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ENVIRONMENTAL QUALIFICATION REPORT FOR ELECTRICAL EQUIPMENT

LIMERICK GENERATING STATION
UNITS 1 AND 2

PHILADELPHIA ELECTRIC COMPANY

U.S. NUCLEAR REGULATORY COMMISSION
EXHIBIT No. Appl #29
Applicant ✓ Staff ___ Intervenor ___
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TABLE OF CONTENTS

INTRODUCTION

In February 1980, the Nuclear Regulatory Commission (NRC) requested that Philadelphia Electric Company (PECo) perform a review of the Environmental Qualification (EQ) of safety-related equipment at the Limerick Generating Station (LGS) to identify the degree to which it complies with the applicable regulatory criteria. The purpose of this report is to discuss the LGS Electric Equipment Qualification Program and to demonstrate Limerick's compliance with the requirements of 10 CFR 50.49 and other applicable regulatory criteria. This LGS Mechanical Equipment Qualification Program will be discussed in a separate report.

The LGS EQ Program encompasses electrical equipment important to safety which has the potential to be subject to a harsh environment. A harsh environment is defined as an area that would be exposed to a significant increase in temperature, pressure, humidity and/or radiation levels during and after Design Basis Accidents (DBA's).

Mild environment equipment qualification is not included in the EQ Program discussed in this report. A mild environment is an environment that would at no time be significantly more severe than the environment that would occur during normal operation. Mild environment EQ is a quality assurance function and as such is addressed using 10 CFR 50, Appendix B and Regulatory Guide 1.33 Criteria.

1.0 ENVIRONMENTAL DESIGN CRITERIA FOR ELECTRICAL EQUIPMENT

All equipment important to safety must be capable of performing its safety function and/or remaining in a safe mode under all conditions postulated to occur during its installed life. This requirement is embodied in General Design Criteria 1, 2, 4 and 23 of Appendix A to 10 CFR 50, in Criteria III and XI of Appendix B to 10 CFR 50, and in 10 CFR 50.55 a(h) which incorporates by reference IEEE Standard 279-1971, "Criteria for Protection Systems for Nuclear Power Generating Stations."

In May 1980, the NRC issued a Commission Memorandum and Order (CLI 80-21) requiring nuclear utilities to demonstrate qualification of their Class IE Equipment. The memorandum and order outlined the following specific criteria to be used in evaluating qualification of electrical equipment:

1. The Division of Operating Reactors', "Guidelines for Evaluating Environmental Qualification of Class IE Electrical Equipment in Operating Reactors" (DOR Guidelines)

2. NUREG-0588, "Interim Staff Position on Environmental Qualification of Safety-Related Electrical Equipment" Revision 0, Category II for plants whose Construction Permit Safety Evaluation Report (CP-SER) was issued on or before July 1, 1974

3. NUREG-0588 Category I for plants whose CP-SER was issued following July 1, 1974 or plants which have a licensing commitment to IEEE 323-1974.

Since the LCS CP-SER was issued in June 1974, NUREG-0588 Category II requirements are applicable.

In January 1983, the NRC issued 10 CFR 50.49 on environmental qualification of electrical equipment.

The following sections demonstrate Limerick's conformance to the applicable regulations and regulatory criteria described above.

3.0 ENVIRONMENTAL SERVICE CONDITIONS

Equipment environmental service conditions have been evaluated for normal/abnormal and accident environments. Plant rooms provide the defined boundaries for environments, and Table 1 in Appendix C provides a summary of environmental conditions by room number for normal and accident conditions. All areas inside containment and rooms containing high energy lines or post LOCA recirculatory fluid lines outside of containment are considered to be harsh environments. As a result harsh environments are limited to the primary containment, the Standby Gas Treatment fan room, and the reactor enclosure.

The methodology used to develop the environmental conditions is discussed below.

3.1 ENVIRONMENTAL CONDITIONS DURING NORMAL OPERATION

Temperature and Humidity

Temperature and humidity conditions during normal operation are maintained within the limits shown in Table 1 of Appendix C by the Heating, Ventilation and Air Conditioning (HVAC) Systems.

HVAC equipment serving safety-related areas is sized for peak thermal loads at a given time consisting of one or all of the following factors:

1. Maximum piping thermal loads for the room, if applicable, using maximum operating temperatures for the pipe contents for each mode or operation

2. Maximum internal electrical load assuming full lighting for the room and using, if applicable, the maximum control and equipment heat rejection for each mode of operation

3. Maximum heat transfer from miscellaneous equipment surfaces, if applicable, using the maximum operating temperature of the contents

4. Maximum heat transfer from the surfaces of the room including walls, floor and ceiling or roof.

FSAR Section 9.4 describes the HVAC Systems that maintain the temperature and humidity in each room within normal limits.

Normal Radiation

Each plant area has been categorized into a radiation zone according to expected radiation levels. Each room, corridor, and pipeway is evaluated for potential radiation sources during normal operation, including anticipated operational occurrences and shutdown.

The total integrated radiation doses for 40 years are provided in Table 1 of Appendix C. These doses were calculated for a 100% load factor and rated power during normal operation. The doses are based on design source terms of the radiation sources within each plant area. The normal radiation design source terms are based on a noble gas fission product release rate of 0.35 Ci/sec (after 30 minutes of decay) and the corresponding fission, activation, and corrosion product concentrations in the primary coolant.

Normal radiation source terms are based on conservative assumptions about system and equipment operations and characteristics to provide conservative radioactivity concentrations. For all systems transporting radioactive materials, conservative allowance is made for transit decay while at the same time providing for daughter product formation. Assumptions from NUREG-0016, "Calculation of Releases of Radioactive Materials in Gaseous and Liquid Effluents for Boiling Water Reactors", Revision 1, were also used where applicable. Therefore, the normal radiation source terms are not intended to approximate the actual system design radioactivity concentrations.

Aging

Aging effects on all electrical equipment important to safety are considered in the EQ Program to conform to the requirements of Section 4 of NUREG-0588. Components susceptible to aging are identified and evaluated using NRC-approved methodologies.

Several methods of evaluating the aging effects of a component have been incorporated into the LGS EQ Program.

Because LGS is a NUREG-0588, Category II Plant, aging of equipment prior to a DBA Test is only required for motors and valve motor operators. As a result, other types of equipment are evaluated on the basis of their materials' susceptibility to aging if pre-aging tests were not conducted.

The Arrhenius methodology is used for accelerated thermal aging. Other aging methods, such as the 10°C Rule, if used, are justified.

Equipment that has not been age conditioned prior to qualification testing is evaluated for its susceptibility to age-related degradation. A review of materials information and/or operating experience is used in the age susceptibility evaluation. Information derived from this evaluation is used in the Maintenance/Surveillance Program described in Section 8.

Synergistic Effects

Synergistic effects, where known, are considered in the accelerated aging program. Specifically, where a supplier has identified a synergism or where PECo is aware of synergistic effects for a particular component, it has been addressed. Appropriate documentation is included in the qualification file. To date the only affected equipment has been cable.

Non-Seismic Plant-Induced Vibration

Effects of known normal vibratory loads on equipment, when significant, are considered in the EQ Program.

Dust

Ventilation filtration ensures a relatively clean, dust-free environment. In addition, plant procedures identify the actions required to maintain the HVAC filtration capability.

3.2 ACCIDENT ENVIRONMENTAL CONDITIONS

Operability Duration

The operability duration is the length of time during and following an accident that equipment must maintain its ability to perform its safety function. The safety functions include:

1. The ability to initiate short-term protective action

2. The ability to place the plant in a controlled condition

3. The ability to keep the plant in a stable condition after the accident and until personnel are able to enter the plant to inspect, repair, or replace equipment important to safety.

The operability duration is determined individually for each LGS piece of equipment. The longest duration an equipment type is evaluated for is 180 days. As in the generation of the equipment list, the Component Classification Program has been utilized in the review and establishment of operability duration.

Temperature, Pressure, and Humidity Conditions Inside Containment

The temperature and pressure conditions inside primary containment for the spectrum of LOCA's have been calculated using approved NRC methodology. The spectrum of LOCA's include:

1. Recirculation line guillotine breaks
2. Main steam line guillotine breaks
3. Intermediate size breaks
4. Small size breaks.

Temperature and pressure profiles were developed which bound the temperature and pressure conditions resulting from the entire range of breaks. The time-dependent

pressure and temperature profiles are included in Appendix C Figures 2 and 3, respectively.

The following considerations were included in the analysis of post-LOCA temperature and pressure conditions:

1. The worst case single failure
2. Loss of offsite power as required
3. Maximum containment operating temperature
4. Heat load effects.

Environmental conditions inside primary containment have been evaluated for 180 days post-accident. The original analysis conducted to determine the post-accident conditions extended only 11.6 days post-accident. As a result, it was necessary to evaluate containment conditions from 11.6 to 180 days. The pressure curve was conservatively assumed to remain constant after 11.6 days. A plant-specific analysis was conducted to determine the temperature from 11.6 to 180 days. The analysis assumed that the drywell temperature varies directly with the suppression pool temperature.

The relative humidity inside primary containment is assumed to remain at 100% for 180 days.

Temperature and Pressure Conditions Outside Primary Containment

Temperature, pressure, and humidity conditions resulting from a LOCA or HELB outside of the primary containment have been evaluated for the reactor enclosure. Table 1 in Appendix C provides the extremes resulting from the spectrum of accident conditions for each of the rooms in the reactor enclosure.

The time-dependent temperature profile for the reactor enclosure following a LOCA is Figure 4 of Appendix C. The profile was determined by reviewing the most limiting occurrences following a pipe break. The following considerations were included in the LOCA analysis:

1. Maximum normal reactor enclosure temperature
2. Outdoor air temperature
3. Building heat sink
4. Equipment heat load
5. Operation of safeguard equipment
6. Loss of offsite power
7. The worst case single failure
8. Solar heat loading
9. Primary containment heat load
10. Temperature distribution
11. Cooling effects of various systems operations.

Relative humidity in the reactor enclosure was conservatively assumed to be 90% for 180 days following a LOCA.

The temperature profile following a HELB for the isolation valve compartment is Figure 5 of Appendix C. The isolation valve compartment is the only compartment in the reactor enclosure which contains equipment required to operate in order to provide long-term containment cooling and shutdown cooling following a HELB in that compartment. Other reactor enclosure compartments contain equipment required for short-term operation to limit the effects of the HELB (i.e., steam isolation dampers, containment isolation valves). However, the safety functions of this equipment will be completed once the blowdown has ceased. Equipment in this category is qualified to the peak temperature and pressure values given in Table 1 in Appendix C for the required duration.

Temperature and pressure conditions in the reactor enclosure were determined by reviewing the most limiting occurrences following a high energy line break. The following considerations were included in the HELB analysis:

1. Loss of offsite power if a trip of the Turbine Generator System or Reactor Protection System is a direct consequence of the postulated piping failure

2. The worst case single failure

3. Maximum normal operating temperatures

4. Outside air temperatures

5. Restoration of normal ventilation.

The equipment within the compartment in which the HELB was postulated to occur has been conservatively considered to be subject to an atmosphere of 100% relative humidity until normal ventilation is restored. When offsite power is available and when access is available to reset the steam flooding dampers which were tripped, the humid air in the compartment will be dispersed by the normal ventilation system. The relative humidity is assumed to increase only in the compartment containing the HELB because all compartments subject to steam flooding from HELB's are protected by redundant steam flooding dampers at all HVAC supply and exhaust openings. These compartments have steam tight boundaries.

Radiation

Post-LOCA radiation doses were calculated in accordance with NUREG-0737 using source terms specified in NUREG-0737 Item II.B.2 and NUREG-0588.

The following release fractions were used as a basis for determining the concentrations for the radiation dose calculations:

Containment atmosphere: 100% noble gases, 25% halogens
Depressurized Reactor Liquid: 50% halogens, 1% solids
Suppression pool liquid: 50% halogens, 1% solids.

For components inside primary containment, the total integrated gamma doses were calculated by adding the post-LOCA primary containment cloud dose to the 40-year normal operating dose.

Total Integrated Doses (TID) and dose rates for the primary containment are provided in Table 1 of Appendix C.

For compartments in the secondary containment, the post-LOCA gamma radiation levels were conservatively calculated by adding the maximum piping contact dose in that compartment to the secondary containment cloud dose. Equipment-specific doses were calculated on as-required bases accounting for distance and spatial relationships. The total integrated gamma dose was then determined by adding the post-LOCA integrated dose to the normal operating integrated dose.

Secondary containment piping doses were calculated based on the radionuclide concentrations present in piping and components for the following systems:

1. Core Spray System
2. HPCI System
3. RCIC System
4. RHR System
5. CRD Hydraulic System
6. RWCU System
7. Gaseous Radwaste System
8. Post-Accident Sampling System
9. Recombiner System
10. Reactor Enclosure Recirculation System
11. Standby Gas Treatment System.

For piping system calculations, appropriate dilution volumes, system design, operating modes were considered in accordance with NUREG-0737 Item II.B.2.

For calculation of radiation doses for the secondary containment atmosphere, the Reactor Enclosure Recirculation System (RERS) filters, and the Standby Gas Treatment System (SGTS) filters, the primary containment design leak rate was assumed, together with consideration of RERS and SGTS design and operating modes, in accordance with NUREG-0737 Item II B.2.

Beta doses were also calculated for the primary and secondary containment. The doses were calculated by assuming that 100% of the core noble gas inventory, 50% of the core halogen inventory, and 1% of the core solid fission product inventory are released. The beta doses and dose rates were calculated assuming an infinite cloud geometry.

The TID's and dose rates for the reactor enclosure are in Table 1 of Appendix C.

The Radiation doses resulting from HELB's are bounded by the LOCA TID. Non-DBA event, e.g., HELB, radiation dose reduction factors that can be applied to the existing LOCA radiation doses have been determined based on the non-DBA source terms provided in NUREG-0588, Section 1.4(1). Additional radiation dose reduction factors to account for dose attenuation due to distance, radioactive piping "deadlegs," event duration and other event-specific parameters can be determined and applied on a case-by-case basis.

Seismic and Hydrodynamic

Dynamic qualification of equipment due to seismic and hydrodynamic loads from SRV and LOCA will be addressed in FSAR Section 3.10 and DAR Section 7.1.7.

Submergence

Submergence of equipment outside containment may be caused by either a HELB or a Moderate Energy Line Break (MELB). The impact of submergence was determined as part of the Separation Review Program (SRP). The SRP ensures that the reactors can be shut down and maintained in a safe shutdown condition in the event of a postulated rupture of a pipe, a non-pipe break generated missile, or a fire. With respect to submergence, analyses were performed for those compartments which have a potential for flooding to determine the flood elevations. Chapter 5 of the Fire Protection Evaluation Report (FPER) lists the equipment in each fire zone, many of which are susceptible to submergence. Based on a loss of all susceptible equipment in a given compartment and postulating the worst case single active failure, safe shutdown flowcharts were reviewed to determine that safe shutdown paths remain. In the cases where the loss of susceptible equipment coincident with the single active failure cause the loss of all shutdown paths, appropriate protective actions are taken to qualify the equipment for submergence or to relocate the equipment. The Equipment Qualification Review Record (Appendix E) for each electrical component indicates if the component is qualified for submergence or if qualification for submergence is not applicable.

Containment Spray

Limerick has the capability of demineralized water spray actuation to mitigate the effects of a LOCA. Therefore, the effects of spray (i.e. spray impingement, dripping) on equipment important to safety are evaluated.

4.0 QUALIFICATION TESTING AND ANALYSIS OF EQUIPMENT

All qualification testing and analysis of electrical equipment important to safety are being evaluated for compliance with the Category II NUREG-0588 guidelines. Equipment testing is reviewed to determine the extent to which it simulates plant conditions and provides sufficient margin. Factors considered during the review of testing include test procedure, test set-up, test sequence, margin and test anomalies.

Supplemental analyses (i.e., beta shielding, thermal degradation) are performed, as required, to support qualification. All analyses based on partial test data are completed using approved methodologies with adequate justification. Equipment-specific analyses are contained in the EQ file along with the appropriate justification.

5.0 METHODOLOGY FOR EVALUATING ENVIRONMENTAL QUALIFICATION SERVICE CONDITIONS

Electrical equipment important to safety is evaluated by comparing demonstrated environmental conditions with required conditions. This evaluation includes review for both 40-year normal environments and accident environments resulting from a spectrum of LOCA's and HELB's. The equipment qualification documentation is considered acceptable when it is demonstrated that the equipment can perform its required safety function under the postulated environmental conditions.

PECo assembles, evaluates, and reviews equipment qualification documentation per PECo Electrical Engineering Procedure (UDP) EE-SES-2. An Equipment Qualification Review Record (EQRR) is completed for each electrical component important to safety requiring EQ. The EQRR form with a description of its entries is provided in Appendix D.

The EQRR's demonstrate that each required parameter is enveloped by the qualified values. Additionally, the EQRR's provide the equipment's description, function, interfaces, maintenance requirements and any corrective actions required to achieve qualification.

Appendix E contains the EQRR's sorted alphanumerically by system.

6.0 CORRECTIVE ACTION PLANS

Corrective action plans have been developed for all equipment whose documentation does not support qualification. The following corrective action plans have been developed for equipment following assessment of its qualification deficiency:

1. Replace equipment with qualified equipment (Category I, NUREG-0588),

2. Partially retest equipment in accordance with NUREG-0588, Category II, or

3. Relocate equipment to a less severe environmental zone for which equipment qualification can be demonstrated.

Corrective action plans are identified on the EQRR for all equipment with qualification deficiencies.

Corrective action plans are expected to be completed prior to fuel load. In the event that completion of some actions plans are delayed, justification for interim operation will be provided.

7.0 JUSTIFICATION FOR INTERIM OPERATION

Justification for interim operation will be provided for all equipment whose qualification can not be demonstrated prior to fuel load. Analyses will be performed to ensure that failure of the equipment will not impact the prescribed safety functions, affect in a detrimental way other safety equipment or functions, or mislead an operator into taking an action that could adversely alter the course of the accident.

8.0 MAINTENANCE/SURVEILLANCE PROGRAM

A maintenance and surveillance program is being developed by PECo to ensure the continued environmental qualification of equipment during plant operation.

The objectives of this maintenance and surveillance program are to ensure that the qualified equipment will perform its intended function in the environment in which it is expected to operate and to maintain retrievable records.

The list of environmentally qualified equipment identifies equipment to be included in the maintenance and surveillance program. The list will be kept current to include mechanical equipment and ensure that equipment added to the plant because of design modifications is incorporated into the qualification program and the maintenance and surveillance program.

For each piece of equipment, a maintenance and surveillance program is being developed based on information such as requirements resulting from the equipment qualification report, manufacturers' recommendations, material analyses, previous experience with similar equipment, etc. The qualification-specific requirements are identified on the individual EQRR forms for each piece of equipment. The initially developed maintenance and surveillance programs will be modified during plant life if additional information such as corrective maintenance frequency, surveillance testing, and industry experience (e.g., NRC information notices, circulars or bulletins, manufacturers' alert, LER's, reliability data bases, etc.) identifies any unanticipated degradation trends. In addition, the maintenance and surveillance program identifies the lubricants suitable for each application and environment. These maintenance and surveillance activities are performed by trained personnel using detailed procedures, as necessary. Spare and replacement parts are discussed in Section 9.0.

The plant maintenance program will be computerized to efficiently handle scheduling and documentation of maintenance requirements and activities. Periodic computer schedules will identify when equipment maintenance, replacement, testing, or calibration is required. Appropriate plant departments will complete the work. On completion of scheduled activities, a documented notification will be made indicating work completion which will then be entered into the computer to document completion and facilitate

rescheduling. This computerized scheduling program will be used to alert appropriate plant departments of preventive maintenance, surveillance, and replacement requirements for environmentally qualified equipment.

Quality assurance and control programs will require inspections, verifications, and audits of activities and procedures important to safety. These will be performed on environmentally qualified equipment to ensure that schedules, maintenance, procedures, replacements, and documentation are completed in a correct and timely manner.

The maintenance and surveillance program will be consistent with NRC requirements and will be implemented at the time of fuel load.

9.0 REPLACEMENT PARTS PROGRAM

For the purpose of this discussion the following definitions are provided:

Equipment	A product that is manufactured
Device	A piece of electrical or electronic equipment that has been qualified as a unit by test or analysis
Components	Items from which a device is assembled (e.g., resistors, capacitors, wires, connectors, transistors, tubes, switches, springs, etc.)
Assembly	Two or more components sharing a common mounting or support structure
Module	Any assembly of interconnected components which constitutes an identifiable unit. A module can be disconnected, removed as a unit, and replaced with a spare. It has definable performance characteristics which permit it to be tested as a unit. A module can be a card or other subassembly.

Replacement components, assemblies, and modules for equipment important to safety are being ordered to meet the environmental requirements of original specifications or to the environmental conditions found necessary as a result of this program. A certificate of conformance is considered sufficient documentation to support qualification for component, assembly, and module replacement parts which are in-kind replacements for the originally supplied equipment. However, if in-kind replacement parts are not available, the effect of the new part on the environmental qualification of the equipment will be evaluated. Supplemental documentation will be included in the EQ file as appropriate.

For those equipment items important to safety upon which maintenance activities are normally performed by the replacement of complete devices, replacement devices will be procured to NUREG-0588 Category I effective on the date of commercial operation unless justification for not procuring to this level is documented.

Spare equipment used to facilitate plant maintenance, such as transmitters, will be evaluated to the generic requirements for its worst case potential application per NUREG-0588 Category II.

10.0 EQRR REFERENCE LIST

Ref. No.	Title
1	Bechtel Specification 8031-M-171 Rev. 1 "Specification for Environmental Qualification Service Conditions."
5	Electrical Calculation #6300 E20 Rev. 3 "Voltage Regulation Study."
7	Vendor Print 8031-E-53-Q3-1-2, NTS Analysis Report No. 528-1132, Rev. A, dated 5/18/83 "Nuclear Environmental Qualification of Twenty-Six (26) 480-Volt AC Motor Control Center for the LGS."
8	Vendor Print 8031-E-40-42-2 "Design Qualification for Electric Penetration Assemblies - Report No. IPS-269.1 dated 6/23/81 by Conax Corporation."
9	Vendor Prints: 8031-E-28-B-47-2: Rockbestos Report No. QR1801 "Qualification of Firewall III Class 1E Electric Cables Chemically Cross-Linked with Factory Insulation Rework" dated 5/18/82. 8031-E-28B-48-2, 8031-E-31A-17-2, 8031-E-31B-45-2: Rockbestos Report No. QR1802. "Qualification of Firewall III Class 1E Electric Cables Irradiation Cross-Linked Insulation with Factory Insulation Rework (Instrument Cable)" dated 5/18/82.
10	Vendor Prints: 8031-E-28B-70-1, 8031-E-31A-22-1, 8031-E-31B-49-1: Rockbestos Report No. QR1812R "Qualification of Firewall III Class 1E Instrumentation and Control Cables Containing Factory Splices and KXL420 Rework" dated 6/24/82.
12	Vendor Prints: 8031-M-60B-31-4: In[illegible]eco Qualification Plan 17173-1 8031-M-60B-31-5S: Qu[illegible]ification Plan 17173-1 Addendum 8031-M-60B-66-1: CCL Qualification Report A-575-83
13	*
15	LGS FSAR Table 3.11-2.
20	Vendor Prints: 8031-E-28B-68-3, 8031-E-31A-20-3, 8031-E-31B-47-3: Rockbestos Report No. QR1806R "Qualification of Firewall III Class 1E Electric Cables (Irradiation Cross-Linked Insulation)," dated 5/18/82.

*See Reference 85

Ref. No.	Title
21	Vendor print 8031-E-29-2-5 "Anaconda's Results of Cable Tests and Qualification Tests per Specification No. 8031-E-29 for 5 kV-and 15 kV-power cables for Limerick Generating Station" dated 8/18/80.
22	Vendor Prints: 8031-E-28B-72-1 8031-E-31A-24-1 8031-E-31B-52-1 — Rockbestos Technical Report TS1982-YJK-2 "Analysis of Beta-Radiation Effect," dated 5/82. 8031-E-28B-72-2 8031-E-31A-24-2 8031-E-31B-52-2 — Supplement to Rockbestos Technical Report TS1982-YJK-2, dated 6/28/82.
27	**
29	**
30	**
36	Vendor Prints: 8031-M-123-394-4 — Reliance Electric Company Summary Report NUC-9 "Nuclear Power Motor Systems Type Test Support Analysis Random Wound Motors," dated 7/1/78. Reliance Electric Company Supplemental Report to NUC-9 Rev. 1 dated 4/14/80. Reliance Electric Company Supplement to Report NUC-9 for Arizona Nuclear Power Project Palo Verde and Georgia Power Company Plant Vogtle, dated 7/7/80. 8031-M-123-394-5S — Reliance Electric Company Supplemental Report to NUC-9 Rev. 2, dated 7/15/81. 8031-M-123-322-11 — Installation, operation, and maintenance instructions for fan cabinets.
37	Vendor Print 8031-E-31A-19-2, Rockbestos Report No. QR #2805 "Qualification of Firewall III Class 1E Electric Cables (Irradiation Cross-Linked Insulation with 20 mil Insulation Wall)" dated 3/15/82.

**See Reference 78

Ref. No.	Title	
38	Vendor Prints:	
	8031-E-28A-1-2	Anaconda Co. Results of Qualification Tests per Specification 8031-E-28 (Rev. 10 for 600 V Power, Control and Instrumentation Cable, dated 3/25/80.
	8031-E-28A-4-1	FIRL Final Report F-C4350-3, July 1976 Test of Electrical Cables Subjected to Thermal Aging, Gamma Radiation and Loss-of-Coolant-Accident Simulation.
40	Bechtel Specification 8031-E-28 Rev. 16 "600 Volt Power, Control and Instrumentation Cable."	
41	Vendor Print 8031-M-1-A61-4010-L-4.3, GE 22A4947 Rev. 2 "Special Wire and Cable."	
42	Vendor Print 8031-E-31B-41-4 Rockbestos Report No. QR #2806, dated 4/23/82 "Report on Qualification Tests for Second Generation Solid Dielectric Coaxial Construction and Cellular Dielectric Coaxial Construction."	
47	Vendor Prints:	
	8031-M-123-395-3	Joy Manufacturing Co. Report No. X-604 "Qualification Testing of Joy Axivane Fan and Reliance Electric Motor for Class I Service for Nuclear Containment per IEEE 334-1974" dated 3/20/80.
	8031-M-123-322-11	Installation, operation, and maintenance instructions for fan cabinets.
48	Vendor Print 8031-M-164-40-2 Westinghouse MM-9112, dated 1/18/80 "Qualification Document - Class 1E Medium A.C. Motors (outside containment)."	
49	Bechtel General Specification 8031-G-10 Rev. 9, "General Project Requirements for Integral and Fractional Horsepower Induction Motors."	
50	Vendor Prints:	
	8031-M-245-14-4	TRP 2375 - Rev. A Qualification Test Report, Aging, Seismic and Accident Simulation Test of Target Rock Corporation 1: Solenoid Valve, Model 77CC-001 (modified per SK4017). TRP 2302 - Rev. C Qualification Test Report, Aging, Seismic and Accident Simulation Test 1: Solenoid Valve, Model 76HH-002.

Ref. No.	Title
	TRC-SK1062 Rev. A - Electrical Assembly.
	Valve Comparison Chart, 76EE Series.
8031-M-245-93-1	TRC-3727 DBA Humidity Values and Valve applicability agreement.
52	LGS FSAR Table 6.2-17 "Containment Penetration Data."
53	**
55	Vendor Print 8031-E-24-2-2 Limitorque Valve Actuators dated 3/10/81.
56	Vendor Print 8031-E-24-3-1 Limitorque Report #B0003 dated 6/7/76 "Qualification Type Test Report for Limitorque Valve Actuators for Class 1E Service Outside Primary Containment."
57	Vendor Print 8031-E-24-1-1 Limitorque Report #B0009, dated 4/30/76 "Qualification Type Test Report for Limitorque dc Valve Actuators for BWR Service."
58	Vendor Print 8031-E-24-4-1 Limitorque Project #600376A, dated 5/13/76 "Qualification Type Test Report for Limitorque Valve Actuators for BWR Service."
59	Regulatory Guide 1.9 Rev. 2 December 1979 "Selection of Diesel Generator Set Capacity for Standby Power Supplies."
60	Document Control No. 116009 "LGS Auxiliary Electrial System Voltage Regulation Study" dated 12/24/81.
63	Bechtel General Specification 8031-G-11, Rev. 13. "General Project Requirements for Valve Motor Operators."
64	Bechtel General Specification 8031-G-12, Rev. 14. "General Project Requirements for Standard Instruments, Controls, and Local Control Boards Supplied with Station Equipment.
65	**
66	**
67	**
68	**
69	Vendor Print 8031-M-70-127-4, Paul Munroe Hydraulic, Inc. Qualification Report PA86231 with Appendices and Supplementary data.

**See Reference 78

Ref. No.	Title
71	Electrical Calculation 6407E.09 Rev. 5 "Cable Sizing 125/250 Volt DC System."
72	Bechtel Specification 8031-E-17 Rev. 4 Section 6. "Battery Chargers" Design and Construction Details.
73	Document Control No. 117443. C&D Batteries letter to Bechtel, dated 1/15/82 "Cell Volts for Items 1, 2A, 3A and 5."
74	**
76	**
78	Bechtel General Specification 8031-G-18 Rev. 6 "General Project Requirements for Environmental Qualification of Class 1E Equipment Located in Harsh Environments."
79	Mechanical Calculation #M-76-42 Rev. 0 dated 2/16/82. "Environmental Conditions for RM202 Pipe Tunnel."
82	Vendor Prints: 8031-E-28B-71-1 8031-E-31A-23-1 8031-E-31B-51-1 — The Rockbestos Instruments Accuracy Document.
83	Vendor Prints: 8031-F-E-3-1-1 — FRC Final Report F-C5205-3 "Qualification Test Program for Terminal Blocks for Weidmuller." 8031-F-E-3-2-1 — Wyle Report No. 58687, dated 6/29/82 Loss-of-Coolant Accident Testing of Five Weidmuller Terminal Blocks."
84	Vendor Prints: 8031-F-E-4-1-1 — Amp Qualification Report 110-11004, Released 2-2-82. 8031-F-E-4-2-1 — Amp Engineering Evaluation Report EER-35. 8031-F-E-4-3-1 — Amp Catalog Information - "Design Properties" of KYNAR insulation.
85	Bechtel Specification 8031-M-171 Rev. 1 "Specification for Environmental Qualification Service Conditions."
86	Vendor Prints: 8031-M-70-101-2S — Bettis Nuclear Qualification Test Report No. 37274 (incomplete) with Appendix FS-C: ASCO Test Report Appendix FS-D: NAMCO EA-790 Test Report. 8031-M-70-101-4S 8031-P-144-58-1 — Bettis Nuclear Qualification Test Report No. 37274 (incomplete).

**See Reference 78

Ref. No.	Title
	8031-M-70-101-6S Bettis letter dated 2/7/83. 8031-P-144-58-2S
	8031-M-70-7S NAMCO letter dated 2/7/83.
87	Vendor Print 8031-F-E-6-1-1 Qualification Test Report for Buchanan Terminal and Fuse Blocks.
93	Vendor Print 8031-F-E-1-1-1 "Markel Braided Fibergalss Sleeving."
94	Vendor Print 8031-F-E-2-4-1 "EQ Test Report for Raychem WCSF-N Nuclear In-Line Cable Splice Assemblies for Raychem Corp."
95	Vendor Print 8031-F-E-2-2-1 Raychem Report #RDR 2001 dated 8/10/78 "Heat Aging Study of WCSF Compound."
97	Vendor Print 8031-M-203-31-1 "Test Report Class 1E Design Qualification Testing of Analog High Range Radiation Monitor (RD-23, RP-2C, RP-23 and RP-20-01) dated 12/15/80.
103	Vendor Print 8031-M-66-185-6 "Environmental Qualification Test Report on the Alison Fire Detection/Extinguishment System Report #377-82.026, Rev. 0."
104	Vendor Print 8031-M-242-1-28-1 Limitorque Report #B0003, dated 6/7/76 "Qualification Type Test Report for Limitorque Valve Actuators for Class 1E Service Outside Primary Containment."
105	Vendor Print 8031-M-66-217-2 MCC Powers Report #377-81-13-A Rev. 3 dated 3/4/83 "Environmental Qualification Test Report on the MINCO Duct Mounted RTD Series S9322 for LGS."
106	Vendor Print 8031-M-69C-89-1, Reliance Electric Company Engineering Report "Nuclear Power Motor Systems Support Analysis Class H Insulation Qualified Life for 4824-RY Insulation, April 28, 1983 for Joy-Bechtel S/O 1XF-882464."
107	Vendor Print 8031-M-31B-50-1 Rockbestos Technical Report TS-YJK-3 dated June, 1982 "Bechtel/SF Questions on COAX Application."
108	Document Control No. 131919, Letter from Rockbestos to Bechtel dated 7/28/82 "Class 1E Qualification of 600 Volt Rated with 20 Mils of Insulation."

Ref. No.	Title
110	Bechtel Specification 8031-E-13 Rev. 6, Section 6.1 "Batteries Types and Ratings."
113	Vendor Print 8031-F-E-5-6-1 AMP Inc. Engineering Test Report 110-11506 (released 12/12, reissued 1[illegible]/1/78). Amp Lugs, EQRR 194.
114	Vendor Print 8031-M-206-22-1 "Rosemount Qualification Test Report 108025, Rev. A."
115	Vendor Print 8031-M-235-37-1 "Comsip Delphi, Inc. H_2-O_2 Analyzer Test Plan and Report."
116	Letter Joy to AAF, dated 8/7/79 - Enclosure to letter AAF to BPC dated 8/23/79, Document Control No. 06910.
117	Vendor Print 8031-M-69C-28-3S Reliance Electric Co. Instructional Manual B-3645 - Duty Master Nuclear Service Class 1E Integral Horsepower Induction Motors December 1977.
119	Vendor Prints: 8031-M-70-101-5S ASCO Qualification Report No. AQR-67368 8031-P-144-67-1 Rev. 0 "Report on Qualification of ASCO DC #154711 Catalog NP-1 Solenoid Valves."
120	Document Control #148279 "Lewis Control Systems Qualification Test of Sample Pump and Selected Pump Components under Simulated LOCA while Operational."
121	Bechtel Specification 8031-359 Rev. 1 "Valve Air Operator."
122	Vendor Print 8031-M-267-1 Vol. I, "NTS Report #548-8854-2 Rev. B Vol. 1 of 3 for Weed Instrument Co."
123	Calculation No. EQ-2, Rev. 3, Sh. 13E and 73B "Radiation Dose Calculation for H_2-O_2 Analyzer" for P.O. #8031-M-235.
124	Electrical Calculation #6470E24 "Voltage Regulation."
125	Vendor Prints: 8031-M-364-1 "Qualification for NAMCO Control Switches Model EA-180" dated 3/3/78. 8031-M-113-364-5S "NAMCO Estimation of Qualified Life of Nuclear Switches" dated 4/26/79.
126	Vendor Prints: 8031-F-E-9-1-1 Rockbestos Report QR #1806R dated 5/3/83 "Qualification of Firewall III Class 1E Electric Cables (Irradiation Cross-Linked Insulation)."

Ref. No.	Title
	8031-F-E-9-2-1 Rockbestos Report QR #1807R dated 5/3/83 "Qualification of Firewall III Class 1E Electric Cables (Chemically Cross-Linked Insulation)."
127	Vendor Prints: 8031-M-113-364-3S NAMCO Report No. QTR105 dated 8/28/80 8031-P-144-72-1 "Qualification of EA180 Series Limit DC #154710 Switches."
128	Vendor Print 8031-E-24-6-1 Limitorque Addendum A to Report #B0003 Rev. C dated 10/15/79.
129	Vendor Print 8031-E-24-8-1 Limitorque Addendum A to Report #B0009 Rev. C dated 10/16/79.
130	Vendor Print 8031-E-24-9-1 Limitorque Addendum A to Project #600376A Rev. B dated 1/23/79.
131	Vendor Prints: 8031-F-E-7-1-1 Conax Report ISP-713 dated 4/30/81 "Electric Conductor Seal Assembly Qualification Report." 8031-F-E-7-2-1 Conax Report IPS-725 Rev. A dated 12/2/81 "Installation Manual for Electric Conductor Seal Assemblies with Long Body."
132	Vendor Print 8031-F-E-7-3-1 Conax Report IPS-409.1 dated 2/25/82 "Addendum to Design Qualification Report IPS-409 for Electric Conductor Seal Assemblies (ECSAs).
133	Document Control No. 150520 dated 3/21/83 TWX from Conax to Bechtel "Addendum to Conax Report IPS-409.1."
134	Vendor Print 8031-M-113-331-1 and 2S "Nuclear Qualification Report for NAMCO EA-740 Limit Switches NAMCO Report QTR-111 Rev. 0."
135	Vednor Print 8031-E-33D-15-5 "Testing Report for P.O. #8031-E-33D-AC."
136	Bechtel Specification 8031-M-203 Rev. U "Process/Airborne Radiation Monitoring Systems."
137	Document Control No. 154713 NAMCO Test Report No. QTR-107, Rev. 0 dated 3/11/83 "Qualification of EA170 Series Limit Switches."

Ref. No.	Title
138	Document Control No. 154712 ASCO Test Report No. AQS-21678/TR Rev. A dated July 1979 "Report on Qualification of ASCO Catalog NP-1 Solenoid Valves."
139	Vendor Print 8031-E-7-447-4, BBC Report No. 33-55112-QSA Rev. 3, dated 5/17/83 "Class 1E Electrical Equipment Environmental Qualification Report."
140	Bechtel Calculation #2006 "Compartment Pressurization Due to Pipe Breaks in the Reactor Enclosure" Rev. 2.
142	Vendor Prints:
	8031-M-113-6-2S — ITT Report No. 721.77.095 "NH90 Qualification Report."
	8031-M-113-6-3S — ITT Report No. 721.77.095, Addendum #4 "HN91 and 95 Series Actuators Model B-92VAC/60HZ Input Power Tests-Summary and Conclusion."
	8031-M-113-6-4S — ITT Engineering Data and Qualification Reports.
	8031-M-113-6-6S — ITT Qualification Reports.
	8031-M-113-6-7S — "Limerick ITT Model Nos." AWV Transmittal dated 5/2/83.
	8031-M-113-6-8S — Mobil Oil Co. letter to Bechtel, dated 5/6/83 "Thermal Stability of Mobil SHC824 Oil."
	8031-M-113-6-9S — Gulf Radiation Technology Report GULF-RT-C12494, 1/25/73 Amended 3/75 "Radiation Testing of a Hydroamctor Actuator."
	8031-M-113-263-2 — "ITT Actuator Material and Processes Certification" dated 2/15/79.
147	Vendor Print #F-E-12-1-1 FRC-F-C5022-1 Term. Blk. Qual. Test.
500	GE Letter T-4793 Design Report-Anticipated Transient Without Scram (ATWS) BOP Information Spec. 22A8465.
501	FSAR Section 5.4.1.1.1 Reactor Coolant System and Connected Systems, Design Basis, Residual Heat Removal Mode (Shutdown Cooling Mode).

Ref. No.	Title
502	FSAR Section 5.4.7.1.2 Reactor Coolant System and Connected Systems, Design Basis, Design Basis for Isolation of RHR from Reactor Coolant System.
503	FSAR Section 5.4.7.1.2 Reactor Coolant System and Connected Systems, Deisgn, Basis, Design Basis for Reliability and Operability.
504	FSAR Section 5.4.7.2.2 Reactor Coolant System and Connected Systems, System Design, Equipment and Component Description.
505	FSAR Section 5.4.7.2.6 Reactor Coolant System and Connected Systems, System Design, Manual Action.
506	FSAR Section 5.4.8 Reactor Coolant System and Connected Systems, Reactor Water Cleanup (RWCU) System.
507	FSAR Section 6.2.3.2.3 Engineered Safety Features, System Design, Containment Bypass Leakage.
508	FSAR Section 6.2.3.2.3.1 Engineered Safety Features, System Design Water Seals.
509	FSAR Section 6.2.4.3.1.3.1.5 Engineered Safety Features, Design Evaluation, RHR, RCIC, CS, and HPCI Pump Suction Lines.
510	FSAR Section 6.2.4.3.1.2.2.1 Engineered Safety Features, Design Evaluation, Main Steam, RCIC, and HPCI Steam Lines, and RHR Shutdown Cooling Supply Line.
511	FSAR Section 6.2.4.3.1.3.1.1 Engineered Safety Features, Design Evaluation, CS, HPCI, and RHR Test Lines and Minimum Flow Bypass Lines.
512	FSAR Section 6.2.4.3.1.3.1.4 Engineered Safety Features, Design Evaluation, HPCI Turbine Exhaust Line.
513	FSAR Section 6.2.4.3.1.3.2.4 Engineered Safety Features, Design Evaluation, RCIC and HPCI Turbine Exhaust Vacuum Breaker Lines.
514	FSAR Section 6.2.5.2.1 Engineered Safety Features, Combustible Gas Control In Containment, Containment Hydrogen Recombiner Subsystem.
515	FSAR Section 6.3.2.2.1 Engineered Safety Features, Emergency Core Cooling Systems, Equipment and Component Descriptions, High Pressure Coolant Injection (HPCI) System.
516	FSAR Section 6.3.2.2.3 Engineered Safety Features, Emergency Core Cooling Systems, Equipment and Component Descriptions, Core Spray (CS) System.

Ref. No.	Title
517	FSAR Section 6.3.2.2.4 Engineered Safety Features, Equipment and Component Descriptions, Low Pressure Coolant Injection System.
518	FSAR Table 6.2-25 ESF Containment Penetrations Compliance with 10CFR Part 50, Appendix J.
519	FSAR Table 6.2-26 ESF Remotely Actuated Valves Required for Post-Accident System Isolation.
520	FSAR Table 6.2-27 ESF Essential/Nonessential Systems.
521	FSAR Section 9.2 Auxiliary Systems, Water Systems.
522	FSAR Section 9.2.3.2 Auxiliary Systems, System Description.
523	FSAR Section 9.4.5.1 Auxiliary Systems, Containment Atmospheric Control (CAC) System.
524	FSAR Section 9.3.5 Auxiliary Systems, Standby Liquid Control System.
525	FSAR Section 10.4.7 Steam and Power Conversion System, Condensate and Feedwater Systems.
526	FSAR Section 10.4.7.2.2 Steam and Power Conversion Systems, System Description, Feedwater System.
527	FSAR Section 5.4.6.1 Reactor Coolant System and Connected Systems, Reactor Core Isolation Cooling System Design Bases.
528	FSAR Section 6.2.4.3.1.3.1.2 Engineered Safety Features, Design Evaluation, RCIC Turbine Exhaust, Vacuum Pump Discharge and RCIC Pump Minimum Flow Bypass Lines.
529	FSAR Section 7.4.1.1.3.1 Instrumentation and Control Systems, Systems required for Safe Shutdown, Reactor Core Isolation Cooling System, General.
530	BPC Memorandum (Document Control No. 154981) Radiation Dose for Rooms 502 and 576.
532	FSAR Section 9.2.2.2 Water Systems, Engineering Service Water System, System Description.
533	FSAR Section 6.5.1.1.2 Fission Product Removal and Control Systems, Standby Gas Treatment System, System Description.

Ref. No.	Title
534	FSAR Section 9.4.2.1.3 Heating, Ventilation, and Air Conditioning Systems, Reactor Enclosure and Refueling Area Ventilation Systems, Safety Evaluation.
535	Vendor Print 8031-M-70-101-7S NAMCO Report for EA 740, Drawing No. EA 749-20010. Limit Switches, EQRRs 145, 142.
536	FSAR Section 9.3.1.3.2 Process Auxiliaries, Primary Containment Instrument Gas System, System Description.
537	FSAR Section 6.2.
538	FSAR Section 9.2.2.3 Water Systems, Emergency Service Water System, Safety Evaluation.
540	Vendor Print 8031-M-206-26-1 Rosemount EQRR 1 (needs further details).
544	FSAR Section 9.4.2.2.1 Heating Ventilation, and Air Conditioning Systems, Reactor Enclosure and Refueling Area Ventilation Systems, Safety-Related Reactor Enclosure Air Cooling System, Design Basis.
545	FSAR Section 9.4.1.5.1 Heating, Ventilation, and Air Conditioning Sytems, Control Room and Control Structure Ventilation Systems, SGTS Equipment Compartment HVAC Systems, Safety Evaluation.
546	FSAR Section 9.4.5.2.3 Heating, Ventilation, and Air Conditioning Systems, Primary Containment Ventilation System, Drywell Air Cooling System, Design Basis.
547	FSAR Section 6.5.1.3.2 Engineered Safety Features, Fission Product Removal and Control Systems, Reactor Enclosure Recirculation System Filter Units, System Description.
548	FSAR Section 9.4.2.1.1 Heating, Ventilation, and Air Conditioning Systems, Reactor Enclosure and Refueling Area Ventilation Systems, Design Bases.
549	FSAR Section 6.2.5.2.2 Engineered Safety Features, Combustible Gas Control in Containment, Combustible Gas Analyzer Subsystem.
550	FSAR Section 9.3.1.3.3 Process Auxiliaries, Compressed Air and Gas Systems, Primary Containment Instrument Gas System, Safety Evaluation.
600	BPC EQG Calculation E-960-1 Rev. 0 dated 3/29/83. NAMCO Limit Switches, models EA180 and EA740, EQRR 150.
601	BPC EQG Calculation E-715-1 Rev. 0 dated 3/8/83. Weed RTDS, EQRR 179.

Ref. No.	Title
602	BPC EQG Review Notice 1084E, dated 6/1/83. Reliance Motor Temperature and Radiation Evaluation, EQRR 63.
603	BPC EQG Calculation E-1053-1 Rev. 0 dated 5/16/83. ITT Electro-Hydraulic Actuator, EQRR 149.
604	BPC EQG Calculation E-609-1 Rev. 0 dated 10/14/82. Rosemount Transmitters, EQRR 1.
605	BPC EQG Calculation E-856-2 EQRR 182 (needs further detail).
606	BPC EQG Calculation 292 Part 3-3 dated 3/4/83. AMP Lugs, EQRR 194.
607	BPC EQG Calculation E-712 Rev. 0 dated 1/11/83. Cutler Hammer MCCs, Champlain Cable, EQRR 16.
608	BPC EQG Calculation E-1057-1 Rev. 0 dated 7/15/83. Buchanan Terminal Blocks, EQRR 205.
609	BPC EQG Calculation E-965-1 Rev. 0 dated 3/29/83. ASCO NP-1 180 Days Post LOCA Requirements.
610	BPC EQG Calculation E-974-1 Rev. 0 dated 7/16/83. EQ Analysis for Elastimold Connectors.
611	PECO EQG Radiation Analysis Reference EPRI NP-1588, EQRR 58.
612	BPC EQG Calculation E-109A-3 Rev. 1 dated 2/25/83. Limitorque Motor Operators, EQRRs 91, 92, 93, 96, 98, 99, 100, 101, 102, 103, 104, 105, 106, 109, 110, 111, 112, 115, 118, 120, 121, 123, 125, 127 and 207.
613	BPC EQG Calculation E-557 (Part I)-2. Limitorque Motor Operators, EQRRs (Same as 612)
614	BPC EQG Calculation E-93A-2 Rev. 0 dated 3/29/83. Limitorque Motor Operatores, EQRRs (Same as 613)
615	BPC EQG Calculation E-246 (Part 2)-1 Rev. 2 dated 3/22/83. Limitorque Motor Operators, EQRR 120.
616	BPC EQG Calculation E-91-3 Rev. 1 dated 3/22/83. Limitorque Motor Operators, EQRRs 89, 90, 104, 120, 123, and 207.
617	BPC EQG Calculation E-1071-1 Rev. 0 dated 5/25/83. Potter Brumfield Relay, Littleman Fuse Holder, Bussman fuse, SIS Wire, SSK Heater Cable, Cold Lead, and Thermocouple qualification EQRR 26.

Ref. No.	Title
618	BPC IOM 144933 dated 1/13/83 to W. C. McDaniel from D. T. Dexheimer. SGTS Heater temperature Detector (Thermal Cutouts) Radiation qualification, EQRR 184.
619	BPC IOM 128730 dated 6/14/82 to W. C. McDaniel from D. T. Dexheimer. H2/02 Combustible Gas Analyzers Pump Motor Radiation Requirement, EQRR 59.
620	BPC EQG Calculation E-246 (Part 2)-1 Rev. 1 dated 3/22/83. Limitorque Motor Operators, EQRR 120.
621	BPC EQG Calculation E-246 (Part 2)-1 Rev. 1 dated 3/22/83. Limitorque Motor Operators, EQRR 207.
700	BPC DCN 155779 Automatic Switch Company letter to BPC dated 5/17/83. ASCO Pressure Differential Switch, EQRR 142.
701	Vendor Letters Westinghouse Electric dated 6/1/83 and 10/14/83, BPC Document Control Numbers 128881, and 138569, respectively. Safeguard Fill Pump Motors, EQRR 73.
800	Package 100; Rosemount Transmitters, 1151 Series: Report #37327B; Qualification of Differential Pressure Transmitters for General Electric, San Jose for Essential Service. Report #127227; Nuclear Service Qualification Testing, Interim Report, Rosemount Incorporated Model 1151DP Differential Transmitter.
801	Package 200; Target Rock Corp. Report #2199; Report of Test on TRC Model 7567F S/R Valve Pneumatic Actuator Assembly. Report #2063C; Qualification Test Procedure ½" 3-way Solenoid Valve Assembly. Draft Technical Manual, Model 7567F.
802	Package 300; PYCO Temperature Elements Report #111275; Method of Measuring Air flow for Thermocouple Response for PYCO. Report #122375; Report of Environmental Aging of Thermocouple Assemblies.
803	Package 400; Conax Explosive Trigger Assembly Report #TR-39; Environmental Qualification Test Report for Conax Valve P/N 1832-159-01.
804	Package 500; ECCS Pump Motor Report #NEDE-30125; Limerick 1 and 2, ECCS Motor Data Comparison with Qualification Data.

Ref. No.	Title
805	Package 600; Ametek Flow Element Environmental Qualification Report for E32-N006B,F,K,P.
806	Package 700; Ametek Flow Transmitter Environmental Qualification Report for E32-N053B,F,K,P.
807	Package 800; MSIV Pilot Valve Report #2792-03-03; Rockwell Test Report Report #126-62; Environmental Testing of MSS/RV Air Control Valves. Report #2864-02-01; Rockwell Test Report.
808	Package 900; GECO Heater Environmental Qualification Report for E32-B001.
809	Package A00; Siemens Motor Environmental Qualification Report for E32-C001 and C002.
810	Package B00; Gould Transmitter Environemntal Qualification Report for E41-N062B,F.

APPENDIX A

LIST OF SYSTEMS IMPORTANT TO SAFETY

TABLE 1

SYSTEMS IMPORTANT TO SAFETY
LGS ELECTRICAL EQUIPMENT
ENVIRONMENTAL QUALIFICATION REPORT

SYSTEM NAME	SAFTEY FUNCT. OBJECTIVE
CLASS 1E POWER INTERFACES	ALL
CONTAINMENT ATMOSPHERIC CONTROL SYS. (CAC)	CI
CONTROL ROD DRIVE (CRD)	SS
CORE SPRAY	CC
DRYWELL CHILLED WATER--ISOLATION VALVES	CI
DRYWELL HVAC	CI
ECCS PUMP ROOM HVAC	RHR,SS,CC
EMERGENCY SERVICE WATER	RHR,SS,CC
EQUIPMENT & FLOOR DRAINS	CI
HIGH PRESSURE COOLANT INJECTION (HPCI)	CC
MAIN STEAM ISOLATION VALVE-LEAKAGE CONTROL SYSTEM (MSIV-LCS)	EC
NUCLEAR BOILER INSTRUMENTATION (NBI)	CC,SS,CI,RHR
NUCLEAR BOILER SYSTEM (NBS)	ALL
NUCLEAR STEAM SUPPLY SHUTOFF SYSTEM (NS4)	CI
PLANT LEAK DETECTION	CI
PRIMARY CONTAINMENT INSTRUMENT GAS	CI
PROCESS RADIATION MONITORING SYSTEM	EC
REACTOR CORE ISOLATION COOLING SYS. (RCIC)	CC
REACTOR ENCLOSURE COOLING WATER--ISOLATION VALVES	CI
REACTOR ENCLOSURE HVAC--RECIRC. MODE	SS
REACTOR WATER CLEANUP SYSTEM (RWCU)	CI
REACTOR RECIRCULATION SYSTEM	CI,SS
RESIDUAL HEAT REMOVAL (RHR)	RHR,CI,SS,CC
SAFEGUARD DC POWER	ALL
SAFEGUARD PIPING FILL SYSTEM	CI,CIN
SAFETY RELIEF VALVE POSITION INDICATION	CC
STANDBY LIQUID CONTROL SYSTEM (SLC)	SS
STANDBY GAS TREATMENT SYSTEM (SGTS)	CI,EC
SUPPRESSION POOL CLEANUP SYSTEM	EC
4KV POWER	ALL
440V LOAD CENTERS & MCC'SALL	

CC = CORE COVERAGE
SS = SAFE SHUTDOWN
CI = CONTAINMENT ISOLATION
RHR= RESIDUAL HEAT REMOVAL
CIN= CONTAINMENT INTEGRITY
EC = EFFLUENT CONTROL
ALL= ALL THE ABOVE

APPENDIX C

PLANT ENVIRONMENTS

TABLE 1

CALCULATED NORMAL AND MAXIMUM PLANT ENVIRONMENTAL CONDITIONS

Unit 1 Room No.	Unit 2 Room No.	Area	NORMAL OPERATING CONDITIONS Pressure	Min/Max Temp (°F)	Relative Humidity Avg/Max %	Dose[1] Rate (rads/hr)	Integrated[1] Dose (rads)
		Reactor Enclosure					
102, 103 203, 204	173, 174, 280, 281	RHR pump compartments	-1/4-inch w.g.	65/115	50/90	1.45	5.09E+5
108	179	RCIC pump compartment	-1/4-inch w.g.	65/115	50/90	1.38	4.84E+5
109	180	HPCI pump compartment	-1/4-inch w.g.	65/115	50/90	2.41	8.46E+5
110, 113, 116, 117	181, 184, 185, 188	CS pump compartments	-1/4-inch w.g.	65/115	50/90	2.5E-3	8.78E+2
111	182, 189	Elevation 177 access area	-1/4-inch w.g.	65/104	50/90	2.5E-3	8.78E+2
118		Elevation 177 access area	-1/4-inch w.g.	65/104	50/90	2.5E-3	8.78E+2
200, 207, 210	279, 284, 287	Elevation 201 access area	-1/4-inch w.g.	65/104	50/90	2.5E-3	8.78E+2
209		Containment isolation valve compartment, el. 201 (Unit 1)	-1/4-inch w.g.	65/120	50/90	2.0	7.00E+5
	286	Containment isolation valve compartment, el. 201 (Unit 2)	-1/4-inch w.g.	65/120	50/90	2.0	7.00E+5
289	285	RCIC piping area	-1/4-inch w.g.	65/115	50/90	1.38	4.84E+5
288	283	HPCI piping area	-1/4-inch w.g.	65/115	50/90	2.41	8.46E+5
304	370	Elevation 217 access area	-1/4-inch w.g.	65/104	50/90	2.5E-3	8.78E+2
306, 307, 309	374, 375, 376	Containment isolation valve Compartment, el. 217	-1/4-inch w.g.	65/120	50/90	2.41	8.46E+5

T1002804-01V

TABLE 1
CALCULATED NORMAL AND MAXIMUM PLANT ENVIRONMENTAL CONDITIONS

Unit 1 Room No.	Unit 2 Room No.	Area	MAXIMUM CONDITIONS Pressure[3] (psig)	Temp[4] (°F)	Relative[5] Humidity %	LOCA Dose Rate (See Notes)	LOCA[6] Dose (rads)	Total[1] Dose (rads)
		Reactor Enclosure						
102, 103, 203, 204	173, 174, 280, 281	RHR pump compartments	Atmos/1.5[i]	115/275[i]	100[i]	(13) (12)	gamma 4.78E+6 beta 1.38E+6	gamma 5.29E+6 beta 1.38E+6
108	179	RCIC pump compartment	Atmos./2.7[a]	115/222[a]	100[a]	(20) (12)	gamma 1.95E+6 beta 1.38E+6	gamma 2.44E+6 beta 1.38E+6
109	180	HPCI pump compartment	Atmos./2.7[b]	115/297[b]	100[b]	(18) (12)	gamma 3.95E+6 beta 1.38E+6	gamma 4.80E+6 beta 1.38E+6
110, 113, 114, 117	181, 184, 185, 188	CS pump compartments	Atmos.	115	90	(18) (12)	gamma 3.95E+6 beta 1.38E+6	gamma 3.95E+6 beta 1.38E+6
111	182, 189	Elevation 177 access area	Atmos.	120	90	(19) (12)	gamma 3.70E+6 beta 1.38E+6	gamma 3.70E+6 beta 1.38E+6
118		Elevation 177 access area	Atmos.	120	90	(12)	gamma 6.63E+4 beta 1.38E+6	gamma 6.71E+4 beta 1.38E+6
200, 207, 210	279, 284, 287	Elevation 201 access area	Atmos.	120	90	(19) (12)	gamma 3.70E+6 beta 1.38E+6	gamma 3.70E+6 beta 1.38E+6
209		Containment isolation valve compartment, el. 201 (Unit 1)	Atmos.	120	90	(19) (12)	gamma 3.70E+6 beta 1.38E+6	gamma 4.40E+6 beta 1.38E+6
	286	Containment isolation valve compartment, el. 201 (Unit 2)	Atmos.	120	90	(12)	gamma 6.63E+4 beta 1.38E+6	gamma 7.66E+5 beta 1.38E+6
289	285	RCIC piping area	Atmos./5.3[a]	115/296[a]	100[a]	(22) (12)	gamma 1.87E+5 beta 1.38E+6	gamma 6.71E+5 beta 1.38E+6
288	283	HPCI piping area	Atmos./6.1[b]	115/298[b]	100[b]	(21) (12)	gamma 8.42E+5 beta 1.38E+6	gamma 1.69E+6 beta 1.38E+6
304	370	Elevation 217 access area	Atmos.	120	90	(15) (12)	gamma 4.15E+6 beta 1.38E+6	gamma 4.15E+6 beta 1.38E+6
306, 307, 309	374, 375, 376	Containment isolation valve Compartment, el. 217	Atmos./1.4[c]	120/264[c]	100[c]	(14) (12)	gamma 4.55E+6 beta 1.38E+6	gamma 5.40E+6 beta 1.38E+6

T1002804-01V

TABLE 1
CALCULATED NORMAL AND MAXIMUM PLANT ENVIRONMENTAL CONDITIONS

			NORMAL OPERATING CONDITIONS				
Unit 1 Room No.	Unit 2 Room No.	Area	Pressure	Min/Max Temp (°F)	Relative Humidity Avg/Max %	Dose[1] Rate (rads/hr)	Integrated[1] Dose (rads)
		Reactor Enclosure					
402	475	CRD hydraulic area	-1/4-inch w.g.	65/104	50/90	0.1	3.51E+4
406		Neutron monitoring area (Unit 1)	-1/4-inch w.g.	65/104	50/90	3.72E+4	6.91E+7
	479	Neutron monitoring area (Unit 2)	-1/4-inch w.g.	65/104	50/90	3.72E+4	6.91E+7
407, 518	480, 587	Main steam tunnel	-1/4-inch w.g.	65/120	50/90	3.84	1.35E+6
501	575	Drywell spray isolation valve compartment	-1/4-inch w.g.	65/115	50/90	0.225	7.99E+4
502	576	Backwash receiving tank compartment	-1/4-inch w.g.	65/110	50/90	577	2.03E+8
503	577	RWCU system regenerative heat exchanger compartment	-1/4-inch w.g.	65/110	50/90	3.37	1.18E+6
504, 505	578, 579	RWCU system nonregenerative heat exchanger compartments	-1/4-inch w.g.	65/110	50/90	1.15	4.02E+5
500		Standby Liquid Control System Area	-1/4-inch w.g.	65/104	50/90	2.5E-3	8.78E+2
	574	Standby Liquid Control System Area	-1/4-inch w.g.	65/104	50/90	2.5E-3	8.78E+2
506A		Containment Hydrogen Recombiner Area (Area 11, Northwest side)	-1/4-inch w.g.	65/104	50/90	2.5E-3	8.78E+2
	580A	Containment Hydrogen Recombiner Area (Area 14, Northeast side)	-1/4-inch w.g.	65/104	50/90	2.5E-3	8.78E+2
506B		Corridor - Access Area (Area 15, Southwest side)	-1/4-inch w.g.	65/104	50/90	2.5E-3	8.78E+2
	580B	Corridor - Access Area (Area 18, Southeast side)	-1/4-inch w.g.	65/104	50/90	2.5E-3	8.78E+2

T1002804-01V

TABLE 1
CALCULATED NORMAL AND MAXIMUM PLANT ENVIRONMENTAL CONDITIONS

Unit 1 Room No.	Unit 2 Room No.	Area	MAXIMUM CONDITIONS Pressure[3] (psig)	Temp[4] (°F)	Relative[5] Humidity %	LOCA Dose Rate (See Notes)	LOCA[6] Dose (rads)	Total[1] Dose (rads)
		Reactor Enclosure						
402	475	CRD hydraulic area	Atmos.	120	90	(15) (12)	gamma 4.15E+6 beta 1.38E+6	gamma 4.19E+6 beta 1.38E+6
406		Neutron monitoring area (Unit 1)	Atmos.	120	90	(19) (12)	gamma 3.70E+6 beta 1.38E+6	gamma 7.26E+7 beta 1.38E+6
	479	Neutron monitoring area (Unit 2)	Atmos.	120	90	(24) (12)	gamma 4.08E+5 beta 1.38E+6	gamma 6.95E+7 beta 1.38E+6
407, 518	480, 587	Main steam tunnel	Atmos./9.9[h]	120/311[h]	100[h]	(27) (12)	gamma 5.16E+6 beta 1.38E+6	gamma 6.51E+6 beta 1.38E+6
501	575	Drywell spray isolation valve compartment	Atmos.	120	90	(16) (12)	gamma 3.95E+6 beta 1.38E+6	gamma 4.03E+6 beta 1.38E+6
502	576	Backwash receiving tank compartment	Atmos.	120	90	(12)	gamma 6.63E+4 beta 1.38E+6	gamma 2.03E+8 beta 1.38E+6
503	577	RHCU system regenerative heat exchanger compartment	Atmos./2.6[g]	120/214[f]	100[f]	(12)	gamma 6.63E+4 beta 1.38E+6	gamma 1.25E+6 beta 1.38E+6
504, 505	578, 579	RHCU system nonregenerative heat exchanger compartments	Atmos./2.7[g]	120/217[d]	100[d]	(12)	gamma 6.63E+4 beta 1.38E+6	gamma 4.68E+5 beta 1.38E+6
500		Standby Liquid Control System Area	Atmos.	120	90	(16) (12)	gamma 3.95E+6 beta 1.38E+6	gamma 3.95E+6 beta 1.38E+6
	574	Standby Liquid Control System Area	Atmos.	120	90	(19) (12)	gamma 3.70E+6 beta 1.38E+6	gamma 3.70E+6 beta 1.38E+6
506A		Containment Hydrogen Recombiner Area (Area 11, Northwest side)	Atmos.	120	90	(19) (12)	gamma 3.70E+6 beta 1.38E+6	gamma 3.70E+6 beta 1.38E+6
	580A	Containment Hydrogen Recombiner Area (Area 14, Northeast side)	Atmos.	120	90	(16) (12)	gamma 3.95E+6 beta 1.38E+6	gamma 3.95E+6 beta 1.38E+6
506B		Corridor - Access Area (Area 15, Southwest side)	Atmos.	120	90	(12)	gamma 6.63E+4 beta 1.38E+6	gamma 6.71E+4 beta 1.38E+6
	580B	Corridor - Access Area (Area 18, Southeast side)	Atmos.	120	90	(16) (12)	gamma 3.95E+6 beta 1.38E+6	gamma 3.95E+6 beta 1.38E+6

T1002804-01V

TABLE 1
CALCULATED NORMAL AND MAXIMUM PLANT ENVIRONMENTAL CONDITIONS

Unit 1 Room No.	Unit 2 Room No.	Area	NORMAL OPERATING CONDITIONS Pressure	Min/Max Temp (°F)	Relative Humidity Avg/Max %	Dose[1] Rate (rads/hr)	Integrated[1] Dose (rads)
		Reactor Enclosure					
506C		Containment Hydrogen Recombiner Area (Area 16, Southeast side)	-1/4-inch w.g.	65/104	50/90	2.5E-3	8.78E+2
	580C	Containment Hydrogen Recombiner Area (Area 17, Southwest side)	-1/4-inch w.g.	65/104	50/90	2.5E-3	8.78E+2
506D		Fuel Pool Service Water Booster Pump Area (Area 12, Northeast Side)	-1/4-inch w.g.	65/104	50/90	2.5E-3	8.78E+2
	580D	Fuel Pool Service Water Booster Pump Area (Area 13, Northwest side)	-1/4-inch w. g.	65/104	50/90	2.5E-3	8.78E+2
507, 508, 509	581, 582, 583	RWCU system pump compartments (Northeast side)	-1/4-inch w.g.	65/104	50/90	3.29	1.16E+6
510, 522	584, 597	RWCU system isolation valve compartment	-1/4-inch w.g.	65/115	50/90	55.5	1.26E+6
511	585	Fuel Pool Cooling Water Pump and Heat Exchanger Area	-1/4-inch w.g.	65/104	50/90	2.5E-3	8.78E+2
519		Access Area (El. 300')	-1/4-inch w.g.	65/104	50/90	2.5E-3	8.78E+2
	594	Access Area (El. 300')	-1/4-inch w.g.	65/104	50/90	2.5E-3	8.78E+2
523	593	Core spray isolation valve compartment	-1/4-inch w.g.	65/115	50/90	0.1	3.51E+4
599	589	LPCI isolation valve compartment	-1/4-inch w.g.	65/115	50/90	0.1	3.51E+4
601, 602 605	637, 638 641	North and South corridors, el. 313	-1/4-inch w.g.	65/104	50/90	2.5E-3	8.78E+2
612, 618	651, 653	RERS filter compartment	-1/4-inch w.g.	65/104	50/90	2.5E-3	8.78E+2

T1002804-01V

TABLE 1
CALCULATED NORMAL AND MAXIMUM PLANT ENVIRONMENTAL CONDITIONS

Unit 1 Room No.	Unit 2 Room No.	Area	MAXIMUM CONDITIONS Pressure[3] (psig)	Temp[4] (°F)	Relative[5] Humidity %	LOCA Dose Rate (See Notes)	LOCA[6] Dose (rads)	Total[1] Dose (rads)
		Reactor Enclosure						
506C		Containment Hydrogen Recombiner Area (Area 16, Southeast side)	Atmos.	120	90	(16) (12)	gamma 3.95E+6 beta 1.38E+6	gamma 3.95E+6 beta 1.38E+6
	580C	Containment Hydrogen Recombiner Area (Area 17, Southwest side)	Atmos.	120	90	(19) (12)	gamma 3.70E+6 beta 1.38E+6	gamma 3.70E+6 beta 1.38E+6
506D		Fuel Pool Service Water Booster Pump Area (Area 12, Northeast Side)	Atmos.	120	90	(16) (12)	gamma 3.95E+6 beta 1.38E+6	gamma 3.95E+6 beta 1.38E+6
	580D	Fuel Pool Service Water Booster Pump Area (Area 13, Northwest side)	Atmos.	120	90	(19) (12)	gamma 3.70E+6 beta 1.38E+6	gamma 3.70E+6 beta 1.38E+6
507, 508, 503	581, 582, 583	RWCU system pump compartments (Northeast side)	Atmos./2.7[g]	120/217[e]	100[e]	(12)	gamma 6.63E+4 beta 1.38E+6	gamma 1.23E+6 beta 1.38E+6
510, 522	584, 597	RWCU system isolation valve compartment	Atmos./2.7[g]	120/210[f]	100[g]	(15) (12)	gamma 4.15E+6 beta 1.38E+6	gamma 5.41E+6 beta 1.38E+6
511	585	Fuel Pool Cooling Water Pump and Heat Exchanger Area	Atmos.	120	90	(16) (12)	gamma 3.95E+6 beta 1.38E+6	gamma 3.95E+6 beta 1.38E+6
519		Access Area (El. 300')	Atmos.	120	90	(19) (12)	gamma 3.70E+6 beta 1.38E+6	gamma 3.70E+6 beta 1.38E+6
	594	Access Area (El. 300')	Atmos.	120	90	(16) (12)	gamma 3.95E+6 beta 1.38E+6	gamma 3.95E+6 beta 1.38E+6
523	593	Core spray isolation valve compartment	Atmos.	120	90	(16) (12)	gamma 3.95E+6 beta 1.38E+6	gamma 3.99E+6 beta 1.38E+6
599	589	LPCI isolation valve compartment	Atmos.	120	90	(15) (12)	gamma 4.15E+6 beta 1.38E+6	gamma 4.19E+6 beta 1.38E+6
601, 602 605	637, 638 641	North and South corridors, el. 313	Atmos.	120	90	(12)	gamma 6.63E+4 beta 1.38E+6	gamma 6.71E+4 beta 1.38E+6
612, 618	651, 653	RERS filter compartment	Atmos.	120	90	(23) (12)	gamma 1.04E+7 beta 1.38E+6	gamma 1.04E+7 beta 1.38E+6

T1002804-01V

TABLE 1
CALCULATED NORMAL AND MAXIMUM PLANT ENVIRONMENTAL CONDITIONS

Room No.	Area	NORMAL OPERATING CONDITIONS Pressure	Min/Max Temp (°F)	Relative[5] Humidity Avg/Max %	Dose[1] Rate (rads/hr)	Integrated[1] Dose (rads)
	Primary Containment					
	Zone I, above core	0.75 psig	65/150	20/100	gamma-24 neutrons-35	gamma 8.4E+6 neutrons-1.2E+7
	Zone II, core region	0.75 psig	65/150	20/100	gamma-50 neutrons-30	gamma-1.8E+7 neutrons-1.1E+7
	Zone III, under vessel	0.75 psig	65/150	20/100	gamma-12 neutrons-14	gamma-4.3E+6 neutrons-5.0E+6
	Zone IV, near recirc. pumps	0.75 psig	65/150	20/100	gamma-50 neutrons-16	gamma-1.8E+7 neutrons-5.5E+6
	Zone V, >15 ft from recirc. pumps	0.75 psig	65/150	20/100	gamma-25 neutrons-16	gamma-8.8E+6 neutrons-5.5E+6
	Zone VI, suppression chamber	0.75 psig	65/150	20/100	gamma-11 neutrons-0.43	gamma-3.7E+6 neutrons-1.5E+5
Room No.	**Control Structure**					
624	SGTS equip. compartment	Atmos.	65/104	50/90	2.35E-2	8.23E+3
533	Control room	+1/4-inch w.g.	76 ± 2	50/55	5.0E-4	1.76E+2
542	Auxiliary equip. room	Atmos.	76 ± 2	50/55	5.0E-4	1.76E+2
449, 450	Cable spreading room	Atmos.	65/104	50/90	5.0E-4	1.76E+2

T1002804-01V

TABLE 1
CALCULATED NORMAL AND MAXIMUM PLANT ENVIRONMENTAL CONDITIONS

Area		MAXIMUM CONDITIONS					
		Pressure[3] (psig)	Temp[4] (°F)	Relative[5] Humidity %	LOCA Dose Rate (See Notes)	LOCA[6] Dose (rads)	Total[1] Dose (rads)
	Primary Containment						
	Zone I, above core	44.0	330	100	(7)	gamma-4.59E+7 neutrons-0 beta-1.18E+9	gamma-5.43E+7 neutrons-1.2E+7 beta-1.18E+9
	Zone II, core region	44.0	330	100	(7)	gamma-4.59E+7 neutrons-0 beta-1.18E+9	gamma-6.39E+7 neutrons-1.1E+7 beta-1.18E+9
	Zone III, under vessel	44.0	330	100	(7)	gamma-4.59E+7 neutrons-0 beta-1.18E+9	gamma-5.02E+7 neutrons-5.0E+6 beta-1.18E+9
	Zone IV, near recirc. pumps	44.0	330	100	(7)	gamma-4.59E+7 neutrons-0 beta-1.18E+9	gamma-6.4E+7 neutrons-5.5E+6 beta-1.18E+9
	Zone V, >15 ft from recirc. pumps	44.0	330	100	(7)	gamma-4.59E+7 neutrons-0 beta-1.18E+9	gamma-5.5E+7 neutrons-5.5E+6 beta-1.18E+9
	Zone VI, suppression chamber	44.0	330	100	(7)	gamma-4.59E+7 neutrons-0 beta-1.18E+9	gamma-4.96E+6 neutrons-1.5E+5 beta-1.18E+9
Room No.	Control Structure						
624	SGTS equip. compartment	Atmos.	120	50/90	(9)	3.22E+5	3.30E+5
533	Control room	+1/4-inch w.g.	78	50/60	(10)	6.4	1.82E+2
542	Auxiliary equip. room	Atmos.	78	50/60	(8)	1.3E+1	1.89E+2
449, 450	Cable spreading room	Atmos.	105	80/100	(8)	2.1E+1	1.97E+2

T1002B04-01V

TABLE 1
CALCULATED NORMAL AND MAXIMUM PLANT ENVIRONMENTAL CONDITIONS

Area			NORMAL OPERATING CONDITIONS				
			Pressure	Min/Max Temp (°F)	Relative[5] Humidity Avg/Max %	Dose[1] Rate (rads/hr)	Integrated[1] Dose (rads)
Room No.	Control Structure						
619	HVAC equip. compartment, el. 304		Atmos.	65/104	50/90	2.5E-3	8.78E+2
625	HVAC equip. compartment, el. 332		Atmos.	65/104	50/90	2.5E-3	8.76E+2
323, 324 360, 361 425, 426 427, 436	Battery compartments		Atmos.	88/104[2]	50/90	5.0E-4	1.76E+2
428-435	Emergency switchgear room		Atmos.	65/104	50/90	5.0E-4	1.76E+2
452, 453	Inverter rooms		Atmos.	65/104	50/90	5.0E-4	1.76E+2
258, 263	Control structure chiller areas		Atmos.	65/104	50/90	2.5E-3	8.78E+2
713[25]	North Stack Radiation Monitoring Room		Atmos.	65/104	50/90	2.5E-3	8.78E+2
202	Elevation 217 Pipe Tunnel		Atmos.	55/123	50/100	2.5E-3	8.78E+2
311, 315	Diesel-Generator Enclosure		Atmos.	65/115	50/90	5.0E-4	1.76E+2
313	Diesel-Generator Corridor		Atmos.	50/100	50/100	5.0E-4	1.76E+2
	Spray Pond Pump Structure		Atmos.	40/115	50/90	5.0E-4	1.76E+2
Unit 1 Room No.	Unit 2 Room No.	Turbine Enclosure					
332	355	Turbine-generator area below el. 250	-1/4 inch wg.	65/120	70/90	7.1E+0	2.50E+6
332m	355m	Turbine-generator area above el. 250	-1/4 inch wg.	65/120	70/90	4.0E+0	1.40E+6
439	456	Feedwater heater area	-1/4 inch wg.	65/120	50/90	1.4E+0	5.00E+5

T10002804-01V

TABLE 1

CALCULATED NORMAL AND MAXIMUM PLANT ENVIRONMENTAL CONDITIONS

Area			MAXIMUM CONDITIONS					
			Pressure[3] (psig)	Temp[4] (°F)	Relative[5] Humidity %	LOCA Dose Rate (See Notes)	LOCA[6] Dose (rads)	Total[7] Dose (rads)
Room No.	Control Structure							
619	HVAC equip. compartment, el. 304		Atmos.	104	50/90	(11)	1.26E+2	1.00E+3
625	HVAC equip. compartment, el. 332		Atmos.	104	50/90	(11)	1.26E+2	1.00E+3
323, 324 369, 369 425, 426 427, 436	Battery compartments		Atmos.	104	50/90	(8)	2.1E+1	1.97E+2
428-435	Emergency switchgear room		Atmos.	104	50/90	(8)	2.1E+1	1.97E+2
452, 453	Inverter rooms		Atmos.	104	50/90	(8)	2.1E+1	1.97E+2
258, 263	Control structure chiller areas		Atmos.	111	80/90	(8)	2.1E+1	8.99E+2
713[25]	North Stack Radiation Monitoring Room		Atmos.	139[26]	50/90	-	4.1E+1	9.19E+2
202	Elevation 217 Pipe Tunnel		Atmos.	123[28]	50/100	-	-	8.78E+2
311, 315	Diesel-Generator Enclosure		Atmos.	115	50/90	-	-	1.79E+2
313	Diesel-Generator Corridor		Atmos.	117	50/100	-	-	1.79E+2
	Spray Pond Pump Structure		Atmos.	115	50/90	-	-	1.79E+2
Unit 1 Room No.	Unit 2 Room No.	Turbine Enclosure						
332	355	Turbine-generator area below el. 250	Atmos.	132[29]	50/100	-	-	2.50E+6
332m	355m	Turbine-generator area above el. 250	Atmos.	138[29]	50/100	-	-	1.40E+6
439	456	Feedwater heater area	Atmos.	160[29]	50/100	-	-	5.00E+5

T10002804-01V

TABLE 1 (Cont'd)

Notes:

(1) The normal total integrated doses are for 40 years. The present post-LOCA gamma doses are conservatively based on NUREG-0737 methodology. These conservative gamma doses would bound the total of the neutron doses and the post-LOCA gamma doses (if the gamma doses were calculated by NUREG-0588 methodology) In view of this, it is not necessary to add the neutron doses to the present gamma doses for equipment qualification purposes.

(2) 88°F represents the battery compartment average temperature.

(3) First number corresponds to maximum LOCA/loss of ventilation pressure. Second number corresponds to maximum High Energy Line Break pressure, where applicable. Break identification is provided in note (4). The maximum LOCA pressure for each area should be assumed to last for 180 days for environmental qualification purposes, except for the primary containment. A bounding primary containment pressure profile is provided in Figure 2. The maximum High Energy Line Break (HELB) pressure for each area should be assumed to last until the isolation valve closes, which in all cases is significantly less than one minute. The maximum pressures listed for the control structure are maximum LOCA pressures. Maximum pressures resulting from other accidents will be evaluated later.

(4) First number corresponds to maximum LOCA/loss of ventilation temperature. Second number corresponds to maximum High Energy Line Break temperature, where applicable. Break identification is indicated as follows:

a. RCIC steam line break in RCIC pump room
b. HPCI steam line break in HPCI pump room
c. HPCI steam line break in isolation valve compartment
d. RWCU line break in RWCU nonregenerative heat exchanger compartment
e. RWCU line break in RWCU pump room
f. RWCU line break in RWCU regenerative heat exchanger compartment
g. RWCU line break in RWCU isolation valve compartment
h. Main steam line break in main steam tunnel
i. RHR steam line break in RHR compartment

LOCA temperature profiles as a function of time are provided in Figure 3 through Figure 6. For areas without LOCA temperature profiles, assume the maximum temperature lasts 180 days. The isolation valve compartment HELB temperature profile as a function of time is provided in Figure 7. Areas which have maximum HELB temperatures listed, but do not have HELB temperature profiles, only contain components which will have completed their safety function once the blowdown has ceased, which in all cases is significantly less than one minute. The maximum temperatures listed for the control structure are maximum LOCA temperatures. Maximum temperatures resulting from other accidents will be evaluated later.

(5) Those rooms which experience High Energy Line Break, identified by letters per note 4, will be subjected to 100% relative humidity for 72 hours after the start of the High Energy Line Break at which time the relative humidity will fall below 90%. For the normal primary containment relative humidity, the minimum relative humidity is provided instead of the average relative humidity.

TABLE 1 (Cont'd)

Notes (Cont'd)

(6) The LOCA total integrated doses are for 180 days. The beta doses and dose rates are conservatively based on infinite cloud geometry, and the doses for areas containing radioactive pipes are conservatively based on piping contact doses. Doses for specific components within these areas may be lower, depending on distance and spatial relationships.
(7) Primary Containment Cloud (See Table 1a).
(8) Control Structure Cloud, Adjacent Piping Shine (Dose rates not tabulated because of low Total Integrated Dose (TID))
(9) SGTS Carbon Filter (See Table 1b).
(10) Adjacent Cloud Shine, Adjacent Piping Shine and SGTS Carbon Filter Shine (Dose rates not tabulated because of low TID).
(11) Control Structure Cloud and SGTS Carbon Filter Shine (Dose rates not tabulated because of low TID).
(12) Secondary Containment Cloud (see Table 1c)
(13) 30" Shutdown Cooling Piping (see Table 1j)
(14) 24" Shutdown Cooling Piping (see Table 1i)
(15) 18" Shutdown Cooling Piping (see Table 1h)
(16) 16" Shutdown Cooling Piping (see Table 1g)
(17) 6" Shutdown Cooling Piping (see Table 1e)
(18) 16" ECCS Piping (see Table 1g)
(19) 14" ECCS Piping (see Table 1f)
(20) 6" ECCS Piping (see Table 1e)
(21) 12" HPCI Steam Supply Piping (see Table 1m)
(22) 10" RCIC Steam Exhaust Piping (see Table 1l)
(23) RERS Carbon Filter (see Table 1k)
(24) 6" recombiner piping (see Table 1d)
(25) This room is located on the reactor enclosure roof.
(26) The North Stack Radiation Monitoring Room temperature drops to 130°F after 6 days
(27) 24" ECCS Piping (see Table 1i)
(28) Minimum temperature with loss of normal heating is 39°F. This temperature includes heat gain from Class 1E powered equipment.
(29) Temperature does not reflect HELB conditions because the components in these areas are not required to mitigate the consequences of a HELB.

TABLE 1a

CALCULATED PRIMARY CONTAINMENT DOSE RATES

Gamma Dose Rates

TIME INT. HRS	DOSE RATE R/HR	INT. DOSE RADS	TOTAL RADS
.10E-01	1.07E+07	.00	.00
.50E+00	3.51E+06	3.16E+06	3.16E+06
.10E+01	2.60E+06	1.52E+06	4.68E+06
.20E+01	1.85E+06	2.20E+06	6.88E+06
.40E+01	1.23E+06	3.04E+06	9.92E+06
.80E+01	7.10E+05	3.79E+06	1.37E+07
.16E+02	3.66E+05	4.15E+06	1.79E+07
.24E+02	2.41E+05	2.39E+06	2.03E+07
.96E+02	7.17E+04	1.01E+07	3.03E+07
.24E+03	3.45E+04	7.32E+06	3.76E+07
.72E+03	4.37E+03	7.00E+06	4.46E+07
.22E+04	2.56E+01	1.22E+06	4.58E+07
.43E+04	6.56E+00	3.02E+04	4.59E+07

Beta Dose Rates

TIME INT. HRS	DOSE RATE R/HR	INT. DOSE RADS	TOTAL RADS
.10E-01	1.30E+08	.00	.00
.50E+00	4.48E+07	3.92E+07	3.92E+07
.10E+01	3.56E+07	2.00E+07	5.92E+07
.20E+01	2.68E+07	3.10E+07	9.02E+07
.40E+01	1.88E+07	4.51E+07	1.35E+08
.80E+01	1.26E+07	6.20E+07	1.97E+08
.16E+02	8.00E+06	8.10E+07	2.78E+08
.24E+02	5.92E+06	5.53E+07	3.34E+08
.96E+02	2.22E+06	2.72E+08	6.05E+08
.24E+03	1.01E+06	2.21E+08	8.26E+08
.72E+03	1.25E+05	2.03E+08	1.03E+09
.22E+04	3.00E+04	9.59E+07	1.13E+09
.43E+04	1.87E+04	5.16E+07	1.18E+09

TABLE 1b

SGTS CARBON FILTER
CALCULATED DOSE RATES

TIME INT. HRS	DOSE RATE R/HR	INT. DOSE RADS	TOTAL RADS
.10E-01	2.50E-03	.00	.00
.50E+00	1.00E+01	6.17E-01	6.17E-01
.10E+01	3.10E+01	9.47E+00	1.01E+01
.20E+01	7.47E+01	4.97E+01	5.98E+01
.40E+01	1.40E+02	2.08E+02	2.68E+02
.80E+01	2.10E+02	6.91E+02	9.58E+02
.16E+02	2.63E+02	1.88E+03	2.84E+03
.24E+02	2.81E+02	2.18E+03	5.02E+03
.96E+02	3.50E+02	2.26E+04	2.76E+04
.24E+03	4.51E+02	5.74E+04	8.50E+04
.72E+03	2.30E+02	1.58E+05	2.43E+05
.22E+04	3.41E+00	7.75E+04	3.21E+05
.43E+04	2.40E-03	1.01E+03	3.22E+05

TABLE 1c

CALCULATED SECONDARY CONTAINMENT DOSE RATES

Gamma Dose Rates

TIME INT. HRS	DOSE RATE R/HR	INT. DOSE RADS	TOTAL RADS
.10E-09	1.00E-10	.00	.00
.50E+00	2.49E+02	4.36E+00	4.36E+00
.10E+01	3.23E+02	1.42E+02	1.46E+02
.20E+01	3.93E+02	3.57E+02	5.03E+02
.40E+01	4.55E+02	8.47E+02	1.35E+03
.80E+01	4.46E+02	1.80E+03	3.15E+03
.24E+02	3.07E+02	5.96E+03	9.11E+03
.96E+02	1.87E+02	1.74E+04	2.65E+04
.24E+03	9.33E+01	1.94E+04	4.59E+04
.72E+03	6.40E+00	1.56E+04	6.15E+04
.43E+04	5.78E-02	4.85E+03	6.63E+04

Beta Dose Rates

TIME INT. HRS	DOSE RATE R/HR	INT. DOSE RADS	TOTAL RADS
.10E-09	1.00E-10	.00	.00
.50E+00	9.40E+02	1.57E+01	1.57E+01
.10E+01	1.39E+03	5.75E+02	5.91E+02
.20E+01	1.92E+03	1.64E+03	2.23E+03
.40E+01	2.50E+03	4.41E+03	6.64E+03
.80E+01	3.03E+03	1.10E+04	1.77E+04
.24E+02	3.50E+03	5.22E+04	6.99E+04
.96E+02	3.35E+03	2.47E+05	3.16E+05
.24E+03	1.75E+03	3.55E+05	6.71E+05
.72E+03	2.01E+02	3.44E+05	1.01E+06
.43E+04	4.23E+01	3.66E+05	1.38E+06

TABLE 1d

6 INCH RECOMBINER
CALCULATED PIPING DOSE RATES

TIME INT. HRS	DOSE RATE R/HR	INT. DOSE RADS	TOTAL RADS
.10E-09	7.53E+04	0	0
.50E+00	2.95E+04	2.44E+04	2.44E+04
.10E+01	2.25E+04	1.29E+04	3.73E+04
.20E+01	1.54E+04	1.87E+04	5.61E+04
.40E+01	9.75E+03	2.47E+04	8.08E+04
.80E+01	5.57E+03	2.99E+04	1.11E+05
.24E+02	1.82E+03	5.36E+04	1.64E+05
.96E+02	4.19E+02	6.86E+04	2.33E+05
.24E+03	2.08E+02	4.34E+04	2.76E+05
.72E+03	3.34E+01	4.59E+04	3.22E+05
.43E+04	8.80E-01	2.02E+04	3.42E+05

TABLE 1e

6 INCH ECCS
CALCULATED PIPE DOSE RATES

TIME INT. HRS	DOSE RATE R/HR	INT. DOSE RADS	TOTAL RADS
.10E-09	5.79E+04	.00	.00
.50E+00	4.18E+04	2.47E+04	2.47E+04
.10E+01	3.57E+04	1.93E+04	4.40E+04
.20E+01	2.77E+04	3.15E+04	7.56E+04
.40E+01	1.97E+04	4.70E+04	1.23E+05
.80E+01	1.32E+04	6.49E+04	1.87E+05
.24E+02	5.91E+03	1.45E+05	3.32E+05
.96E+02	1.91E+03	2.55E+05	5.87E+05
.24E+03	1.12E+03	2.13E+05	8.00E+05
.72E+03	4.42E+02	3.50E+05	1.15E+06
.43E+04	7.05E+01	7.28E+05	1.88E+06

TABLE 1f

14 INCH ECCS
CALCULATED PIPING DOSE RATES

TIME INT. HRS	DOSE RATE R/HR	INT. DOSE RADS	TOTAL RADS
.10E-09	1.15E+05	.00	.00
.50E+00	8.30E+04	4.92E+04	4.92E+04
.10E+01	7.07E+04	3.84E+04	8.75E+04
.20E+01	5.49E+04	6.25E+04	1.50E+05
.40E+01	3.89E+04	9.29E+04	2.43E+05
.80E+01	2.58E+04	1.28E+05	3.71E+05
.24E+02	1.14E+04	2.83E+05	6.53E+05
.96E+02	3.62E+03	4.89E+05	1.14E+06
.24E+03	2.13E+03	4.05E+05	1.55E+06
.72E+03	8.54E+02	6.70E+05	2.22E+06
.43E+04	1.38E+02	1.41E+06	3.63E+06

TABLE 1g

16 INCH ECCS
CALCULATED PIPING DOSE RATES

TIME INT. HRS	DOSE RATE R/HR	INT. DOSE RADS	TOTAL RADS
.10E-09	1.24E+05	.00	.00
.50E+00	8.93E+04	5.30E+04	5.30E+04
.10E+01	7.60E+04	4.13E+04	9.42E+04
.20E+01	5.90E+04	6.71E+04	1.61E+05
.40E+01	4.18E+04	9.98E+04	2.61E+05
.80E+01	2.77E+04	1.37E+05	3.98E+05
.24E+02	1.22E+04	3.03E+05	7.01E+05
.96E+02	3.85E+03	5.21E+05	1.22E+06
.24E+03	2.27E+03	4.30E+05	1.65E+06
.72E+03	9.12E+02	7.15E+05	2.37E+06
.43E+04	1.48E+02	1.51E+06	3.88E+06

TABLE 1h

18 INCH SHUTDOWN COOLING
CALCULATED PIPING DOSE RATES

TIME INT. HRS	DOSE RATE R/HR	INT. DOSE RADS	TOTAL RADS
.10E-09	1.32E+05	.00	.00
.50E+00	9.45E+04	5.60E+04	5.60E+04
.10E+01	8.04E+04	4.37E+04	9.97E+04
.20E+01	6.23E+04	7.10E+04	1.71E+05
.40E+01	4.42E+04	1.05E+05	2.77E+05
.80E+01	2.92E+04	1.45E+05	4.21E+05
.24E+02	1.28E+04	3.19E+05	7.39E+05
.96E+02	4.04E+03	5.47E+05	1.28E+06
.24E+03	2.37E+03	4.51E+05	1.73E+06
.72E+03	9.59E+02	7.50E+05	2.49E+06
.43E+04	1.55E+02	1.59E+06	4.08E+06

TABLE 1i

24 INCH ECCS
CALCULATED PIPING DOSE RATES

TIME INT. HRS	DOSE RATE R/HR	INT. DOSE RADS	TOTAL RADS
.10E-09	1.47E+05	.00	.00
.50E+00	1.05E+05	6.26E+04	6.26E+04
.10E+01	8.95E+04	4.85E+04	1.11E+05
.20E+01	6.93E+04	7.91E+04	1.90E+05
.40E+01	4.90E+04	1.17E+05	3.07E+05
.80E+01	3.24E+04	1.60E+05	4.68E+05
.24E+02	1.41E+04	3.53E+05	8.20E+05
.96E+02	4.40E+03	5.99E+05	1.42E+06
.24E+03	2.59E+03	4.93E+05	1.91E+06
.72E+03	1.05E+03	8.20E+05	2.73E+06
.43E+04	1.71E+02	1.74E+06	4.49E+06

TABLE 1j

30 INCH SHUTDOWN COOLING
CALCULATED PIPING DOSE RATES

TIME INT. HRS	DOSE RATE R/HR	INT. DOSE RADS	TOTAL RADS
.10E-09	1.57E+05	.00	.00
.50E+00	1.12E+05	6.65E+04	6.65E+04
.10E+01	9.48E+04	5.15E+04	1.18E+05
.20E+01	7.34E+04	8.37E+04	2.02E+05
.40E+01	5.19E+04	1.23E+05	3.25E+05
.80E+01	3.42E+04	1.70E+05	4.95E+05
.24E+02	1.48E+04	3.70E+05	8.66E+05
.96E+02	4.59E+03	6.29E+05	1.50E+06
.24E+03	2.72E+03	5.15E+05	2.01E+06
.72E+03	1.11E+03	8.59E+05	2.87E+06
.43E+04	1.80E+02	1.84E+06	4.71E+06

TABLE 1k

CALCULATED RERS CARBON FILTER DOSE RATES

TIME INT. HRS	DOSE RATE R/HR	INT. DOSE RADS	TOTAL RADS
.10E-01	2.50E+03	.00	.00
.50E+00	7.99E+02	3.09E+01	3.09E+01
.10E+01	2.08E+03	6.70E+02	7.01E+02
.20E+01	4.20E+03	3.02E+03	3.72E+03
.40E+01	6.64E+03	1.07E+04	1.44E+04
.80E+01	8.90E+03	3.09E+04	4.52E+04
.24E+02	1.11E+04	1.60E+05	2.05E+05
.96E+02	1.18E+04	8.25E+05	1.03E+06
.24E+03	1.45E+04	1.89E+06	2.92E+06
.72E+03	7.40E+03	5.07E+06	7.99E+06
.43E+04	7.69E-02	2.32E+06	1.03E+07

TABLE 11

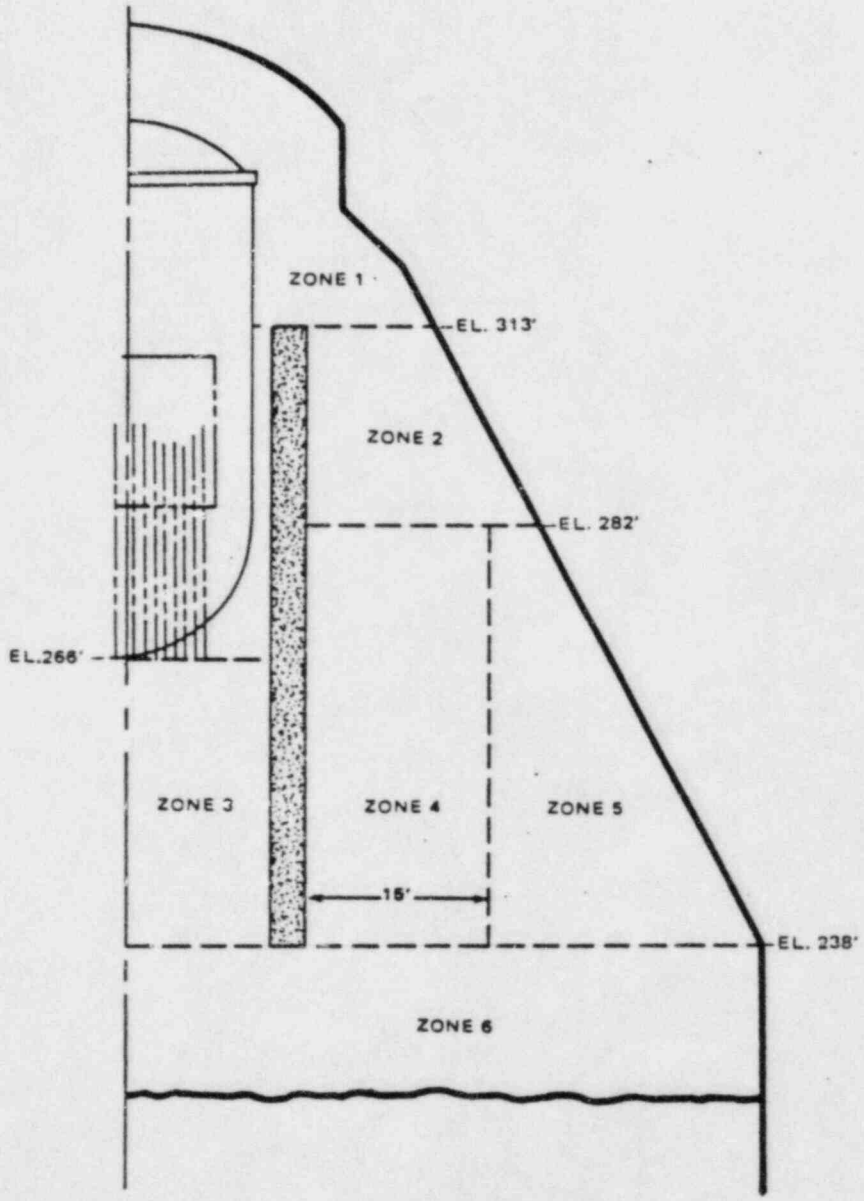
10 INCH RCIC STEAM EXHAUST
CALCULATED PIPING DOSE RATES

TIME INT. HRS	DOSE RATE R/HR	INT. DOSE RADS	TOTAL RADS
.10E-09	2.06E+05	.00	.00
.50E+00	6.02E+04	5.93E+04	5.93E+04
.10E+01	3.41E+04	2.30E+04	8.23E+04
.20E+01	1.31E+04	2.19E+04	1.04E+05
.40E+01	2.56E+03	1.29E+04	1.17E+05
.80E+01	1.40E+02	3.33E+03	1.20E+05
.24E+02	3.92E-03	2.14E+02	1.21E+05

TABLE 1m

CALCULATED 12 INCH HPCI STEAM SUPPLY PIPING DOSE RATES

TIME INT. HRS	DOSE RATE R/HR	INT. DOSE RADS	TOTAL RADS
.10E-09	4.62E+06	.00	.00
.50E+00	2.25E+05	7.27E+05	7.27E+05
.10E+01	2.14E+04	4.33E+04	7.71E+05
.20E+01	2.28E+02	4.67E+03	7.76E+05
.40E+01	3.50E-02	5.20E+01	7.76E+05



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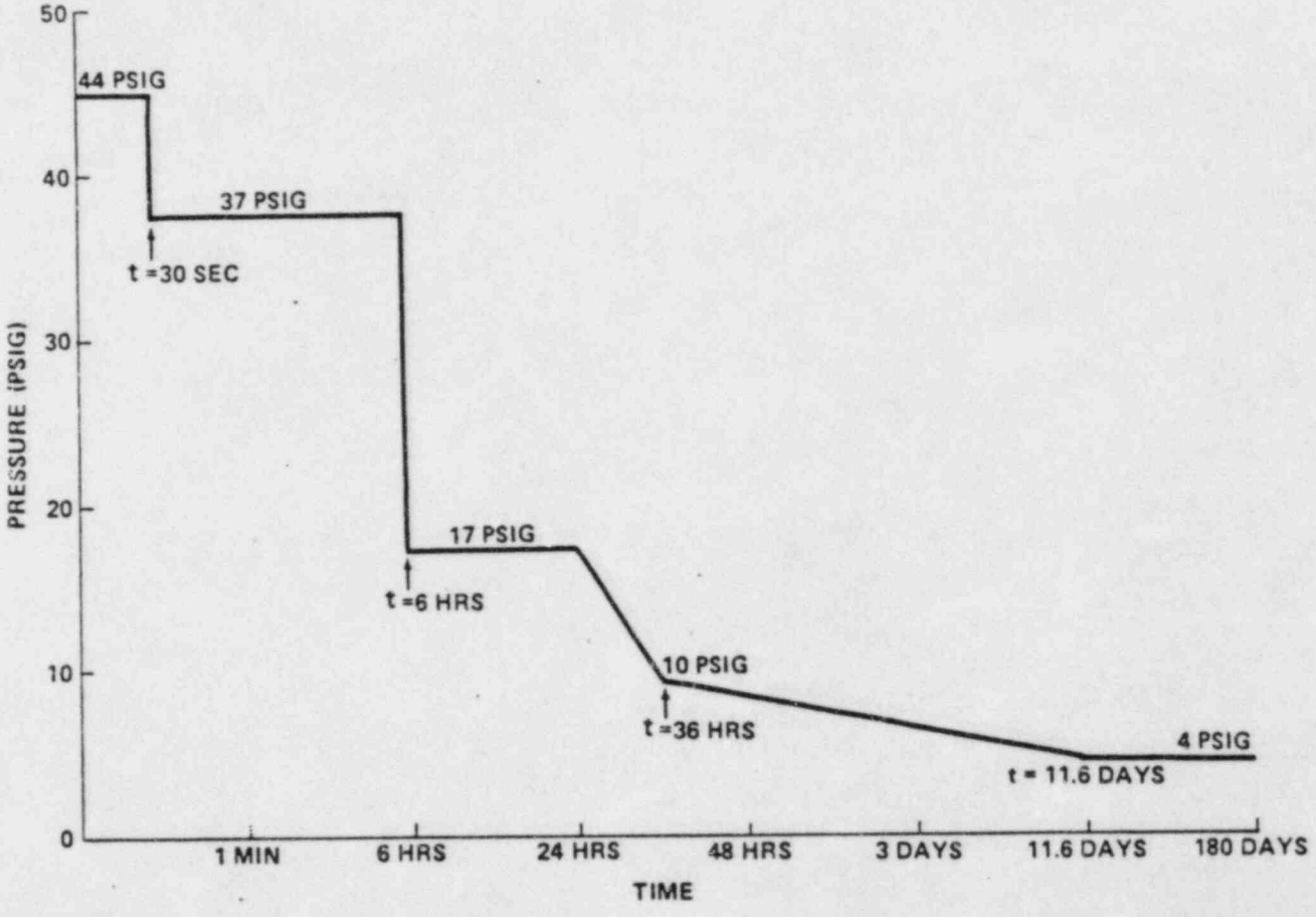
SPECIFICATION 8031-M-171

PRIMARY CONTAINMENT ZONES

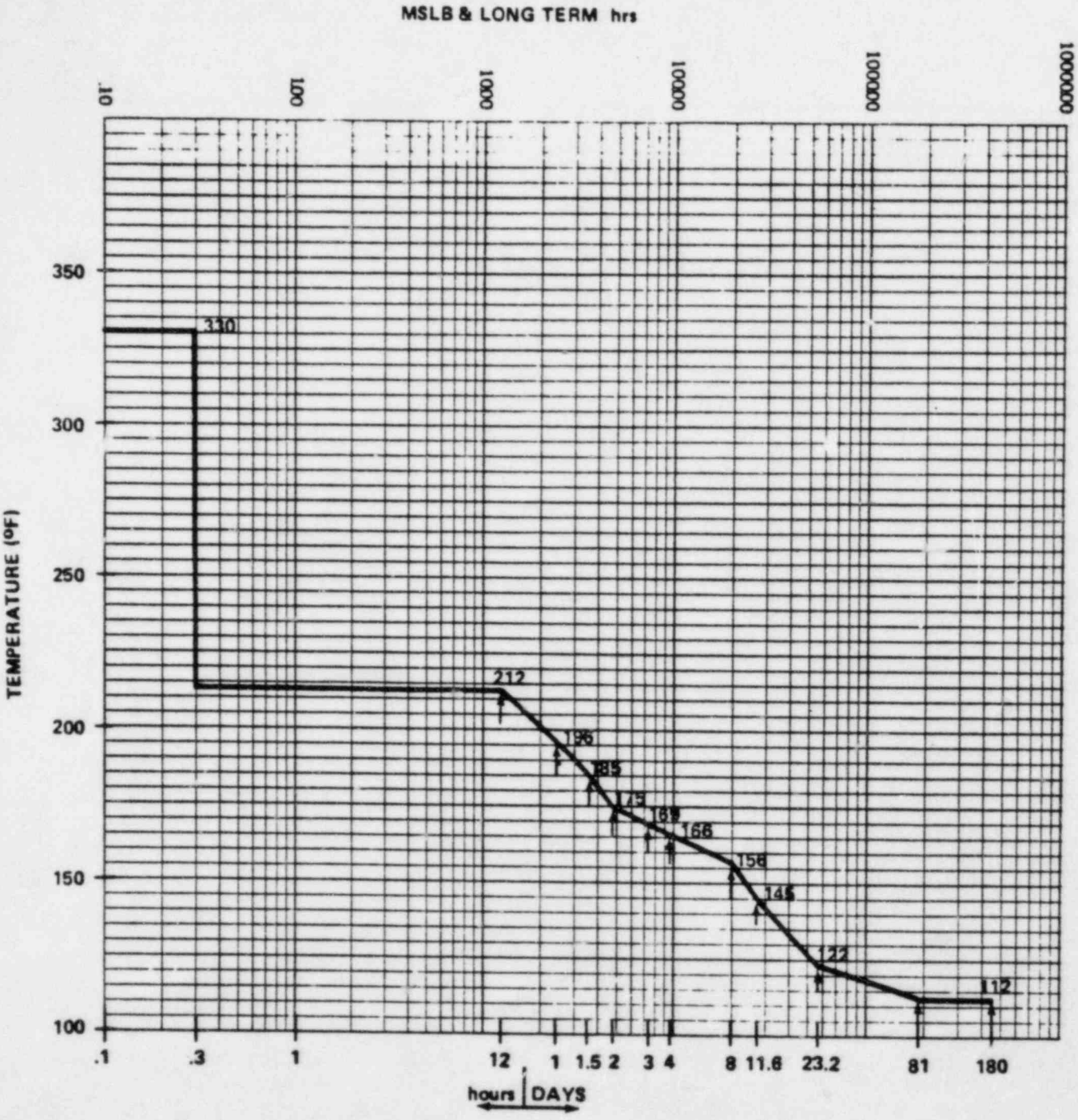
FIGURE 1



LIMERICK GENERATING STATION
UNITS 1 AND 2
SPECIFICATION 8031-M-171

CALCULATED POST-LOCA
BOUNDING PRIMARY CONTAINMENT
PRESSURE PROFILE

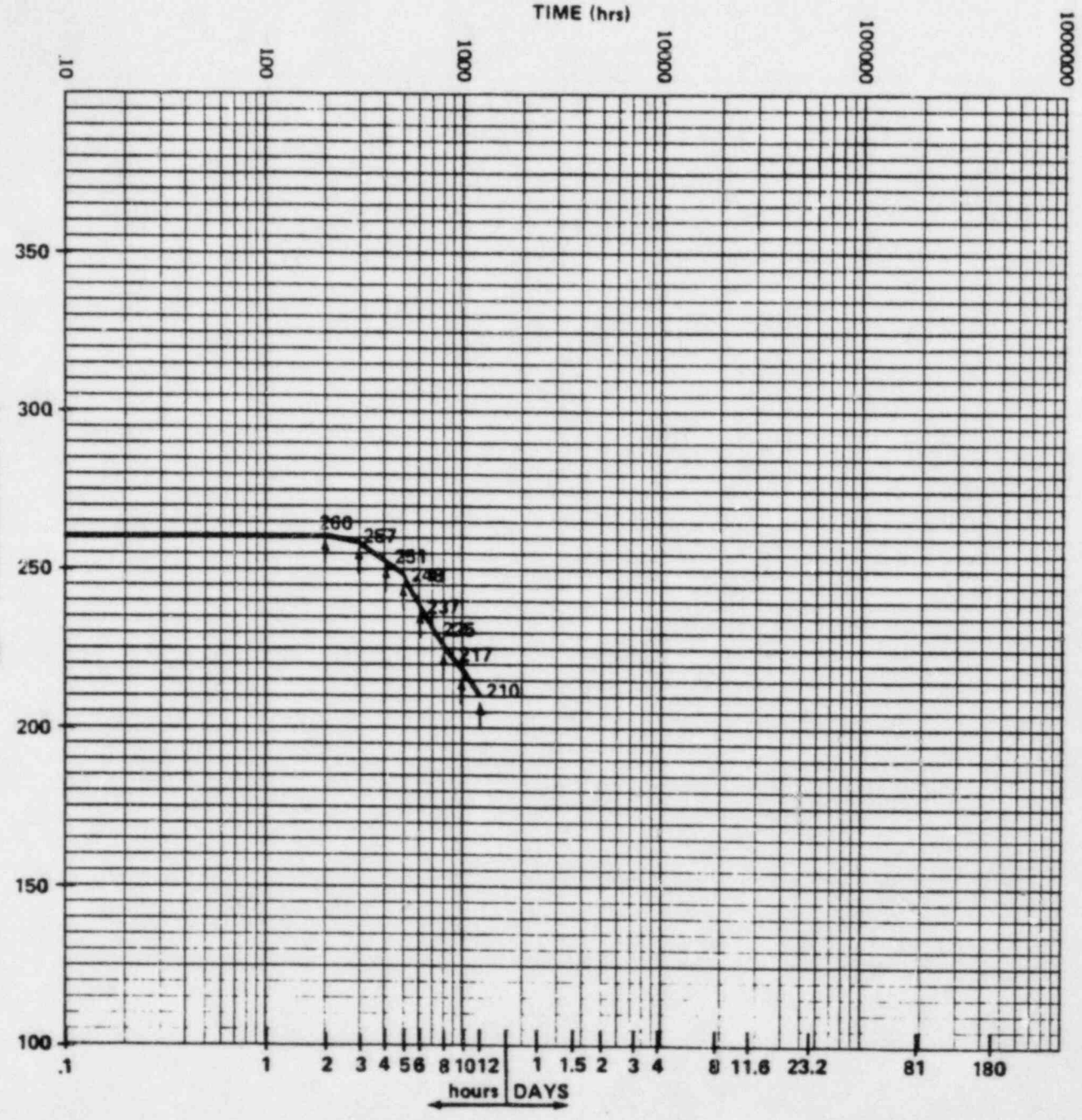
FIGURE 2



LIMERICK GENERATING STATION
UNITS 1 AND 2
SPECIFICATION 8031-M-171

CALCULATED
BOUNDING DRYWELL
TEMPERATURE PROFILE
FOLLOWING A LARGE-BREAK LOCA

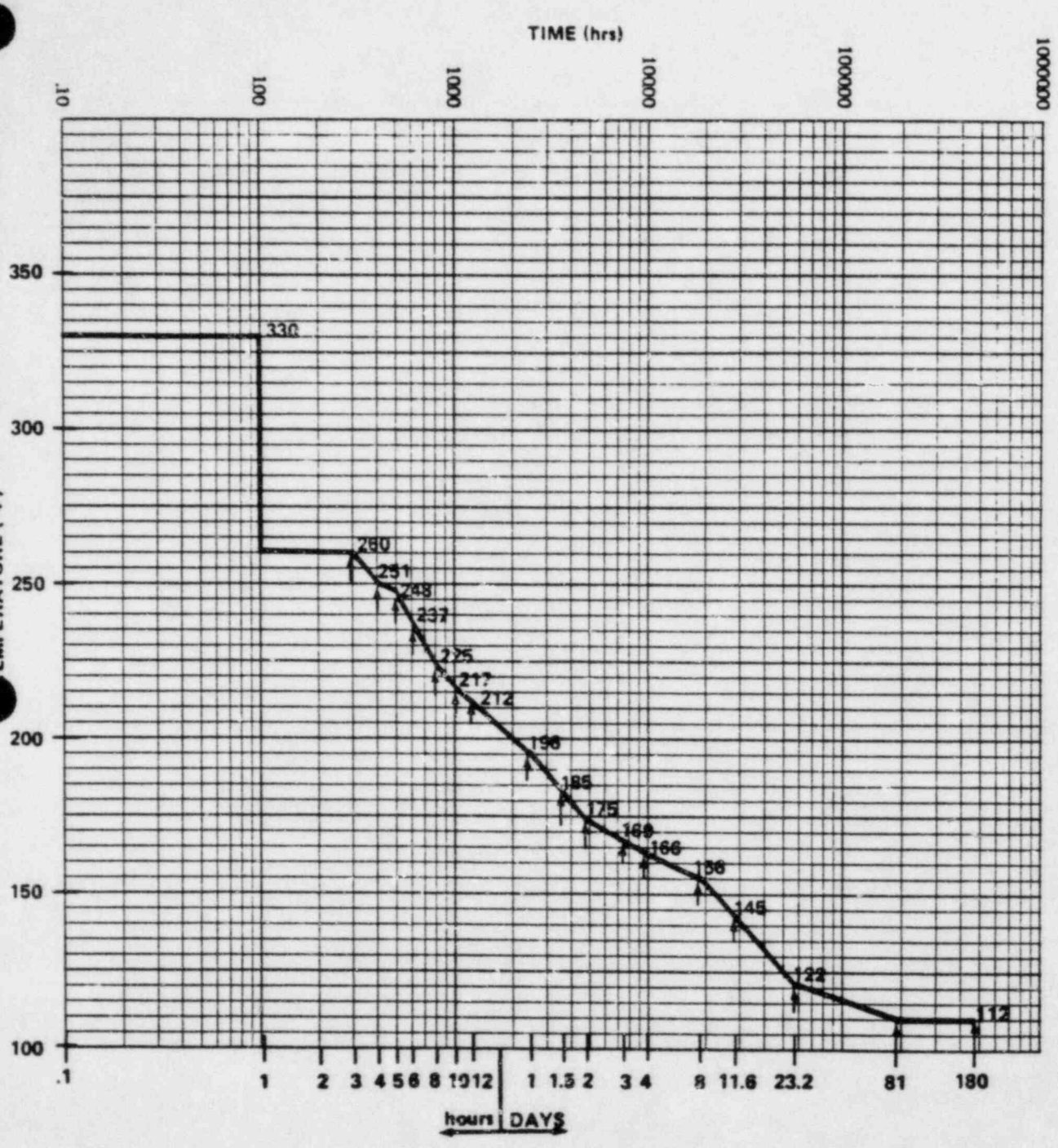
FIGURE 3A



LIMERICK GENERATING STATION
UNITS 1 AND 2
SPECIFICATION 8031-M-171

CALCULATED
BOUNDING DRYWELL
TEMPERATURE PROFILE
FOLLOWING A SMALL-BREAK LOCA

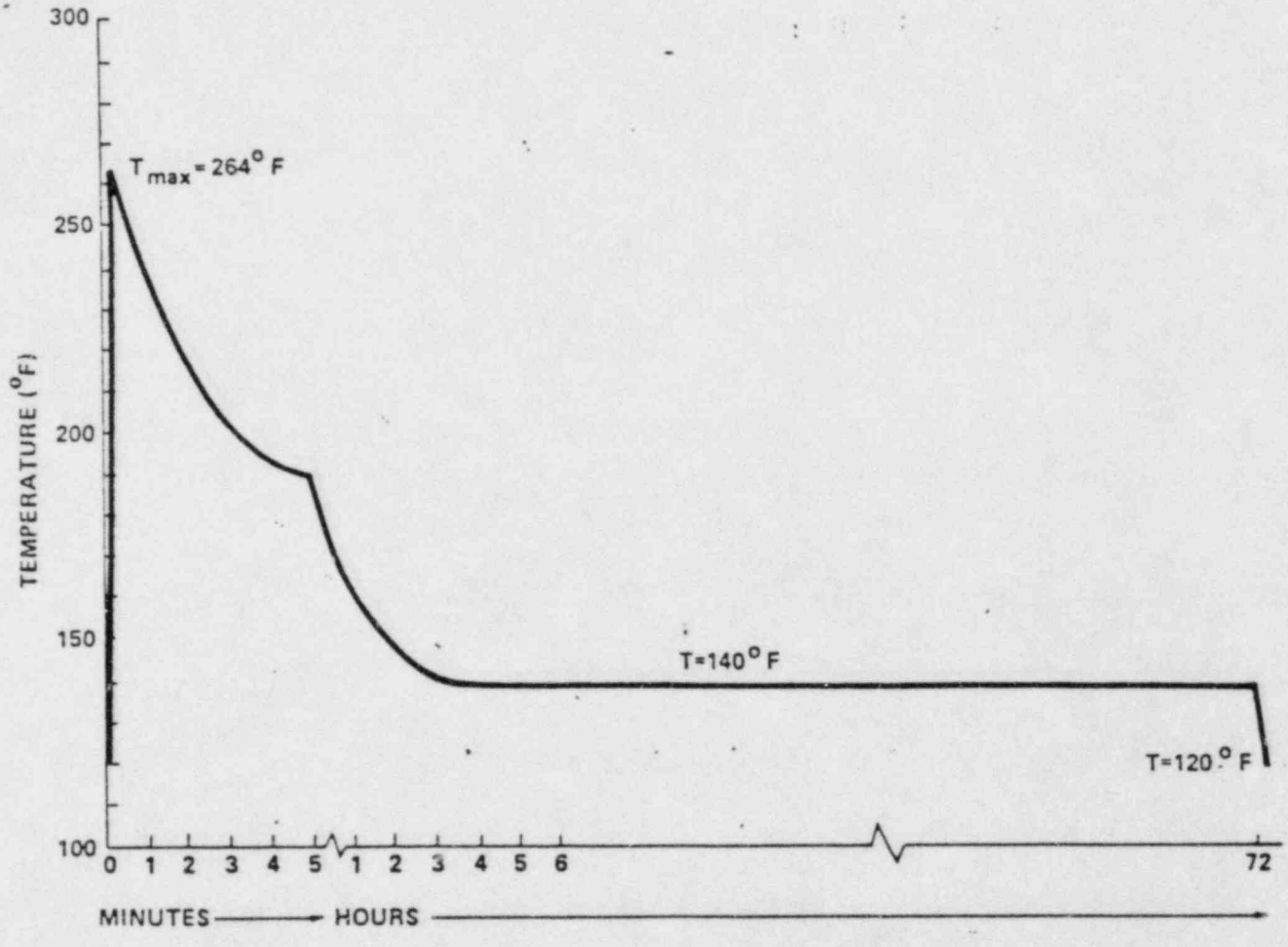
FIGURE 3B



LIMERICK GENERATING STATION
UNITS 1 AND 2
SPECIFICATION 8031-M-171

CALCULATED
BOUNDING DRYWELL
TEMPERATURE PROFILE

FIGURE 3C



LIMERICK GENERATING STATION
UNITS 1 AND 2
SPECIFICATION 8031-M-171

ISOLATION VALVE COMPARTMENT
(EL 217') HELB TEMPERATURE PROFILE

FIGURE 5

APPENDIX D

EQUIPMENT QUALIFICATION REVIEW RECORD

DESCRIPTION OF EQRR ENTRIES

FACILITY:	LGS - Limerick Generating Station
UNIT:	Provides the Unit Number as 1, 2, or 0 (for common equipment)
EQRR:	Assigns a unique Environmental Qualification Review Record number for each unique EQ package evaluated
PREPARED BY:	Indicates the initials of the individual preparing the EQRR
DATE:	Indicates the date the EQRR was prepared
REVIEWED BY:	Indicates the initials of the individual responsible for the review of the EQRR
DATE:	Indicates the date the EQRR was reviewed
REVISION DATE:	Indicates the date of current revision
PLANT ID:	Provides Plant ID from Component Classification Program
SYSTEM:	Provides name of system from Component Classification Program
COMPONENT:	Provides description of component being qualified

*ASSOCIATED COMPONENT:	Provides description of associated components. For valves, an "x" followed by a number indicates the associated penetration.
MANUFACTURER:	Provides name of manuafacturer
*ASSOCIATED MANUFACTURER:	Provides name of manufacturer corresponding to the associated component identified above
MODEL NUMBER:	Provides model number of component
*ASSOCIATED MODEL NUMBER:	Provides model number of associated component
*SERIAL NUMBER:	Provides serial number of component
*ASSOCIATED S/N:	Provides serial number of associated components
SERVICE:	Provides the service description; indicates the state of the equipment during normal operation
FUNCTION:	Provides the safety function of the equipment. Indicates for which DBA the equipment is required to perform its S/R function.
ACCURACY SPECIFIED:	Provides the specified accurancy necessary to per. orm the equipment's safety function
Demonstrated:	Demonstrated provides the demostrated accuracy
Reference:	Provides the reference from which the demonstrated accuracy value was obtained
LOCATION:	Provides equipment's location

*Entry optional.

*RACK/PANEL	For information only
*ASSOCIATED DRAWING:	For information only
*PURCHASE ORDER NUMBER	For information only
SUBMERGENCE:	Indicate with a "Yes" if the component is required to be and has been qualified for submergence. Indicate with a "No" if the component is required to be qualified for submergence, but deficiency exists. Indicate with an N/A if the component is not required to be qualified for submergence.
CHEMICAL SPRAY:	Indicate with a "Yes" if the component is required to be and has been qualified for chemical spray. Indicate with "No" if the component is required to be qualified for chemical spray, but deficiences exist. Indicate with "N/A" if chemical spray is not required.
OPERATING TIME:	SPECIFIED: Provides the maximum time period for which the equipment must perform its safety function based upon FSAR requirements (minutes, hours, days). QUALIFIED: Provides the time period for which the equipment has been demonstrated to perform its safety function based upon review of documentation. DOC REF: Provides the documentation references for the specified and qualified values. QUAL METHOD: Provides the qualification methods employed.

*Entry optional.

TEMPERATURE:

SPECIFIED: Provides the required maximum temperature that corresponds to the specified operating time given above. Applicability of HELB value dependent upon component's requirement to function during that specific event. For a HELB value, a letter in parentheses identifies the specific HELB per Table 1, Page C6.

QUALIFIED: Provides the maximum temperature demonstrated.

DOC REF: Provides the documentation references for the specified and qualified values provided above.

QUAL METHOD: Provides the qualification methods employed.

PRESSURE:

SPECIFIED: Provides the required maximum pressure that corresponds to the specified operating time given above. Applicability of HELB value dependent upon component's requirement to function during that specific event. For a HELB value, a letter in parentheses identifies the specific HELB per Table 1, Page C6.

QUALIFIED: Provides the maximum pressure demonstrated.

DOC REF: Provides the documentation references for the specified and qualified values provided above.

QUAL METHOD: Provides the qualification methods employed.

RELATIVE HUMIDITY:

SPECIFIED: Provides the required maximum relative humidity that corresponds to the specified operating time given above. Applicability of HELB value dependent upon component's requirement to function during that specific event. For a

HELB value, a letter in parentheses identifies the specific HELB per Table 1, Page D6.

QUALIFIED: Provides the maximum relative humidity demonstrated.

DOC REF: Provides the documentation references for the specified and qualified values.

QUAL METHOD: Provides the qualification methods employed.

RADIATION:

SPECIFIED: Provides the Total Integrated Dose (TID) that corresponds to the 40-year normal radiation TID plus the TID for the required operating time and function provided above. For cable or other exposed organics, both gamma and beta radiation are specified. The values are followed by a "G" for gamma and "B" for beta radiation. For shielded organics, the gamma radiation is specified.

QUALIFIED: Provides the maximum radiation dose demonstrated.

DOC REF: Provides the documentation references for the specified and qualified values provided above.

QUAL METHOD: Provides the qualification methods employed.

AGING:

SPECIFIED: 40 Years.

QUALIFIED: Provides the designated life of the equipment; maximum installed life.

DOC REF: Provides the documentation references for the specified and designated values provided above.

QUAL METHOD: Provides the evaluation methods employed.

OUTSTANDING ITEMS:	Indicates any problems or outstanding items, as appropriate
INTERFACES:	Provides a description of any interfaces used and provides a reference to the applicable EQRR
MAINTENANCE REQUIREMENTS:	Provides any restricting maintenance requirements and/or provides the documentation reference
REMARKS:	Provides remarks as appropriate. Any non-conservative deviation for specified values should be noted in the remarks section
DEFICIENCY RESOLUTION:	Indicates unique deficiency resolutions, as appropriate

PREPARED BY: DATE: REVISION DATE:

FACILITY: LGS UNIT: DOCKET: EQRR:

REVIEWED BY: DATE:

SYSTEM: ACCY: SPEC: LOCATION:
DEMON:
PLANT ID: REF: PACK/PANEL:

COMPONENT: MODEL NO.:
ASSOC COMP: ASSOC M/N: ASSOC. DWG:
ASSOC COMP: ASSOC M/N:

MANUFACTU: SERIAL NO:
ASSOC MANF: ASSOC S/N:
ASSOC MANF: ASSOC S/N:

SERVICE:

P.O. NO:

FUNCTION:

SUBMERGENCE:

CHEMICAL SPRAY:

PARAMETER	ENVIRONMENT		DOCUMENTATION REFERENCE		QUALIFICATION	OUTSTANDING ITEMS	INTERFACES:
	SPECIFICATION	QUALIFICATION	SPECIFICATION	QUALIFICATION	METHOD		
OPERATING TIME							
TEMPERATURE (F)							MAINTENANCE REQUIREMENTS:
PRESSURE (PSIA)							
RELATIVE HUMIDITY (%)							
RADIATION							REMARKS:
AGING							

DEFICIENCY RESOLUTION: