Safe Shutdown Study (Appendix R)
  - (d) Electrical Equipment Separation per Reg. Guide 1.75.
2. Common Sensor Failure Study.
  3. Control Systems Failure Study.
  4. Reactor Vessel Water Level Instrumentation Study.
  5. Nuclear Safety Operational Analysis
  6. Control Room Design Review
  7. Effect of High Energy Line Breaks in Control Systems.

Any components identified by these studies whose failure could prevent attainment of the safety function objective are included on the project Q-list.

A separate HCGS program to verify that all safety-related equipment for both the NSS and BOP systems and components have been properly classified was completed. This classification program involved a re-review of the following documents:

- FSAR
- P&IDs, Elementaries
- Systems Descriptions and Operating Manuals
- Logic/Loop Diagrams
- Instrument, Equipment and Valve Indices
- Electrical Drawings

The P&ID is the basic lead design document and is developed by the use of the system descriptions, which are based on multi-discipline design standards, the logic/loop diagrams identifying the process control/indication required and in some systems, a process flow diagram is developed. From the P&ID, PSAR and later, FSAR, commitments are made, the Q-list is updated, all inputs to the indices are made, and all required components are purchased for the design depicted. Later receipt of the supplier drawings and components completes that portion of the design furnished by the supplier. All the information developed is entered into the Master Equipment List (MEL) computerized system for maintenance, surveillance and spare parts accountability.



The postulated event analyses in Chapter 15 of the FSAR were reviewed to identify systems which have a safety-related function or support in any manner a safety-related function. The Q list was updated to reflect any systems and components identified in the Chapter 15 analysis.

The following information describes the interface activities between Bechtel and PSE&G which were performed to assure that all components requiring qualification were identified.

- (1) Bechtel furnished, for PSE&G review and comment, a listing of both safety and non-safety related components used at HCGS. The safety related components were further subdivided into those that require actuation during or following the DBA ("active") as well as those not requiring actuation to mitigate or follow a DBA ("passive").
- (2) This list was used to develop a safety related components list for both active and passive components. Included in this listing by Bechtel was the physical location on a component-by-component basis which was determined from review of HCGS arrangement drawings, instrument location drawings and HVAC location drawings.
- (3) Bechtel reviewed the environmental effects of each postulated DBA and determined which locations at HCGS would be subjected to a harsh environment. Areas found not to be affected were designated as mild environment locations. The identified harsh environmental areas were found to be within either the Reactor Building or the Steam Tunnel.
- (4) Comparison of the areas identified as being subjected to a harsh environment to the list of safety related components developed in Item #2 resulted in the determination of which active safety related components required qualification for harsh environment. Safety related mechanical components which could be shown to have no age related failure mechanisms that could impair the components ability to perform its defined safety function were considered exempt from EQ requirements. Their qualified life was assumed to be equal to the stated service life. Passive safety related components were not included as they were assumed to fail "as is" and were determined not to require actuation to perform either short or long term monitoring or control functions.

(5) During the course of identifying the equipment which requires qualification, safety related equipment was identified which is both subject to a harsh environment and for which exception is taken with respect to qualification to that harsh environment. In these instances the equipment meets one or more of the following conditions:

- Equipment is not required to perform its safety function to mitigate the effects of any DBA in the harsh environment, and equipment failure in the harsh environment will not adversely impact safety functions or mislead the operator.
- Equipment is required to perform its safety function to mitigate the effects of a specific DBA, but is not subjected to a harsh environment as a result of that DBA.
- Equipment performs its function before its exposure to the harsh environment, and the adequacy of the time margin provided is justified; subsequent failure of the equipment as a result of the harsh environment will not degrade other safety functions or mislead the operator.
- The safety function can be accomplished by some other designated equipment that has been adequately qualified and satisfies the single-failure criterion.

Appropriate justification for the determination of one of the above categories is provided on an equipment-specific basis.

(6) All safety related devices which were determined to be required to operate during and/or following a DBA but which were located in a mild environmental area, were also identified.

(7) The above activities resulted in FSAR Tables 3.11-4 (mechanical) and 3.11-5 (electrical) which include all NSSS and non-NSSS components requiring qualification for a harsh environment. Table 3.11-5 is also inclusive of components required for post accident monitoring per Reg. Guide 1.97, Revision 2 (HCGS FSAR Section 1.8.1.97) and post TMI-2 action items.

- (8) Verification that a particular component listed in Tables 3.11-4 & 5 existed and that it was correctly identified as being safety related was performed by re-reviewing relevant documentation such as the instrument index, P&ID's, loop diagrams, electrical drawings, FSAR sections, Systems Descriptions, the electrical device list, and other design documents.

C. System Component Listing

The listing of safety related components requiring harsh EQ are per the attached tables:

Table 3.11-4

Mechanical Components

Table 3.11-5

Electrical Components

TABLE 3.11-4  
MECHANICAL EQUIPMENT SELECTED FOR HARSH  
ENVIRONMENT QUALIFICATION

<u>PURCHASE ORDER</u>	<u>COMPONENT</u>	<u>I.D. NUMBER</u>
M-001	Safety Relief Valves	B21-F013
M-001	Main Steam Isolation Valves	B21-F022/F028
M-001	Recirculation Pumps	B31-C001
M-001	Recirc. System Valves (Suction and Discharge)	B31-F023/F031
M-001	Hydraulic Control Units	C11-D001
M-001	CRD Vent Valves	C11-F010/F180
M-001	CRD Drain Valves	C11-F011/F181
M-001	SLC Pumps	C41-C001
M-001	RHR Heat Exchanger Relief Valves	E11-B001
M-001	RHR Pumps	E11-C002
M-001	RHR Check Valves	E11-F041/F050
M-001	LPCS Check Valves	E21-F006
-001	LPCS Pump	E21-C001
M-001	HPCI Pump	E41-C001
M-001	RCIC Pump	E51-C001
M-001	Neutron Monitoring System Valve Assembly	C51-J004
M-001	RCIC Turbine Assembly	E51-C002
P-301(Q)	Valves	
P-302(Q)	Valves	
P-303A(Q)	Valves	
P-305(Q)	Butterfly Valves	
P-366(Q)	Check Valves	
P-401D	Snubbers	
M-070(Q)	SACS Pumps	
M-082(Q)	Fuel Pool Pumps	
M-141	Relief Valves	
M-150(Q)	Vacuum Relief Valves	
M-713(Q)	Centrifugal Fans	
J-601(Q)	Control Valves	
J-605(Q)	Valves	
J-703(Q)	Excess Flow Check Valves	
J-705(Q)	Instrument Valves	
J-715(Q)	Instrument Valves	

HCGS FSAR  
TABLE 3.11-5

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

P&ID  
M-01-1

SYSTEM: MAIN STEAM  
AB

P.O.	ID NO.	MPL NO.	COMPONENT	LOCATION		PAM EQUIP. NOTE (1)	TMI ACTION PLAN EQUIP. NOTE (2)	COMMENTS
				BLDG.	ELEV.			
M001	1-SB-PS-N005A	C71	Press. Switch	Turbine	137	No	No	
M001	1-SB-PS-N005B	C71	Press. Switch	Turbine	137	No	No	
M001	1-SB-PS-N005C	C71	Press. Switch	Turbine	137	No	No	
M001	1-SB-PS-N005D	C71	Press. Switch	Turbine	137	No	No	



HCCS FSAR  
TABLE 3.11-5

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

P&ID  
M-08-0

SYSTEM: CONDENSATE & REFUELING WATER STORAGE & TRANSFER  
AP

P.O.	ID NO.	MPL NO.	COMPONENT	LOCATION		P&ID EQUIP. NOTE (1)	TMI ACTION		COMMENTS
				BLDG.	ELEV.		PLAN	EQUIP.	
P3010	1-RN-HV-2069		Contr. Valve	Reactor	54	No	No		
P3010	1-AP-HV-2072		Contr. Valve	Reactor	54	No	No		
P3010	1-AP-HV-2073		Contr. Valve	Reactor	54	No	No		
M001	1-BJ-LT-N061A	E41	Level Trans	Reactor	77	No	No		
M001	1-BJ-LT-N061E	E41	Level Trans	Reactor	77	No	No		
M001	1-BD-LIS-N035A	E51	Level Indicating Sw.	Reactor	77	No	No		
M001	1-BD-LIS-N035E	E51	Level Indicating Sw.	Reactor	77	No	No		

HCGS FSAR  
TABLE 3.11-5

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

PAID  
M-10-1

SYSTEM: SERVICE WATER		P.O.	ID NO.	MPL NO.	COMPONENT	LOCATION		PAM EQUIP. NOTE (1)	TMI ACTION PLAN NOTE (2)	COMMENTS
EA	EA					BLDG.	ELEV.			
		P103A0	1-EG-HV-2446		Control Valve	Reactor	102	NO	NO	
		P103A0	1-EG-HV-2447		Control Valve	Reactor	102	NO	NO	
		P103A0	1-EC-HV-4647		Control Valve	Reactor	162	NO	NO	
		P103A0	1-EC-HV-4648		Control Valve	Reactor	162	NO	NO	
		12010	1-EA-HS-2367A		Hand Switch	Reactor	102	NO	NO	
		12010	1-EA-HS-2367B		Hand Switch	Reactor	102	NO	NO	
		12010	1-EA-HS-2367C		Hand Switch	Reactor	102	NO	NO	
		12010	1-EA-HS-2367D		Hand Switch	Reactor	102	NO	NO	
		P1050	1-EA-HV-2203		Control Valve	Reactor	102	NO	NO	
		P1050	1-EA-HV-2204		Control Valve	Reactor	102	NO	NO	
		P1050	1-EA-HV-2207		Control Valve	Reactor	102	NO	NO	
		P1050	1-EA-HV-2234		Control Valve	Reactor	77	NO	NO	
		P1050	1-EA-HV-2236		Control Valve	Reactor	77	NO	NO	
		P1050	1-EA-HV-2238		Control Valve	Reactor	77	NO	NO	
		P1050	1-EA-HV-2346		Control Valve	Reactor	77	NO	NO	
		P1050	1-EA-HV-2355A		Control Valve	Reactor	102	NO	NO	
		P1050	1-EA-HV-2355B		Control Valve	Reactor	102	NO	NO	
		P1050	1-EA-HV-2356A		Control Valve	Reactor	102	NO	NO	
		P1050	1-EA-HV-2356B		Control Valve	Reactor	102	NO	NO	
		P1050	1-EA-HV-2357A		Control Valve	Reactor	77	NO	NO	
		P1050	1-EA-HV-2357B		Control Valve	Reactor	77	NO	NO	
		P1050	1-EA-HV-2371A		Control Valve	Reactor	102	NO	NO	
		P1050	1-EA-HV-2371B		Control Valve	Reactor	102	NO	NO	
		P1050	1-EA-HV-F073		Control Valve	Reactor	77	NO	NO	
		J1010	1-EA-POT-2354A		Press. Diff. Trans.	Reactor	102	NO	NO	
		J1010	1-EA-POT-2354B		Press. Diff. Trans.	Reactor	102	NO	NO	
		J1010	1-EA-POT-2373A		Press Diff. Trans.	Reactor	102	NO	NO	
		J1010	1-EA-POT-2373B		Press Diff. Trans.	Reactor	102	NO	NO	
		J1010	1-EA-PT-2356A1		Press Trans.	Reactor	77	NO	NO	
		J1010	1-EA-PT-2356A2		Press Trans.	Reactor	77	NO	NO	
		J1010	1-EA-PT-2356A3		Press Trans.	Reactor	77	NO	NO	
		J1010	1-EA-PT-2356B1		Press Trans.	Reactor	77	NO	NO	
		J1010	1-EA-PT-2356B2		Press Trans.	Reactor	77	NO	NO	
		J1010	1-EA-PT-2356B3		Press Trans.	Reactor	102	NO	NO	
		J1010	1-EA-SV-2235		Solenoid Valve	Reactor	77	NO	NO	
		J1010	1-EA-SV-2237		Solenoid Valve	Reactor	102	NO	NO	
		J1010	1-EA-SV-2239		Solenoid Valve	Reactor	77	NO	NO	
		J1010	1-EA-SV-2367A		Solenoid Valve	Reactor	102	NO	NO	
		J1010	1-EA-SV-2367B		Solenoid Valve	Reactor	102	NO	NO	
		J1010	1-EA-SV-2367C		Solenoid Valve	Reactor	102	NO	NO	
		J1010	1-EA-SV-2367D		Solenoid Valve	Reactor	102	NO	NO	
		J1010	1-BC-SV-F074		Solenoid Valve	Reactor	77	NO	NO	

R11

HCGS FSAR  
TABLE 3.11-5

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

P&ID  
M-11-1

SYSTEM: SAFETY AUX COOL SYSTEM  
EG

P.O.	ID NO.	MPL NO.	COMPONENT	LOCATION		PAM EQUIP. NOTE (1)	TMI ACTION PLAN EQUIP. NOTE (2)	COMMENTS
				BLDG.	ELEV.			
J201Q	1-AC-201		SACS Control Panel A	Reactor	102	No	No	
E112AQ	1-AP-210		SACS Pump Motor	Reactor	102	No	No	
J201Q	1-BC-201		SACS Control Panel B	Reactor	102	No	No	
E112AQ	1-BP-210		SACS Pump Motor	Reactor	102	No	No	
J201Q	1-CC-201		SACS Control Panel C	Reactor	102	No	No	
E112AQ	1-CP-210		SACS Pump Motor	Reactor	102	No	No	
J201Q	1-DC-201		SACS Control Panel D	Reactor	102	No	No	
E112AQ	1-DP-210		Pump Motor	Reactor	102	No	No	
J301Q	1-EG-FT-2511A		Flow Trans.	Reactor	77	No	No	
J301Q	1-EG-FT-2511B		Flow Trans.	Reactor	77	No	No	
J301Q	1-EG-FT-2544A		Flow Trans.	Reactor	102	No	No	
J301Q	1-EG-FT-2544B		Flow Trans.	Reactor	102	No	No	
J301Q	1-EG-FT-2544C		Flow Trans.	Reactor	102	No	No	
J301Q	1-EG-FT-2544D		Flow Trans.	Reactor	102	No	No	
J301Q	1-EG-FT-2549A1		Flow Trans.	Reactor	102	Yes	No	
J301Q	1-EG-FT-2549B1		Flow Trans.	Reactor	102	Yes	No	
J301Q	1-EG-FT-2549B3		Flow Trans.	Reactor	102	No	No	
J201Q	1-EG-HS-2457A		Hand Switch	Reactor	102	No	No	
J201Q	1-EG-HS-2457B		Hand Switch	Reactor	102	No	No	
J201Q	1-EG-HS-2485A2		Hand Switch	Reactor	102	No	No	
J201Q	1-EG-HS-2485B2		Hand Switch	Reactor	102	No	No	
J201Q	1-EG-HS-2485C2		Hand Switch	Reactor	102	No	No	
J201Q	1-EG-HS-2485D2		Hand Switch	Reactor	102	No	No	
J201Q	1-EG-HS-2517A		Hand Switch	Reactor	102	No	No	
J201Q	1-EG-HS-2517B		Hand Switch	Reactor	102	No	No	
P305Q	1-EG-HV-2314A		Contr. Valve	Reactor	162	No	No	
P305Q	1-EG-HV-2314B		Contr. Valve	Reactor	162	No	No	
P305Q	1-EG-HV-2317A		Contr. Valve	Reactor	162	No	No	
P305Q	1-EG-HV-2317B		Contr. Valve	Reactor	162	No	No	
P303AQ	1-EG-HV-2320A		Contr. Valve	Reactor	132	No	No	
P303AQ	1-EG-HV-2320B		Contr. Valve	Reactor	132	No	No	
P303AQ	1-EG-HV-2321A		Contr. Valve	Reactor	132	No	No	
P303AQ	1-EG-HV-2321B		Contr. Valve	Reactor	132	No	No	
P303AQ	1-EG-HV-2452A		Contr. Valve	Reactor	132	No	No	
P303AQ	1-EG-HV-2452B		Contr. Valve	Reactor	132	No	No	
P303AQ	1-EG-HV-2453A		Contr. Valve	Reactor	132	No	No	
P303AQ	1-EG-HV-2453B		Contr. Valve	Reactor	132	No	No	
P305Q	1-EG-HV-2491A		Contr. Valve	Reactor	102	No	No	
P305Q	1-EG-HV-2491B		Contr. Valve	Reactor	102	No	No	
P305Q	1-EG-HV-2494A		Contr. Valve	Reactor	102	No	No	
P305Q	1-EG-HV-2494B		Contr. Valve	Reactor	102	No	No	

HCCS FSAR  
 TABLE 3.11-5  
 EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

SYSTEM: SAFETY AUX COOL SYSTEM  
 EG

P.O.	ID NO.	MPL NO.	COMPONENT	BLDG.	ELEV.	P&ID EQUIP. NOTE (1)	TMI ACTION PLAN EQUIP. NOTE (2)	COMMENTS
P3050	1-EG-HV-2496A		Contr. Valve	Reactor	102	NO	NO	
P3050	1-EG-HV-2496B		Contr. Valve	Reactor	102	NO	NO	
P3050	1-EG-HV-2496C		Contr. Valve	Reactor	102	NO	NO	
P3050	1-EG-HV-2496D		Contr. Valve	Reactor	77	NO	NO	
P3050	1-EG-HV-2512A		Contr. Valve	Reactor	77	NO	NO	
P3050	1-EG-HV-2512B		Contr. Valve	Reactor	162	NO	NO	
P3050	1-EG-HV-7921A		Contr. Valve	Reactor	162	NO	NO	
P3050	1-EG-HV-7921H		Contr. Valve	Reactor	162	NO	NO	
P3050	1-EG-HV-7922A		Contr. Valve	Reactor	162	NO	NO	
P3050	1-EG-HV-7922H		Contr. Valve	Reactor	102	NO	NO	
P3050	1-EG-HV-2522A		Converter	Reactor	102	NO	NO	
P3050	1-EG-HV-2522B		Converter	Reactor	102	NO	NO	
P3050	1-EG-HV-2522C		Converter	Reactor	102	NO	NO	
P3050	1-EG-HV-2522D		Converter	Reactor	201	NO	NO	
J3010	1-EG-LT-2508A		Level Trans.	Reactor	201	NO	NO	
J3010	1-EG-LT-2508H		Level Trans.	Reactor	201	NO	NO	
J3010	1-EG-LT-2508C		Level Trans.	Reactor	201	NO	NO	
J3010	1-EG-LT-2508D		Level Trans.	Reactor	162	NO	NO	
J3010	1-EG-PDT-2529A		Press. Diff. Trans.	Reactor	162	NO	NO	
J3010	1-EG-PDT-2529H		Press. Diff. Trans.	Reactor	162	NO	NO	
P3010	1-EG-SV-2290A		Solenoid Valve	Reactor	54	NO	NO	
P3010	1-EG-SV-2290H		Solenoid Valve	Reactor	54	NO	NO	
P3010	1-EG-SV-2290C		Solenoid Valve	Reactor	54	NO	NO	
P3010	1-EG-SV-2290D		Solenoid Valve	Reactor	54	NO	NO	
P3010	1-EG-SV-2290E		Solenoid Valve	Reactor	77	NO	NO	
P3010	1-EG-SV-2290F		Solenoid Valve	Reactor	77	NO	NO	
P3010	1-EG-SV-2290G		Solenoid Valve	Reactor	54	NO	NO	
P3010	1-EG-SV-2290H		Solenoid Valve	Reactor	54	NO	NO	
P3010	1-EG-SV-2292A		Solenoid Valve	Reactor	54	NO	NO	
P3010	1-EG-SV-2292B		Solenoid Valve	Reactor	54	NO	NO	
P3010	1-EG-SV-2293A		Solenoid Valve	Reactor	54	NO	NO	
P3010	1-EG-SV-2293B		Solenoid Valve	Reactor	54	NO	NO	
P3010	1-EG-SV-2302A		Solenoid Valve	Reactor	132	NO	NO	
P3010	1-EG-SV-2302B		Solenoid Valve	Reactor	178	NO	NO	
P3010	1-EG-SV-2302C		Solenoid Valve	Reactor	132	NO	NO	
P3010	1-EG-SV-2302D		Solenoid Valve	Reactor	162	NO	NO	
P3010	1-EG-SV-2302E		Solenoid Valve	Reactor	162	NO	NO	
P3010	1-EG-SV-2302F		Solenoid Valve	Reactor	178	NO	NO	
P3010	1-EG-SV-2325A		Solenoid Valve	Reactor	54	NO	NO	
P3010	1-EG-SV-2325B		Solenoid Valve	Reactor	54	NO	NO	
P3010	1-EG-SV-2325C		Solenoid Valve	Reactor	54	NO	NO	

HGS PSAR  
TABLE 3.11-5

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

P&ID  
M-11-1

SYSTEM: SAFETY AUX COOL. SYSTEM  
EG

P.O.	ID NO.	MPL NO.	COMPONENT	LOCATION BLDG.	ELEV.	P&ID EQUIP. NOTE (1)	TMI ACTION PLAN EQUIP. NOTE (2)	COMMENTS
P101Q	1-EG-SV-2325D		Solenoid Valve	Reactor	54	No	No	
P101Q	1-EG-SV-2325E		Solenoid Valve	Reactor	54	No	No	
P101Q	1-EG-SV-2325F		Solenoid Valve	Reactor	54	No	No	
P101Q	1-EG-SV-2325G		Solenoid Valve	Reactor	54	No	No	
P101Q	1-EG-SV-2325H		Solenoid Valve	Reactor	54	No	No	
P105Q	1-EG-SV-2457A		Solenoid Valve	Reactor	102	No	No	
P105Q	1-EG-SV-2457B		Solenoid Valve	Reactor	102	No	No	
J605Q	1-EG-SV-2517A		Solenoid Valve	Reactor	102	No	No	
J605Q	1-EG-SV-2517B		Solenoid Valve	Reactor	102	No	No	
P103AQ	1-EG-SV-2520A		Solenoid Valve	Reactor	54	No	No	
P103AQ	1-EG-SV-2520B		Solenoid Valve	Reactor	54	No	No	
P103AQ	1-EG-SV-2520C		Solenoid Valve	Reactor	54	No	No	
P103AQ	1-EG-SV-2520D		Solenoid Valve	Reactor	54	No	No	
J556Q	1-EG-TE-2457A		Temp. Element	Reactor	102	No	No	
J556Q	1-EG-TE-2457B		Temp. Element	Reactor	102	No	No	
J556Q	1-EG-TE-2515A		Temp. Element	Reactor	102	Yes	No	
J556Q	1-EG-TE-2515B		Temp. Element	Reactor	102	Yes	No	
M001	1-EG-TE-N005A	E11	Temp. Element	Reactor	54	No	No	
M001	1-EG-TE-N005B	E11	Temp. Element	Reactor	54	No	No	



HCCS FSAR  
TABLE 3.11-5

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

P&ID  
M-11-1

Page 7 of 7

SYSTEM: REACTOR AUXILIARIES COOLING  
ED

P.O.	ID NO.	MPL NO.	COMPONENT	LOCATION		PAH EQUIP. NOTE (1)	TMI ACTION PLAN EQUIP. NOTE (2)	COMMENTS
				BLDG.	ELEV.			
P301Q	1-ED-HV-2553		Contr. Valve	Reactor	102	No	No	
P301Q	1-ED-HV-2554		Contr. Valve	Reactor	100	No	No	
P301Q	1-ED-HV-2555		Contr. Valve	Reactor	102	No	No	
P301Q	1-ED-HV-2556		Contr. Valve	Reactor	100	No	No	
P305Q	1-ED-HV-2598		Contr. Valve	Reactor	54	No	No	
P305Q	1-ED-HV-2599		Contr. Valve	Reactor	54	No	No	
P301Q	1-ED-2S-2553		Limit Switch	Reactor	102	Yes	No	
P301Q	1-ED-2S-2554		Limit Switch	Reactor	100	Yes	No	
P301Q	1-ED-2S-2555		Limit Switch	Reactor	102	Yes	No	
P301Q	1-ED-2S-2556		Limit Switch	Reactor	100	Yes	No	

HCGS FSAR  
TABLE 3 11-5

PLIP  
M-15-0

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

SYSTEM: COMPRESSED AIR (INSTR.)

P.O.	ID NO.	REF. NO.	COMPONENT	LOCATION BLDG.	ELEV.	PAM EQUIP. NOTE (1)	TMI ACTION PLAN EQUIP. NOTE (2)	COMMENTS
				Reactor	77	No	No	
P3010	1-KA-HV-7626		Contr. Valve	Reactor	77	No	No	
P3010	1-KB-HV-7629		Contr. Valve					

HCCS FSAR  
TABLE 3.11-5

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

P&ID  
M-18-0

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SYSTEM: DEMINERALIZED WATER  
AN

P.O.	ID. NO.	MPL. NO.	COMPONENT	LOCATION BLDG. ELEV.	PAR EQUIP. NOTE (1)	TMI ACTION PLAN EQUIP. NOTE (2)	COMMENTS
PJ010	I-AN-HV-2600		Contr. Valve	Reactor 54	No	No	

HCGS PSAR  
TABLE 3.11-5

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

P&ID  
M-25-1

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SYSTEM: PLANT LEAK DETECTION  
SK

P.O.	ID NO.	MPL NO.	COMPONENT	LOCATION		P&M EQUIP. NOTE (1)	TMI ACTION PLAN EQUIP. NOTE (2)	COMMENTS
				BLDG.	ELEV.			
M001	1-SK-TE-N012A	B21	Temp. Elemt.	Reactor	102	No	No	
J483Q	1-BC-LSH-4403R1		Level Sw. High	Reactor	54	No	No	
J483Q	1-BC-LSH-4403R2		Level Sw. High	Reactor	54	No	No	
J483Q	1-BC-LSH-4403C1		Level Sw. High	Reactor	54	No	No	
J483Q	1-BC-LSH-4403C2		Level Sw. High	Reactor	54	No	No	
J483Q	1-BC-LSH-4403D1		Level Sw. High	Reactor	54	No	No	
J483Q	1-BC-LSH-4403D2		Level Sw. High	Reactor	54	No	No	
M001	1-SK-TE-N030A	E11	Temp. Elemt.	Reactor	54	No	No	
J483Q	1-BD-LSH-4151-1		Level Sw. High	Reactor	54	No	No	
J483Q	1-BD-LSH-4151-2		Level Sw. High	Reactor	54	No	No	
J483Q	1-BE-LSH-4581A1		Level Sw. High	Reactor	54	No	No	
J483Q	1-BE-LSH-4581A2		Level Sw. High	Reactor	54	No	No	
J483Q	1-BE-LSH-4581B1		Level Sw. High	Reactor	54	No	No	
J483Q	1-BE-LSH-4581B2		Level Sw. High	Reactor	54	No	No	
J483Q	1-BE-LSH-4581C1		Level Sw. High	Reactor	54	No	No	
J483Q	1-BE-LSH-4581C2		Level Sw. High	Reactor	54	No	No	
J483Q	1-BE-LSH-4581D1		Level Sw. High	Reactor	54	No	No	
J483Q	1-BE-LSH-4581D2		Level Sw. High	Reactor	54	No	No	
M001	1-BG-TE-N016E	G33	Temp. Elemt.	Reactor	132	No	No	
M001	1-BC-TE-N016H	G33	Temp. Elemt.	Reactor	132	No	No	
M001	1-BG-TE-N016J	G33	Temp. Elemt.	Reactor	145	No	No	
M001	1-BG-TE-N016N	G33	Temp. Elemt.	Reactor	145	No	No	
M001	1-BG-TE-N016T	G33	Temp. Elemt.	Reactor	145	No	No	
J483Q	1-BJ-LSH-4807		Level Sw. High	Reactor	54	No	No	
J483Q	1-BJ-LSH-4808		Level Sw. High	Reactor	54	No	No	
J483Q	1-ED-LSH-2365A		Level Sw. High	Reactor	77	No	No	
J483Q	1-ED-LSH-2365B		Level Sw. High	Reactor	77	No	No	
J483Q	1-SK-LSH-2365C		Level Sw. High	Reactor	77	No	No	
J483Q	1-EG-LSH-2359A		Level Sw. High	Reactor	102	No	No	
J483Q	1-EG-LSH-2359B		Level Sw. High	Reactor	102	No	No	
J483Q	1-EG-LSH-2364A		Level Sw. High	Reactor	102	No	No	
J483Q	1-EG-LSH-2364B		Level Sw. High	Reactor	102	No	No	
M001	1-SK-TE-N025K	E51	Temp. Elemt.	Reactor	54	No	No	
M001	1-SK-TE-N025P	E51	Temp. Elemt.	Reactor	54	No	No	
M001	1-SK-TE-N025S	E51	Temp. Elemt.	Reactor	54	No	No	
M001	1-SK-TE-N025M	E51	Temp. Elemt.	Reactor	54	No	No	
M001	1-SK-TE-N025R	E41	Temp. Elemt.	Reactor	54	No	No	
M001	1-SK-TE-N028A	E41	Temp. Elemt.	Reactor	54	No	No	
M001	1-SK-TE-N028C	E41	Temp. Elemt.	Reactor	54	No	No	
M001	1-SK-TE-N029A	E41	Temp. Elemt.	Reactor	54	No	No	
M001	1-SK-TE-N029A	E11	Temp. Elemt.	Reactor	54	No	No	
M001	1-SK-TE-N029B	E11	Temp. Elemt.	Reactor	54	No	No	

HCGS FSAR  
TABLE 3.11-5

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

P&ID  
M-25-1

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SYSTEM: PLANT LEAK DETECTION  
SK

P.O.	ID NO.	MPL NO.	COMPONENT	LOCATION		P&I EQUIP. NOTE (1)	T&I ACTION PLAN EQUIP. NOTE (2)	COMMENTS
				BLDG.	ELEV.			
M001	1-SK-TE-N029C	E41	Temp. Elemt.	Reactor	54	No	No	
M001	1-SK-TE-N030A	E41	Temp. Elemt.	Reactor	54	No	No	
M001	1-FD-TE-N030C	E41	Temp. Elemt.	Reactor	77	No	No	
P303AQ	1-SK-HV-4953		Control Valve	Reactor	145	No	No	
P303AQ	1-SK-HV-4957		Control Valve	Reactor	145	No	No	
P303AQ	1-SK-HV-4981		Control Valve	Reactor	145	No	No	
P303AQ	1-SK-HV-5018		Control Valve	Reactor	145	No	No	
J483Q	1-BD-LE-4151-1		Level Element	Reactor	54	No	No	
J483Q	1-BD-LE-4151-2		Level Element	Reactor	54	No	No	
J483Q	1-BC-LE-4403A1		Level Element	Reactor	54	No	No	
J483Q	1-BC-LE-4403A2		Level Element	Reactor	54	No	No	
J483Q	1-BC-LE-4403B1		Level Element	Reactor	54	No	No	
J483Q	1-BC-LE-4403B2		Level Element	Reactor	54	No	No	
J483Q	1-BC-LE-4403C1		Level Element	Reactor	54	No	No	
J483Q	1-BC-LE-4403C2		Level Element	Reactor	54	No	No	
J483Q	1-BC-LE-4403D1		Level Element	Reactor	54	No	No	
J483Q	1-BC-LE-4403D2		Level Element	Reactor	54	No	No	
J483Q	1-BJ-LE-4807		Level Element	Reactor	54	No	No	
J483Q	1-BJ-LE-4808		Level Element	Reactor	54	No	No	
J483Q	1-BC-LSH-4403A1		Level Sw. High	Reactor	54	No	No	
J483Q	1-BC-LSH-4403A2		Level Sw. High	Reactor	54	No	No	
M001	1-SK-TE-N009A	E11	Temp. Elemt.	Reactor	77	No	No	
M001	1-SK-TE-N009B	E11	Temp. Elemt.	Reactor	77	No	No	
M001	1-SK-TE-N010A	B21	Temp. Elemt.	Reactor	102	No	No	
M001	1-SK-TE-N010B	B21	Temp. Elemt.	Reactor	102	No	No	
M001	1-SK-TE-N010C	B21	Temp. Elemt.	Reactor	102	No	No	
M001	1-SK-TE-N010D	B21	Temp. Elemt.	Reactor	102	No	No	
M001	1-SK-TE-N011	E51	Temp. Elemt.	Reactor	54	No	No	
M001	1-SK-TE-N011A	B21	Temp. Elemt.	Reactor	132	No	No	
M001	1-SK-TE-N011B	B21	Temp. Elemt.	Reactor	132	No	No	
M001	1-SK-TE-N011D	B21	Temp. Elemt.	Reactor	132	No	No	
M001	1-SK-TE-N012B	B21	Temp. Elemt.	Reactor	102	No	No	
M001	1-SK-TE-N012C	B21	Temp. Elemt.	Reactor	102	No	No	
M001	1-SK-TE-N012D	B21	Temp. Elemt.	Reactor	102	No	No	
M001	1-SK-TE-N013A	B21	Temp. Elemt.	Reactor	132	No	No	
M001	1-SK-TE-N013B	B21	Temp. Elemt.	Reactor	132	No	No	
M001	1-SK-TE-N013C	B21	Temp. Elemt.	Reactor	132	No	No	
M001	1-SK-TE-N013D	B21	Temp. Elemt.	Reactor	132	No	No	
M001	1-SK-TE-N014	B21	Temp. Elemt.	Reactor	132	No	No	
M001	1-SK-TE-N016	B21	Temp. Elemt.	Reactor	102	No	No	
M001	1-SK-TE-N016A	G33	Temp. Elemt.	Reactor	132	No	No	
M001	1-SK-TE-N016AA	G33	Temp. Elemt.	Reactor	145	No	No	



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TABLE 3.11-5

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

P&ID  
M-25-1

SYSTEM: PLANT LEAK DETECTION  
SK

P.O.	ID NO.	MPL NO.	COMPONENT	LOCATION		PAM EQUIP. NOTE (1)	TMI ACTION PLAN EQUIP. NOTE (2)	COMMENTS
				BLDG.	ELEV.			
M001	1-SK-TE-N016D	G33	Temp. Elemt.	Reactor	132	No	No	
M001	1-SK-TE-N016DD	G33	Temp. Elemt.	Reactor	145	No	No	
M001	1-SK-TE-N016M	G33	Temp. Elemt.	Reactor	145	No	No	
M001	1-SK-TE-N016S	G33	Temp. Elemt.	Reactor	145	No	No	
M001	1-SK-TE-N016W	G33	Temp. Elemt.	Reactor	145	No	No	
M001	1-SK-TE-N017	B21	Temp. Elemt.	Reactor	132	No	No	
M001	1-SK-TE-N021B	E51	Temp. Elemt.	Reactor	54	No	No	
M001	1-SK-TE-N021D	F51	Temp. Elemt.	Reactor	54	No	No	
M001	1-SK-TE-N022A	G33	Temp. Elemt.	Reactor	132	No	No	
M001	1-SK-TE-N022AA	G33	Temp. Elemt.	Reactor	132	No	No	
M001	1-SK-TE-N022B	E51	Temp. Elemt.	Reactor	54	No	No	
M001	1-SK-TE-N022D	E51	Temp. Elemt.	Reactor	54	No	No	
M001	1-SK-TE-N022D	G33	Temp. Elemt.	Reactor	132	No	No	
M001	1-SK-TE-N022DD	G33	Temp. Elemt.	Reactor	145	No	No	
M001	1-SK-TE-N022E	G33	Temp. Elemt.	Reactor	132	No	No	
M001	1-SK-TE-N022H	G33	Temp. Elemt.	Reactor	132	No	No	
M001	1-SK-TE-N022J	G33	Temp. Elemt.	Reactor	145	No	No	
M001	1-SK-TE-N022M	G33	Temp. Elemt.	Reactor	145	No	No	
M001	1-SK-TE-N022N	G33	Temp. Elemt.	Reactor	145	No	No	
M001	1-SK-TE-N022S	G33	Temp. Elemt.	Reactor	145	No	No	
M001	1-SK-TE-N022T	G33	Temp. Elemt.	Reactor	145	No	No	
M001	1-SK-TE-N022W	G33	Temp. Elemt.	Reactor	145	No	No	
M001	1-SK-TE-N023A	G33	Temp. Elemt.	Reactor	132	No	No	
M001	1-SK-TE-N023AA	G33	Temp. Elemt.	Reactor	145	No	No	
M001	1-SK-TE-N023B	E51	Temp. Elemt.	Reactor	54	No	No	
M001	1-SK-TE-N023D	E51	Temp. Elemt.	Reactor	54	No	No	
M001	1-SK-TE-N023D	G33	Temp. Elemt.	Reactor	132	No	No	
M001	1-SK-TE-N023DD	G33	Temp. Elemt.	Reactor	145	No	No	
M001	1-SK-TE-N023E	G33	Temp. Elemt.	Reactor	132	No	No	
M001	1-SK-TE-N023H	G33	Temp. Elemt.	Reactor	132	No	No	
M001	1-SK-TE-N023J	G33	Temp. Elemt.	Reactor	145	No	No	
M001	1-SK-TE-N023M	G33	Temp. Elemt.	Reactor	145	No	No	
M001	1-SK-TE-N023N	G33	Temp. Elemt.	Reactor	145	No	No	
M001	1-SK-TE-N023S	G33	Temp. Elemt.	Reactor	145	No	No	
M001	1-SK-TE-N023T	G33	Temp. Elemt.	Reactor	145	No	No	
M001	1-SK-TE-N023W	G33	Temp. Elemt.	Reactor	145	No	No	
M001	1-SK-TE-N024	E41	Temp. Elemt.	Reactor	54	No	No	
M001	1-SK-TE-N025A	E41	Temp. Elemt.	Reactor	102	No	No	
M001	1-SK-TE-N025B	E51	Temp. Elemt.	Reactor	102	No	No	
M001	1-SK-TE-N025C	E41	Temp. Elemt.	Reactor	102	No	No	
M001	1-SK-TE-N025D	E51	Temp. Elemt.	Reactor	102	No	No	
M001	1-SK-TE-N025E	E41	Temp. Elemt.	Reactor	54	No	No	

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TABLE 3.11-5

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

P&ID  
M-25-1

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SYSTEM: PLANT LEAK DETECTION  
SK

P.O.	ID NO.	MPL NO.	COMPONENT	LOCATION		PAM EQUIP. NOTE (1)	TMI ACTION PLAN EQUIP. NOTE (2)	COMMENTS
				BLDG.	ELEV.			
M001	1-SK-TE-N025F	E51	Temp. Elemt.	Reactor	102	No	No	
M001	1-SK-TE-N025G	E41	Temp. Elemt.	Reactor	54	No	No	
M001	1-SK-TE-N025H	E51	Temp. Elemt.	Reactor	54	No	No	
M001	1-SK-TE-N025J	E41	Temp. Elemt.	Reactor	54	No	No	
M001	1-SK-TE-N025L	E41	Temp. Elemt.	Reactor	54	No	No	
M001	1-SK-TE-N025N	E41	Temp. Elemt.	Reactor	54	No	No	
M001	1-SK-TE-N030B	E11	Temp. Elemt.	Reactor	77	No	No	
M001	1-SK-TE-N011C	R21	Temp. Elemt.	Reactor	132	No	No	
P303AQ	1-SK-ZS-4953		Limit Switch	Reactor	145	Yes	No	
P303AQ	1-SK-ZS-4957		Limit Switch	Reactor	145	Yes	No	
P303AQ	1-SK-ZS-4981		Limit Switch	Reactor	145	Yes	No	
P303AQ	1-SK-ZS-5018		Limit Switch	Reactor	145	Yes	No	

HCS FSAR  
TABLE 3.11-5

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

P&ID  
M-26-1

SYSTEM: RADIOLOGICAL MONITORING SYS  
SP

P.O.	ID NO.	MPL NO.	COMPONENT	BLDG.	ELEV.	P&ID EQUIP. NOTE (1)	TMI ACTION PLAN EQUIP. NOTE (2)	COMMENTS
M001	1-SP-RE-N006A	D11	Radiation Element	Reactor	102	No	No	
M001	1-SP-RE-N006B	D11	Radiation Element	Reactor	102	No	No	
M001	1-SP-RE-N006C	D11	Radiation Element	Reactor	102	No	No	
M001	1-SP-RE-N006D	D11	Radiation Element	Reactor	102	No	No	
J3710	1-SP-RE-8825A		Radiation Element	Reactor	145	Yes	Yes	
J3710	1-SP-RE-8825B		Radiation Element	Reactor	145	Yes	Yes	
J3710	1-SP-RE-8856A		Radiation Element	Reactor	201	No	No	
J3710	1-SP-RE-8856B		Radiation Element	Reactor	201	No	No	
J3710	1-SP-RE-8856C		Radiation Element	Reactor	201	No	No	
J3710	1-SP-RE-8857A		Radiation Element	Reactor	178	No	No	
J3710	1-8P-RE-8857B		Radiation Element	Reactor	178	No	No	
J3710	1-SP-RE-8857C		Radiation Element	Reactor	178	No	No	

HCGS FSAR  
TABLE 3.11-5

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

F41D  
M-38-0

SYSTEM: POST ACCIDENT LIQUID & GAS SAMPLING  
RC

P.O.	ID NO.	MPL NO.	COMPONENT	LOCATION		PAM EQUIP. NOTE (1)	TMI ACTION PLAN EQUIP. NOTE (2)	COMMENTS
				BLDG.	ELEV.			
J603Q	1-RC-SV-0643A		Solenoid Valve	Reactor	77	No	Yes	
J603Q	1-RC-SV-0643B		Solenoid Valve	Reactor	77	No	Yes	
J603Q	1-RC-SV-0645A		Solenoid Valve	Reactor	54	No	Yes	
J603Q	1-RC-SV-0645B		Solenoid Valve	Reactor	54	No	Yes	
J603Q	1-RC-SV-0646A		Solenoid Valve	Reactor	54	No	Yes	
J603Q	1-RC-SV-0646B		Solenoid Valve	Reactor	54	No	Yes	
J603Q	1-RC-SV-0707A		Solenoid Valve	Reactor	77	No	Yes	
J603Q	1-RC-SV-0707B		Solenoid Valve	Reactor	77	No	Yes	
J603Q	1-RC-SV-0728A		Solenoid Valve	Reactor	77	No	Yes	
J603Q	1-RC-SV-0728B		Solenoid Valve	Reactor	77	No	Yes	
J603Q	1-RC-SV-0729A		Solenoid Valve	Reactor	77	No	Yes	
J603Q	1-RC-SV-0729B		Solenoid Valve	Reactor	77	No	Yes	
J603Q	1-RC-SV-0730A		Solenoid Valve	Reactor	162	No	Yes	
J603Q	1-RC-SV-0730B		Solenoid Valve	Reactor	162	No	Yes	
J603Q	1-RC-SV-0731A		Solenoid Valve	Reactor	162	No	Yes	
J603Q	1-RC-SV-0731B		Solenoid Valve	Reactor	162	No	Yes	
J603Q	1-RC-SV-8903A		Solenoid Valve	Reactor	77	No	Yes	
J603Q	1-RC-SV-8903B		Solenoid Valve	Reactor	77	No	Yes	
J603Q	1-RC-ZS-0643A		Limit Switch	Reactor	77	Yes	No	
J603Q	1-RC-ZS-0643B		Limit Switch	Reactor	77	Yes	No	
J603Q	1-RC-ZS-0707A		Limit Switch	Reactor	77	Yes	No	
J603Q	1-RC-ZS-0707B		Limit Switch	Reactor	77	Yes	No	
J603Q	1-RC-ZS-0728A		Limit Switch	Reactor	77	Yes	No	
J603Q	1-RC-ZS-0728B		Limit Switch	Reactor	77	Yes	No	
J603Q	1-RC-ZS-0729A		Limit Switch	Reactor	77	Yes	No	
J603Q	1-RC-ZS-0729B		Limit Switch	Reactor	77	Yes	No	
J603Q	1-RC-ZS-0730A		Limit Switch	Reactor	162	Yes	No	
J603Q	1-RC-ZS-0730B		Limit Switch	Reactor	162	Yes	No	
J603Q	1-RC-ZS-0731A		Limit Switch	Reactor	162	Yes	No	
J603Q	1-RC-ZS-0731B		Limit Switch	Reactor	162	Yes	No	
J603Q	1-RC-ZS-8903A		Limit Switch	Reactor	77	Yes	No	
J603Q	1-RC-ZS-8903B		Limit Switch	Reactor	77	Yes	No	

HCGS FSAR  
TABLE 3.11-5

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

P&ID  
M-41-1

SYSTEM: NUCLEAR BOILER  
AB

P.O.	ID NO.	MPL NO.	COMPONENT	BLDG.	LOCATION ELEV.	P&ID EQUIP. NOTE (1)	TMI ACTION PLAN EQUIP. NOTE (2)	COMMENTS
P3020	1-AE-HV-F032A	B21	Control Valve	Reactor	102	NO	NO	
P3020	1-AE-HV-F011A	B21	Control Valve	Reactor	121	NO	NO	
P3020	1-AE-HV-F011B	B21	Control Valve	Reactor	121	NO	NO	
P3020	1-AE-HV-F032B	H21	Control Valve	Reactor	102	NO	NO	
P3020	1-AE-SV-F074A1	B21	Solenoid Valve	Reactor	102	NO	NO	
P3020	1-AE-SV-F074A2	B21	Solenoid Valve	Reactor	102	NO	NO	
P3020	1-AE-SV-F074B1	B21	Solenoid Valve	Reactor	102	NO	NO	
P3020	1-AE-SV-F074B2	B21	Solenoid Valve	Reactor	102	NO	NO	
P303AQ	1-BB-HV-F001	B21	Control Valve	Reactor	121	NO	NO	
P303AQ	1-BB-HV-F005	B21	Control Valve	Reactor	121	NO	NO	
P303AQ	1-BB-HV-F002	B21	Control Valve	Reactor	121	NO	NO	
M001	1-AE-FDT-N003A	C32	Press Diff. Trans.	Reactor	77	NO	NO	
M001	1-AE-FDT-N003B	C32	Press Diff. Trans.	Reactor	77	NO	NO	
M001	1-AE-FDT-N003C	C32	Press Diff. Trans.	Reactor	77	NO	NO	
M001	1-AE-FDT-N003D	C32	Press Diff. Trans.	Reactor	77	NO	NO	
M001	1-SM-SV-3652A	H21-F013	Solenoid Valve	Reactor	121	NO	NO	
M001	1-SM-SV-3652B	B21-F013	Solenoid Valve	Reactor	121	NO	NO	
M001	1-SM-SV-3653A	H21-F013	Solenoid Valve	Reactor	121	NO	NO	
M001	1-SM-SV-3653B	B21-F013	Solenoid Valve	Reactor	121	NO	NO	
M001	1-SM-SV-3654A	H21-F013	Solenoid Valve	Reactor	121	NO	NO	
M001	1-SM-SV-3654B	B21-F013	Solenoid Valve	Reactor	121	NO	NO	
M001	1-SM-SV-3655A	H21-F013	Solenoid Valve	Reactor	121	NO	NO	
M001	1-SM-SV-3655B	B21-F013	Solenoid Valve	Reactor	121	NO	NO	
M001	1-SM-SV-3656A	H21-F013	Solenoid Valve	Reactor	121	NO	NO	
M001	1-SM-SV-3657A	H21-F013	Solenoid Valve	Reactor	121	NO	NO	
M001	1-SM-SV-3658A	B21-F013	Solenoid Valve	Reactor	121	NO	NO	
M001	1-SM-SV-3659A	H21-F013	Solenoid Valve	Reactor	121	NO	NO	
M001	1-SM-SV-3660A	H21-F013	Solenoid Valve	Reactor	121	NO	NO	
M001	1-SM-SV-3661A	B21-F013	Solenoid Valve	Reactor	121	NO	NO	
M001	1-SM-SV-3662A	H21-F013	Solenoid Valve	Reactor	121	NO	NO	
M001	1-SM-SV-3663A	H21-F013	Solenoid Valve	Reactor	121	NO	NO	
M001	1-SM-SV-3664A	B21-F013	Solenoid Valve	Reactor	121	NO	NO	
M001	1-SM-SV-3665A	H21-F013	Solenoid Valve	Reactor	121	NO	NO	
M001	1-SM-SV-3665B	B21-F013	Solenoid Valve	Reactor	121	NO	NO	
M001	1-SM-SV-3666A	H21-F013	Solenoid Valve	Reactor	121	NO	NO	
M001	1-SM-SV-3667A	B21-F013	Solenoid Valve	Reactor	121	NO	NO	
M001	1-SM-SV-3668A	H21-F013	Solenoid Valve	Reactor	121	NO	NO	
M001	1-SM-SV-3669A	B21-F013	Solenoid Valve	Reactor	121	NO	NO	
M001	1-SM-SV-3670A	H21-F013	Solenoid Valve	Reactor	121	NO	NO	
P3020	1-AB-HV-3631A		Control Valve	Reactor	102	NO	NO	
P3020	1-AB-HV-3631B		Control Valve	Reactor	102	NO	NO	
P3020	1-AB-HV-3631C		Control Valve	Reactor	102	NO	NO	
P3020	1-AB-HV-3631D		Control Valve	Reactor	100	NO	NO	
P3020	1-AB-HV-F016	B21	Control Valve	Reactor	102	NO	NO	
P303AQ	1-AB-HV-F067A	B21	Control Valve	Reactor	102	NO	NO	
P303AQ	1-AB-HV-F067B	B21	Control Valve	Reactor	102	NO	NO	
P303AQ	1-AB-HV-F067C	B21	Control Valve	Reactor	102	NO	NO	



HCCS FSAR  
TABLE 3.11-5

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

P&ID  
M-41-1

SYSTEM: NUCLEAR BOILER  
AB

P.O.	ID NO.	MPL NO.	COMPONENT	LOCATION		PAM EQUIP. NOTE (1)	TMI ACTION PLAN EQUIP. NOTE (2)	COMMENTS
				BLDG.	ELEV.			
P303AQ	1-AB-HV-F067D	B21	Control Valve	Reactor	102	No	No	
P303AQ	1-AB-HV-F070A	B21	Control Valve	Reactor	102	No	No	
P303AQ	1-AB-HV-F070B	B21	Control Valve	Reactor	102	No	No	
P303AQ	1-AB-HV-F070C	B21	Control Valve	Reactor	102	No	No	
P303AQ	1-AB-HV-F070D	B21	Control Valve	Reactor	102	No	No	
P303AQ	1-AB-HV-F071	B21	Control Valve	Reactor	102	No	No	
M001	1-AB-PDT-N086A	B21	Press Diff. Trans.	Reactor	77	No	No	
M001	1-AB-PDT-N086B	B21	Press Diff. Trans.	Reactor	77	No	No	
M001	1-AB-PDT-N086C	B21	Press Diff. Trans.	Reactor	77	No	No	
M001	1-AB-PDT-N086D	B21	Press Diff. Trans.	Reactor	77	No	No	
M001	1-AB-PDT-N087A	B21	Press Diff. Trans.	Reactor	77	No	No	
M001	1-AB-PDT-N087B	B21	Press Diff. Trans.	Reactor	77	No	No	
M001	1-AB-PDT-N087C	B21	Press Diff. Trans.	Reactor	77	No	No	
M001	1-AB-PDT-N087D	B21	Press Diff. Trans.	Reactor	77	No	No	
M001	1-AB-PDT-N088A	B21	Press Diff. Trans.	Reactor	77	No	No	
M001	1-AB-PDT-N088B	B21	Press Diff. Trans.	Reactor	77	No	No	
M001	1-AB-PDT-N088C	B21	Press Diff. Trans.	Reactor	77	No	No	
M001	1-AB-PDT-N088D	B21	Press Diff. Trans.	Reactor	77	No	No	
M001	1-AB-PDT-N089A	B21	Press Diff. Trans.	Reactor	77	No	No	
M001	1-AB-PDT-N089B	B21	Press Diff. Trans.	Reactor	77	No	No	
M001	1-AB-PDT-N089C	B21	Press Diff. Trans.	Reactor	77	No	No	
M001	1-AB-PDT-N089D	B21	Press Diff. Trans.	Reactor	77	No	No	
M001	1-AB-PT-5838A		Press. Trans.	Reactor	102	No	No	
M001	1-AB-PT-5838B		Press. Trans.	Reactor	102	No	No	
M001	1-AB-SV-F022A1	B21	Solenoid Valve	Reactor	100	No	No	
M001	1-AB-SV-F022A2	B21	Solenoid Valve	Reactor	100	No	No	
M001	1-AB-SV-F022B1	B21	Solenoid Valve	Reactor	100	No	No	
M001	1-AB-SV-F022B2	B21	Solenoid Valve	Reactor	100	No	No	
M001	1-AB-SV-F022C1	B21	Solenoid Valve	Reactor	100	No	No	
M001	1-AB-SV-F022C2	B21	Solenoid Valve	Reactor	100	No	No	
M001	1-AB-SV-F022D1	B21	Solenoid Valve	Reactor	100	No	No	
M001	1-AB-SV-F022D2	B21	Solenoid Valve	Reactor	100	No	No	
M001	1-AB-SV-F028A1	B21	Solenoid Valve	Reactor	102	No	No	
M001	1-AB-SV-F028A2	B21	Solenoid Valve	Reactor	102	No	No	
M001	1-AB-SV-F028B1	B21	Solenoid Valve	Reactor	102	No	No	
M001	1-AB-SV-F028B2	B21	Solenoid Valve	Reactor	102	No	No	
M001	1-AB-SV-F028C1	B21	Solenoid Valve	Reactor	102	No	No	
M001	1-AB-SV-F028C2	B21	Solenoid Valve	Reactor	102	No	No	
M001	1-AB-SV-F028D1	B21	Solenoid Valve	Reactor	102	No	No	
M001	1-AB-SV-F028D2	B21	Solenoid Valve	Reactor	102	No	No	
J556Q	1-SB-TE-3647A		Temp. Elemt.	Reactor	54	Yes	No	
J556Q	1-SB-TE-3647B		Temp. Elemt.	Reactor	54	Yes	No	
J556Q	1-SB-TE-3647C		Temp. Elemt.	Reactor	54	Yes	No	

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TABLE 3.11-5

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

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SYSTEM: NUCLEAR BOILER  
AB

P.O.	ID NO.	NPL NO.	COMPONENT	LOCATION		PAM EQUIP. NOTE (1)	TMI ACTION PLAN EQUIP. NOTE (2)	COMMENTS
				BLDG.	ELEV.			
J5560	1-SB-TE-3647D		Temp. Elemt.	Reactor	54	Yes	No	
J5560	1-SB-TE-3647E		Temp. Elemt.	Reactor	54	Yes	No	
J5560	1-SB-TE-3647F		Temp. Elemt.	Reactor	54	Yes	No	
J5560	1-SB-TE-3647G		Temp. Elemt.	Reactor	54	Yes	No	
J5560	1-SB-TE-3647H		Temp. Elemt.	Reactor	54	Yes	No	
J5560	1-SB-TE-3647J		Temp. Elemt.	Reactor	54	Yes	No	
J5560	1-SB-TE-3647K		Temp. Elemt.	Reactor	54	Yes	No	
J5560	1-SB-TE-3647L		Temp. Elemt.	Reactor	54	Yes	No	
J5560	1-SB-TE-3647M		Temp. Elemt.	Reactor	54	Yes	No	
J5560	1-SB-TE-3647N		Temp. Elemt.	Reactor	54	Yes	No	
J5560	1-SB-TE-3647P		Temp. Elemt.	Reactor	54	Yes	No	
J5560	1-SB-TE-3647Q		Temp. Elemt.	Reactor	54	Yes	No	
J5560	1-SB-TE-3647R		Temp. Elemt.	Reactor	54	Yes	No	
J5560	1-SB-TE-3648A		Temp. Elemt.	Reactor	54	Yes	No	
J5560	1-SB-TE-3648B		Temp. Elemt.	Reactor	54	Yes	No	
J5560	1-SB-TE-3648C		Temp. Elemt.	Reactor	54	Yes	No	
J5560	1-SB-TP-3648D		Temp. Elemt.	Reactor	54	Yes	No	
M001	1-AB-TE-N004A	B21	Temp. Elemt.	Reactor	121	No	Yes	
M001	1-AB-TE-N004B	B21	Temp. Elemt.	Reactor	121	No	Yes	
M001	1-AB-TE-N004C	B21	Temp. Elemt.	Reactor	121	No	Yes	
M001	1-AB-TE-N004D	B21	Temp. Elemt.	Reactor	121	No	Yes	
M001	1-AB-TE-N004E	B21	Temp. Elemt.	Reactor	121	No	Yes	
M001	1-AB-TE-N004F	B21	Temp. Elemt.	Reactor	121	No	Yes	
M001	1-AB-TE-N004G	B21	Temp. Elemt.	Reactor	121	No	Yes	
M001	1-AB-TE-N004H	B21	Temp. Elemt.	Reactor	121	No	Yes	
M001	1-AB-TE-N004J	B21	Temp. Elemt.	Reactor	121	No	Yes	
M001	1-AB-TE-N004K	B21	Temp. Elemt.	Reactor	121	No	Yes	
M001	1-AB-TE-N004L	B21	Temp. Elemt.	Reactor	121	No	Yes	
M001	1-AB-TE-N004M	B21	Temp. Elemt.	Reactor	121	No	Yes	
M001	1-AB-TE-N004P	B21	Temp. Elemt.	Reactor	121	No	Yes	
M001	1-AB-TE-N004R	B21	Temp. Elemt.	Reactor	121	No	Yes	
M001	1-AB-TE-N057A	B21	Temp. Elemt.	Reactor	102	No	No	
M001	1-AB-TE-N057B	B21	Temp. Elemt.	Reactor	102	No	No	
M001	1-AB-TE-N057C	B21	Temp. Elemt.	Reactor	102	No	No	
M001	1-AB-TE-N057D	B21	Temp. Elemt.	Reactor	102	No	No	
M001	1-AB-TE-N057E	B21	Temp. Elemt.	Reactor	102	No	No	
M001	1-AB-TE-N059	B21	Temp. Elemt.	Reactor	102	No	No	
J800Q	1-AB-XE-4507A		Acoustic Elemt.	Reactor	121	No	Yes	
J800Q	1-AB-XE-4507B		Acoustic Elemt.	Reactor	121	No	Yes	
J800Q	1-AB-XE-4507C		Acoustic Elemt.	Reactor	121	No	Yes	
J800Q	1-AB-XE-4507D		Acoustic Elemt.	Reactor	121	No	Yes	
J800Q	1-AB-XE-4507E		Acoustic Elemt.	Reactor	102	No	Yes	
J800Q	1-AB-XE-4507F		Acoustic Elemt.	Reactor	121	No	Yes	

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TABLE 3.11-5

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

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SYSTEM: NUCLEAR BOILER  
AB

P.O.	ID NO.	MPL NO.	COMPONENT	LOCATION		PAM EQUIP. NOTE (1)	TMI ACTION PLAN EQUIP. NOTE (2)	COMMENTS
				BLDG.	ELEV.			
1800Q	1-AB-XE-4507G		Acoustic Elemt.	Reactor	121	No	Yes	
1800Q	1-AB-XE-4507H		Acoustic Elemt.	Reactor	121	No	Yes	
1800Q	1-AB-XE-4507J		Acoustic Elemt.	Reactor	121	No	Yes	
1800Q	1-AB-XE-4507K		Acoustic Elemt.	Reactor	121	No	Yes	
1800Q	1-AB-XE-4507L		Acoustic Elemt.	Reactor	121	No	Yes	
1800Q	1-AB-XE-4507M		Acoustic Elemt.	Reactor	121	No	Yes	
1800Q	1-AB-XE-4507P		Acoustic Elemt.	Reactor	121	No	Yes	
1800Q	1-AB-XE-4507R		Acoustic Elemt.	Reactor	121	No	Yes	
1800Q	1-AB-XT-4507A		Acoustic Trans.	Reactor	121	No	Yes	
1800Q	1-AB-XT-4507B		Acoustic Trans.	Reactor	121	No	Yes	
1800Q	1-AB-XT-4507C		Acoustic Trans.	Reactor	121	No	Yes	
1800Q	1-AB-XT-4507D		Acoustic Trans.	Reactor	121	No	Yes	
1800Q	1-AB-XT-4507E		Acoustic Trans.	Reactor	121	No	Yes	
1800Q	1-AB-XT-4507F		Acoustic Trans.	Reactor	121	No	Yes	
1800Q	1-AB-XT-4507G		Acoustic Trans.	Reactor	121	No	Yes	
1800Q	1-AB-XT-4507H		Acoustic Trans.	Reactor	121	No	Yes	
1800Q	1-AB-XT-4507J		Acoustic Trans.	Reactor	121	No	Yes	
1800Q	1-AB-XT-4507K		Acoustic Trans.	Reactor	121	No	Yes	
1800Q	1-AB-XT-4507L		Acoustic Trans.	Reactor	121	No	Yes	
1800Q	1-AB-XT-4507M		Acoustic Trans.	Reactor	121	No	Yes	
1800Q	1-AB-XT-4507P		Acoustic Trans.	Reactor	121	No	Yes	
1800Q	1-AB-XT-4507R		Acoustic Trans.	Reactor	121	No	Yes	
P102Q	1-AB-ZS-F016		Limit Switch	Reactor	100	Yes	No	
P102Q	1-AB-ZS-F019		Limit Switch	Reactor	102	Yes	No	
M001	1-AB-ZS-F022A	B21	Limit Switch	Reactor	100	Yes	No	
M001	1-AB-ZS-F022B	B21	Limit Switch	Reactor	100	Yes	No	
M001	1-AB-ZS-F022C	B21	Limit Switch	Reactor	100	Yes	No	
M001	1-AB-ZS-F022D	B21	Limit Switch	Reactor	100	Yes	No	
M001	1-AB-ZS-F028A	B21	Limit Switch	Reactor	102	Yes	No	
M001	1-AB-ZS-F028B	B21	Limit Switch	Reactor	102	Yes	No	
M001	1-AB-ZS-F028C	B21	Limit Switch	Reactor	102	Yes	No	
M001	1-AB-ZS-F028D	B21	Limit Switch	Reactor	102	Yes	No	
P102Q	1-AB-ZS-F032A		Limit Switch	Reactor	102	Yes	No	
P102Q	1-AB-ZS-F032B		Limit Switch	Reactor	102	Yes	No	
P103AQ	1-AB-ZS-F067A		Limit Switch	Reactor	102	Yes	No	
P103AQ	1-AB-ZS-F067B		Limit Switch	Reactor	102	Yes	No	
P103AQ	1-AB-ZS-F067C		Limit Switch	Reactor	102	Yes	No	
P103AQ	1-AB-ZS-F067D		Limit Switch	Reactor	102	Yes	No	
P102Q	1-AB-ZS-F074A		Limit Switch	Reactor	102	Yes	No	
P102Q	1-AB-ZS-F074B		Limit Switch	Reactor	102	Yes	No	
M001	10-C 015	421-P015	Panel	Reactor	77	No	No	

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TABLE 3.11-5

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

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SYSTEM: NUCLEAR BOILER  
AB

P.O.	ID NO.	MPL NO.	COMPONENT	LOCATION		PAM EQUIP. NOTE (1)	TMI ACTION PLAN EQUIP. NOTE (2)	COMMENTS
				BLDG.	ELEV.			
M001	10-C 025	H21-P025	Panel	Reactor	77	No	No	
M001	10-C 041	H21-P041	Panel	Reactor	77	No	No	
M001	10-C 042	H21-P042	Panel	Reactor	77	No	No	

HCGS FSAR  
TABLE 3.11-5

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

P41D  
M-42-1

SYSTEM: NUCLEAR BOILER VESSEL INSTRUMENTATION

P.O.	ID NO.	WPL NO.	COMPONENT	LOCATION		PAM EQUIP. NOTE (1)	TMI ACTION PLAN EQUIP. NOTE (2)	COMMENTS
				BLDG.	ELEV.			
0001	1-BB-PT-N094A	B21	Pressure Transmitter	Reactor	162	No	No	
0001	1-BB-PT-N094B	B21	Pressure Transmitter	Reactor	162	No	No	
0001	1-BB-PT-N094C	B21	Pressure Transmitter	Reactor	162	No	No	
0001	1-BB-PT-N094D	B21	Pressure Transmitter	Reactor	162	No	No	
0001	1-BB-PT-N094E	B21	Pressure Transmitter	Reactor	162	No	No	
0001	1-BB-PT-N094F	B21	Pressure Transmitter	Reactor	162	No	No	
0001	1-BB-PT-N094G	B21	Pressure Transmitter	Reactor	162	No	No	
0001	1-BB-PT-N094H	B21	Pressure Transmitter	Reactor	162	No	No	
0001	1-BB-LT-N097D	B21	Level Transmitter	Reactor	77	No	No	
0001	1-BE-LT-N097F	B21	Level Transmitter	Reactor	77	No	No	
0001	1-BE-LT-N097H	B21	Level Transmitter	Reactor	77	No	No	
0001	1-BE-LT-N097B	B21	Level Transmitter	Reactor	77	No	No	
11010	1-CS-PT-4960A2		Pressure Transmitter	Reactor	162	Yes	Yes	
11010	1-CS-PT-4960B2		Pressure Transmitter	Reactor	162	Yes	Yes	
0001	1-BB-LT-N080A	B21	Level Transmitter	Reactor	77	No	No	
0001	1-BB-LT-N080B	B21	Level Transmitter	Reactor	77	No	No	
0001	1-BB-LT-N091A	B21	Level Transmitter	Reactor	77	Yes	No	
0001	1-BB-LT-N091B	B21	Level Transmitter	Reactor	77	Yes	No	
0001	1-BB-LT-N091C	B21	Level Transmitter	Reactor	77	No	No	
0001	1-BB-LT-N091D	B21	Level Transmitter	Reactor	77	No	No	
0001	1-BB-LT-N091E	B21	Level Transmitter	Reactor	77	No	No	
0001	1-BB-LT-N091F	B21	Level Transmitter	Reactor	77	No	No	
0001	1-BB-LT-N091G	B21	Level Transmitter	Reactor	77	No	No	
0001	1-BB-LT-N091H	B21	Level Transmitter	Reactor	77	No	No	
0001	1-BB-PDT-N004B	C32	Press Diff. Trans.	Reactor	77	No	No	
0001	1-BB-PT-N008	C32	Pressure Transmitter	Reactor	77	No	No	
0001	1-BB-PT-N078A	B21	Pressure Transmitter	Reactor	77	No	No	
0001	1-BB-PT-N078B	B21	Pressure Transmitter	Reactor	77	No	No	
0001	1-BB-PT-N090A	B21	Pressure Transmitter	Reactor	77	No	No	
0001	1-BB-PT-N090B	B21	Pressure Transmitter	Reactor	77	No	No	
0001	1-BB-PT-N090E	B21	Pressure Transmitter	Reactor	77	No	No	
0001	1-BB-PT-N090F	B21	Pressure Transmitter	Reactor	77	No	No	
0001	1-BE-PT-N090J	B21	Pressure Transmitter	Reactor	77	No	No	
0001	1-BE-PT-N090K	B21	Pressure Transmitter	Reactor	77	No	No	
0001	1-BE-PT-N090N	B21	Pressure Transmitter	Reactor	77	No	No	
0001	1-BE-PT-N090P	B21	Pressure Transmitter	Reactor	77	No	No	



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TABLE 3.11-5

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

P61D  
M-42-1

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SYSTEM: NUCLEAR BOILER VESSEL INSTRUMENTATION

P.O.	ID NO.	MPL NO.	COMPONENT	LOCATION		PAM EQUIP. NOTE (1)	TMI ACTION PLAN EQUIP. NOTE (2)	COMMENTS
				BLDG.	ELEV.			
0001	1-SE-RE-N001A	C51	Radiation Elemt.	Reactor	121	No	No	
0001	1-SE-RE-N001B	C51	Radiation Elemt.	Reactor	121	No	No	
0001	1-SE-RE-N001C	C51	Radiation Elemt.	Reactor	121	No	No	
0001	1-SE-RE-N001D	C51	Radiation Elemt.	Reactor	121	No	No	
0001	1-SE-RE-N002A	C51	Radiation Elemt.	Reactor	121	No	No	
0001	1-SE-RE-N002B	C51	Radiation Elemt.	Reactor	121	No	No	
0001	1-SE-RE-N002C	C51	Radiation Elemt.	Reactor	121	No	No	
0001	1-SE-RE-N002D	C51	Radiation Elemt.	Reactor	121	No	No	
0001	1-SE-RE-N002E	C51	Radiation Elemt.	Reactor	121	No	No	
0001	1-SE-RE-N002F	C51	Radiation Elemt.	Reactor	121	No	No	
0001	1-SE-RE-N002G	C51	Radiation Elemt.	Reactor	121	No	No	
0001	1-SE-RE-N002H	C51	Radiation Elemt.	Reactor	121	No	No	
0001	1-SM-LT-N081A	B21	Level Transmitter	Reactor	77	No	No	
0001	1-SM-LT-N081B	B21	Level Transmitter	Reactor	77	No	No	
0001	1-SM-LT-N081D	B21	Level Transmitter	Reactor	77	No	No	
0001	1-SM-LT-N095B	B21	Level Transmitter	Reactor	77	No	No	
0001	1-SM-LT-N095D	B21	Level Transmitter	Reactor	77	No	No	
1010	1-BB-LT-3622A		Level Transmitter	Reactor	77	Yes	No	
1010	1-BB-LT-3622B		Level Transmitter	Reactor	102	Yes	No	
1010	1-BB-LT-3682A		Level Transmitter	Reactor	77	No	No	
1010	1-BB-LT-3682B		Level Transmitter	Reactor	77	No	No	
1010	1-BB-LT-3683A		Level Transmitter	Reactor	77	No	No	
1010	1-BB-LT-3683B		Level Transmitter	Reactor	77	No	No	
1010	1-BB-LT-7854		Level Transmitter	Reactor	77	No	No	
0001	1-BB-LT-N027	B21	Level Transmitter	Reactor	77	No	No	
0001	1-BB-LT-N080C	B.1	Level Transmitter	Reactor	77	No	No	
0001	1-BB-LT-N080D	B21	Level Transmitter	Reactor	77	No	No	
0001	1-BB-LT-N081C	B21	Level Transmitter	Reactor	77	No	No	
0001	1-BB-LT-N085A	B21	Level Transmitter	Reactor	77	Yes	No	
0001	1-BB-LT-N085B	B21	Level Transmitter	Reactor	77	Yes	No	

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TABLE 3.11-5

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

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SYSTEM: NUCLEAR BOILER VESSEL INSTRU  
BB

I.D.	ID NO.	MPL NO.	COMPONENT	LOCATION		PAM EQUIP. NOTE (1)	TMI ACTION PLAN EQUIP. NOTE (2)	COMMENTS
				BLDG.	ELEV.			
4001	1-SA-LT-402A	B21	Level Transmitter	Reactor	77	No	No	
4001	1-SA-LT-N402B	B21	Level Transmitter	Reactor	77	No	No	
4001	1-SA-LT-N402E	B21	Level Transmitter	Reactor	77	No	No	
4001	1-SA-LT-N402F	B21	Level Transmitter	Reactor	77	No	No	
4001	1-SA-PT-N403A	B21	Press Transmitter	Reactor	77	No	No	
4001	1-SA-PT-N403B	B21	Press Transmitter	Reactor	77	No	No	
4001	1-BB-PDT-N004A	C32	Press Diff. Trans.	Reactor	77	No	No	
4001	1-BB-PDT-N004C	C32	Press Diff. Trans.	Reactor	77	No	No	
4001	1-BB-PDT-N017	C32	Press Diff. Trans.	Reactor	77	No	No	
4001	1-BB-PDT-N032	B21	Press Diff. Trans.	Reactor	77	No	No	
1101Q	1-BB-PT-3684A		Pressure Transmitter	Reactor	77	Yes	No	
1101Q	1-BB-PT-3684B		Pressure Transmitter	Reactor	77	Yes	No	
1101Q	1-CS-PT-4960A3		Pressure Transmitter	Reactor	162	No	No	
1101Q	1-BB-PT-7853A		Pressure Transmitter	Reactor	77	No	No	
1101Q	1-BB-PT-7853D		Pressure Transmitter	Reactor	77	No	No	
4001	1-BB-PT-N005	C32	Pressure Transmitter	Reactor	77	No	No	
4001	1-BB-PT-N050A	C71	Pressure Transmitter	Reactor	162	No	No	
4001	1-BB-PT-N050B	C71	Pressure Transmitter	Reactor	162	No	No	
4001	1-BB-PT-N050C	C71	Pressure Transmitter	Reactor	162	No	No	
4001	1-BB-PT-N050D	C71	Pressure Transmitter	Reactor	162	No	No	
4001	1-BB-PT-N078C	B21	Pressure Transmitter	Reactor	77	No	No	
4001	1-BB-PT-N078D	B21	Pressure Transmitter	Reactor	77	No	No	
4001	1-BB-PT-N403E	B21	Press Transmitter	Reactor	77	No	No	
4001	1-SA-PT-N403F	B21	Press Transmitter	Reactor	77	No	No	
4001	1-SA-RE-120193	B11	Radiation Elemt.	Reactor	120	No	No	
4001	1-BB-RE-130193	B11	Radiation Elemt.	Reactor	120	No	No	
4001	1-BB-RE-140193	B11	Radiation Elemt.	Reactor	120	No	No	
4001	1-BB-RE-150193	B11	Radiation Elemt.	Reactor	120	No	No	
4001	1-BB-RE-160193	B11	Radiation Elemt.	Reactor	120	No	No	
4001	1-BB-RE-210193	B11	Radiation Elemt.	Reactor	120	No	No	
4001	1-BB-RE-220193	B11	Radiation Elemt.	Reactor	120	No	No	
4001	1-BB-RE-230193	B11	Radiation Elemt.	Reactor	120	No	No	
4001	1-BB-RE-240193	B11	Radiation Elemt.	Reactor	120	No	No	
4001	1-BB-RE-250193	B11	Radiation Elemt.	Reactor	120	No	No	
4001	1-BB-RE-260193	B11	Radiation Elemt.	Reactor	120	No	No	
4001	1-BB-RE-270193	B11	Radiation Elemt.	Reactor	120	No	No	
4001	1-BB-RE-310193	B11	Radiation Elemt.	Reactor	120	No	No	
4001	1-BB-RE-320193	B11	Radiation Elemt.	Reactor	120	No	No	

HCCS FSAR  
TABLE 3.11-5

PSID  
M-42-1

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

SYSTEM: NUCLEAR BOILER VESSEL INSTRU  
BB

P.O.	ID NO.	MPL NO.	COMPONENT	BLDG.	ELEV.	PAM EQUIP. NOTE (1)	TMI ACTION PLAN EQUIP. NOTE (2)	COMMENTS
M001	1-BB-RE-330193	B11	Radiation Element.	Reactor	120	No	No	
M001	1-BB-RE-340193	B11	Radiation Element.	Reactor	120	No	No	
M001	1-BB-RE-350193	B11	Radiation Element.	Reactor	120	No	No	
M001	1-BB-RE-360193	B11	Radiation Element.	Reactor	120	No	No	
M001	1-BB-RE-370193	B11	Radiation Element.	Reactor	120	No	No	
M001	1-BB-RE-410193	B11	Radiation Element.	Reactor	120	No	No	
M001	1-BB-RE-420193	B11	Radiation Element.	Reactor	120	No	No	
M001	1-BB-RE-430193	B11	Radiation Element.	Reactor	120	No	No	
M001	1-BB-RE-440193	B11	Radiation Element.	Reactor	120	No	No	
M001	1-BB-RE-450193	B11	Radiation Element.	Reactor	120	No	No	
M001	1-BB-RE-460193	B11	Radiation Element.	Reactor	120	No	No	
M001	1-BB-RE-470193	B11	Radiation Element.	Reactor	120	No	No	
M001	1-BB-RE-510193	B11	Radiation Element.	Reactor	120	No	No	
M001	1-BB-RE-520193	B11	Radiation Element.	Reactor	120	No	No	
M001	1-BB-RE-530193	B11	Radiation Element.	Reactor	120	No	No	
M001	1-BB-RE-540193	B11	Radiation Element.	Reactor	120	No	No	
M001	1-BB-RE-550193	B11	Radiation Element.	Reactor	120	No	No	
M001	1-BB-RE-560193	B11	Radiation Element.	Reactor	120	No	No	
M001	1-BB-RE-570193	B11	Radiation Element.	Reactor	120	No	No	
M001	1-BB-RE-610193	B11	Radiation Element.	Reactor	120	No	No	
M001	1-BB-RE-620193	B11	Radiation Element.	Reactor	120	No	No	
M001	1-BB-RE-630193	B11	Radiation Element.	Reactor	120	No	No	
M001	1-BB-RE-640193	B11	Radiation Element.	Reactor	120	No	No	
M001	1-BB-RE-650193	B11	Radiation Element.	Reactor	120	No	No	
M001	1-BB-RE-660193	B11	Radiation Element.	Reactor	120	No	No	
M001	1-BB-RE-720193	B11	Radiation Element.	Reactor	120	No	No	
M001	1-BB-RE-730193	B11	Radiation Element.	Reactor	120	No	No	
M001	1-BB-RE-740193	B11	Radiation Element.	Reactor	120	No	No	
M001	1-BB-RE-750193	B11	Radiation Element.	Reactor	120	No	No	
M001	10-C 004	H21-P004	Panel	Reactor	77	No	No	
M001	10-C 005	H21-P005	Panel	Reactor	77	No	No	
M001	10-C 008	H21-P008	Panel	Reactor	77	No	No	
M001	10-C 009	H21-P009	Panel	Reactor	77	No	No	
M001	10-C 010	H21-P010	Panel	Reactor	77	No	No	
M001	10-C 026	H21-P026	Panel	Reactor	77	No	No	
M001	10-C 027	H21-P027	Panel	Reactor	77	No	No	
M001	10-C 030	H21-P030	Panel	Reactor	102	No	No	
M001	10-C 031	H21-P031	Panel	Reactor	102	No	No	
M001	10-C 032	H21-P032	Panel	Reactor	102	No	No	
M001	10-C 033	H21-P033	Panel	Reactor	102	No	No	

HCGS FSAR  
TABLE 3.11-5

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

P&ID  
M-43-1

Page 25 of 74

SYSTEM: REACTOR RECIRC SYS  
BB

P.O.	ID NO.	MPI NO.	COMPONENT	LOCATION		P&ID EQUIP. NOTE (1)	TMI ACTION PLAN EQUIP. NOTE (2)	COMMENTS
				BLDG.	ELEV.			
P303AQ	1-BF-HV-3800A		Control Valve	Reactor	77	No	No	
P303AQ	1-BF-HV-3800B		Control Valve	Reactor	77	No	No	
1301Q	1-BB-FT-N014A		Flow Trans.	Reactor	77	No	No	
1301Q	1-BB-FT-N014B		Flow Trans.	Reactor	77	No	No	
1301Q	1-BB-FT-N014C		Flow Trans.	Reactor	77	No	No	
1301Q	1-BB-FT-N014D		Flow Trans.	Reactor	77	No	No	
1301Q	1-BB-FT-N024A		Flow Trans.	Reactor	77	No	No	
1301Q	1-BB-FT-N024B		Flow Trans.	Reactor	77	No	No	
1301Q	1-BB-FT-N024C		Flow Trans.	Reactor	77	No	No	
1301Q	1-BB-FT-N024D		Flow Trans.	Reactor	77	No	No	
1603Q	1-BB-SV-4310		Solenoid Valve	Reactor	121	Yes	No	
1603Q	1-BB-SV-4311		Solenoid Valve	Reactor	145	Yes	No	
1603Q	1-BB-ZS-4310		Limit Switch	Reactor	77	Yes	No	
1603Q	1-BB-ZS-4311		Limit Switch	Reactor	77	Yes	No	
P303AQ	1-BF-ZS-3800A		Limit Switch	Reactor	77	Yes	No	
P303AQ	1-BF-ZS-3800B		Limit Switch	Reactor	77	Yes	No	

HCCS FSAR  
TABLE 3.11-5

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

PL10  
M-44-1

SYSTEM: REACTOR WATER CLEAN-UP  
BG

P.O.	ID NO.	MPL NO.	COMPONENT	LOCATION		PAM EQUIP. NOTE (1)	TMI ACTION		COMMENTS
				BLDG.	ELEV.		PLAN	EQUIP. NOTE (2)	
P1020	1-AE-HV-F039	G33	Contr. Valve	Reactor	102	No		No	
P1020	1-BG-ZS-F004	G33	Limit Switch	Reactor	145	Yes		No	
M001	1-BG-FT-N012A	G33	Flow Trans.	Reactor	77	No		No	
M001	1-BG-FT-N012D	G33	Flow Trans.	Reactor	102	No		No	
M001	1-BG-FT-N036A	G33	Flow Trans.	Reactor	77	No		No	
M001	1-BG-FT-N036D	G33	Flow Trans.	Reactor	77	No		No	
M001	1-BG-FT-N041A	G33	Flow Trans.	Reactor	102	No		No	
M001	1-BG-FT-N041D	G33	Flow Trans.	Reactor	102	No		No	
P1020	1-BG-HV-F001	G33	Contr. Valve	Reactor	145	No		No	
P1020	1-BG-HV-F004	G33	Contr. Valve	Reactor	145	No		No	
P1020	1-BG-HV-F034	G33	Contr. Valve	Reactor	77	No		No	
P1020	1-BG-HV-F035	G33	Contr. Valve	Reactor	77	No		No	
M001	1-BG-T1SH-N008	G33	Temp. Indicating Sw. High	Reactor	77	No		No	
P1020	1-BG-ZS-F001	G33	Limit Switch	Reactor	145	Yes		No	
P1020	1-BG-ZS-F039		Limit Switch	Reactor	102	Yes		No	
M001	10-C 002	H21-P002	Panel	Reactor	102	No		No	



HGS FSAR  
TABLE 3.11-5

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

P&ID  
M-45-1

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SYSTEM: CLEAN-UP FILTER/DEMINERALIZER  
RC

C.O.	ID NO.	MPL NO.	COMPONENT	LOCATION		PAM EQUIP. NOTE (1)	TMI ACTION PLAN EQUIP. NOTE (2)	COMMENTS
				BLDG.	ELEV.			
1103A0	1-RC-HV-3980		Contr. Valve	Reactor	132			No

HCS: FSAR  
TABLE 3.11-5

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

P&ID  
3-46-1

Page 28 of 7

SYSTEM: CONTROL ROD DRIVE HYD-PART A  
BF

ID.	ID NO.	MPL NO.	COMPONENT	LOCATION BLDG.	ELEV.	PAN EQUIP. NOTE (1)	TMI ACTION PLAN EQUIP. NOTE (2)	COMMENTS
03010	1-BF-HV-4005		Contr. Valve	Reactor	54	No	No	

HCGS FSAR  
TABLE 3.11-5

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

P&ID  
M-47-1

SYSTEM: CONTROL ROD DRIVE HYD-PART B  
BF

P.O.	ID NO.	MPL NO.	COMPONENT	LOCATION		PAM EQUIP. NOTE (1)	TMI ACTION PLAN EQUIP. NOTE (2)	COMMENTS
				BLDG.	ELEV.			
M001	1-BF-LT-N012A	C11	Level Trans	Reactor	102	No	No	
M001	1-BF-LT-N012B	C11	Level Trans	Reactor	102	No	No	
M001	1-BF-LT-N012C	C11	Level Trans	Reactor	102	No	No	
M001	1-BF-LT-N012D	C11	Level Trans	Reactor	102	No	No	
M001	1-BF-LS-N013A	C11	Level Switch	Reactor	102	No	No	
M001	1-BF-LS-N013B	C11	Level Switch	Reactor	102	No	No	
M001	1-BF-LS-N013C	C11	Level Switch	Reactor	102	No	No	
M001	1-BF-LS-N013D	C11	Level Switch	Reactor	102	No	No	
M001	1-BF-LS-N013E	C11	Level Switch	Reactor	102	No	No	
M001	1-BF-LS-N013F	C11	Level Switch	Reactor	102	No	No	
M001	1-BF-LS-N013G	C11	Level Switch	Reactor	102	No	No	
M001	1-BF-LS-N013H	C11	Level Switch	Reactor	102	No	No	
M001	1-BF-SV-117	C11	Solenoid Valve	Reactor	102	No	No	
M001	1-BF-SV-F009A	C11	Solenoid Valve	Reactor	102	No	No	
M001	1-BF-SV-F009B	C11	Solenoid Valve	Reactor	102	No	No	
M001	1-BF-SV-F110A	C11	Solenoid Valve	Reactor	102	No	No	
M001	1-BF-SV-F110B	C11	Solenoid Valve	Reactor	102	No	No	
M001	1-BF-SV-F160A	C11	Solenoid Valve	Reactor	102	No	No	
M001	1-BF-SV-F160B	C11	Solenoid Valve	Reactor	102	No	No	
M001	1-BF-SV-F162A	C11	Solenoid Valve	Reactor	102	No	No	
M001	1-BF-SV-F162B	C11	Solenoid Valve	Reactor	102	No	No	
M001	1-BF-SV-F162C	C11	Solenoid Valve	Reactor	102	No	No	
M001	1-BF-SV-F162D	C11	Solenoid Valve	Reactor	102	No	No	
M001	1-BF-SV-F163A	C11	Solenoid Valve	Reactor	102	No	No	
M001	1-BF-SV-F163B	C11	Solenoid Valve	Reactor	102	No	No	
M001	1-BF-SV-F163C	C11	Solenoid Valve	Reactor	102	No	No	
M001	1-BF-SV-F182A	C11	Solenoid Valve	Reactor	102	No	No	
M001	1-BF-SV-F182B	C11	Solenoid Valve	Reactor	102	No	No	
M001	1-BF-TRS-R018	C11	Temp. Recorder	Reactor	102	No	No	
M001	1-BF-ZS-F010	C11-F010	Limit Switch	Reactor	102	No	No	
M001	1-BF-ZS-F011	C11-F011	Limit Switch	Reactor	102	No	No	
M001	10-C 007	H21-P007	Panel	Reactor	102	No	No	

HCGS FSAR  
TABLE 3.11-5

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

P4TD  
M-48-1

SYSTEM: STANDBY LIQUID CONTROL.  
BH

P.O.	ID NO.	MPL NO.	COMPONENT	BLDG.	FLEV.	FAM EQUIP. NOTE (1)	TMI ACTION PLAN EQUIP. NOTE (2)	COMMENTS
M001	1-AP-208	C41 C001	Pump Motor	Reactor	162	NO	NO	
M001	1-BP-208	C41 C001	Pump Motor	Reactor	162	NO	NO	
M001	1-BH-HS-S4A	C41A	Hand Sw.	Reactor	162	NO	NO	
M001	1-BH-HS-S4B	C41A	Hand Sw.	Reactor	162	NO	NO	
P303AQ	1-BH-HV-F006A	C41	Control Valve	Reactor	145	NO	NO	
P303AQ	1-BH-HV-F006B	C41	Control Valve	Reactor	145	NO	NO	
M001	1-BH-PT-N004A	C41	Press Trans.	Reactor	162	NO	NO	
M002	1-BH-XV-F004A	C41	Unclassified Control Valve	Reactor	162	NO	NO	
M001	1-BH-XV-F004B	C41	Unclassified Control Valve	Reactor	162	NO	NO	
P303AQ	1-BH-ZS-F006A	C41	Limit Switch	Reactor	145	Yes	NO	
P303AQ	1-BH-ZS-F006B	C41	Limit Switch	Reactor	145	Yes	NO	
M001	1-BH-PT-N004B	C41	Press Trans.	Reactor	162	NO	NO	
M001	1-BH-LT-N010A	C41	Level Trans.	Reactor	162	NO	NO	
M001	1-BH-LT-N010B	C41	Level Trans.	Reactor	162	NO	NO	
M001	1-BH-LT-N010E	C41	Level Trans.	Reactor	162	NO	NO	
M001	1-BH-LT-N010F	C41	Level Trans.	Reactor	162	NO	NO	
M001	10-C 011	B21-P011	Panel	Reactor	201	NO	NO	

HCGS FSAR  
TABLE 3.11-5

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

P&ID  
M-49-1

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SYSTEM: REACTOR CORE ISOL COOL.  
BD

P.O.	ID NO.	MPL NO.	COMPONENT	LOCATION		PAM EQUIP. NOTE (1)	TMI ACTION PLAN EQUIP. NOTE (2)	COMMENTS
				BLDG.	ELEV.			
P302Q	1-FC-HV-F007	E51	Control Valve	Reactor	100	No	No	
P302Q	1-FC-HV-F008	E51	Control Valve	Reactor	102	No	No	
P301Q	1-FC-HV-F059	E51	Control Valve	Reactor	77	No	No	
P303AQ	1-FC-HV-F060	E51	Control Valve	Reactor	54	No	No	
P301Q	1-FC-HV-F062	E51	Control Valve	Reactor	54	No	No	
P303AQ	1-FC-HV-F076	E51	Control Valve	Reactor	100	No	No	
P301Q	1-FC-HV-F084	E51	Control Valve	Reactor	77	No	No	
M001	1-FC-PT-N058B	E51	Press. Trans	Reactor	77	No	No	
M001	1-FC-PT-N058D	E51	Press. Trans	Reactor	77	No	No	
M001	1-FC-PT-N058F	E51	Press. Trans	Reactor	77	No	No	
M001	1-FC-PT-N058H	E51	Press. Trans	Reactor	77	No	No	
P303AQ	1-FC-SV-F025	E51	Solenoid Valve	Reactor	54	No	No	
P303AQ	1-FC-SV-F026	E51	Solenoid Valve	Reactor	54	No	No	
J600	1-FC-SV-F054	E51	Solenoid Valve	Reactor	54	No	No	
P301Q	1-FC-ZS-F059	E51	Limit Switch	Reactor	77	Yes	No	
P301Q	1-FC-ZS-F062	E51	Limit Switch	Reactor	54	Yes	No	
P303AQ	1-FC-ZS-F076	E51	Limit Switch	Reactor	100	Yes	No	
P301Q	1-FC-ZS-F084	E51	Limit Switch	Reactor	77	Yes	No	
J301Q	1-BD-FT-4158		Flow Trans.	Reactor	54	No	No	
M001	1-BD-FT-N003	E51	Flow Trans	Reactor	54	Yes	No	
M001	1-BD-FT-N051	E51	Flow Trans	Reactor	54	No	No	
P301Q	1-BD-HV-F010	E51	Control Valve	Reactor	54	No	No	
P302Q	1-BD-HV-F012	E51	Control Valve	Reactor	54	No	No	
P302Q	1-BD-HV-F013	E51	Control Valve	Reactor	102	No	No	
J603Q	1-BD-SV-F019		Solenoid Valve	Reactor	77	No	No	
P302Q	1-BD-HV-F022	E51	Control Valve	Reactor	77	No	No	
P301Q	1-BD-HV-F031	E51	Control Valve	Reactor	54	No	No	
M001	1-FC-LSH-N010	E51	Level Switch High	Reactor	54	No	No	
M001	1-FC-PDT-N057B	E51	Press. Diff. Trans	Reactor	77	No	No	
M001	1-FC-PDT-N057D	E51	Press. Diff. Trans	Reactor	77	No	No	
J301Q	1-BD-PT-4157		Press. Trans.	Reactor	54	No	No	
M001	1-BD-PT-N007	E51	Press. Trans	Reactor	54	No	No	
M001	1-BD-PT-N050	E51	Press. Trans	Reactor	54	No	No	
P302Q	1-BD-ZS-F007	E51	Limit Switch	Reactor	100	Yes	No	
P302Q	1-BD-ZS-F008	E51	Limit Switch	Reactor	102	Yes	No	
P302Q	1-BD-ZS-F013	E51	Limit Switch	Reactor	102	Yes	No	
P303A	1-BD-ZS-F019	E51	Limit Switch	Reactor	77	Yes	No	
P301Q	1-BD-ZS-F031	E51	Limit Switch	Reactor	54	Yes	No	
P303AQ	1-BD-ZS-F060	E51	Limit Switch	Reactor	54	Yes	No	
M001	10-C 037	H21-P037	Panel	Reactor	77	No	No	



HCGS FSAR  
TABLE 3.11-5  
EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

SYSTEM: RCIC PUMP TURBINE  
FC

P.O.	ID NO.	MPL NO.	COMPONENT	LOCATION BLDG.	ELEV.	PAM EQUIP. NOTE (1)	TMI ACTION PLAN EQUIP. NOTE (2)	COMMENTS
P303A0	1-BD-HV-F046	E51	Control Valve	Reactor	54	No	No	
J3010	1-BD-PT-4303	E11	Press. Trans.	Reactor	54	No	No	
M001	1-BD-PT-N028	E51	Press. Trans.	Reactor	77	No	No	
M001	1-BD-PT-N053	E51	Press. Trans.	Reactor	77	No	No	
M001	1-BD-PT-N052	E51	Press. Trans.	Reactor	77	No	No	
M0020	1-BP-228	E51	Jockey Pump Motor	Reactor	54	No	No	
M001	1-FC-FV-4283	E51-C002	Flow Control Valve	Reactor	54	No	No	
M001	1-FC-FY-4283	E51-C002	Converter	Reactor	54	No	No	
P3020	1-FC-HV-F045	E51	Control Valve	Reactor	54	No	No	
M001	1-FC-HV-4284	E51-C002	Control Valve	Reactor	54	No	No	
M001	1-FC-LSH-4286	E51-C002	Level Sw. High	Reactor	54	No	No	
M001	1-OP-219	E51	Vacuum Pump Motor	Reactor	54	No	No	
M001	1-OP-220	E51	Condensate Pump Motor	Reactor	54	No	No	
M001	1-FC-FDISH-4279	E51-C002	Press. Diff. Sw. High	Reactor	54	No	No	
M001	1-FC-PSL-4276	E51-C002	Press. Sw. Low	Reactor	54	No	No	
M001	1-FC-PT-N055B	E51	Press. Trans.	Reactor	77	No	No	
M001	1-FC-PT-N055D	E51	Press. Trans.	Reactor	77	No	No	
M001	1-FC-PT-N055F	E51	Press. Trans.	Reactor	77	No	No	
M001	1-FC-PT-N055H	E51	Press. Trans.	Reactor	77	No	No	
M001	1-FC-PT-N056B	E51	Press. Trans.	Reactor	77	No	No	
M001	1-FC-PT-N056F	E51	Press. Trans.	Reactor	54	No	No	
M001	1-FC-SE-4280	E51-C002	Speed Elem.	Reactor	54	No	No	
M001	1-FC-SV-F004	E51	Solenoid Valve	Reactor	54	No	No	
P303A0	1-FC-SV-F005	E51	Solenoid Valve	Reactor	54	No	No	
J6010	1-FC-TSH-4277	E51-C002	Temp. Sw. High	Reactor	54	No	No	
M001	1-FC-TSH-4278	E51-C002	Temp. Sw. High	Reactor	54	No	No	
M001	1-FC-ZS-4275	E51-C002	Position Sw.	Reactor	54	No	No	

HCGS PSAR  
TABLE 3.11-5

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

P&ID  
M-51-1

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SYSTEM: RESIDUAL HEAT REMOVAL SYSTEM  
BC

P.O.	ID NO.	MPL NO.	COMPONENT	LOCATION		PAM EQUIP. NOTE (1)	TMI ACTION PLAN EQUIP. NOTE (2)	COMMENTS
				BLDG.	ELEV.			
M001	1-AP-202	E11 C002	RHR-Pump Motor	Reactor	54	No	No	
M001	1-BP-202	E11 C002	RHR-Pump Motor	Reactor	54	No	No	
M001	1-BC-CE-N001A	E11	Conductivity Elemt.	Reactor	54	No	No	
M001	1-BC-CE-N001B	E11	Conductivity Elemt.	Reactor	54	No	No	
M001	1-CP-202	E11 C002	RHR-Motor	Reactor	54	No	No	
M082Q	1-CP-228		Jockey Pump Motor	Reactor	54	No	No	
M001	1-DP-202	E11 C002	RHR-Motor	Reactor	54	No	No	
M082Q	1-DP-228		Jockey Pump Motor	Reactor	54	No	No	
J301Q	1-BC-FT-4435		Flow Trans.	Reactor	77	No	No	
J301Q	1-BC-FT-4461A		Flow Trans.	Reactor	77	Yes	No	
J301Q	1-BC-FT-4461B		Flow Trans.	Reactor	77	Yes	No	
J301Q	1-BC-FT-4462A		Flow Trans.	Reactor	102	Yes	No	
J301Q	1-BC-FT-4462B		Flow Trans.	Reactor	77	Yes	No	
M001	1-BC-FT-N013	E11	Flow Transmitter	Reactor	102	No	No	
M001	1-BC-FT-N015A	E11	Flow Transmitter	Reactor	77	Yes	No	
M001	1-BC-FT-N052A	E11	Flow Transmitter	Reactor	77	No	No	
M001	1-BC-FT-N015B	E11	Flow Transmitter	Reactor	77	Yes	No	
M001	1-BC-FT-N015C	E11	Flow Transmitter	Reactor	54	Yes	No	
M001	1-BC-FT-N015D	E11	Flow Transmitter	Reactor	54	Yes	No	
M001	1-BC-FT-N052B	E11	Flow Transmitter	Reactor	77	No	No	
M001	1-BC-FT-N052C	E11	Flow Transmitter	Reactor	54	No	No	
M001	1-BC-FT-N052D	E11	Flow Transmitter	Reactor	54	No	No	
P301Q	1-BC-HV-4420A		Control Valve	Reactor	77	No	No	
P301Q	1-BC-HV-4420B		Control Valve	Reactor	77	No	No	
P301Q	1-BC-HV-4421		Control Valve	Reactor	77	No	No	
P303AQ	1-BC-HV-4428		Control Valve	Reactor	77	No	No	
P301Q	1-BC-HV-4439		Control Valve	Reactor	77	No	No	
P301Q	1-BC-HV-F003A	E11	Control Valve	Reactor	54	No	No	
P301Q	1-BC-HV-F003B	E11	Control Valve	Reactor	54	No	No	
P301Q	1-BC-HV-F004A	E11	Control Valve	Reactor	54	No	No	
P301Q	1-BC-HV-F004B	E11	Control Valve	Reactor	54	No	No	
P301Q	1-BC-HV-F004C	E11	Control Valve	Reactor	54	No	No	
P301Q	1-BC-HV-F004D	E11	Control Valve	Reactor	54	No	No	
P301Q	1-BC-HV-F006A	E11	Control Valve	Reactor	54	No	No	
P301Q	1-BC-HV-F006B	E11	Control Valve	Reactor	54	No	No	
P301Q	1-BC-HV-F007A	E11	Control Valve	Reactor	54	No	No	
P301Q	1-BC-HV-F007B	E11	Control Valve	Reactor	54	No	No	
P301Q	1-BC-HV-F007C	E11	Control Valve	Reactor	54	No	No	
P301Q	1-BC-HV-F007D	E11	Control Valve	Reactor	54	No	No	
P302Q	1-BC-HV-F008	E11	Control Valve	Reactor	102	No	No	
P302Q	1-BC-HV-F009	E11	Control Valve	Reactor	102	No	No	

HCGS FSAR  
TABLE 3.11-5

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

PAID  
M-51-1

SYSTEM: RESIDUAL HEAT REMOVAL SYSTEM  
RC

P.O.	ID NO.	MPL NO.	COMPONENT	BLDG.	ELEV.	PAM EQUIP. NOTE (1)	TMI ACTION PLAN EQUIP. NOTE (2)	COMMENTS
P3010	1-BC-HV-F010A	E11	Control Valve	Reactor	54	No	No	
P3010	1-BC-HV-F010B	E11	Control Valve	Reactor	54	No	No	
P3010	1-BC-HV-F011A	E11	Control Valve	Reactor	54	No	No	
P3010	1-BC-HV-F011B	E11	Control Valve	Reactor	54	No	No	
P3020	1-BC-HV-F015A	E11	Control Valve	Reactor	102	No	No	
P3020	1-BC-HV-F015B	E11	Control Valve	Reactor	102	No	No	
P3010	1-BC-HV-F016A	E11	Control Valve	Reactor	102	No	No	
P3010	1-BC-HV-F016B	E11	Control Valve	Reactor	102	No	No	
P3020	1-BC-HV-F017A	E11	Control Valve	Reactor	102	No	No	
P3020	1-BC-HV-F017B	E11	Control Valve	Reactor	102	No	No	
P3020	1-BC-HV-F017C	E11	Control Valve	Reactor	102	No	No	
P3020	1-BC-HV-F017D	E11	Control Valve	Reactor	102	No	No	
P3010	1-RC-HV-F021A	E11	Control Valve	Reactor	102	No	No	
P3010	1-RC-HV-F021B	E11	Control Valve	Reactor	132	No	No	
P3020	1-RC-HV-F022	E11	Control Valve	Reactor	145	No	No	
P3020	1-RC-HV-F023	E11	Control Valve	Reactor	145	No	No	
P3010	1-RC-HV-F024A	E11	Control Valve	Reactor	54	No	No	
P3010	1-RC-HV-F024B	E11	Control Valve	Reactor	54	No	No	
P3010	1-RC-HV-F026A	E11	Control Valve	Reactor	54	No	No	
P3010	1-RC-HV-F026B	E11	Control Valve	Reactor	54	No	No	
P3010	1-RC-HV-F027A	E11	Control Valve	Reactor	77	No	No	
P3010	1-RC-HV-F027B	E11	Control Valve	Reactor	77	No	No	
P3010	1-RC-HV-F040	E11	Control Valve	Reactor	77	No	No	
P3010	1-RC-HV-F047A	E11	Control Valve	Reactor	77	No	No	
P3010	1-RC-HV-F047B	E11	Control Valve	Reactor	77	No	No	
J6050	1-RC-HV-F048A	E11	Control Valve	Reactor	77	No	No	
J6050	1-RC-HV-F048B	E11	Control Valve	Reactor	77	No	No	
P3010	1-RC-HV-F049	E11	Control Valve	Reactor	77	No	No	
P3020	1-RC-HV-F052A	E11	Control Valve	Reactor	77	No	No	
P3020	1-RC-HV-F052B	E11	Control Valve	Reactor	77	No	No	
P3010	1-RC-HV-F075	E11	Control Valve	Reactor	77	No	No	
P303A0	1-BC-HV-F103A	E11	Control Valve	Reactor	77	No	No	
P303A0	1-BC-HV-F103B	E11	Control Valve	Reactor	77	No	No	
P303A0	1-BC-HV-F104A	E11	Control Valve	Reactor	77	No	No	
P303A0	1-BC-HV-F104B	E11	Control Valve	Reactor	77	No	No	
M001	1-RC-LT-N008B	E11	Level Transmitter	Reactor	54	No	No	
M001	1-RC-LY-K001A	E11	Level I/P Converter	Reactor	54	No	No	
M001	1-RC-LY-K001B	E11	Level I/P Converter	Reactor	54	No	No	
M001	1-RC-PDT-M058A	E11	Press. Diff. Trans.	Reactor	77	No	No	
M001	1-RC-PDT-M058B	E11	Press. Diff. Trans.	Reactor	77	No	No	
M001	1-RC-PDT-M058C	E11	Press. Diff. Trans.	Reactor	77	No	No	
M001	1-RC-PDT-M058D	E11	Press. Diff. Trans.	Reactor	77	No	No	

HCCS FSAR  
TABLE 3.11-5

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

P&ID  
M-51-1

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SYSTEM: RESIDUAL HEAT REMOVAL SYSTEM  
RC

P.O.	ID NO.	MPL NO.	COMPONENT	LOCATION		PAM EQUIP. NOTE (1)	TMI ACTION PLAN EQUIP. NOTE (2)	COMMENTS
				BLDG.	ELEV.			
M001	1-BC-PDT-N060A	E11	Press. Diff. Trans.	Reactor	77	No	No	
M001	1-BC-PDT-N060B	E11	Press. Diff. Trans.	Reactor	77	No	No	
M001	1-BC-PT-N026A	E11	Press. Transmitter	Reactor	77	No	No	
M001	1-BC-PT-N026B	E11	Press. Transmitter	Reactor	77	No	No	
M001	1-BC-PT-N053A	E11	Press. Trans	Reactor	54	No	No	
M001	1-BC-PT-N053B	E11	Press. Trans	Reactor	54	No	No	
M001	1-BC-PT-N053C	E11	Press. Trans	Reactor	54	No	No	
M001	1-BC-PT-N053D	E11	Press. Trans	Reactor	54	No	No	
M001	1-BC-PT-N055B	E11	Press. Trans	Reactor	54	No	No	
M001	1-BC-PT-N055D	E11	Press. Trans	Reactor	54	No	No	
M001	1-BC-PT-N055F	E11	Press. Trans	Reactor	54	No	No	
M001	1-BC-PT-N055H	E11	Press. Trans	Reactor	54	No	No	
M001	1-BC-PT-N056B	E11	Press. Trans	Reactor	54	No	No	
M001	1-BC-PT-N056D	E11	Press. Trans	Reactor	54	No	No	
M001	1-BC-PT-N056F	E11	Press. Trans	Reactor	54	No	No	
M001	1-BC-PT-N056H	E11	Press. Trans	Reactor	54	No	No	
M001	1-BC-PT-N057	E11	Press. Trans.	Reactor	77	No	No	
M001	1-BC-PY-K003A	E11	Press I/P Converter	Reactor	77	No	No	
M001	1-BC-PY-K003B	E11	Press I/P Converter	Reactor	77	No	No	
M001	1-BC-LT-N008A	E11	Level Transmitter	Reactor	54	No	No	
M001	1-BC-SV-F041A	E11	Solenoid Valve	Reactor	100	No	No	
M001	1-BC-SV-F041B	E11	Solenoid Valve	Reactor	100	No	No	
M001	1-BC-SV-F041C	E11	Solenoid Valve	Reactor	100	No	No	
M001	1-BC-SV-F041D	E11	Solenoid Valve	Reactor	100	No	No	
M001	1-BC-SV-F050A	E11	Solenoid Valve	Reactor	100	No	No	
M001	1-BC-SV-F050B	E11	Solenoid Valve	Reactor	100	No	No	
J601Q	1-BC-SV-F051A		Solenoid Valve	Reactor	77	No	No	
J601Q	1-BC-SV-F051B		Solenoid Valve	Reactor	77	No	No	
J601Q	1-BC-SV-F053A		Solenoid Valve	Reactor	54	No	No	
J601Q	1-BC-SV-F053B		Solenoid Valve	Reactor	54	No	No	
J603Q	1-BC-SV-F079A		Solenoid Valve	Reactor	77	No	No	
J603Q	1-BC-SV-F079B		Solenoid Valve	Reactor	77	No	No	
J603Q	1-BC-SV-F080A		Solenoid Valve	Reactor	54	No	No	
J603Q	1-BC-SV-F080B		Solenoid Valve	Reactor	77	No	No	
P303AQ	1-BC-SV-F122A	E11	Solenoid Valve	Reactor	100	No	No	
P303AQ	1-BC-SV-F122B	E11	Solenoid Valve	Reactor	100	No	No	
P303AQ	1-BC-SV-F146A	E11	Solenoid Valve	Reactor	100	No	No	
P303AQ	1-BC-SV-F146B		Solenoid Valve	Reactor	100	No	No	
P303AQ	1-BC-SV-F146C		Solenoid Valve	Reactor	100	No	No	
P303AQ	1-BC-SV-F146D		Solenoid Valve	Reactor	100	No	No	
J556Q	1-BC-TE-4401		Temp. Elemt.	Reactor	77	No	No	
M001	1-BC-TE-N027A	E11	Temp. Element	Reactor	77	Yes	No	
M001	1-BC-TE-N027B	E11	Temp. Element	Reactor	77	Yes	No	

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TABLE 3.11-5

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

P41D  
M-51-1

SYSTEM: RESIDUAL HEAT REMOVAL SYSTEM  
HC

P.O.	ID NO.	MPL NO.	COMPONENT	LOCATION		PAM EQUIP. NOTE (1)	THE ACTION PLAN EQUIP. NOTE (2)	COMMENTS
				BLDG.	ELEV.			
P303AQ	1-BC-ZE-F103A	E11	Position Elemt.	Reactor	77	No	No	
P303AQ	1-BC-ZE-F103B	E11	Position Elemt.	Reactor	77	No	No	
P303AQ	1-BC-ZE-F104A	E11	Position Elemt.	Reactor	77	No	No	
P303AQ	1-BC-ZE-F104B	E11	Position Elemt.	Reactor	77	No	No	
P301Q	1-BC-ZS-4470A		Limit Switch	Reactor	77	Yes	No	
P301Q	1-BC-ZS-4420B		Limit Switch	Reactor	77	Yes	No	
P301Q	1-BC-ZS-4421		Limit Switch	Reactor	77	Yes	No	
P301Q	1-BC-ZS-F004A	E11	Limit Switch	Reactor	54	Yes	No	
P301Q	1-BC-ZS-F004B	E11	Limit Switch	Reactor	54	Yes	No	
P301Q	1-BC-ZS-F004C	E11	Limit Switch	Reactor	54	Yes	No	
P301Q	1-BC-ZS-F004D	E11	Limit Switch	Reactor	54	Yes	No	
P301Q	1-BC-ZS-F007A	E11	Limit Switch	Reactor	54	Yes	No	
P301Q	1-BC-ZS-F007B	E11	Limit Switch	Reactor	54	Yes	No	
P301Q	1-BC-ZS-F007C	E11	Limit Switch	Reactor	54	Yes	No	
P301Q	1-BC-ZS-F007D	E11	Limit Switch	Reactor	54	Yes	No	
P302Q	1-BC-ZS-F008	E11	Limit Switch	Reactor	102	Yes	No	
P302Q	1-BC-ZS-F009	E11	Limit Switch	Reactor	102	Yes	No	
P301Q	1-BC-ZS-F010A	E11	Limit Switch	Reactor	54	Yes	No	
P301Q	1-BC-ZS-F010B	E11	Limit Switch	Reactor	54	Yes	No	
P301Q	1-BC-ZS-F011A	E11	Limit Switch	Reactor	54	Yes	No	
P301Q	1-BC-ZS-F011B	E11	Limit Switch	Reactor	54	Yes	No	
P302Q	1-BC-ZS-F015A	E11	Limit Switch	Reactor	102	Yes	No	
P302Q	1-BC-ZS-F015B	E11	Limit Switch	Reactor	102	Yes	No	
P301Q	1-BC-ZS-F016A	E11	Limit Switch	Reactor	102	Yes	No	
P301Q	1-BC-ZS-F016B	E11	Limit Switch	Reactor	102	Yes	No	
P302Q	1-BC-ZS-F017A	E11	Limit Switch	Reactor	102	Yes	No	
P302Q	1-BC-ZS-F017B	E11	Limit Switch	Reactor	102	Yes	No	
P302Q	1-BC-ZS-F017C	E11	Limit Switch	Reactor	102	Yes	No	
P302Q	1-BC-ZS-F017D	E11	Limit Switch	Reactor	102	Yes	No	
P301Q	1-BC-ZS-F021A	E11	Limit Switch	Reactor	102	Yes	No	
P301Q	1-BC-ZS-F021B	E11	Limit Switch	Reactor	132	Yes	No	
P302Q	1-BC-ZS-F022	E11	Limit Switch	Reactor	145	Yes	No	
P302Q	1-BC-ZS-F023	E11	Limit Switch	Reactor	145	Yes	No	
P301Q	1-BC-ZS-F024A	E11	Limit Switch	Reactor	145	Yes	No	
P301Q	1-BC-ZS-F024B	E11	Limit Switch	Reactor	145	Yes	No	
P301Q	1-BC-ZS-F027A	E11	Limit Switch	Reactor	145	Yes	No	
P301Q	1-BC-ZS-F027B	E11	Limit Switch	Reactor	145	Yes	No	
P302Q	1-BC-ZS-F060A	E11	Position Sw.	Reactor	102	No	No	
P302Q	1-BC-ZS-F060B	E11	Position Sw.	Reactor	102	No	No	
P302Q	1-BC-ZS-F065A	E11	Position Sw.	Reactor	102	No	No	
P302Q	1-BC-ZS-F065B	E11	Position Sw.	Reactor	102	No	No	
P302Q	1-BC-ZS-F065C	E11	Position Sw.	Reactor	102	No	No	
P302Q	1-BC-ZS-F065D	E11	Position Sw.	Reactor	102	No	No	



HCCS FSAR  
TABLE 3.11-5

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

P&ID  
M-51-1

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SYSTEM: RESIDUAL HEAT REMOVAL SYSTEM  
BC

P.O.	ID NO.	MPL NO.	COMPONENT	LOCATION		FAM EQUIP. NOTE (1)	TMI ACTION PLAN EQUIP. NOTE (2)	COMMENTS
				BLDG.	ELEV.			
P3020	1-BC-ZS-F077	E11	Position Sw.	Reactor	102	No	No	
P303AQ	1-BC-ZS-F103A		Limit Switch	Reactor	77	Yes	No	
P303AQ	1-BC-ZS-F103B		Limit Switch	Reactor	77	Yes	No	
M001	10-C 018	H21-F018	Panel	Reactor	54	No	No	
M001	10-C 021	H21-P021	Panel	Reactor	54	No	No	
M001	10-C 069	H21-P069	Panel	Reactor	54	No	No	

HCGS FSAR  
TABLE 3.11-5

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

P&ID  
M-52-1

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SYSTEM: CORE SPRAY  
BE

P.O.	ID NO.	MPL NO.	COMPONENT	LOCATION		PAM EQUIP. NOTE (1)	TMI ACTION PLAN EQUIP. NOTE (2)	COMMENTS
				BLDG.	ELEV.			
M001	1-AP-206	E21 C001	Pump Motor	Reactor	54	No	No	
M001	1-BP-206	E21 C001	Pump Motor	Reactor	54	No	No	
M001	1-CP-206	E21 C001	Pump Motor	Reactor	54	No	No	
M001	1-DP-206	E21 C001	Pump Motor	Reactor	54	No	No	
M001	1-BE-FT-N003A	E21	Flow Trans.	Reactor	54	Yes	No	
M001	1-BE-FT-N003B	E21	Flow Trans.	Reactor	54	Yes	No	
M001	1-BE-FT-N051A	E21	Flow Trans.	Reactor	54	No	No	
M001	1-BE-FT-N051H	E21	Flow Trans.	Reactor	54	No	No	
P301Q	1-BE-HV-F001A	E21	Contr. Valve	Reactor	54	No	No	
P301Q	1-BE-HV-F001B	E21	Contr. Valve	Reactor	54	No	No	
P301Q	1-BE-HV-F001C	E21	Contr. Valve	Reactor	54	No	No	
P301Q	1-BE-HV-F001D	E21	Contr. Valve	Reactor	54	No	No	
P302Q	1-BE-HV-F004A	E21	Contr. Valve	Reactor	102	No	No	
P302Q	1-BE-HV-F004B	E21	Contr. Valve	Reactor	102	No	No	
P302Q	1-BE-HV-F005A	E21	Contr. Valve	Reactor	102	No	No	
P302Q	1-BE-HV-F005B	E21	Contr. Valve	Reactor	102	No	No	
M001	1-BE-PDT-N056	E21	Press. Diff. Trans.	Reactor	77	No	No	
M001	1-BE-PT-N054A	E21	Press Trans.	Reactor	54	No	No	
M001	1-BE-PT-N054B	E21	Press Trans.	Reactor	54	No	No	
M001	1-BE-PT-N055B	E21	Press. Trans.	Reactor	54	No	No	
M001	1-BE-PT-N055D	E21	Press. Trans.	Reactor	54	No	No	
M001	1-BE-PT-N055F	E21	Press. Trans.	Reactor	54	No	No	
M001	1-BE-PT-N055H	E21	Press. Trans.	Reactor	54	No	No	
M001	1-BE-SV-F006A	E21	Solenoid Valve	Reactor	100	No	No	
M001	1-BE-SV-F006B	E21	Solenoid Valve	Reactor	100	No	No	
P301Q	1-BE-ZS-F001A	E21	Limit Switch	Reactor	54	Yes	No	
P301Q	1-BE-ZS-F001B	E21	Limit Switch	Reactor	54	Yes	No	
P301Q	1-BE-ZS-F001C	E21	Limit Switch	Reactor	54	Yes	No	
P301Q	1-BE-ZS-F001D	E21	Limit Switch	Reactor	54	Yes	No	
P302Q	1-BE-ZS-F005A	E21	Limit Switch	Reactor	102	Yes	No	
P302Q	1-BE-ZS-F005B	E21	Limit Switch	Reactor	102	Yes	No	
P303AQ	1-BE-ZS-F007A	E21	Position SW	Reactor	100	No	No	
P303AQ	1-BE-ZS-F007B	E21	Position SW	Reactor	100	No	No	
P301Q	1-BE-HV-F015A	E21	Contr. Valve	Reactor	77	No	No	
P301Q	1-BE-ZS-F015A	E21	Limit Switch	Reactor	77	Yes	No	
P301Q	1-BE-HV-F015B	E21	Contr. Valve	Reactor	77	No	No	
P301Q	1-BE-ZS-F015B	E21	Limit Switch	Reactor	77	Yes	No	
P301Q	1-BE-HV-F031A	E21	Contr. Valve	Reactor	54	No	No	
P301Q	1-BE-ZS-F031A	E21	Limit Switch	Reactor	54	Yes	No	
P301Q	1-BE-HV-F031B	E21	Contr. Valve	Reactor	54	No	No	
P301Q	1-BE-ZS-F031B	E21	Limit Switch	Reactor	54	Yes	No	
P303AQ	1-BE-SV-F039A	E21	Solenoid Valve	Reactor	100	No	No	
P303AQ	1-BE-SV-F039B	E21	Solenoid Valve	Reactor	100	No	No	
P303AQ	1-BE-ZS-F039B	E21	Limit Switch	Reactor	100	Yes	No	

HCGS FSAR  
TABLE 3.11-5

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

P&ID  
M-53-1

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SYSTEM: FUEL POOL COOLING & TORUS WTR CLEANUP  
EC

P.O.	ID NO.	MPL NO.	COMPONENT	LOCATION		PAM EQUIP. NOTE (1)	TMI ACTION PLAN EQUIP. NOTE (2)	COMMENTS
				BLDG.	ELEV.			
P301Q	1-EE-HV-4652		Control Valve	Reactor	54	No	No	
P301Q	1-EE-SV-4655		Solenoid Valve	Reactor	54	No	No	
P301Q	1-EE-SV-4656		Solenoid Valve	Reactor	54	No	No	
P301Q	1-EE-SV-4663		Solenoid Valve	Reactor	77	No	No	
P301Q	1-EE-HV-4679		Control Valve	Reactor	54	No	No	
P301Q	1-EE-HV-4680		Control Valve	Reactor	54	No	No	
P301Q	1-EE-HV-4681		Control Valve	Reactor	54	No	No	
M0820	1-AP-211		Pump Motor	Reactor	162	No	No	
M0820	1-BP-211		Pump Motor	Reactor	162	No	No	
J301Q	1-EC-FT-4649A		Flow Transmitter	Reactor	162	No	No	
J301Q	1-EC-FT-4649B		Flow Transmitter	Reactor	162	No	No	
J301Q	1-EC-LT-4661A		Level Transmitter	Reactor	162	No	No	
J301Q	1-EC-LT-4661B		Level Transmitter	Reactor	178	No	No	
J301Q	1-EC-PT-4669A		Pressure Transmitter	Reactor	162	No	No	
J301Q	1-EC-PT-4669B		Pressure Transmitter	Reactor	162	No	No	
P301Q	1-EC-SV-4676A		Solenoid Valve	Reactor	77	No	No	
P301Q	1-EC-SV-4676B		Solenoid Valve	Reactor	77	No	No	
P301Q	1-EC-SV-4678		Solenoid Valve	Reactor	77	No	No	
P301Q	1-EC-ZS-4652		Limit Switch	Reactor	54	Yes	No	
P301Q	1-EC-ZS-4679		Limit Switch	Reactor	54	Yes	No	
P301Q	1-EC-ZS-4680		Limit Switch	Reactor	54	Yes	No	
P301Q	1-EC-ZS-4681		Limit Switch	Reactor	54	Yes	No	
I556Q	1-EC-TE-4683		Temp. Elemt.	Reactor	162	No	No	
P301Q	1-EC-HV-4689A		Control Valve	Reactor	162	No	No	
P301Q	1-EC-HV-4689B		Control Valve	Reactor	162	No	No	

HCCS FSAR  
TABLE 3.11-5

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

P&ID  
M-55-1

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SYSTEM: HIGH PRESS COOL. INJECTION  
BJ

P.O.	ID NO.	MPL NO.	COMPONENT	LOCATION		PAM EQUIP. NOTE (1)	TMI ACTION PLAN EQUIP. NOTE (2)	COMMENTS
				BLDG.	ELEV.			
P3020	1-AP-HV-F011	E41	Control Valve	Reactor	77	No	No	
M001	1-FD-FT-N008	E41	Flow Trans.	Reactor	54	Yes	No	
P3020	1-FD-HV-F001	E41	Control Valve	Reactor	54	No	No	
P3020	1-FD-HV-F002	E41	Control Valve	Reactor	100	No	No	
P3020	1-FD-HV-F003	E41	Control Valve	Reactor	102	No	No	
P3010	1-FD-HV-F075	E41	Control Valve	Reactor	77	No	No	
P3010	1-FD-HV-F079	E41	Control Valve	Reactor	77	No	No	
P303AQ	1-FD-HV-F100	E41	Control Valve	Reactor	100	No	No	
M001	1-FD-LSH-N014	E41	Level Switch High	Reactor	54	No	No	
M001	1-FD-PDT-N057A	E41	Press. Diff. Trans.	Reactor	77	No	No	
M001	1-FD-PDT-N057C	E41	Press. Diff. Trans.	Reactor	77	No	No	
M001	1-FD-PT-N013	E41	Press. Trans.	Reactor	54	No	No	
M001	1-FD-PT-N058A	E41	Press. Transmitter	Reactor	77	No	No	
M001	1-FD-PT-N058C	E41	Press. Transmitter	Reactor	77	No	No	
M001	1-FD-PT-N058E	E41	Press. Transmitter	Reactor	77	No	No	
M001	1-FD-PT-N058G	E41	Press. Transmitter	Reactor	77	No	No	
P303AQ	1-FD-SV-F028	E41	Solenoid Valve	Reactor	54	No	No	
P303AQ	1-FD-SV-F029	E41	Solenoid Valve	Reactor	54	No	No	
J6000	1-FD-SV-F054		Solenoid Valve	Reactor	54	No	No	
P3010	1-FD-HV-F071	E41	Control Valve	Reactor	77	No	No	
M001	1-BJ-FT-N051	E41	Flow Trans.	Reactor	54	No	No	
P303AQ	1-BJ-HV-4803		Control Valve	Reactor	54	No	No	
P303AQ	1-BJ-HV-4804		Control Valve	Reactor	54	No	No	
P303AQ	1-BJ-HV-4865		Control Valve	Reactor	54	No	No	
P303AQ	1-BJ-HV-4866		Control Valve	Reactor	54	No	No	
P3020	1-BJ-HV-8278		Control Valve	Reactor	102	No	No	
P3010	1-BJ-HV-F004	E41	Control Valve	Reactor	54	No	No	
P3020	1-BJ-HV-F006	E41	Control Valve	Reactor	102	No	No	
P3020	1-BJ-HV-F007	E41	Control Valve	Reactor	54	No	No	
P3020	1-BJ-HV-F008	E41	Control Valve	Reactor	77	No	No	
P3020	1-BJ-HV-F012	E41	Control Valve	Reactor	54	No	No	
P3010	1-BJ-HV-F042	E41	Control Valve	Reactor	54	No	No	
J3010	1-BJ-LT-4801		Level Trans.	Reactor	54	Yes	Yes	
J3010	1-BJ-LT-4805-1		Level Trans.	Reactor	54	Yes	No	
J3010	1-BJ-LT-4805-2		Level Trans.	Reactor	54	No	No	
M001	1-BJ-LT-N062A	E41	Level Transmitter	Reactor	54	No	No	
M001	1-BJ-LT-N062E	E41	Level Trans.	Reactor	54	No	No	
J3010	1-BJ-PT-4771		Press. Trans.	Reactor	54	No	No	
M001	1-BJ-PT-N050	E41	Press. Trans.	Reactor	54	No	No	
P303AQ	1-BJ-ZS-4803		Limit Switch	Reactor	54	Yes	No	
P303AQ	1-BJ-ZS-4804		Limit Switch	Reactor	54	Yes	No	
P303AQ	1-BJ-ZS-4865		Limit Switch	Reactor	54	Yes	No	

HCGS FSAR  
TABLE 3.11-5

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

P&ID  
M-55-1

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SYSTEM: HIGH PRESS COOL. INJECTION  
BJ

P.O.	ID NO.	MPL NO.	COMPONENT	LOCATION		PAM EQUIP. NOTE (1)	TMI ACTION PLAN EQUIP. NOTE (2)	COMMENTS
				BLDG.	ELEV.			
P303AQ	1-BJ-ZS-4866		Limit Switch	Reactor	54	Yes	No	
P302Q	1-BJ-ZS-8278		Limit Switch	Reactor	102	Yes	No	
P302Q	1-BJ-ZS-F002	E41	Limit Switch	Reactor	100	Yes	No	
P302Q	1-BJ-ZS-F003	E41	Limit Switch	Reactor	102	Yes	No	
P302Q	1-BJ-ZS-F006	E41	Limit Switch	Reactor	102	Yes	No	
P302Q	1-BJ-ZS-F012	E41	Limit Switch	Reactor	54	Yes	No	
P301Q	1-BJ-ZS-F042	E41	Limit Switch	Reactor	54	Yes	No	
P301Q	1-BJ-ZS-F071	E41	Limit Switch	Reactor	77	Yes	No	
P301Q	1-BJ-ZS-F075	E41	Limit Switch	Reactor	77	Yes	No	
P301Q	1-BJ-ZS-F079	E41	Limit Switch	Reactor	77	Yes	No	
P303AQ	1-BJ-ZS-F100	E41	Limit Switch	Reactor	100	Yes	No	
H001	10-C 014	H21-P014	Panel	Reactor	54	No	No	
H001	10-C 016	H21-P014	Panel	Reactor	77	No	No	

RCGS FSAR  
TABLE 3.11-5

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

9&1D  
M-56-1

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SYSTEM: HPCI PUMP TURBINE  
FD

P.O.	ID NO.	MPL NO.	COMPONENT	LOCATION		PAM EQUIP. NOTE (1)	TMI ACTION PLAN EQUIP. NOTE (2)	COMMENTS
				BLDG.	ELEV.			
P103AQ	1-BJ-HV-F059	E41	Control Valve	Reactor	54	No	No	
M001	1-BJ-PT-N052	E41	Press. Trans.	Reactor	54	No	No	
M001	1-FD-PT-N056A	E41	Press. Trans.	Reactor	54	No	No	
J301Q	1-BJ-PT-4891		Press Trans.	Reactor	77	No	No	
M082Q	1-AP-228		Jockey Pump Motor	Reactor	54	No	No	
M001	1-FD-FV-4879	E41	Flow Control Valve Actuator	Reactor	54	No	No	
M001	1-FD-FV-4880	E41	Flow Control Valve Actuator	Reactor	54	No	No	
P328	1-FD-HV-4922		Control Valve	Reactor	54	No	No	
M001	1-OP-213		Aux. Oil Pump Motor	Reactor	54	No	No	
M001	1-BJ-PT-N053		Press. Trans.	Reactor	54	No	No	
M001	1-FD-PT-N056E	E41	Press. Trans.	Reactor	54	No	No	
M001	1-FD-PT-N055A	E41	Press. Trans.	Reactor	77	No	No	
M001	1-FD-PT-N055C	E41	Press. Trans.	Reactor	77	No	No	
M001	1-FD-PT-N055E	E41	Press. Trans.	Reactor	77	No	No	
M001	1-FD-PT-N055G	E41	Press. Trans.	Reactor	77	No	No	
J601Q	1-FD-SV-F025		Solenoid Valve	Reactor	54	No	No	
P103AQ	1-FD-SV-F026	E41	Solenoid Valve	Reactor	54	No	No	



HCGS FSAR  
TABLE 3.11-5

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

P&ID  
M-58-1

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SYSTEM: CONTAINMENT HYDROGEN RECOMBINATION SYSTEM  
GS

P.O.	ID NO.	MPL NO.	COMPONENT	LOCATION		FAM EQUIP. NOTE (1)	TMI ACTION PLAN EQUIP. NOTE (2)	COMMENTS
				BLDG.	ELEV.			
M47AQ	1-AC-215		Power Panel	Reactor	162	No	No	
M47AQ	1-AE-215		Heater	Reactor	162	No	No	
M47AQ	1-AS-205		Hydrogen Recombiner	Reactor	162	No	No	
M47AQ	1-AV-215		Fan Motor	Reactor	162	No	No	
M47AQ	1-BC-215		Power Panel	Reactor	162	No	No	
M47AQ	1-BE-215		Heater	Reactor	162	No	No	
M47AQ	1-BS-205		Hydrogen Recombiner	Reactor	162	No	No	
M47AQ	1-BV-215		Fan Motor	Reactor	162	No	No	
M47AQ	1-GS-FT-5066A		Flow Trans.	Reactor	162	No	No	
M47AQ	1-GS-FT-5066B		Flow Trans.	Reactor	162	No	No	
M47AQ	1-GS-FT-5067A		Flow Trans.	Reactor	162	No	No	
M47AQ	1-GS-FT-5067B		Flow Trans.	Reactor	162	No	No	
P301Q	1-GS-HV-5050A		Contr. Valve	Reactor	145	No	Yes	
P301Q	1-GS-HV-5050B		Contr. Valve	Reactor	102	No	Yes	
P301Q	1-GS-HV-5052A		Contr. Valve	Reactor	145	No	Yes	
P301Q	1-GS-HV-5052B		Contr. Valve	Reactor	102	No	Yes	
P301Q	1-GS-HV-5053A		Contr. Valve	Reactor	77	No	Yes	
P301Q	1-GS-HV-5053B		Contr. Valve	Reactor	77	No	Yes	
P301Q	1-GS-HV-5054A		Contr. Valve	Reactor	77	No	Yes	
P301Q	1-GS-HV-5054B		Contr. Valve	Reactor	77	No	Yes	
P303AQ	1-GS-HV-5055A		Contr. Valve	Reactor	54	No	No	
P303AQ	1-GS-HV-5055B		Contr. Valve	Reactor	77	No	No	
P303AQ	1-GS-HV-5057A		Contr. Valve	Reactor	54	No	No	
P303AQ	1-GS-HV-5057B		Contr. Valve	Reactor	77	No	No	
M47AQ	1-GS-HV-5077A		Contr. Valve	Reactor	162	No	No	
M47AQ	1-GS-HV-5077B		Contr. Valve	Reactor	162	No	No	
M47AQ	1-GS-HV-5078A		Contr. Valve	Reactor	162	No	No	
M47AQ	1-GS-HV-5078B		Contr. Valve	Reactor	162	No	No	
M47AQ	1-GS-HV-5079B		Contr. Valve	Reactor	162	No	No	
M47AQ	1-GS-HV-5080A		Contr. Valve	Reactor	162	No	No	
M47AQ	1-GS-HV-5080B		Contr. Valve	Reactor	162	No	No	
M47AQ	1-GS-PT-5098A		Press. Trans.	Reactor	162	No	No	
M47AQ	1-GS-PT-5098B		Press. Trans.	Reactor	162	No	No	
M47AQ	1-GS-TE-5068A		Temp. Elemt.	Reactor	162	No	No	
M47AQ	1-GS-TE-5068B		Temp. Elemt.	Reactor	162	No	No	
M47AQ	1-GS-TE-5069A		Temp. Elemt.	Reactor	162	No	No	
M47AQ	1-GS-TE-5069B		Temp. Elemt.	Reactor	162	No	No	
M47AQ	1-GS-TE-5070A		Temp. Elemt.	Reactor	162	No	No	
M47AQ	1-GS-TE-5070B		Temp. Elemt.	Reactor	162	No	No	
M47AQ	1-GS-TE-5073A		Temp. Elemt.	Reactor	162	No	No	
M47AQ	1-GS-TE-5073B		Temp. Elemt.	Reactor	162	No	No	
M47AQ	1-GS-TE-5074A1		Temp. Elemt.	Reactor	162	No	No	
M47AQ	1-GS-TE-5074A2		Temp. Elemt.	Reactor	162	No	No	

HCGS FSAR  
TABLE 3.11-5

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

P&ID  
M-5B-1

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SYSTEM: CONTAINMENT HYDROGEN RECOMBINATION SYSTEM  
GS

P.O.	ID NO.	MPL NO.	COMPONENT	LOCATION		PAM EQUIP. NOTE (1)	TMI ACTION PLAN EQUIP. NOTE (2)	COMMENTS
				BLDG.	ELEV.			
M47A0	1-GS-TE-5074B1		Temp. Elemt.	Reactor	162	No	No	
M47A0	1-GS-TE-5074B2		Temp. Elemt.	Reactor	162	No	No	
M47A0	1-GS-TE-5075A		Temp. Elemt.	Reactor	162	No	No	
M47A0	1-GS-TE-5075B		Temp. Elemt.	Reactor	162	No	No	
M47A0	1-GS-TE-5076A		Temp. Elemt.	Reactor	162	No	No	
M47A0	1-GS-TE-5076B		Temp. Elemt.	Reactor	162	No	No	
M47A0	1-GS-TE-5097A		Temp. Elemt.	Reactor	162	No	No	
M47A0	1-GS-TE-5097B		Temp. Elemt.	Reactor	162	No	No	
P3010	1-GS-ZS-5050A		Limit Switch	Reactor	145	Yes	No	
P3010	1-GS-ZS-5050B		Limit Switch	Reactor	102	Yes	No	
P3010	1-GS-ZS-5052A		Limit Switch	Reactor	145	Yes	No	
P3010	1-GS-ZS-5052B		Limit Switch	Reactor	102	Yes	No	
P3010	1-GS-ZS-5053A		Limit Switch	Reactor	77	Yes	No	
P3010	1-GS-ZS-5053B		Limit Switch	Reactor	77	Yes	No	
P3010	1-GS-ZS-5054A		Limit Switch	Reactor	77	Yes	No	
P3010	1-GS-ZS-5054B		Limit Switch	Reactor	77	Yes	No	

HCGS FSAR  
TABLE 3.11-5

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

P&ID  
M-59-1

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SYSTEM: PRIMARY CONTAINMENT INSTRUMENT GAS  
KL

P.O.	ID NO.	MPL NO.	COMPONENT	LOCATION		PAM EQUIP. NOTE (1)	TMI ACTION PLAN EQUIP. NOTE (2)	COMMENTS
				BLDG.	ELEV.			
M480	1-AC-213		Compressor A CTRL PNL	Reactor	132	No	No	
M480	1-AK-202		Compressor Instr. Gas	Reactor	132	No	No	
M480	1-BC-213		Compressor B CTRL PNL	Reactor	132	No	No	
M480	1-BK-202		Compressor Instr. Gas	Reactor	132	No	No	
M480	1-KL-HS-5137A-2		Hand Switch	Reactor	132	No	No	
M480	1-KL-HS-5137B-2		Hand Switch	Reactor	132	No	No	
P303AQ	1-KL-HV-5124A		Control Valve	Reactor	102	No	No	
P303AQ	1-KL-HV-5124B		Control Valve	Reactor	121	No	No	
P303AQ	1-KL-HV-5126A		Control Valve	Reactor	102	No	No	
P303AQ	1-KL-HV-5126B		Control Valve	Reactor	102	No	No	
P303AQ	1-KL-HV-5147		Control Valve	Reactor	145	No	No	
P303AQ	1-KL-HV-5148		Control Valve	Reactor	145	No	No	
P303AQ	1-KL-HV-5152A		Control Valve	Reactor	100	No	No	
P303AQ	1-KL-HV-5152B		Control Valve	Reactor	100	No	No	
P303AQ	1-KL-HV-5160A		Control Valve	Reactor	132	No	No	
P303AQ	1-KL-HV-5160B		Control Valve	Reactor	132	No	No	
P303AQ	1-KL-HV-5162		Control Valve	Reactor	132	No	No	
P303AQ	1-KL-HV-5172A		Control Valve	Reactor	102	No	No	
P303AQ	1-KL-HV-5172B		Control Valve	Reactor	102	No	No	
M480	1-KL-MAH-5031A		Moisture Alarm High	Reactor	132	No	No	
M480	1-KL-MAH-5031B		Moisture Alarm High	Reactor	132	No	No	
M480	1-KL-ME-5031A		Moisture Element	Reactor	132	No	No	
M480	1-KL-ME-5031B		Moisture Element	Reactor	132	No	No	
M480	1-KL-PAH-5140A		Press Alarm High	Reactor	132	No	No	
M480	1-KL-PAH-5140B		Press Alarm High	Reactor	132	No	No	
M480	1-KL-PAL-5142A		Press Alarm Low	Reactor	132	No	No	
M480	1-KL-PAL-5142B		Press Alarm Low	Reactor	132	No	No	
M480	1-KL-PAL-5145A		Press Alarm Low	Reactor	132	No	No	
M480	1-KL-PAL-5145B		Press Alarm Low	Reactor	132	No	No	
M480	1-KL-PAL-5158A		Press Alarm Low	Reactor	132	No	No	
M480	1-KL-PAL-5158B		Press Alarm Low	Reactor	132	No	No	
M480	1-KL-PSH-5131A		Press Switch High	Reactor	132	No	No	
M480	1-KL-PSH-5131B		Press Switch High	Reactor	132	No	No	
M480	1-KL-PSH-5140A		Press Switch High	Reactor	132	No	No	
M480	1-KL-PSH-5140B		Press Switch High	Reactor	132	No	No	
M480	1-KL-PSL-5130A		Press Switch Low	Reactor	132	No	No	
M480	1-KL-PSL-5130B		Press Switch Low	Reactor	132	No	No	
M480	1-KL-PSL-5142A		Press Switch Low	Reactor	132	No	No	
M480	1-KL-PSL-5142B		Press Switch Low	Reactor	132	No	No	
M480	1-KL-PSL-5145A		Press Switch Low	Reactor	132	No	No	

HCGS FSAR  
TABLE 3.11-5

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

P&ID  
M-59-1

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SYSTEM: PRIMARY CONTAINMENT INSTRUMENT GAS  
KL

F.O.	ID NO.	MPL. NO.	COMPONENT	LOCATION		PAM EQUIP. NOTE (1)	TMI ACTION PLAN EQUIP. NOTE (2)	COMMENTS
				BLDG.	ELEV.			
M48Q	1-KL-PSL-5145B		Press Switch Low	Reactor	132	No	No	
M48Q	1-KL-PSL-5158A		Press Switch Low	Reactor	132	No	No	
M48Q	1-KL-PSL-5158B		Press Switch Low	Reactor	132	No	No	
M48Q	1-KL-PSLL-5132A		Press Switch Low Low	Reactor	132	No	No	
M48Q	1-KL-PSLL-5132B		Press Switch Low Low	Reactor	132	No	No	
P303AQ	1-KL-SV-5154		Solenoid Valve	Reactor	77	No	No	
P303AQ	1-KL-SV-5155		Solenoid Valve	Reactor	77	No	No	
P303AQ	1-KL-SV-5156A		Solenoid Valve	Reactor	132	No	No	
P303AQ	1-KL-SV-5156B		Solenoid Valve	Reactor	132	No	No	
M48Q	1-KL-SV-5157A		Solenoid Valve	Reactor	132	No	No	
M48Q	1-KL-SV-5157B		Solenoid Valve	Reactor	132	No	No	
P303AQ	1-SE-SV-5161		Solenoid Valve	Reactor	100	No	No	
M48Q	1-KL-SV-5164A		Solenoid Valve	Reactor	132	No	No	
M48Q	1-KL-SV-5164B		Solenoid Valve	Reactor	132	No	No	
M001	1-SE-SV-J004A-1	C51	Solenoid Valve	Reactor	102	No	No	C51-J600JA K16
M001	1-SE-SV-J004A-2	C51	Solenoid Valve	Reactor	102	No	No	C51-J600JA K26
M001	1-SE-SV-J004A-3	C51	Solenoid Valve	Reactor	102	No	No	C51-J600JB K16
M001	1-SE-SV-J004A-4	C51	Solenoid Valve	Reactor	102	No	No	C51-J600JB K26
M001	1-SE-SV-J004A-5	C51	Solenoid Valve	Reactor	102	No	No	C51-J6004 K16
M48Q	1-KL-TAH-5141A		Temp. Alarm High	Reactor	132	No	No	
M48Q	1-KL-TAH-5141B		Temp. Alarm High	Reactor	132	No	No	
M48Q	1-KL-TAH-5143A		Temp. Alarm High	Reactor	132	No	No	
M48Q	1-KL-TAH-5143B		Temp. Alarm High	Reactor	132	No	No	
M48Q	1-KL-TAH-5144A		Temp. Alarm High	Reactor	132	No	No	
M48Q	1-KL-TAH-5144B		Temp. Alarm High	Reactor	132	No	No	
M48Q	1-KL-TAH-5159A		Temp. Alarm High	Reactor	132	No	No	
M48Q	1-KL-TAH-5159B		Temp. Alarm High	Reactor	132	No	No	
M48Q	1-KL-TAH-5221A		Temp. Alarm High	Reactor	132	No	No	
M48Q	1-KL-TAH-5221B		Temp. Alarm High	Reactor	132	No	No	
M48Q	1-KL-TAH-5223A		Temp. Alarm High	Reactor	132	No	No	
M48Q	1-KL-TAH-5223B		Temp. Alarm High	Reactor	132	No	No	
M48Q	1-KL-TSH-5141A		Temp. Switch High	Reactor	132	No	No	
M48Q	1-KL-TSH-5141B		Temp. Switch High	Reactor	132	No	No	
M48Q	1-KL-TSH-5143A		Temp. Switch High	Reactor	132	No	No	
M48Q	1-KL-TSH-5143B		Temp. Switch High	Reactor	132	No	No	
M48Q	1-KL-TSH-5144A		Temp. Switch High	Reactor	132	No	No	
M48Q	1-KL-TSH-5144B		Temp. Switch High	Reactor	132	No	No	
M48Q	1-KL-TSH-5159A		Temp. Switch High	Reactor	132	No	No	
M48Q	1-KL-TSH-5159B		Temp. Switch High	Reactor	132	No	No	
M48Q	1-KL-TSH-5221A		Temp. Switch High	Reactor	132	No	No	
M48Q	1-KL-TSH-5221B		Temp. Switch High	Reactor	132	No	No	
M48Q	1-KL-TSH-5223A		Temp. Switch High	Reactor	132	No	No	

HCGS FSAR  
TABLE 3.11-5

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

PAID  
M-59-1

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SYSTEM: PRIMARY CONTAINMENT INSTRUMENT GAS  
KL

P.O.	ID NO.	MPL NO.	COMPONENT	LOCATION		PAM EQUIP. NOTE (1)	TMI ACTION PLAN EQUIP. NOTE (2)	COMMENTS
				BLDG.	ELEV.			
M48Q	1-KL-TSH-5223B		Temp. Switch High	Reactor	132	No	No	
P303AQ	1-KL-ZS-5126A		Limit Switch	Reactor	102	Yes	No	
P303AQ	1-KL-ZS-5126B		Limit Switch	Reactor	102	Yes	No	
P303AQ	1-KL-ZS-5147		Limit Switch	Reactor	145	Yes	No	
P303AQ	1-KL-ZS-5148		Limit Switch	Reactor	145	Yes	No	
P303AQ	1-KL-ZS-5152A		Limit Switch	Reactor	100	Yes	No	
P303AQ	1-KL-ZS-5152B		Limit Switch	Reactor	100	Yes	No	
P303AQ	1-KL-ZS-5154		Limit Switch	Reactor	77	Yes	No	
P303AQ	1-KL-ZS-5155		Limit Switch	Reactor	77	Yes	No	
P303AQ	1-KL-ZS-5161		Limit Switch	Reactor	100	Yes	No	
P303AQ	1-KL-ZS-5162		Limit Switch	Reactor	132	Yes	No	

HCGS FSAR  
TABLE 3.11-5

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

P&ID  
M-61-1

SYSTEM: LIQUID RADWASTE COLLECTION  
HB

P.O.	ID NO.	MPL NO.	COMPONENT	LOCATION		PAM EQUIP. NOTE (1)	TMI ACTION PLAN EQUIP. NOTE (2)		COMMENTS
				BLDG.	ELEV.				
P301Q	1-HB-HV-5262		Control Valve	Reactor	77	No	No		
P301Q	1-HB-HV-5275		Control Valve	Reactor	77	No	No		
P301Q	1-HB-HV-F003	G14	Control Valve	Reactor	77	No	No		
P301Q	1-HB-HV-F004	G14	Control Valve	Reactor	77	No	No		
P301Q	1-HB-HV-F019	G14	Control Valve	Reactor	77	No	No		
P301Q	1-HB-HV-F020	G14	Control Valve	Reactor	77	No	No		
P301Q	1-HB-ZS-F003	G14	Limit Switch	Reactor	77	Yes	No		
P301Q	1-HB-ZS-F004	G14	Limit Switch	Reactor	77	Yes	No		
P301Q	1-HB-ZS-F019	G14	Limit Switch	Reactor	77	Yes	No		
P301Q	1-HB-ZS-F020	G14	Limit Switch	Reactor	77	Yes	No		



HCS PSAR  
TABLE 2.11-5

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

P41D  
M-66-0

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SYSTEM: SOLID RADWASTE COLLECTION  
HC

P.O.	ID NO.	MPL NO.	COMPONENT	LOCATION:		PAM EQUIP. NOTE (1)	THE ACTION PLAN EQUIP. NOTE (2)		COMMENTS
				BLDG.	ELEV.				
P3050	1-GH-HV-5543		Contr. Valve	Reactor	77	No	No		
P3010	1-HC-HV-5551		Contr. Valve	Reactor	132	No	No		

HCCS FSAR  
TABLE 3.11-5

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

P&ID  
M-72-1

SYSTEM: MAIN STEAM ISO VLV SEAL SYS  
KP

P.O.	ID. NO.	MPL. NO.	COMPONENT	LOCATION BLDG.	ELEV.	FAM EQUIP. NOTE (1)	TMI ACTION PLAN EQUIP. NOTE (2)	COMMENTS
M001	1-AB-PT-5834R		Press Trans.	Reactor	102	No	No	
M001	1-AB-PT-5835A		Press Trans.	Reactor	102	Yes	No	
M001	1-AB-PT-5835B		Press Trans.	Reactor	102	No	No	
M001	1-AB-PT-5836A		Press Trans.	Reactor	102	Yes	No	
M001	1-AB-PT-5836B		Press Trans.	Reactor	102	No	No	
M001	1-AB-PT-5837A		Press Trans.	Reactor	102	Yes	No	
M001	1-AB-PT-5837B		Press Trans.	Reactor	102	No	No	
M001	1-BB-PT-5824A		Press Trans.	Reactor	145	No	No	
M001	1-BB-PT-5824B		Press Trans.	Reactor	145	No	No	
J301Q	1-KP-PT-6051A		Flow Trans.	Reactor	102	No	No	
J301Q	1-KP-PT-6053R		Flow Trans.	Reactor	102	No	No	
P303AQ	1-KP-HV-5829A		Control Valve	Reactor	102	No	No	
P303AQ	1-KP-HV-5829B		Control Valve	Reactor	102	No	No	
P303AQ	1-KP-HV-5834A		Control Valve	Reactor	102	No	No	
P303AQ	1-KP-HV-5834B		Control Valve	Reactor	102	No	No	
P303AQ	1-KP-HV-5835A		Control Valve	Reactor	102	No	No	
P303AQ	1-KP-HV-5835B		Control Valve	Reactor	102	No	No	
P303AQ	1-KP-HV-5836A		Control Valve	Reactor	102	No	No	
P303AQ	1-KP-HV-5836B		Control Valve	Reactor	102	No	No	
P303AQ	1-KP-HV-5837A		Control Valve	Reactor	102	No	No	
P303AQ	1-KP-HV-5837B		Control Valve	Reactor	102	No	No	
J603Q	1-KL-PDV-5825A		Press. Diff. Valve	Reactor	102	No	No	
J603Q	1-KL-PDV-5825B		Press. Diff. Valve	Reactor	102	No	No	
J603Q	1-KL-PDY-5825A		Press. Diff. Converter	Reactor	102	No	No	
J603Q	1-KL-PDY-5825B		Press. Diff. Converter	Reactor	102	No	No	
J301Q	1-KP-PT-5827A		Press Trans.	Reactor	102	No	No	
J301Q	1-KP-PT-5827B		Press Trans.	Reactor	102	No	No	
M001	1-AB-PT-5834A		Press Trans.	Reactor	102	No	No	
P303AQ	1-KP-SV-6055A		Solenoid Valve	Reactor	77	Yes	No	
P303AQ	1-KP-SV-6055B		Solenoid Valve	Reactor	77	No	No	
P303AQ	1-KL-SV-6057		Solenoid Valve	Reactor	77	No	No	
P303AQ	1-KP-ZS-5834A		Limit Switch	Reactor	102	Yes	No	
P303AQ	1-KP-ZS-5835B		Limit Switch	Reactor	102	Yes	No	
P303AQ	1-KP-ZS-5834B		Limit Switch	Reactor	102	Yes	No	
P303AQ	1-KP-ZS-5835A		Limit Switch	Reactor	102	Yes	No	
P303AQ	1-KP-ZS-5836A		Limit Switch	Reactor	102	Yes	No	
P303AQ	1-KP-ZS-5836B		Limit Switch	Reactor	102	Yes	No	
P303AQ	1-KP-ZS-5837A		Limit Switch	Reactor	102	Yes	No	
P303AQ	1-KP-ZS-5837B		Limit Switch	Reactor	102	Yes	No	

HCGS PSAR  
TABLE 3.11-5

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

P&ID  
M-83-1

SYSTEM: REACTOR BLDG, SUPPLY CONTROL DIAG.  
GR

P.O.	ID NO.	MPL NO.	COMPONENT	LOCATION		PAM EQUIP. NOTE (1)	TMI ACTION PLAN EQUIP. NOTE (2)	COMMENTS
				BLDG.	ELEV.			
M780AQ	1-GU-FSL-9377AA		Flow Sw. Low	Reactor	145	No	No	
M780AQ	1-GU-FSL-9377AB		Flow Sw. Low	Reactor	145	No	No	
M780AQ	1-GU-FSL-9377BA		Flow Sw. Low	Reactor	178	No	No	
M780AQ	1-GU-FSL-9377BB		Flow Sw. Low	Reactor	178	No	No	
M780AQ	1-GU-FSL-9377CA		Flow Sw. Low	Reactor	145	No	No	
M780AQ	1-GU-FSL-9377CB		Flow Sw. Low	Reactor	145	No	No	
M780AQ	1-GU-FSL-9377DA		Flow Sw. Low	Reactor	162	No	No	
M780AQ	1-GU-FSL-9377DB		Flow Sw. Low	Reactor	162	No	No	
M780AQ	1-GU-FT-9377A		Flow Trans.	Reactor	145	No	No	
M780AQ	1-GU-FT-9377B		Flow Trans.	Reactor	178	No	No	
M780AQ	1-GU-FT-9377C		Flow Trans.	Reactor	145	No	No	
M780AQ	1-GU-FT-9377D		Flow Trans.	Reactor	162	No	No	
M780AQ	1-GU-FT-9377E		Flow Trans.	Reactor	162	No	No	
M780AQ	1-GU-FT-9377F		Flow Trans.	Reactor	162	No	No	
J301Q	1-GU-FT-9394A		Flow Trans.	Reactor	132	No	No	
J301Q	1-GU-FT-9394B		Flow Trans.	Reactor	178	No	No	
J301Q	1-GU-FT-9394C		Flow Trans.	Reactor	132	No	No	
J301Q	1-GU-FT-9394D		Flow Trans.	Reactor	162	No	No	
J301Q	1-GU-FT-9394E		Flow Trans.	Reactor	162	No	No	
J301Q	1-GU-FT-9394F		Flow Trans.	Reactor	178	No	No	
M717Q	1-GU-HD-9377A-1		Hand Damper Actuator	Reactor	132	No	No	
M717Q	1-GU-HD-9377A-2		Hand Damper Actuator	Reactor	145	No	No	
M717Q	1-GU-HD-9377B-1		Hand Damper Actuator	Reactor	178	No	No	
M717Q	1-GU-HD-9377B-2		Hand Damper Actuator	Reactor	178	No	No	
M717Q	1-GU-HD-9377C-1		Hand Damper Actuator	Reactor	132	No	No	
M717Q	1-GU-HD-9377C-2		Hand Damper Actuator	Reactor	145	No	No	
M717Q	1-GU-HD-9377D-1		Hand Damper Actuator	Reactor	162	No	No	
M717Q	1-GU-HD-9377D-2		Hand Damper Actuator	Reactor	162	No	No	
M717Q	1-GU-HD-9377E-1		Hand Damper Actuator	Reactor	162	No	No	
M717Q	1-GU-HD-9377E-2		Hand Damper Actuator	Reactor	162	No	No	
M717Q	1-GU-HD-9377F-2		Hand Damper Actuator	Reactor	178	No	No	
M780AQ	1-GU-MT-9379A		Moisture Trans.	Reactor	132	No	No	
M780AQ	1-GU-MT-9379B		Moisture Trans.	Reactor	178	No	No	
M780AQ	1-GU-MT-9379C		Moisture Trans.	Reactor	132	No	No	
M780AQ	1-GU-MT-9379D		Moisture Trans.	Reactor	162	No	No	
M780AQ	1-GU-MT-9379E		Moisture Trans.	Reactor	162	No	No	
M780AQ	1-GU-MT-9379F		Moisture Trans.	Reactor	178	No	No	
M786Q	1-GU-MY-9379A		Moisture Converter	Reactor	132	No	No	
M786Q	1-GU-MY-9379B		Moisture Converter	Reactor	178	No	No	
M786Q	1-GU-MY-9379C		Moisture Converter	Reactor	132	No	No	
M786Q	1-GU-MY-9379D		Moisture Converter	Reactor	162	No	No	
M786Q	1-GU-MY-9379E		Moisture Converter	Reactor	162	No	No	

HCCS FSAR  
TABLE 3.11-5

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

P&ID  
M-81-1

Page 56 of

SYSTEM: REACTOR BLDG. SUPPLY CONTROL DIAG.  
GR

P.O.	ID NO.	MPL NO.	COMPONENT	LOCATION		PAM EQUIP. NOTE (1)	TMI ACTION PLAN EQUIP. NOTE (2)		COMMENTS
				BLDG.	ELEV.				
M786Q	1-GU-MY-9379F		Moisture Converter	Reactor	178	No		No	
M70AQ	1-GU-PDSH-9377A1		Press. Diff. Sw. High	Reactor	132	No		No	
M780AQ	1-GU-PDSH-9377B1		Press. Diff. Sw. High	Reactor	178	No		No	
M780AQ	1-GU-PDSH-9377C1		Press. Diff. Sw. High	Reactor	132	No		No	
M780AQ	1-GU-PDSH-9377D1		Press. Diff. Sw. High	Reactor	162	No		No	
M780AQ	1-GU-PDSH-9377E1		Press. Diff. Sw. High	Reactor	162	No		No	
M780AQ	1-GU-PDSH-9377F1		Press. Diff. Sw. High	Reactor	178	No		No	
M780AQ	1-GU-PDT-9377A		Press. Diff. Trans.	Reactor	132	No		No	
M780AQ	1-GU-PDT-9377C		Press. Diff. Trans.	Reactor	132	No		No	
M780AQ	1-GU-PDT-9377D		Press. Diff. Trans.	Reactor	162	No		No	
M780AQ	1-GU-PDT-9377E		Press. Diff. Trans.	Reactor	162	No		No	
M780AQ	1-GU-PDT-9377F		Press. Diff. Trans.	Reactor	178	No		No	
M728Q	1-GU-SV-9370B		Solenoid Valve	Reactor	178	No		No	
M780AQ	1-GU-SV-9372C		Solenoid Valve	Reactor	162	No		No	
M786Q	1-GU-TE-9377A		Temp. Elemt.	Reactor	132	No		No	
M786Q	1-GU-TE-9377B		Temp. Elemt.	Reactor	178	No		No	
M786Q	1-GU-TE-9377C		Temp. Elemt.	Reactor	132	No		No	
M786Q	1-GU-TE-9377D		Temp. Elemt.	Reactor	162	No		No	
M786Q	1-GU-TE-9377E		Temp. Elemt.	Reactor	162	No		No	
M786Q	1-GU-TE-9377F		Temp. Elemt.	Reactor	178	No		No	
M780AQ	1-GU-TE-9378A		Temp. Elemt.	Reactor	132	No		No	
M780AQ	1-GU-TE-9378B		Temp. Elemt.	Reactor	178	No		No	
M780AQ	1-GU-TE-9378C		Temp. Elemt.	Reactor	132	No		No	
M780AQ	1-GU-TE-9378D		Temp. Elemt.	Reactor	162	No		No	
M780AQ	1-GU-TE-9378E		Temp. Elemt.	Reactor	162	No		No	
M780AQ	1-GU-TE-9378F		Temp. Elemt.	Reactor	178	No		No	
M717Q	1-GT-2S-9372A		Limit Switch	Reactor	145	Yes		No	
M780AQ	1-AC-281		Unit Cooler Ctrl Pnl.	Reactor	102	No		No	
M713Q	1-AV-213		Fan & E-H Actuator	Reactor	132	No		No	
M786Q	1-AVE-213		Heater	Reactor	132	No		No	
M711Q	1-AVH-208		Unit Cooler	Reactor	54	No		No	
M711Q	1-AVH-209		Unit Cooler	Reactor	54	No		No	
M711Q	1-AVH-210		Unit Cooler	Reactor	54	No		No	
M711Q	1-AVH-211		Unit Cooler	Reactor	54	No		No	
M711Q	1-AVH-214		Unit Cooler	Reactor	102	No		No	
M780AQ	1-BC-281		Unit Cooler Ctrl Pnl.	Reactor	102	No		No	
M713Q	1-BV-213		Fan & E-H Actuator	Reactor	178	No		No	
M786Q	1-BVE-213		Heater	Reactor	178	No		No	
M711Q	1-BVH-208		Unit Cooler	Reactor	54	No		No	
M711Q	1-BVH-209		Unit Cooler	Reactor	54	No		No	
M711Q	1-BVH-210		Unit Cooler	Reactor	54	No		No	
M711Q	1-BVH-211		Unit Cooler	Reactor	54	No		No	

HCGS FSAR  
TABLE 3.11-5

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

P&ID  
M-83-1

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SYSTEM: REACTOR BLDG. SUPPLY CONTROL DIAG.  
GR

P.O.	ID NO.	MPL NO.	COMPONENT	LOCATION		PAM EQUIP. NOTE (1)	TMI ACTION PLAN EQUIP. NOTE (2)	COMMENTS
				BLDG.	ELEV.			
M7110	1-BVH-214		Unit Cooler	Reactor	102	No	No	
M780AQ	1-CC-281		Unit Cooler Ctrl Pnl.	Reactor	102	No	No	
M7130	1-CV-213		Fan & E-H Actuator	Reactor	132	No	No	
M7860	1-CVE-213		Heater	Reactor	132	No	No	
M7110	1-CVH-210		Unit Cooler	Reactor	54	No	No	
M7110	1-CVH-211		Unit Cooler	Reactor	54	No	No	
M7110	1-CVH-214		Unit Cooler	Reactor	102	No	No	
M780AQ	1-DC-281		Unit Cooler Ctrl Pnl.	Reactor	77	No	No	
M7130	1-DV-213		Fan & E-H Actuator	Reactor	162	No	No	
M7860	1-DVE-213		Heater	Reactor	162	No	No	
M7110	1-DVH-210		Unit Cooler	Reactor	54	No	No	
M7110	1-DVH-211		Unit Cooler	Reactor	54	No	No	
M7110	1-DVH-214		Unit Cooler	Reactor	102	No	No	
M7130	1-EV213		Fan & E-H Actuator	Reactor	162	No	No	
M7860	1-EVE-213		Heater	Reactor	162	No	No	
M7110	1-EVH-210		Unit Cooler	Reactor	77	No	No	
M7110	1-EVH-211		Unit Cooler	Reactor	54	No	No	
M780AQ	1-GR-FSL-9381A1		Flow Sw. Low	Reactor	54	No	No	
M780AQ	1-GR-FSL-9381A3		Flow Sw. Low	Reactor	54	No	No	
M780AQ	1-GR-FSL-9381B1		Flow Sw. Low	Reactor	54	No	No	
M780AQ	1-GR-FSL-9381B3		Flow Sw. Low	Reactor	54	No	No	
M780AQ	1-GR-FSL-9382A1		Flow Sw. Low	Reactor	54	No	No	
M780AQ	1-GR-FSL-9382A3		Flow Sw. Low	Reactor	54	No	No	
M780AQ	1-GR-FSL-9382B1		Flow Sw. Low	Reactor	54	No	No	
M780AQ	1-GR-FSL-9382B3		Flow Sw. Low	Reactor	54	No	No	
M780AQ	1-GR-FSL-9383A1		Flow Sw. Low	Reactor	54	No	No	
M780AQ	1-GR-FSL-9383A3		Flow Sw. Low	Reactor	54	No	No	
M780AQ	1-GR-FSL-9383B1		Flow Sw. Low	Reactor	54	No	No	
M780AQ	1-GR-FSL-9383B3		Flow Sw. Low	Reactor	54	No	No	
M780AQ	1-GR-FSL-9383C1		Flow Sw. Low	Reactor	54	No	No	
M780AQ	1-GR-FSL-9383C3		Flow Sw. Low	Reactor	54	No	No	
M780AQ	1-GR-FSL-9383D1		Flow Sw. Low	Reactor	54	No	No	
M780AQ	1-GR-FSL-9383D3		Flow Sw. Low	Reactor	54	No	No	
M780AQ	1-GR-FSL-9383E1		Flow Sw. Low	Reactor	77	No	No	
M780AQ	1-GR-FSL-9383E3		Flow Sw. Low	Reactor	77	No	No	
M780AQ	1-GR-FSL-9383F1		Flow Sw. Low	Reactor	77	No	No	
M780AQ	1-GR-FSL-9383F3		Flow Sw. Low	Reactor	77	No	No	
M780AQ	1-GR-FSL-9383G1		Flow Sw. Low	Reactor	54	No	No	
M780AQ	1-GR-FSL-9383G3		Flow Sw. Low	Reactor	54	No	No	
M780AQ	1-GR-FSL-9383H1		Flow Sw. Low	Reactor	54	No	No	
M780AQ	1-GR-FSL-9383H3		Flow Sw. Low	Reactor	54	No	No	

HCCS FSAR  
TABLE 3.11-5

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

P&ID  
M-83-1

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SYSTEM: REACTOR BLDG. SUPPLY CONTROL DIAG.  
GR

P.O.	ID NO.	MPL NO.	COMPONENT	LOCATION		P&I EQUIP. NOTE (1)	TMI ACTION PLAN EQUIP. NOTE (2)	COMMENTS
				BLDG.	ELEV.			
M780AQ	1-GR-FSL-9384A1		Flow Sw. Low	Reactor	54	No	No	
M780AQ	1-GR-FSL-9384A3		Flow Sw. Low	Reactor	54	No	No	
M780AQ	1-GR-FSL-9384B1		Flow Sw. Low	Reactor	54	No	No	
M780AQ	1-GR-FSL-9384B3		Flow Sw. Low	Reactor	54	No	No	
M780AQ	1-GR-FSL-9384C1		Flow Sw. Low	Reactor	54	No	No	
M780AQ	1-GR-FSL-9384C3		Flow Sw. Low	Reactor	54	No	No	
M780AQ	1-GR-FSL-9384D1		Flow Sw. Low	Reactor	54	No	No	
M780AQ	1-GR-FSL-9384D3		Flow Sw. Low	Reactor	54	No	No	
M780AQ	1-GR-FSL-9384E1		Flow Sw. Low	Reactor	54	No	No	
M780AQ	1-GR-FSL-9384E3		Flow Sw. Low	Reactor	54	No	No	
M780AQ	1-GR-FSL-9384F1		Flow Sw. Low	Reactor	54	No	No	
M780AQ	1-GR-FSL-9384F3		Flow Sw. Low	Reactor	54	No	No	
M780AQ	1-GR-FSL-9384G1		Flow Sw. Low	Reactor	54	No	No	
M780AQ	1-GR-FSL-9384G3		Flow Sw. Low	Reactor	54	No	No	
M780AQ	1-GR-FSL-9384H1		Flow Sw. Low	Reactor	54	No	No	
M780AQ	1-GR-FSL-9384H3		Flow Sw. Low	Reactor	54	No	No	
M780AQ	1-GR-FSL-9385A1		Flow Sw. Low	Reactor	102	No	No	
M780AQ	1-GR-FSL-9385A3		Flow Sw. Low	Reactor	102	No	No	
M780AQ	1-GR-FSL-9385B1		Flow Sw. Low	Reactor	102	No	No	
M780AQ	1-GR-FSL-9385B3		Flow Sw. Low	Reactor	102	No	No	
M780AQ	1-GR-FSL-9385C1		Flow Sw. Low	Reactor	102	No	No	
M780AQ	1-GR-FSL-9385C3		Flow Sw. Low	Reactor	102	No	No	
M780AQ	1-GR-FSL-9385D1		Flow Sw. Low	Reactor	102	No	No	
M780AQ	1-GR-FSL-9385D3		Flow Sw. Low	Reactor	102	No	No	
M713Q	1-FV-213		Fan & E-H Actuator	Reactor	178	No	No	
M786Q	1-FVE-213		Heater	Reactor	178	No	No	
M711Q	1-FVH-210		Unit Cooler	Reactor	77	No	No	
M711Q	1-FVH-211		Unit Cooler	Reactor	54	No	No	
M711Q	1-GVH-210		Unit Cooler	Reactor	54	No	No	
M711Q	1-GVH-211		Unit Cooler	Reactor	54	No	No	
M717Q	1-GU-HD-9377F-1		Hand Damper Actuator	Reactor	162	No	No	
M780AQ	1-GR-HS-9381A		Hand Switch	Reactor	102	No	No	
M780AQ	1-GR-HS-9381B		Hand Switch	Reactor	102	No	No	
M780AQ	1-GR-HS-9382A		Hand Switch	Reactor	102	No	No	
M780AQ	1-GR-HS-9382B		Hand Switch	Reactor	102	No	No	
M780AQ	1-GR-HS-9383A		Hand Switch	Reactor	102	No	No	
M780AQ	1-GR-HS-9383B		Hand Switch	Reactor	102	No	No	
M780AQ	1-GR-HS-9383C		Hand Switch	Reactor	102	No	No	
M780AQ	1-GR-HS-9383D		Hand Switch	Reactor	77	No	No	
M780AQ	1-GR-HS-9383E		Hand Switch	Reactor	102	No	No	
M780AQ	1-GR-HS-9383F		Hand Switch	Reactor	102	No	No	
M780AQ	1-GR-HS-9383G		Hand Switch	Reactor	102	No	No	



HCCS PSAR  
TABLE 3.11-5

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

P41D  
M-83-1

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SYSTEM: REACTOR BLDG. SUPPLY CONTROL DIAG.  
GR

P.O.	ID NO.	MPI NO.	COMPONENT	LOCATION		PAM EQUIP. NOTE (1)	IMI ACTION PLAN EQUIP. NOTE (2)	COMMENTS
				BLDG.	ELEV.			
M780AQ	1-GR-HS-9383H		Hand Switch	Reactor	77	No	No	
M780AQ	1-GR-HS-9384A		Hand Switch	Reactor	102	No	No	
M780AQ	1-GR-HS-9384B		Hand Switch	Reactor	102	No	No	
M780AQ	1-GR-HS-9384C		Hand Switch	Reactor	102	No	No	
M780AQ	1-GR-HS-9384D		Hand Switch	Reactor	77	No	No	
M780AQ	1-GR-HS-9384E		Hand Switch	Reactor	102	No	No	
M780AQ	1-GR-HS-9384F		Hand Switch	Reactor	102	No	No	
M780AQ	1-GR-HS-9384G		Hand Switch	Reactor	102	No	No	
M780AQ	1-GR-HS-9384H		Hand Switch	Reactor	77	No	No	
M780AQ	1-GR-HS-9385A		Hand Switch	Reactor	102	No	No	
M780AQ	1-GR-HS-9385B		Hand Switch	Reactor	102	No	No	
M780AQ	1-GR-HS-9385C		Hand Switch	Reactor	77	No	No	
M780AQ	1-GR-HS-9385D		Hand Switch	Reactor	77	No	No	
M711Q	1-HVH-210		Unit Cooler	Reactor	54	No	No	
M711Q	1-HVH-211		Unit Cooler	Reactor	54	No	No	
M780AQ	1-GU-MT-9425A		Moisture Trans.	Reactor	145	No	No	
M780AQ	1-GU-MT-9425R		Moisture Trans.	Reactor	145	No	No	
M786Q	1-GU-MY-9425A		Moisture Converter	Reactor	145	No	No	
M786Q	1-GU-MY-9425R		Moisture Converter	Reactor	145	No	No	
M780AQ	1-GU-SV-9372A		Solenoid Valve	Reactor	162	No	No	
M780AQ	1-GU-SV-9395A		Solenoid Valve	Reactor	178	No	No	
M780AQ	1-GU-SV-9395B		Solenoid Valve	Reactor	178	No	No	
M780AQ	1-GR-TE-9381A		Temp. Elemt.	Reactor	54	No	No	
M780AQ	1-GR-TE-9381B		Temp. Elemt.	Reactor	54	No	No	
M780AQ	1-GR-TE-9382A		Temp. Elemt.	Reactor	54	No	No	
M780AQ	1-GR-TE-9382B		Temp. Elemt.	Reactor	54	No	No	
M780AQ	1-GR-TE-9383A		Temp. Elemt.	Reactor	54	No	No	
M780AQ	1-GR-TE-9383B		Temp. Elemt.	Reactor	54	No	No	
M780AQ	1-GR-TE-9383C		Temp. Elemt.	Reactor	54	No	No	
M780AQ	1-GR-TE-9383D		Temp. Elemt.	Reactor	54	No	No	
M780AQ	1-GR-TE-9383E		Temp. Elemt.	Reactor	77	No	No	
M780AQ	1-GR-TE-9383F		Temp. Elemt.	Reactor	77	No	No	
M780AQ	1-GR-TE-9383G		Temp. Elemt.	Reactor	54	No	No	
M780AQ	1-GR-TE-9383H		Temp. Elemt.	Reactor	54	No	No	
M780AQ	1-GR-TE-9384A		Temp. Elemt.	Reactor	54	No	No	
M780AQ	1-GR-TE-9384B		Temp. Elemt.	Reactor	54	No	No	
M780AQ	1-GR-TE-9384C		Temp. Elemt.	Reactor	54	No	No	
M780AQ	1-GR-TE-9384D		Temp. Elemt.	Reactor	54	No	No	
M780AQ	1-GR-TE-9384E		Temp. Elemt.	Reactor	54	No	No	
M780AQ	1-GR-TE-9384F		Temp. Elemt.	Reactor	54	No	No	
M780AQ	1-GR-TE-9384G		Temp. Elemt.	Reactor	54	No	No	
M780AQ	1-GR-TE-9384H		Temp. Elemt.	Reactor	54	No	No	

HCCS FSAR  
TABLE 3.11-5

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

P&ID  
M-83-1

Page 60 of

SYSTEM: REACTOR BLDG. SUPPLY CONTROL DIAG.  
GR

P.O.	ID NO.	NPL NO.	COMPONENT	LOCATION		PAM EQUIP. NOTE (1)	TMI ACTION PLAN EQUIP. NOTE (2)	COMMENTS
				BLDG.	ELEV.			
M780AQ	1-GR-TE-9385A		Temp. Element.	Reactor	102	No	No	
M780AQ	1-GR-TE-9385C		Temp. Element.	Reactor	102	No	No	
M780AQ	1-GR-TE-9385D		Temp. Element.	Reactor	102	No	No	
M780AQ	1-GR-TS-9381A		Temp. Sw.	Reactor	54	No	No	
M780AQ	1-GR-TS-9381B		Temp. Sw.	Reactor	54	No	No	
M780AQ	1-GR-TS-9382A		Temp. Sw.	Reactor	54	No	No	
M780AQ	1-GR-TS-9382B		Temp. Sw.	Reactor	54	No	No	
M780AQ	1-GR-TS-9383A		Temp. Sw.	Reactor	54	No	No	
M780AQ	1-GR-TS-9383B		Temp. Sw.	Reactor	54	No	No	
M780AQ	1-GR-TS-9383C		Temp. Sw.	Reactor	54	No	No	
M780AQ	1-GR-TS-9383D		Temp. Sw.	Reactor	54	No	No	
M780AQ	1-GR-TS-9383E		Temp. Sw.	Reactor	77	No	No	
M780AQ	1-GR-TS-9383F		Temp. Sw.	Reactor	77	No	No	
M780AQ	1-GR-TS-9383G		Temp. Sw.	Reactor	54	No	No	
M780AQ	1-GR-TS-9383H		Temp. Sw.	Reactor	54	No	No	
M780AQ	1-GR-TS-9384A		Temp. Sw.	Reactor	54	No	No	
M780AQ	1-GR-TS-9384B		Temp. Sw.	Reactor	54	No	No	
M780AQ	1-GR-TS-9384C		Temp. Sw.	Reactor	54	No	No	
M780AQ	1-GR-TS-9384D		Temp. Sw.	Reactor	54	No	No	
M780AQ	1-GR-TS-9384E		Temp. Sw.	Reactor	54	No	No	
M780AQ	1-GR-TS-9384F		Temp. Sw.	Reactor	54	No	No	
M780AQ	1-GR-TS-9384G		Temp. Sw.	Reactor	54	No	No	
M780AQ	1-GR-TS-9384H		Temp. Sw.	Reactor	54	No	No	
M780AQ	1-GR-TS-9385A		Temp. Sw.	Reactor	102	No	No	
M780AQ	1-GR-TS-9385B		Temp. Sw.	Reactor	102	No	No	
M780AQ	1-GR-TS-9385C		Temp. Sw.	Reactor	102	No	No	
M780AQ	1-GR-TS-9385D		Temp. Sw.	Reactor	102	No	No	
M728Q	1-GR-ZS-9370B		Limit Switch	Reactor	178	Yes	No	
M717Q	1-GT-ZS-9372C		Limit Switch	Reactor	162	Yes	No	

HCGS FSAR  
TABLE 3.11-5

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

P41D  
M-84-1

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SYSTEM: REAC BLDG EXH CONTRL  
GU

P.O.	ID NO.	MPL NO.	COMPONENT	LOCATION		PAM EQUIP. NOTE (1)	TME ACTION PLAN EQUIP. NOTE (2)	COMMENTS
				BLDG.	ELEV.			
M7170	1-GT-PD-9438G2		Press. Damper Actuator	Reactor	162	No	No	
M7170	1-GT-PD-9438H1		Press. Damper Actuator	Reactor	162	No	No	
M7170	1-GT-PD-9438H2		Press. Damper Actuator	Reactor	162	No	No	
M780AQ	1-AC-281		Unit Cooler Ctrl Pnl	Reactor	102	No	No	
M7130	1-AV-206		Fan	Reactor	145	No	No	
M786Q	1-AVE-206		Heater	Reactor	145	No	No	
M786Q	1-AVE-261		Heater	Reactor	162	No	No	
M780AQ	1-BC-281		Unit Cooler Ctrl Pnl	Reactor	102	No	No	
M7130	1-BV-206		Fan	Reactor	145	No	No	
M786Q	1-BVE-206		Heater	Reactor	145	No	No	
M786Q	1-BVE-261		Heater	Reactor	162	No	No	
M780AQ	1-CC-281		Unit Cooler Ctrl Pnl	Reactor	102	No	No	
M780AQ	1-DC-281		Unit Cooler Ctrl Pnl	Reactor	102	No	No	
M7170	1-GU-FD-9425A3		Flow Damper Actuator	Reactor	145	No	No	
M7170	1-GU-FD-9425A4		Flow Damper Actuator	Reactor	145	No	No	
M7170	1-GU-FD-9425A5		Flow Damper Actuator	Reactor	145	No	No	
M7170	1-GU-FD-9425B3		Flow Damper Actuator	Reactor	145	No	No	
M7170	1-GU-FD-9425B4		Flow Damper Actuator	Reactor	45	No	No	
M7170	1-GU-FD-9425B5		Flow Damper Actuator	Reactor	145	No	No	
M7130	1-GU-FD-9426A		Flow Damper Actuator	Reactor	145	No	No	
M7130	1-GU-FD-9426B		Flow Damper Actuator	Reactor	145	No	No	
M780AQ	1-GU-FSL-9426A1		Flow Sw. Low	Reactor	145	No	No	
M780AQ	1-GU-FSL-9426A2		Flow Sw. Low	Reactor	145	No	No	
M780AQ	1-GU-FSL-9426B1		Flow Sw. Low	Reactor	145	No	No	
M780AQ	1-GU-FSL-9426B2		Flow Sw. Low	Reactor	145	No	No	
J301Q	1-GU-FT-9425A		Flow Trans.	Reactor	145	No	No	
J301Q	1-GU-FT-9425B		Flow Trans.	Reactor	145	No	No	
M780AQ	1-GU-FT-9426A		Flow Trans.	Reactor	145	No	No	
M780AQ	1-GU-FT-9426B		Flow Trans.	Reactor	145	No	No	
M7170	1-GU-HD-9425A1		Hand Damper Actuator	Reactor	162	No	No	
M7170	1-GU-HD-9425A2		Hand Damper Actuator	Reactor	145	No	No	
M7170	1-GU-HD-9425B1		Hand Damper Actuator	Reactor	162	No	No	
M7170	1-GU-HD-9425B2		Hand Damper Actuator	Reactor	145	No	No	
M780AQ	1-GU-HS-9428-1		Hand Switch	Reactor	102	No	No	
M780AQ	1-GU-HS-9428-2		Hand Switch	Reactor	102	No	No	
M780A	1-GU-HS-9429-1		Hand Switch	Reactor	102	No	No	
M780A	1-GU-HS-9429-2		Hand Switch	Reactor	77	No	No	
M780A	1-GU-HS-9432-1		Hand Switch	Reactor	102	No	No	
M780A	1-GU-HS-9432-2		Hand Switch	Reactor	102	No	No	
M780A	1-GU-HS-9433-1		Hand Switch	Reactor	102	No	No	
M780A	1-GU-HS-9433-2		Hand Switch	Reactor	77	No	No	
M780A	1-GU-HS-9434-1		Hand Switch	Reactor	102	No	No	

HCGS FSAR  
TABLE 3.11-5

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

P4ID  
M-84-1

SYSTEM: REAC BLDG EXH CONTRL  
GU

P.O.	ID NO.	MPL NO.	COMPONENT	LOCATION		PAM EQUIP. NOTE (1)	TMI ACTION PLAN EQUIP. NOTE (2)	COMMENTS
				BLDG.	ELEV.			
M780AQ	1-GU-HS-9434-2		Hand Switch	Reactor	102	No	No	
M780AQ	1-GU-HS-9435-1		Hand Switch	Reactor	102	No	No	
M780AQ	1-GU-HS-9435-2		Hand Switch	Reactor	102	No	No	
M780AQ	1-GU-HS-9436-1		Hand Switch	Reactor	102	No	No	
M780AQ	1-GU-HS-9436-2		Hand Switch	Reactor	77	No	No	
M780AQ	1-GU-HS-9437-1		Hand Switch	Reactor	102	No	No	
M780AQ	1-GU-HS-9437-2		Hand Switch	Reactor	102	No	No	
M780AQ	1-GU-HS-9438-1		Hand Switch	Reactor	102	No	No	
M780AQ	1-GU-HS-9438-2		Hand Switch	Reactor	102	No	No	
M780AQ	1-GU-HS-9439-1		Hand Switch	Reactor	102	No	No	
M780AQ	1-GU-HS-9439-2		Hand Switch	Reactor	102	No	No	
M780AQ	1-GU-HS-9450		Hand Switch	Reactor	102	No	No	
M780AQ	1-GU-HS-9451		Hand Switch	Reactor	178	No	No	
M780AQ	1-GU-HS-9457-1		Hand Switch	Reactor	102	No	No	
M780AQ	1-GU-HS-9457-2		Hand Switch	Reactor	77	No	No	
M301Q	1-GU-HV-9451		Control Valve	Reactor	178	No	No	
M780AQ	1-OC-286		Control Panel	Reactor	102	No	No	
M786Q	1-OVE-259		Heater	Reactor	54	No	No	
M786Q	1-OVE-260		Heater	Reactor	54	No	No	
M717Q	1-GU-PD-9428A1		Press. Damper Actuator	Reactor	102	No	No	
M717Q	1-GU-PD-9428A2		Press. Damper Actuator	Reactor	102	No	No	
M717Q	1-GU-PD-9428B1		Press. Damper Actuator	Reactor	145	No	No	
M717Q	1-GU-PD-9428B2		Press. Damper Actuator	Reactor	145	No	No	
M717Q	1-GU-PD-9429A1		Press. Damper Actuator	Reactor	145	No	No	
M717Q	1-GU-PD-9429A2		Press. Damper Actuator	Reactor	145	No	No	
M717Q	1-GU-PD-9429B1		Press. Damper Actuator	Reactor	145	No	No	
M717Q	1-GU-PD-9429B2		Press. Damper Actuator	Reactor	145	No	No	
M717Q	1-GU-PD-9432A1		Press. Damper Actuator	Reactor	77	No	No	
M717Q	1-GU-PD-9432A2		Press. Damper Actuator	Reactor	77	No	No	
M717Q	1-GU-PD-9432B1		Press. Damper Actuator	Reactor	54	No	No	
M717Q	1-GU-PD-9432B2		Press. Damper Actuator	Reactor	54	No	No	
M717Q	1-GU-PD-9433A1		Press. Damper Actuator	Reactor	54	No	No	
M717Q	1-GU-PD-9433A2		Press. Damper Actuator	Reactor	54	No	No	
M717Q	1-GU-PD-9433B1		Press. Damper Actuator	Reactor	77	No	No	
M717Q	1-GU-PD-9433B2		Press. Damper Actuator	Reactor	77	No	No	
M717Q	1-GU-PD-9434A1		Press. Damper Actuator	Reactor	54	No	No	
M717Q	1-GU-PD-9434A2		Press. Damper Actuator	Reactor	54	No	No	
M717Q	1-GU-PD-9434B1		Press. Damper Actuator	Reactor	77	No	No	
M717Q	1-GU-PD-9434B2		Press. Damper Actuator	Reactor	77	No	No	
M717Q	1-GU-PD-9435A1		Press. Damper Actuator	Reactor	54	No	No	

HCCS FSAR  
TABLE 3.11-5

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

P41D  
M-84-1

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SYSTEM: REAC BLDG EXH CONTRL  
GU

P.O.	ID NO.	MPL NO.	COMPONENT	LOCATION		PAM EQUIP. NOTE (1)	TMI ACTION PLAN EQUIP. NOTE (2)	COMMENTS
				BLDG.	ELEV.			
H7170	1-GU-PD-9435A2		Press. Damper Actuator	Reactor	54	No	No	
H7170	1-GU-PD-9435B1		Press. Damper Actuator	Reactor	77	No	No	
H7170	1-GU-PD-9435B2		Press. Damper Actuator	Reactor	77	No	No	
H7170	1-GU-PD-9436A1		Press. Damper Actuator	Reactor	77	No	No	
H7170	1-GU-PD-9436A2		Press. Damper Actuator	Reactor	77	No	No	
H7170	1-GU-PD-9436B1		Press. Damper Actuator	Reactor	77	No	No	
H7170	1-GU-PD-9436B2		Press. Damper Actuator	Reactor	77	No	No	
H7170	1-GU-PD-9437A1		Press. Damper Actuator	Reactor	102	No	No	
H7170	1-GU-PD-9437A2		Press. Damper Actuator	Reactor	102	No	No	
H7170	1-GU-PD-9437B1		Press. Damper Actuator	Reactor	102	No	No	
H7170	1-GU-PD-9437B2		Press. Damper Actuator	Reactor	102	No	No	
H7170	1-GU-PD-9438A1		Press. Damper Actuator	Reactor	145	No	No	
H7170	1-GU-PD-9438A2		Press. Damper Actuator	Reactor	145	No	No	
H7170	1-GU-PD-9438B1		Press. Damper Actuator	Reactor	102	No	No	
H7170	1-GU-PD-9438B2		Press. Damper Actuator	Reactor	102	No	No	
H7170	1-GU-PD-9438C1		Press. Damper Actuator	Reactor	102	No	No	
H7170	1-GU-PD-9438C2		Press. Damper Actuator	Reactor	102	No	No	
H7170	1-GU-PD-9438D1		Press. Damper Actuator	Reactor	132	No	No	
H7170	1-GU-PD-9438D2		Press. Damper Actuator	Reactor	132	No	No	
H7170	1-GU-PD-9438E1		Press. Damper Actuator	Reactor	132	No	No	
H7170	1-GU-PD-9438E2		Press. Damper Actuator	Reactor	132	No	No	
H7170	1-GU-PD-9438F1		Press. Damper Actuator	Reactor	132	No	No	
H7170	1-GU-PD-9438F2		Press. Damper Actuator	Reactor	132	No	No	
H7170	1-GT-PD-9438G1		Press. Damper Actuator	Reactor	162	No	No	
H7170	1-GU-PD-9439A1		Press. Damper Actuator	Reactor	102	No	No	
H7170	1-GU-PD-9439A2		Press. Damper Actuator	Reactor	102	No	No	
H7170	1-GU-PD-9439B1		Press. Damper Actuator	Reactor	102	No	No	
H7170	1-GU-PD-9439B2		Press. Damper Actuator	Reactor	102	No	No	
H7170	1-GU-PD-9457A1		Press. Damper Actuator	Reactor	145	No	No	
H7170	1-GU-PD-9457A2		Press. Damper Actuator	Reactor	145	No	No	
H780AQ	1-GU-PDSH-9428-1		Press. Diff. Sw. High	Reactor	102	No	No	
H780AQ	1-GU-PDSH-9428-2		Press. Diff. Sw. High	Reactor	102	No	No	
H780AQ	1-GU-PDSH-9429-1		Press. Diff. Sw. High	Reactor	145	No	No	
H780AQ	1-GU-PDSH-9429-2		Press. Diff. Sw. High	Reactor	145	No	No	
H780AQ	1-GU-PDSH-9432-1		Press. Diff. Sw. High	Reactor	54	No	No	
H780AQ	1-GU-PDSH-9432-2		Press. Diff. Sw. High	Reactor	54	No	No	
H780AQ	1-GU-PDSH-9433-1		Press. Diff. Sw. High	Reactor	54	No	No	
H780AQ	1-GU-PDSH-9433-2		Press. Diff. Sw. High	Reactor	54	No	No	
H780AQ	1-GU-PDSH-9434-1		Press. Diff. Sw. High	Reactor	54	No	No	
H780AQ	1-GU-PDSH-9434-2		Press. Diff. Sw. High	Reactor	54	No	No	
H780AQ	1-GU-PDSH-9435-1		Press. Diff. Sw. High	Reactor	54	No	No	
H780AQ	1-GU-PDSH-9435-2		Press. Diff. Sw. High	Reactor	54	No	No	
H780AQ	1-GU-PDSH-9436-1		Press. Diff. Sw. High	Reactor	77	No	No	



HCGS PSAR  
TABLE 3.11-5

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

P&ID  
M-84-1

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SYSTEM: REAC BLDG EXH CONTRL  
GU

P.O.	ID NO.	MPL NO.	COMPONENT	LOCATION		PAM EQUIP. NOTE (1)	TMI ACTION PLAN EQUIP. NOTE (2)	COMMENTS
				BLDG.	ELEV.			
M780AQ	1-GU-PDSH-9436-2		Press. Diff. Sw. High	Reactor	77	No	No	
M780AQ	1-GU-PDSH-9437-1		Press. Diff. Sw. High	Reactor	102	No	No	
M780AQ	1-GU-PDSH-9437-2		Press. Diff. Sw. High	Reactor	102	No	No	
M780AQ	1-GU-PDSH-9438-1		Press. Diff. Sw. High	Reactor	102	No	No	
M780AQ	1-GU-PDSH-9438-2		Press. Diff. Sw. High	Reactor	102	No	No	
M780AQ	1-GU-PDSH-9439-1		Press. Diff. Sw. High	Reactor	102	No	No	
M780AQ	1-GU-PDSH-9439-2		Press. Diff. Sw. High	Reactor	102	No	No	
M780AQ	1-GU-PDSH-9457-1		Press. Diff. Sw. High	Reactor	145	No	No	
M780AQ	1-GU-PDSH-9457-2		Press. Diff. Sw. High	Reactor	145	No	No	
M780AQ	1-GU-PDT-9425A		Press. Diff. Trans.	Reactor	145	No	No	
M780AQ	1-GU-PDT-9425B		Press. Diff. Trans.	Reactor	145	No	No	
M780AQ	1-GU-PDT-9426A1		Press. Diff. Trans.	Reactor	102	No	No	
M780AQ	1-GU-PDT-9426A2		Press. Diff. Trans.	Reactor	102	No	No	
M780AQ	1-GU-PDT-9426B1		Press. Diff. Trans.	Reactor	102	No	No	
M780AQ	1-GU-PDT-9426B2		Press. Diff. Trans.	Reactor	102	No	No	
M728Q	1-GU-SV-9414A		Solenoid Valve	Reactor	178	No	No	
M728Q	1-GU-SV-9450A		Solenoid Valve	Reactor	102	No	No	
M728Q	1-GU-SV-9450B		Solenoid Valve	Reactor	102	No	No	
M786Q	1-GU-TE-9425A		Temp. Elemt.	Reactor	145	No	No	
M786Q	1-GU-TE-9425B		Temp. Elemt.	Reactor	145	No	No	
M780AQ	1-GU-TE-9428-1		Temp. Elemt.	Reactor	102	No	No	
M780AQ	1-GU-TE-9428-2		Temp. Elemt.	Reactor	102	No	No	
M780AQ	1-GU-TE-9429-1		Temp. Elemt.	Reactor	145	No	No	
M780AQ	1-GU-TE-9429-2		Temp. Elemt.	Reactor	145	No	No	
M780AQ	1-GU-TE-9432-1		Temp. Elemt.	Reactor	77	No	No	
M780AQ	1-GU-TE-9432-2		Temp. Elemt.	Reactor	77	No	No	
M780AQ	1-GU-TE-9433-1		Temp. Elemt.	Reactor	77	No	No	
M780AQ	1-GU-TE-9433-2		Temp. Elemt.	Reactor	77	No	No	
M780AQ	1-GU-TE-9434-1		Temp. Elemt.	Reactor	54	No	No	
M780AQ	1-GU-TE-9434-2		Temp. Elemt.	Reactor	54	No	No	
M780AQ	1-GU-TE-9435-1		Temp. Elemt.	Reactor	54	No	No	
M780AQ	1-GU-TE-9435-2		Temp. Elemt.	Reactor	54	No	No	
M780AQ	1-GU-TE-9436-1		Temp. Elemt.	Reactor	77	No	No	
M780AQ	1-GU-TE-9436-2		Temp. Elemt.	Reactor	77	No	No	
M780AQ	1-GU-TE-9437-1		Temp. Elemt.	Reactor	102	No	No	
M780AQ	1-GU-TE-9437-2		Temp. Elemt.	Reactor	102	No	No	
M780AQ	1-GU-TE-9438-1		Temp. Elemt.	Reactor	145	No	No	
M780AQ	1-GU-TE-9438-2		Temp. Elemt.	Reactor	145	No	No	
M780AQ	1-GU-TE-9439-1		Temp. Elemt.	Reactor	102	No	No	
M780AQ	1-GU-TE-9439-2		Temp. Elemt.	Reactor	102	No	No	
M780AQ	1-GU-TE-9457-1		Temp. Elemt.	Reactor	145	No	No	
M780AQ	1-GU-TE-9457-2		Temp. Elemt.	Reactor	145	No	No	
M786Q	1-GU-TIC-9434		Temp. Indicator Controller	Reactor	54	No	No	



RCGS FSAR  
TABLE 3.11-5

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

PSID  
M-84-1

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SYSTEM: REAC BLDG EXH CONTROL  
GU

I.D.	ID NO.	MPL NO.	COMPONENT	LOCATION		PAM EQUIP. NOTE (1)	TMI ACTION PLAN EQUIP. NOTE (2)	COMMENTS
				BLDG.	ELEV.			
47860	1-GU-TIC-9435		Temp. Indicator Controller	Reactor	54	NO	NO	
47860	1-GU-TIC-9436		Temp. Indicator Controller	Reactor	162	NO	NO	
47860	1-GU-TIC-9438		Temp. Indicator Controller	Reactor	162	NO	NO	
47280	1-GU-ZS-9414A		Limit Switch	Reactor	178	Yes	NO	

HCGS FSAR  
TABLE 3.11-5

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

P&ID  
M-87-1

SYSTEM: CHILLED WATER SYSTEM  
GB

P.O.	ID NO.	MPL NO.	COMPONENT	BLDG.	ELEV.	P&ID EQUIP. NOTE (1)	TMI ACTION PLAN EQUIP. NOTE (2)	COMMENTS
P1010	1-GB-HV-9531A1		Control Valve	102		No	No	
P1010	1-GB-HV-9531A2		Control Valve	102		No	No	
P1010	1-GB-HV-9531A3		Control Valve	102		No	No	
P1010	1-GB-HV-9531A4		Control Valve	100		No	No	
P1010	1-GB-HV-9531B1		Control Valve	100		No	No	
P1010	1-GB-HV-9531B2		Control Valve	100		No	No	
P1010	1-GB-HV-9531B3		Control Valve	77		No	No	
P1010	1-GB-HV-9531B4		Control Valve	162		No	No	
P1010	1-GB-HV-9531C-1		Control Valve	162		No	No	
P1010	1-GB-HV-9531C-2		Control Valve	102		Yes	No	
P1010	1-GB-ZS-9531A1		Limit Switch	102		Yes	No	
P1010	1-GB-ZS-9531A2		Limit Switch	102		Yes	No	
P1010	1-GB-ZS-9531A3		Limit Switch	102		Yes	No	
P1010	1-GB-ZS-9531A4		Limit Switch	100		Yes	No	
P1010	1-GB-ZS-9531B1		Limit Switch	100		Yes	No	
P1010	1-GB-ZS-9531B2		Limit Switch	100		Yes	No	
P1010	1-GB-ZS-9531B3		Limit Switch	100		Yes	No	
P1010	1-GB-ZS-9531B4		Limit Switch	77		Yes	No	

HCGS FSAR  
TABLE 3.11-5

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

ELECT. DWG.  
E-0011

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SYSTEM: 250VDC  
PJ

P.O.	ID NO.	MPL NO.	COMPONENT	LOCATION		PAM EQUIP. NOTE (1)	TMI ACTION PLAN EQUIP. NOTE (2)		COMMENTS
				BLDG.	ELEV.				
F121Q	1-00-251		250VDC MCC	Reactor	54	No	No		
F121Q	1-00-261		250VDC MCC	Reactor	54	No	No		

HCS FSAR  
TABLE 3.11-5

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

ELECT. Dwg.  
E001B Page 68 of

SYSTEM: 480VAC  
PG

P.O.	ID NO.	MPL NO.	COMPONENT	BLDG.	LOCATION ELEV.	PAM EQUIP. NOTE (1)	TWI ACTION PLAN EQUIP. NOTE (2)	COMMENTS
E1180	1-08-212		480V MCC	Reactor	102	NO	NO	
E1180	1-08-222		480V MCC	Reactor	102	NO	NO	
E1180	1-08-232		480V MCC	Reactor	102	NO	NO	
E1180	1-08-242		480V MCC	Reactor	77	NO	NO	

HCGS FSAR  
TABLE 3.11-5

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

PAID  
N/A

SYSTEM: GENERIC

P.O.	ID NO.	VENDOR	COMPONENT	LOCATION		PAM EQUIP. NOTE (1)	TMI ACTION PLAN EQUIP. NOTE (2)	COMMENTS
				BLDG.	ELEV.			
E1290	A00	Okonite	5kV Power Cable	Note (3)		N/A	N/A	
E1290	A04	Okonite	5kV Power Cable	Note (3)		N/A	N/A	
E1290	A35	Okonite	5kV Power Cable	Note (3)		N/A	N/A	
E1290	A50	Okonite	5kV Power Cable	Note (3)		N/A	N/A	
E1290	A75	Okonite	5kV Power Cable	Note (3)		N/A	N/A	
E1350	1AW200	Westinghouse	Electric Penetration Assy.	Note (3)		N/A	N/A	
E1350	1BW200	Westinghouse	Electric Penetration Assy.	Note (3)		N/A	N/A	
E1350	1CW200	Westinghouse	Electric Penetration Assy.	Note (3)		N/A	N/A	
E1350	1DW200	Westinghouse	Electric Penetration Assy.	Note (3)		N/A	N/A	
E1350	1AW201	Westinghouse	Electric Penetration Assy.	Note (3)		N/A	N/A	
E1350	1BW201	Westinghouse	Electric Penetration Assy.	Note (3)		N/A	N/A	
E1350	1CW201	Westinghouse	Electric Penetration Assy.	Note (3)		N/A	N/A	
E1350	1DW201	Westinghouse	Electric Penetration Assy.	Note (3)		N/A	N/A	
E1350	1EW201	Westinghouse	Electric Penetration Assy.	Note (3)		N/A	N/A	
E1350	1FW201	Westinghouse	Electric Penetration Assy.	Note (3)		N/A	N/A	
E1350	1AW202	Westinghouse	Electric Penetration Assy.	Note (3)		N/A	N/A	
E1350	1BW202	Westinghouse	Electric Penetration Assy.	Note (3)		N/A	N/A	
E1350	1CW202	Westinghouse	Electric Penetration Assy.	Note (3)		N/A	N/A	
E1350	1AW203	Westinghouse	Electric Penetration Assy.	Note (3)		N/A	N/A	
E1350	1BW203	Westinghouse	Electric Penetration Assy.	Note (3)		N/A	N/A	
E1350	1AW204	Westinghouse	Electric Penetration Assy.	Note (3)		N/A	N/A	
E1350	1BW204	Westinghouse	Electric Penetration Assy.	Note (3)		N/A	N/A	
E1350	1CW204	Westinghouse	Electric Penetration Assy.	Note (3)		N/A	N/A	
E1350	1EW204	Westinghouse	Electric Penetration Assy.	Note (3)		N/A	N/A	
E1350	1FW204	Westinghouse	Electric Penetration Assy.	Note (3)		N/A	N/A	
E1350	1GW204	Westinghouse	Electric Penetration Assy.	Note (3)		N/A	N/A	
E1350	1JW204	Westinghouse	Electric Penetration Assy.	Note (3)		N/A	N/A	
E1350	1KW204	Westinghouse	Electric Penetration Assy.	Note (3)		N/A	N/A	
E1350	1AW205	Westinghouse	Electric Penetration Assy.	Note (3)		N/A	N/A	
E1350	1BW205	Westinghouse	Electric Penetration Assy.	Note (3)		N/A	N/A	
E1350	1BW203	Westinghouse	Electric Penetration Assy.	Note (3)		N/A	N/A	

HCCS FSAR  
TABLE 3.11-5

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

PAID  
N/A

SYSTEM: GENERIC

P.O.	ID NO.	VENDOR	COMPONENT	LOCATION		FAM EQUIP. NOTE (1)	TMI ACTION PLAN EQUIP. NOTE (2)	COMMENTS
				BLDG.	ELEV.			
E135	IDW205	Westinghouse	Electric Penetration Assy	Note (3)		N/A	N/A	
E135	IEW205	Westinghouse	Electric Penetration Assy	Note (3)		N/A	N/A	
E135	IPW205	Westinghouse	Electric Penetration Assy	Note (3)		N/A	N/A	
E135	IGW205	Westinghouse	Electric Penetration Assy	Note (3)		N/A	N/A	
E135	IHW205	Westinghouse	Electric Penetration Assy	Note (3)		N/A	N/A	
E135	IAW206	Westinghouse	Electric Penetration Assy	Note (3)		N/A	N/A	
E135	IRW206	Westinghouse	Electric Penetration Assy	Note (3)		N/A	N/A	
E135	ICW206	Westinghouse	Electric Penetration Assy	Note (3)		N/A	N/A	
E135	IAW207	Westinghouse	Electric Penetration Assy	Note (3)		N/A	N/A	
E135	IBW207	Westinghouse	Electric Penetration Assy	Note (3)		N/A	N/A	
E135	ICW207	Westinghouse	Electric Penetration Assy	Note (3)		N/A	N/A	
E135	IDW207	Westinghouse	Electric Penetration Assy	Note (3)		N/A	N/A	
E135	IAW208	Westinghouse	Electric Penetration Assy	Note (3)		N/A	N/A	
E135	IAW209	Westinghouse	Electric Penetration Assy	Note (3)		N/A	N/A	
E157Q	CO2	Okonite	600V Control Cable	Note (3)		N/A	N/A	
E157Q	CO3	Okonite	600V Control Cable	Note (3)		N/A	N/A	
E157Q	CO5	Okonite	600V Control Cable	Note (3)		N/A	N/A	
E157Q	CO7	Okonite	600V Control Cable	Note (3)		N/A	N/A	
E157Q	CO9	Okonite	600V Control Cable	Note (3)		N/A	N/A	
E157Q	CO12	Okonite	600V Control Cable	Note (3)		N/A	N/A	
E157Q	CO19	Okonite	600V Control Cable	Note (3)		N/A	N/A	
E158Q	IT3	Okonite	600V Power Cable	Note (3)		N/A	N/A	
E158Q	IT5	Okonite	600V Power Cable	Note (3)		N/A	N/A	
E158Q	102	Okonite	600V Power Cable	Note (3)		N/A	N/A	
E158Q	106	Okonite	600V Power Cable	Note (3)		N/A	N/A	
E158Q	110	Okonite	600V Power Cable	Note (3)		N/A	N/A	
E158Q	112	Okonite	600V Power Cable	Note (3)		N/A	N/A	
E158Q	120	Okonite	600V Power Cable	Note (3)		N/A	N/A	
E158Q	135	Okonite	600V Power Cable	Note (3)		N/A	N/A	
E158Q	140	Okonite	600V Power Cable	Note (3)		N/A	N/A	
E158Q	150	Okonite	600V Power Cable	Note (3)		N/A	N/A	
E158Q	202	Okonite	600V Power Cable	Note (3)		N/A	N/A	



HCFS FSAR  
TABLE 3.11-5

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

Page 71 of  
P&ID  
N/A

SYSTEM: GENERIC

P.O.	ID NO.	VENDOR	COMPONENT	LOCATION		PAM EQUIP. NOTE (1)	TMI ACTION PLAN EQUIP. NOTE (2)	COMMENTS
				BLDG.	ELEV.			
E1580	209	Okonite	600V Power Cable	Note (3)		N/A	N/A	
E1580	302	Okonite	600V Power Cable	Note (3)		N/A	N/A	
E1580	304	Okonite	600V Power Cable	Note (3)		N/A	N/A	
E1580	306	Okonite	600V Power Cable	Note (3)		N/A	N/A	
E1580	308	Okonite	600V Power Cable	Note (3)		N/A	N/A	
E1580	309	Okonite	600V Power Cable	Note (3)		N/A	N/A	
E1580	312	Okonite	600V Power Cable	Note (3)		N/A	N/A	
E1580	320	Okonite	600V Power Cable	Note (3)		N/A	N/A	
E1580	340	Okonite	600V Power Cable	Note (3)		N/A	N/A	
E1580	402	Okonite	600V Power Cable	Note (3)		N/A	N/A	
E1580	404	Okonite	600V Power Cable	Note (3)		N/A	N/A	
E1580	409	Okonite	600V Power Cable	Note (3)		N/A	N/A	
E1580	412	Okonite	600V Power Cable	Note (3)		N/A	N/A	
E1580	420	Okonite	600V Power Cable	Note (3)		N/A	N/A	
E1580	510	Okonite	600V Power Cable	Note (3)		N/A	N/A	
E1580	712	Okonite	600V Power Cable	Note (3)		N/A	N/A	
E1700	RG2	Brand-Rex	Co, Tri, and Twinaxial Cable	Note (3)		N/A	N/A	
E1700	RG3	Brand-Rex	Co, Tri, and Twinaxial Cable	Note (3)		N/A	N/A	
E1700	RG14	Brand-Rex	Co, Tri, and Twinaxial Cable	Note (3)		N/A	N/A	
E1700	RG16	Brand-Rex	Co, Tri, and Twinaxial Cable	Note (3)		N/A	N/A	
E1700	RG58	Brand-Rex	Co, Tri, and Twinaxial Cable	Note (3)		N/A	N/A	
E1700	RG59	Brand-Rex	Co, Tri, and Twinaxial Cable	Note (3)		N/A	N/A	
E1700	RG62	Brand-Rex	Co, Tri, and Twinaxial Cable	Note (3)		N/A	N/A	
E1700AQ	R06	Rockbestos	Co, Tri, and Twinaxial Cable	Note (3)		N/A	N/A	
E1700AQ	R22	Rockbestos	600V Shielded Instru Cable	Note (3)		N/A	N/A	
E1710	104	Eaton	600V Shielded Instru Cable	Note (3)		N/A	N/A	
E1710	D01	Eaton	600V Shielded Instru Cable	Note (3)		N/A	N/A	
E1710	D02	Eaton	600V Shielded Instru Cable	Note (3)		N/A	N/A	
E1710	D03	Eaton	600V Shielded Instru Cable	Note (3)		N/A	N/A	
E1710	D04	Eaton	600V Shielded Instru Cable	Note (3)		N/A	N/A	
E1710	D05	Eaton	600V Shielded Instru Cable	Note (3)		N/A	N/A	
E1710	D06	Eaton	600V Shielded Instru Cable	Note (3)		N/A	N/A	

HCGS PSAR  
TABLE 3.11-5

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

P&ID  
N/A

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SYSTEM: GENERIC

P.O.	ID NO.	VENDOR	COMPONENT	LOCATION		PAM EQUIP. NOTE (1)	TMI ACTION PLAN EQUIP. NOTE (2)	COMMENTS
				BLDG.	ELEV.			
E1710	D07	Eaton	600V Shielded Instru Cable	Note (3)		N/A	N/A	
E1710	D08	Eaton	600V Shielded Instru Cable	Note (3)		N/A	N/A	
E1710	D09	Eaton	600V Shielded Instru Cable	Note (3)		N/A	N/A	
E1710	D30	Eaton	600V Shielded Instru Cable	Note (3)		N/A	N/A	
E1710	D31	Eaton	600V Shielded Instru Cable	Note (3)		N/A	N/A	
E1710	D32	Eaton	600V Shielded Instru Cable	Note (3)		N/A	N/A	
E1710	D33	Eaton	600V Shielded Instru Cable	Note (3)		N/A	N/A	
E1710	I02	Eaton	600V Shielded Instru Cable	Note (3)		N/A	N/A	
E1710	I03	Eaton	600V Shielded Instru Cable	Note (3)		N/A	N/A	
E1710	I04	Eaton	600V Shielded Instru Cable	Note (3)		N/A	N/A	
E1710	I06	Eaton	600V Shielded Instru Cable	Note (3)		N/A	N/A	
E1710	I10	Eaton	600V Shielded Instru Cable	Note (3)		N/A	N/A	
E1710	I12	Eaton	600V Shielded Instru Cable	Note (3)		N/A	N/A	
E1710	I20	Eaton	600V Shielded Instru Cable	Note (3)		N/A	N/A	
E1710	I24	Eaton	600V Shielded Instru Cable	Note (3)		N/A	N/A	
E1710	I28	Eaton	600V Shielded Instru Cable	Note (3)		N/A	N/A	
E1710	IT2	Eaton	600V Shielded Instru Cable	Note (3)		N/A	N/A	
E1710	IT3	Eaton	600V Shielded Instru Cable	Note (3)		N/A	N/A	
E1710	IT4	Eaton	600V Shielded Instru Cable	Note (3)		N/A	N/A	
E1710	IT6	Eaton	600V Shielded Instru Cable	Note (3)		N/A	N/A	
E1710	NO8	Eaton	600V Shielded Instru Cable	Note (3)		N/A	N/A	
E1710	S03	Eaton	600V Shielded Instru Cable	Note (3)		N/A	N/A	
E1710	S19	Eaton	600V Shielded Instru Cable	Note (3)		N/A	N/A	
E1710	S24	Eaton	600V Shielded Instru Cable	Note (3)		N/A	N/A	
E1710	S28	Eaton	600V Shielded Instru Cable	Note (3)		N/A	N/A	
E1710	TA1	Eaton	600V Shielded Instru Cable	Note (3)		N/A	N/A	
E1710	TA2	Eaton	600V Shielded Instru Cable	Note (3)		N/A	N/A	
E1710	TH1	Eaton	600V Shielded Instru Cable	Note (3)		N/A	N/A	
E1710	TH2	Eaton	600V Shielded Instru Cable	Note (3)		N/A	N/A	
E1710	TH1	Eaton	600V Shielded Instru Cable	Note (3)		N/A	N/A	
E1710	TH3	Eaton	600V Shielded Instru Cable	Note (3)		N/A	N/A	

HCCS FSAR  
TABLE 3.11-5

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

P&ID  
N/A

SYSTEM: GENERIC

P.O.	ID NO.	VENDOR	COMPONENT	LOCATION		PAM EQUIP. NOTE (1)	TMI ACTION		COMMENTS
				BLDG.	ELEV.		PLAN	EQUIP. NOTE (2)	
E171Q	TP1	Eaton	600V Shielded Instru Cable	Note (3)		N/A		N/A	
E171Q	TP2	Eaton	600V Shielded Instru Cable	Note (3)		N/A		N/A	
E171Q	TP3	Eaton	600V Shielded Instru Cable	Note (3)		N/A		N/A	
E171Q	TP4	Eaton	600V Shielded Instru Cable	Note (3)		N/A		N/A	
FIELD PURCHASE	RAT-853	Thomas & Betts	Pressure Terminal Connectors	Note (3)		N/A		N/A	
FIELD PURCHASE	RAT-863	Thomas & Betts	Pressure Terminal Connectors	Note (3)		N/A		N/A	
FIELD PURCHASE	RAT-873	Thomas & Betts	Pressure Terminal Connectors	Note (3)		N/A		N/A	
FIELD PURCHASE	RAT-713	Thomas & Betts	Pressure Terminal Connectors	Note (3)		N/A		N/A	
FIELD PURCHASE	RBT-853	Thomas & Betts	Pressure Terminal Connectors	Note (3)		N/A		N/A	
FIELD PURCHASE	RBT-863	Thomas & Betts	Pressure Terminal Connectors	Note (3)		N/A		N/A	
FIELD PURCHASE	RBT-873	Thomas & Betts	Pressure Terminal Connectors	Note (3)		N/A		N/A	
FIELD PURCHASE	RBT-713	Thomas & Betts	Pressure Terminal Connectors	Note (3)		N/A		N/A	
FIELD PURCHASE	RCT-333	Thomas & Betts	Pressure Terminal Connectors	Note (3)		N/A		N/A	
FIELD PURCHASE	RCT-863	Thomas & Betts	Pressure Terminal Connectors	Note (3)		N/A		N/A	
FIELD PURCHASE	RCT-363	Thomas & Betts	Pressure Terminal Connectors	Note (3)		N/A		N/A	
FIELD PURCHASE	RCT-713	Thomas & Betts	Pressure Terminal Connectors	Note (3)		N/A		N/A	
FIELD PURCHASE	RCT-703	Thomas & Betts	Pressure Terminal Connectors	Note (3)		N/A		N/A	
FIELD PURCHASE	RCT-733	Thomas & Betts	Pressure Terminal Connectors	Note (3)		N/A		N/A	
FIELD PURCHASE	RDT-10361	Thomas & Betts	Pressure Terminal Connectors	Note (3)		N/A		N/A	
FIELD PURCHASE	RDT-10711	Thomas & Betts	Pressure Terminal Connectors	Note (3)		N/A		N/A	
FIELD PURCHASE	RDT-10721	Thomas & Betts	Pressure Terminal Connectors	Note (3)		N/A		N/A	
FIELD PURCHASE	RDT-10731	Thomas & Betts	Pressure Terminal Connectors	Note (3)		N/A		N/A	
FIELD PURCHASE	RET-10261	Thomas & Betts	Pressure Terminal Connectors	Note (3)		N/A		N/A	
FIELD PURCHASE	RET-10711	Thomas & Betts	Pressure Terminal Connectors	Note (3)		N/A		N/A	
FIELD PURCHASE	RET-10721	Thomas & Betts	Pressure Terminal Connectors	Note (3)		N/A		N/A	
FIELD PURCHASE	RET-10731	Thomas & Betts	Pressure Terminal Connectors	Note (3)		N/A		N/A	
FIELD PURCHASE	RFT-10261	Thomas & Betts	Pressure Terminal Connectors	Note (3)		N/A		N/A	
FIELD PURCHASE	RFT-10711	Thomas & Betts	Pressure Terminal Connectors	Note (3)		N/A		N/A	
FIELD PURCHASE	RFT-10721	Thomas & Betts	Pressure Terminal Connectors	Note (3)		N/A		N/A	
FIELD PURCHASE	RFT-10731	Thomas & Betts	Pressure Terminal Connectors	Note (3)		N/A		N/A	

HCGS FSAP  
TABLE 3.11-5

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

P&ID  
N/A

SYSTEM: GENERIC

P.O.	ID NO.	VENDOR	COMPONENT	LOCATION		P&I EQUIP. NOTE (1)	T&I ACTION PLAN EQUIP. NOTE (2)	COMMENTS
				BLDG.	ELEV.			
FIELD PURCHASE	RGT-9261	Thomas & Betts	Pressure Terminal Connectors	Note (3)		N/A	N/A	
FIELD PURCHASE	RGT-9711	Thomas & Betts	Pressure Terminal Connectors	Note (3)		N/A	N/A	
FIELD PURCHASE	RGT-9721	Thomas & Betts	Pressure Terminal Connectors	Note (3)		N/A	N/A	
FIELD PURCHASE	RGT-9731	Thomas & Betts	Pressure Terminal Connectors	Note (3)		N/A	N/A	
FIELD PURCHASE	RGT-9751	Thomas & Betts	Pressure Terminal Connectors	Note (3)		N/A	N/A	
FIELD PURCHASE	TYZ-23M	Thomas & Betts	TY-RAP Cable Tie	Note (3)		N/A	N/A	
FIELD PURCHASE	TYZ-25M	Thomas & Betts	TY-RAP Cable Tie	Note (3)		N/A	N/A	
FIELD PURCHASE	TYZ-27M	Thomas & Betts	TY-RAP Cable Tie	Note (3)		N/A	N/A	
FIELD PURCHASE	TYZ-28M	Thomas & Betts	TY-RAP Cable Tie	Note (3)		N/A	N/A	

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TABLE 3.11-5  
NOTES

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- (1) This column identifies the equipment located in a harsh environment required for post accident monitoring as defined in R.G.1.97 and FSAR Section 1.8.1.97.1.
- (2) This column identifies the equipment located in a harsh environment identified as TMI Action Plan Equipment as defined in NUREG 0717.
- (3) Items that are generic are purchased and used throughout the plant and may be used in the DBA Harsh Environment.

## VIII QUALIFICATION TESTING/ANALYSIS

As is noted in HCGS FSAR Section 3.11, NSSS and non-NSSS electrical components are qualified in accordance with the EQ criteria and guidelines delineated in IEEE-323-1971 and noted as Category II in NUREG 0588. Upgrading to IEEE-323-1974 and to Category I as defined in NUREG 0588 is being attempted wherever scheduling constraints and technical feasibility allow. The safety related components located in a harsh environment are being qualified by test, analysis, or a combination thereof for the worst case anticipated environmental transients under which they are required to function.

For safety related mechanical equipment located in a harsh environment, the EQ program establishes, via analysis, the qualified life of the component. This analysis is performed by identifying significant aging mechanisms as defined in IEEE-627-1980, Section 4.4.1.

The EQ program conforms with 10CFR50.49 in that testing or a combination of testing and analysis was the preferred method of proving component operability under the worst case environmental scenarios. IEEE-323 methods were used for the analysis. These analyses, when performed for EQ to supplement testing, were justified and documented in the appropriate EQ packages. Additionally, analyses were used only when their results could be shown to be conservative. Analytical techniques included similarity, extrapolation and mathematical modeling.

The actual implementation of the HCGS EQ program is subdivided into the following two sections:

### (1) NSSS Safety Related Components

#### (a) Electrical Components

The HCGS EQ program efforts for NSSS safety related electrical components are based upon the guidelines and methodologies outlined in General Electric's Licensing Topical Report #NEDE-24326-1-P. This generic approach, when coupled with HCGS plant specific environmental parameters has been reviewed and found to be acceptable by the USNRC Division of Equipment Safety. HCGS has submitted plant specific environments consistent with those provided in FSAR Section 3.11 including seismic and dynamic input into GE's EQ program.



These parameters were enveloped in GE's qualification program for devices in the HCGS scope. The specific seismic and dynamic qualification documentation will include a determination of natural frequencies to assure that none are below 4 Hertz. Appropriately justified analysis and testing will be done to verify this depending on the equipment type being qualified. Additionally, the four following generic USNRC "Open Items" concerning GE EQ Program #NEDE-24326-1-P will be responded to in the following manner:

USNRC OPEN ITEM #1

- "1. Application of time margins less than one hour will be justified for each piece of equipment, including any judgments regarding survivability limits of the equipment."

GE/HCGS RESPONSE TO OPEN ITEM #1

The Functional Performance Requirements shall document the function times for all Class 1E equipment and the supporting Design Record Files shall contain the justification for the margin for each function time less than ten hours if a time margin less than one hour is used. The qualification reports for Class 1E equipment with time margins less than one hour shall document judgments regarding the survivability limits of the equipment beyond the tested time to the one hour margin limit.

USNRC OPEN ITEM #2

- "2. The required operability time will be justified with consideration for a spectrum of breaks and the potential need for the equipment later in an event or during recovery operations."

GE/HCGS RESPONSE TO ITEM #2

The Functional Performance Requirements shall document the function times for all Class 1E equipment and the supporting Design Record Files shall contain the justification for the margin for each function time less than ten hours if a time margin less than one hour is used. The applicable function times for all such accidents and qualification shall be addressed in the qualification report.

### USNRC OPEN ITEM #3

"3. It will be demonstrated that failure of the equipment after the required operability time will neither mislead the operator to take an improper action nor further degrade the event by causing a failure in systems necessary for mitigation of the event."

### GE/HCGS RESPONSE TO ITEM #3

The Functional Performance Requirements shall contain failure analyses which address failure effects on other, needed equipment for those cases where qualification is based on a time less than the accident duration.

### USNRC OPEN ITEM #4

"4. The margin applied to the required operability time when combined with other test margins will account for the uncertainties associated with the design, production tolerances, testing techniques, and the number of units tested."

### GE/HCGS RESPONSE TO ITEM #4

For function times less than ten hours with time margins less than one hour, tests shall be performed on more than one sample (size, cost and availability permitting) or margins increased, and the qualification report shall clearly state that the equipment is only qualified for the time tested which shall include appropriate time margin. All other margins shall also be applied as required by NEDE-24326-1-P.

This HCGS EQ Summary Report will be updated to reflect final resolution of these open items.

#### (b) Mechanical Components

The NSSS program for mechanical equipment qualification consisted of the GE recommended listing of all the Class 1 mechanical components which met the following criteria:

- (1) Safety related as defined by safety function/time.
- (2) Located in a harsh environment.

- (3) Used to mitigate an accident including post accident operation.
- (4) Contained non-metallic parts which were known to be age sensitive.

This listing, included in this EQ Summary Report and in FSAR Section 3-11 as Table 3.11-4, is independent of other ongoing EQ efforts such as ATWS/SDS Phase 2 efforts, Class 1E efforts included in this report, HPCI EQ and mechanical components located in the main control room.

(2) Non-NSSS (BOP) Safety Related Components

(a) Electrical Components

The Balance of Plant (BOP) EQ program is limited to the safety related electrical components supplied to HCGS by the A/E (Bechtel) and are identified and ordered by "Q" purchase orders. Each purchase order includes a material specification which identifies to the component vendors the envelopes to which the components were to be qualified. Prior to the actual performance of the EQ test, the vendors were required to submit the test plan to PSE&G/Bechtel for review and approval. Testing approaches were justified and documented for inclusion in the EQ central file.

(b) Mechanical Components

The BOP mechanical components, like the electrical components, were identified and ordered by "Q" purchase orders. If the identified non-metallic part was found to be the same material as that identified in the NSSS/GE qualification program, the results of the NSSS/GE program were used and no further qualification was performed. For other identified age sensitive non-metallic parts, a failure modes and effects analysis (FMEA) was performed by Bechtel to determine if the parts failure would jeopardize the components' ability to perform its required safety function. If so, analysis was performed by either the vendor or an independent testing laboratory to determine the parts replacement interval.

The listing of these BOP safety related, mechanical parts located in a harsh environment and requiring EQ are listed in the attached Table 3.11-4.

#### Review of Vendor Reports

The purpose of the review of vendor environmental qualification reports is to assure that the applicable environmental operating conditions (normal/abnormal/accident) for each component required to operate have been considered, evaluated and achieved, or that deficiencies have been identified and resolved.

Each qualification report received by Bechtel and transmitted to PSE&G for review is assigned a unique documentation identification number. For components supplied by the NSSS vendor (GE), this number references a "GE Book Number". For the remaining components, this number is correlated to the purchase order identification number. In either case, when an EQ report is received by PSE&G and/or Bechtel, it is reviewed in detail in the manner described below.

Items included in the review of EQ reports include the following:

- a) Verification of the test method used (i.e., type test, analysis, operating experience or combination).
- b) Review of the equipment type, model or product identification number, serial number, batch number and other salient component descriptions to ensure that the component being tested is indicative of the actual component being procured for system installation.
- c) Verification that EQ documentation is traceable to the component being tested.
- d) Correct categorization of the component testing to applicable standards (NUREG 0588 Cat. I or Cat. II, IEEE-323-1971 or 1974, etc.).
- e) Verification of the adequacy of the test procedures to address the following areas of concern:
  - (1) Performance of testing sequence per IEEE-323-1974 or justification of method used to ensure most severe sequencing. This includes pretest preparation, component mounting configurations, inspec-

tion and proper function measurements as well as verification that the same test specimen(s) is used throughout any testing.

- (2) Addition of margins to test parameters-time durations and the justifications for these margin selections to meet the intent of IEEE-323-1974 and IEEE-627-1980.
- (3) Verification that the aging (thermal, radiation, mechanical cycling, electrical cycling, synergistic effects) techniques are properly analyzed, applied and justified to provide the most conservative end-of-life component test condition.

Acceptable thermal aging techniques for electrical and mechanical components included the Arrhenius method or other justified methodology in accordance with IEEE-323 or IEEE-627. Thermal and radiation aging was considered on an individual component basis in that the component must contain an age sensitive (organic) part to be applicable.

Each aging method (thermal, radiation, mechanical, etc.) was reviewed to ensure that it placed the equipment in its end of qualified life condition before subjecting it to its worst case DBA. The age related degradation verification included concerns about normal/abnormal operating temperatures, radiation exposure and cyclical mechanical operation and electrical (feeder voltage variations, etc.) stresses which are anticipated to occur during the normal (pre-DBA) qualified life operation of the equipment.

- (4) Verification that synergistic effects were accounted for, justified, and documented, where applicable, in accordance with NUREG 0588.
- (5) Review to ensure that variations in ambient environmental conditions, such as non-seismic vibration, dust, humidity, submergence, etc., have been considered, evaluated and addressed.



- (6) Verification that the most conservative DBA environmental conditions for the component being tested have been enveloped or that deviations have been adequately justified.
- (7) Review of the test results to ensure that the component was correctly energized and/or operated to simulate required normal/abnormal/DBA operating conditions during all phases of the EQ testing. This includes review of the test parameters monitored to verify required extremes in test conditions (voltages, currents, input/output signal ramping, loading, etc.), are achieved.

Also, verification that the instrumentation used to monitor, control and record test parameters has been properly calibrated and documented.

- (8) Verification that the determination of equipment failure has been defined and that resolution of any failure has been clearly identified and justified. If modifications to either the component or test setup have been made, verify that they are justified.
- f) Verification that the documentation packages are complete and accurate and that they address:
- (1) Applicability of component testing to HCGS.
  - (2) Equipment performance per vendor technical specification requirements.
  - (3) Synopsis of test plan including test objective; equipment tested; test facility description; listing of calibrated instrumentation used; test procedures; test data and accuracy; summary, conclusions and recommendations; support data; and proper signoff and dating of EQ report.



- g) If operating experience is used, verify that the components monitored and the environmental conditions listed are applicable to HCGS. Documentation and justification of applicable performance, environmental, failure and maintenance conditions must be verified.
- h) If analysis methods are used, justification for analysis and the analysis methodology must be verified. All assumptions, empirical values, mathematical models, failure analysis, computer programs, extrapolations, etc., must be documented, justified, and properly signed off/dated.

Upon completion of this detailed review, areas of concern by PSE&G/Bechtel are documented, numbered and returned to the component supplier for resolution. Resubmittals are in turn reviewed in detail and this "review/comment to vendor-/resolution/resubmittal" process is repeated until the EQ report satisfies the concerns of PSE&G/Bechtel of the components ability to perform its function under any postulated plant condition.

#### Component Test Witnessing

Stipulations within purchase orders placed with vendors supplying safety related electrical and mechanical equipment requiring environmental qualification testing specify that Bechtel and/or PSE&G be advised of the schedule of particularly important stages and events of the EQ test program. This timely notification has allowed the opportunity for Bechtel/PSE&G to inspect both the components being tested and the test facilities as well as to witness key events.

The activities, stages, and events that have been witnessed include, but are not limited to, the following:

- a) Component physical mounting/set up for DBA testing.
- b) Start-up of DBA chamber testing.
- c) Configuration of test monitoring/data collection instrumentation.
- d) Set up and performance of seismic testing.
- e) Verification of proper test sequencing.
- f) Thermal aging facilities and test setups.

- g) Mechanical (repeated operation) and electrical- (voltage/current/frequency variations) cycling methodologies and test setups.
- h) Radiation exposure rates, durations and source strengths.
- i) Component failure recognition and determination of problem resolutions.

The above noted tasks are separate from, and in addition to, those functions performed by the Quality Assurance organization noted in Section V of this EQ Summary Report.

FOLLOW-ON PROGRAM

HCGS is developing a computer based maintenance and surveillance program to ensure compliance with 10CFR50.49 and Regulatory Guide 1.33. The components for this program were selected as a result of detailed review of existing documentation, (FSAR, Tech Specs, System Descriptions, etc.), drawings (P&ID's; loops, one lines, etc.) and review of the Master Equipment List (MEL) and, as such, includes all safety related electrical and mechanical equipment located in both harsh and mild environments. The purpose of the program is to provide a documented method to verify that the required maintenance and surveillance are performed. This ensures proper equipment operation over the equipments' identified qualified life.

Maintenance of the items ranges from periodic visual inspection of the equipment to detect excess wear and/or verify proper working order to scheduled replacement of identified parts or even total equipment replacement when necessary.

The maintenance and surveillance program is divided into the two following categories:

(1) Components in a Harsh Environment

The safety related electrical and mechanical components located in a harsh environment have been identified in Section VII of this EQ Summary Report. These components are subdivided into the following categories:

- (A) Components with a qualified forty year life which require no replacement parts or planned maintenance for their stated life. These components are listed in the maintenance and surveillance program and the operating procedure or normal operating mode used to verify the devices operability is also listed. This listing is "passive" in that normal operation provides for this operability verification. However, the components inclusion on the program's list provides a mechanism to identify unanticipated failures or abnormal operation should they occur. In this way, failure trending allows identification of any compromise in the components qualified life and will allow re-analysis on a real time, case by case basis.

- (B) Components with a qualified life of forty years if identified parts are replaced or if the components are replaced in total. These components are listed in the "active" section of the maintenance and surveillance program. This provides plant maintenance/performance department notification, via a computer based real time print-out, of both the maintenance required and the date by which the action must be completed to ensure the components operability requirements over the plants forty year life. The notification provides for adequate lead time needed to procure replacement parts/components, if applicable.

(2) Components in a Mild Environment

Using the MEL for reference in compiling this list of safety related components located in a mild environment, the identified components are subdivided into the following categories:

- (A) Components whose operability is proven via either Tech Spec requirements (Diesel Generators, SW Pumps, ESFAS, etc.) or via normal plant operation (breakers, relays, valves, pumps, etc.). Maintenance and/or replacement of component parts or total component replacement is based on a combination of manufacturers' recommendations, good engineering judgement and/or actual plant experience with the components.
- (B) Components whose operability is verified via scheduled maintenance and surveillance procedures. Frequency of procedure performance and corresponding replacement of identified parts or total component replacement is based on a combination of manufacturers' maintenance recommendations, good engineering judgement and/or actual plant experience on a component by component basis.

Engineering Interface With Plant EQ Program

The following engineering information exchange is provided to the station for the Maintenance and Surveillance Program:

- (1) A single document summarizing the safety related electrical and mechanical components located in a harsh environment with a forty year qualified life.

- (2) Documents summarizing the safety related electrical and mechanical components located in a harsh environment which require maintenance, replacement of parts and/or total component replacement to meet the forty year qualified life commitment. The documents delineate maintenance requirements and maintenance/replacement intervals.
- (3) For safety related electrical and mechanical components located in a mild environment, engineering provides both a listing of component parts and the required maintenance/replacement interval to ensure component operability.

Additionally, as HCGS achieves commercial operation and associated work history experience, these time intervals will be updated to reflect actual operating experience. Also, feedback from the industry via vendor technical bulletins, USNRC IE Bulletins/Notices, NPRDS, INPO reports, etc., will be used to further refine maintenance/replacement intervals.



X. EQUIPMENT ENVIRONMENTAL SUMMARY SHEETS

The Equipment Environmental Summary Sheets (EESS) provide a tabulated synopsis of the EQ related data on a component-by-component basis. This data is taken from the EQ file which includes the actual EQ test data for each component. A sample EESS and a listing identifying each item included on an EESS is attached on Pages X-2 thru X-6.



## EQUIPMENT EVALUATION SUMMARY SHEET

HOPE CREEK GENERATING STATION

SIT. NO: \_\_\_\_\_  
REV. NO: \_\_\_\_\_  
DATE: \_\_\_\_\_

EQUIPMENT DESCRIPTION	PARAMETERS	ENVIRONMENT		DOCUMENTATION REFERENCE		QUALIF. METHOD	OPEN ITEMS	MARGIN	REMARKS
		SPECIFIED	QUALIFIED	SPECIFIED	QUALIFIED				
(1) SYSTEM	OPERATING TIME	12	28	13	29	44	60	52	
(2) TAG NO.	TEMP. (°F)	14	30	15	31	45	61	53	
(3) COMPONENT	PRESSURE (PSIA)	16	32	17	33	46	62	54	
(4) MANUFACTURER	RELATIVE HUMIDITY (%)	18	34	19	35	47	63	55	
(5) MODEL NO.	FLOODING/FROTH	20	36	21	37	48	64	56	
(6) FUNCTION	RADIATION (RADS)	22	38	23	39	49	65	57	
(7) ACCURACY a) SPECIFIED _____ b) ACTUAL _____	AGING	24	40	25	41	50	66	58	
(8) LOCATION	SPRAY	26	42	27	43	51	67	59	
(9) ABOVE FLOOD LEVEL YES ___ NO ___	DOCUMENTATION REFERENCE:				NOTES				
(10) SEISMICALLY TESTED YES ___ REF. ___ NO ___									
(11) SURVEILLANCE REQD. YES ___ REF. ___ NO ___									

1. System(s) of which the equipment is a part (i.e., RCIC, HPCS, etc.).
2. Bechtel tag number(s). [include system designation.]
3. Generic descriptions of equipment (i.e., pressure transmitter, temperature element, etc.). [Use same description that is in Table 3.11-5 data base.]
4. Name of actual vendor, (not the sub-purchaser, i.e., GE, Westinghouse, etc.).
5. Vendor model number (preferred) or drawing number.
6. Brief description of what is measured or done by the equipment for each application listed in Item 2.
- 7a. Accuracy of the equipment as or if specified on the Bechtel Specification. (Not applicable if the equipment is passive).
- 7b. Accuracy of the equipment as demonstrated in the report. If 7b is not as accurate as 7a, then a note should be added directing the reader/reviewer to an explanation if this is acceptable. (Not applicable if equipment is passive.)
8. Location in the plant in which the equipment can be found (insert building/room, elevation, etc.).
9. Does flooding occur in the room in which the equipment is found? (DITS 7.5) If yes, the highest flood level elevation specified must be considered; if the equipment/component is below that level, then submergence shall be addressed.
10. If seismically tested, identify reference document. (See SQRT File)
11. If maintenance and surveillance is required, state the reference document. (Use vendor Report No. and list page no. of report or refer to document prepared by PSE&G).
12. The length of time, starting with DBE initiation, during which the equipment is required to perform its safety function or not fail detrimentally.
13. The auditable exhibit\* that documents the specification for Item 12.
14. The time-dependent temperature profile during the period of Item 12, for the time the equipment is required to perform its safety function or not fail detrimentally.

15. The auditable exhibit\* that documents the specification for Item 14.
16. The time-dependent pressure profile during DBE under which the equipment is required to perform its safety function or not fail detrimentally.
17. The auditable exhibit\* that documents the specification for Item 16.
18. The time-dependent profile of relative humidity during DBE in which the equipment is required to perform its safety function or not fail detrimentally.
19. The auditable exhibit\* that documents the specification for Item 18.
20. "None required" if above highest flood/froth level elevation. The entry here should be consistent with Item 9 for flood.
21. the auditable exhibit\* that documents the requirement for Item 20.
22. Radiation exposure expressed in three entries (identify type):
  - a) integrated dose during normal service,
  - b) integrated dose during DBE (Item 12), and
  - c) total integrated dose (TID), sum of (a) and (b).
23. The auditable exhibit\* that documents the specification for Item 22 (including beta, gamma, neutrons, total dose, dose rates as applicable).
24. Enter environmental and operating stress (temperature, cycles, etc.) for 40-year period, excluding DBE; for pipe-mounted equipment, include any specified long term vibration. In addition, hydrodynamic loads of a long duration shall be specified and applied therein.
25. The auditable exhibit\* that documents the specification for Item 24.
26. If applicable, state containment spray rate and composition of the spray.
27. The auditable exhibit\* that documents the requirement for Item 26.

28. The length of time, starting with DBE initiation, during which the equipment has been demonstrated to perform its safety function.
29. The auditable exhibit\* that documents the demonstration for Item 28.
30. The time-dependent temperature profile to which the equipment has been exposed and demonstrated to function properly.
31. the auditable exhibit\* that documents the temperature profile and the function of the equipment for Item 30.
32. The time-dependent pressure profile to which the equipment has been exposed and demonstrated to function properly.
33. The auditable exhibit\* that documents the pressure profile and the function of the equipment for Item 32.
34. The time-dependent profile of relative humidity to which the equipment has been exposed and demonstrated to function properly.
35. The auditable exhibit\* that documents the relative humidity profile and the function of the equipment for Item 34.
36. A statement of capability during and after submersion and/or exposure to froth, if required.
37. the auditable exhibit\* that documents the fllooding/froth exposure and the function of the product for Item 36.
38. the total integrated radiation does to which the equipment has been exposed and demonstrated to function properly (identify type).
39. the auditable exhibit\* that documents the radiation exposure and the function of the equipment for Item 38.
40. Demonstrated qualified life for conditions in Item 24.
41. Reference the Equipment Qualification Report and the auditable document\* that exhibits the aging exposure and the function for Item 40.
42. A statement of capability during and after exposure to spray, if required.



HCGS FSAR  
TABLE 3.11-5

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

P&ID  
M-57-1

Page 43 of 74

SYSTEM: CONTAINMENT ATMOS. CONTRL.  
GS

P.O.	ID NO.	MPL NO.	COMPONENT	LOCATION		PAM EQUIP. NOTE (1)	TMI ACTION PLAN EQUIP. NOTE (2)	COMMENTS
				BLDG.	ELEV.			
J359Q	1-AC-200		H2/O2 Analyzer PNL A	Reactor	162	No	Yes	
J359Q	1-GS-AE-5039A1		Analysis Elemt.	Reactor	162	No	No	
J359Q	1-GS-AE-5039A2		Analysis Elemt.	Reactor	162	No	No	
J359Q	1-GS-AE-5039B1		Analysis Elemt.	Reactor	162	No	No	
J359Q	1-GS-AE-5039B2		Analysis Elemt.	Reactor	162	No	No	
J359Q	1-GS-AI-5040A		Anal. Indicator	Reactor	162	No	No	
J359Q	1-GS-AI-5040B		Anal. Indicator	Reactor	162	No	No	
J359Q	1-GS-AIT-5039A1		Anal. Indicating Trans	Reactor	162	No	No	
J359Q	1-GS-AIT-5039A2		Anal. Indicating Trans	Reactor	162	No	No	
J359Q	1-GS-AIT-5039B1		Anal. Indicating Trans	Reactor	162	No	No	
J359Q	1-GS-AIT-5039B2		Anal. Indicating Trans	Reactor	162	No	No	
J359Q	1-GS-AIT-5041A		Anal. Indicating Trans	Reactor	162	No	No	
J359Q	1-GS-AIT-5041B		Anal. Indicating Trans	Reactor	162	No	No	
J359Q	1-AS-206		H <sub>2</sub> /O <sub>2</sub> Anal. Pkg.	Reactor	162	No	No	
J359Q	1-GS-AS-5039A1		Anal. Sw.	Reactor	162	No	No	
J359Q	1-GS-AS-5039A2		Anal. Sw.	Reactor	162	No	No	
J359Q	1-GS-AS-5039B1		Anal. Sw.	Reactor	162	No	No	
J359Q	1-GS-AS-5039B2		Anal. Sw.	Reactor	162	No	No	
J359Q	1-GS-ASH-5037A		Analysis Sw. High	Reactor	162	No	No	
J359Q	1-GS-ASH-5037B		Analysis Sw. High	Reactor	162	No	No	
J359Q	1-GS-ASH-5041A		Analysis Sw. High	Reactor	162	No	No	
J359Q	1-GS-ASH-5041B		Analysis Sw. High	Reactor	162	No	No	
J359Q	1-GS-AT-5039A1		Anal. Trans.	Reactor	162	Yes	No	
J359Q	1-GS-AT-5039A2		Anal. Trans.	Reactor	162	Yes	No	
J359Q	1-GS-AT-5039B1		Anal. Trans.	Reactor	162	Yes	No	
J359Q	1-GS-AT-5039B2		Anal. Trans.	Reactor	162	Yes	No	
J359Q	1-RC-200		H2/O2 Analyzer PNL B	Reactor	162	No	Yes	
J359Q	1-HS-206		H <sub>2</sub> /O <sub>2</sub> Anal. Pkg.	Reactor	162	No	No	
J359Q	1-CC-200		H <sub>2</sub> /O <sub>2</sub> Analyzer HT PNL	Reactor	162	No	No	
J359Q	1-DC-200		H2/O2 Analyzer HT PNL	Reactor	162	No	No	
J359Q	1-GS-HS-5085B		Hand Sw.	Reactor	162	No	No	
J359Q	1-GS-HS-5086A		Hand Sw.	Reactor	162	No	No	
J359Q	1-GS-HS-5086B		Hand Sw.	Reactor	162	No	No	
J359Q	1-GS-HS-5087A		Hand Sw.	Reactor	162	No	No	
J359Q	1-GS-HS-5087B		Hand Sw.	Reactor	162	No	No	
J359Q	1-GS-HS-5092A		Hand Sw.	Reactor	162	No	No	
J359Q	1-GS-HS-5092B		Hand Sw.	Reactor	162	No	No	
J359Q	1-GS-HS-5094A		Hand Sw.	Reactor	162	No	No	
J359Q	1-GS-HS-5094B		Hand Sw.	Reactor	162	No	No	
J359Q	1-GS-HS-5095A		Hand Sw.	Reactor	162	No	No	
J359Q	1-GS-HS-5095B		Hand Sw.	Reactor	162	No	No	
P303AQ	1-GS-HV-4951		Control Valve	Reactor	145	No	No	

HCGS FSAR  
TABLE 3.11-5  
EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

P&ID  
M-57-1

SYSTEM: CONTAINMENT ATMOS. CONTRL.  
GS

P.O.	ID NO.	MPL NO.	COMPONENT	BLDG.	ELEV.	PAM EQUIP. NOTE (1)	TMI ACTION PLAN EQUIP. NOTE (2)	COMMENTS
P303AO	1-GS-HV-4955A		Control Valve	Reactor	162	No	No	
P303AO	1-GS-HV-4955B		Control Valve	Reactor	162	No	No	
P303AO	1-GS-HV-4959A		Control Valve	Reactor	77	No	No	
P303AO	1-GS-HV-4959B		Control Valve	Reactor	77	No	No	
P303AO	1-GS-HV-4963		Control Valve	Reactor	77	No	No	
P303AO	1-GS-HV-4965A		Control Valve	Reactor	77	No	No	
P303AO	1-GS-HV-4965B		Control Valve	Reactor	77	No	No	
P303AO	1-GS-HV-4966A		Control Valve	Reactor	77	No	No	
P303AO	1-GS-HV-4966B		Control Valve	Reactor	102	No	No	
P303AO	1-GS-HV-4974		Control Valve	Reactor	102	No	No	
P303AO	1-GS-HV-4987A		Control Valve	Reactor	162	No	No	
P303AO	1-GS-HV-4987B		Control Valve	Reactor	162	No	No	
P303AO	1-GS-HV-4987C		Control Valve	Reactor	162	No	No	
P303AO	1-GS-HV-4987A		Control Valve	Reactor	162	No	No	
P303AO	1-GS-HV-4987B		Control Valve	Reactor	162	No	No	
P303AO	1-GS-HV-5019A		Control Valve	Reactor	162	No	No	
P303AO	1-GS-HV-5019B		Control Valve	Reactor	162	No	No	
P303AO	1-GS-HV-5022A		Control Valve	Reactor	77	No	No	
P303AO	1-GS-HV-5022B		Control Valve	Reactor	102	No	No	
P303AO	1-GS-HV-5741A		Control Valve	Reactor	132	No	No	
P303AO	1-GS-HV-5741B		Control Valve	Reactor	132	No	No	
J3590	1-GS-PDS-5094A1		Heat Tracing	Reactor	162	No	No	
J3590	1-GS-PDS-5094A2		Press. Diff. Sw.	Reactor	162	No	No	
J3590	1-GS-PDS-5094B1		Press. Diff. Sw.	Reactor	162	No	No	
J3590	1-GS-PDS-5094B2		Press. Diff. Sw.	Reactor	162	No	No	
J3010	1-GS-PDT-5029		Press. Diff. Trans.	Reactor	102	No	No	
J3010	1-GS-PDT-5031		Press. Diff. Trans.	Reactor	102	No	No	
J3590	1-GS-PSH-5081A		Press. Sw. High	Reactor	162	No	No	
J3590	1-GS-PSH-5081B		Press. Sw. High	Reactor	162	No	No	
J3590	1-GS-PSL-5081A		Press. Sw. Low	Reactor	162	No	No	
J3590	1-GS-PSL-5081B		Press. Sw. Low	Reactor	162	No	No	
J3590	1-GS-PSL-5085A1		Press. Sw. Low	Reactor	162	No	No	
J3590	1-GS-PSL-5085A2		Press. Sw. Low	Reactor	162	No	No	
J3590	1-GS-PSL-5085A3		Press. Sw. Low	Reactor	162	No	No	
J3590	1-GS-PSL-5085A4		Press. Sw. Low	Reactor	162	No	No	
J3590	1-GS-PSL-5085B1		Press. Sw. Low	Reactor	162	No	No	
J3590	1-GS-PSL-5085B2		Press. Sw. Low	Reactor	162	No	No	
J3590	1-GS-PSL-5085B3		Press. Sw. Low	Reactor	162	No	No	
J3590	1-GS-PSL-5085B4		Press. Sw. Low	Reactor	162	No	No	
J3010	1-GS-PT-4960A1		Press. Trans.	Reactor	102	Yes	No	
J3010	1-GS-PT-4960B1		Press. Trans.	Reactor	102	Yes	No	



HCCS FSAR  
TABLE 3.11-5

EQUIPMENT SELECTED FOR HARSH ENVIRONMENT QUALIFICATION

P&ID  
M-57-1

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SYSTEM: CONTAINMENT ATMOS. CONTRL.  
GS

F.O.	ID NO.	MPL. NO.	COMPONENT	LOCATION		PAM EQUIP. NOTE (1)	TMI ACTION PLAN EQUIP. NOTE (2)	COMMENTS
				BLDG.	ELEV.			
P303AQ	1-GS-ZS-4963		Limit Switch	Reactor	77	Yes	No	
P305Q	1-GS-ZS-4964		Limit Switch	Reactor	77	Yes	No	
P303AQ	1-GS-ZS-4965A		Limit Switch	Reactor	77	Yes	No	
P303AQ	1-GS-ZS-4965B		Limit Switch	Reactor	77	Yes	No	
P303AQ	1-GS-ZS-4966A		Limit Switch	Reactor	77	Yes	No	
P303AQ	1-GS-ZS-4966B		Limit Switch	Reactor	102	Yes	No	
P303AQ	1-GS-ZS-4974		Limit Switch	Reactor	102	Yes	No	
P305Q	1-GS-ZS-4978		Limit Switch	Reactor	102	Yes	No	
P305Q	1-GS-ZS-4979		Limit Switch	Reactor	102	Yes	No	
P305Q	1-GS-ZS-4980		Limit Switch	Reactor	77	Yes	No	
P303AQ	1-GS-ZS-4983A		Limit Switch	Reactor	162	Yes	No	
P303AQ	1-GS-ZS-4983B		Limit Switch	Reactor	162	Yes	No	
P303AQ	1-GS-ZS-4984A		Limit Switch	Reactor	162	Yes	No	
P303AQ	1-GS-ZS-4984B		Limit Switch	Reactor	162	Yes	No	
P303AQ	1-GS-ZS-5019A		Limit Switch	Reactor	162	Yes	No	
P303AQ	1-GS-ZS-5019B		Limit Switch	Reactor	77	Yes	No	
P303AQ	1-GS-ZS-5022A		Limit Switch	Reactor	102	Yes	No	
P303AQ	1-GS-ZS-5022B		Limit Switch	Reactor	77	Yes	No	
P305Q	1-GS-ZS-5029		Limit Switch	Reactor	77	Yes	No	
P305Q	1-GS-ZS-5031		Limit Switch	Reactor	77	Yes	No	