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SUBJECT: Forwards summaries of equipement that need not be seismically qualified by fuel load per SER (NUREG-0892). Justification explaining why facility can be operated safety until qualification completed included.

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November 4, 1983
G02-83-1023

Docket No. 50-397

Director of Nuclear Reactor Regulation
Attention: Mr. A. Schwencer, Chief
Licensing Branch No. 2
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Schwencer:

Subject: NUCLEAR PROJECT 2
EQUIPMENT SEISMIC QUALIFICATION

References: 1) Safety Evaluation Report Related to the Operation of WPPSS Nuclear Project No. 2, Docket No. 50-397, NUREG-0892, Supplement No. 3, dated May 1983
2) G02-83-590, G. D. Bouchey to A. Schwencer, Docket No. 50-397, "Justification for Interim Operation", dated June 30, 1983

Safety-related equipment required to operate WNP-2 safely will be seismically qualified by fuel load. We have identified certain equipment that need not be qualified by fuel load. The equipment identified at this time is described in attachments, along with justifications as to why WNP-2 can be operated safely until qualification is completed.

As we have previously emphasized, reference 2), we expect a continuing flow of plant changes which will require development of qualification documents. We will act on these changes and develop final qualification documentation in a timely manner, which we believe is responsive to the Staff's requirements in this area.

Very truly yours,

G. C. Sorensen, Acting Manager
Nuclear Safety and Regulatory Programs

KRW/sms
Attachment

cc: R Auluck - NRC
WS Chin - BPA
A Toth - NRC Site
J. Singh - EG&G

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TABLE

Justification No.	Equipment Type
-1	WMA Filters
-2	HPCS Diesel Generator
-3	MSIV
-4	SDV Modifications
-5	CRD Air Operators
-6	Heat Trace Control Panel
-7	Spray Pond Monitors
-8	Fatigue
-9	Wetwell Level Monitors

EPN: WMA-FL-53A, 53B

Description: WMA-FL-53A and 53B are roughing filters for the critical switchgear air handling units WMA-AH-53A and 53B, respectively. They are continuously rolling type filters.

Safety Function: WMA-FL-53A and 53B filter the air that heats or cools the critical switchgear room, battery and battery charging rooms, electrical equipment rooms, and the RPS rooms, which contain the M-G sets and motor control centers. The filter itself is passive and need not operate during or after a seismic event.

Justification: If the rolling filter fails due to a seismic event, heating or cooling is not immediately prevented. The probable failure mode would be local yielding in filter media support grid. Structural failure of the filter media support grid could cause a breach of the filter media. This would have no near term operational effect on the cooling or heating performance of the air handling units. An alternate failure mode is stalling of the filter media. Long-term effect of this failure mode would be the eventual clogging of the filter media. If it does, there is a differential pressure switch to detect it and actuate a control room annunciation. Even with a clogged filter, the reduced air flow could keep the rooms within their design temperature range. In addition, there are also temperature monitors in each room which actuate a control room annunciation. These temperature monitors are of the same manufacturer and model as Seismically Qualified Safety-related monitors. Safe shutdown is not prevented and there are alarms to indicate failure.

Name: HPCS Diesel Generator, engine, various control panels and components.

EPN: DG-ENG-1C+

Safety Function: To provide emergency power, in the event of loss of off-site power sources, to the HPCS which supplies high pressure emergency cooling water to the reactor pressure vessel, in order to maintain reactor core temperatures within specification limits.

Failure Effect: A. Effect on Primary Use

Failures concurrent with loss of off-site power and LOCA with additional loss of redundant ECCS System (ADS) could cause flow rate of emergency cooling water to be less than required to maintain reactor core temperatures within specification limits under high pressure accident conditions.

Justification: The diesel generator on the Supply System Nuclear Project No. 2 High Pressure Core Spray System has been undergoing an extensive seismic qualification upgrade program. Original qualification was to IEEE-344, 1971. This program, using a combination of test and analysis, has shown that the majority of essential components mounted on the diesel generator are qualified to the SQRT criteria. However, a few essential components require additional tests or analyses to complete their qualification upgrade to current SQRT requirements.

Diesel generator systems are designed for high vibration applications (i.e., locomotives, shipboard, etc.) and by their nature (internal combustion engine) produce vibrations often higher than seismic during normal running conditions. We have confidence that the components with incomplete documentation will not fail during a seismic event due to basic diesel design requirements and partial qualification information.

Operation of Supply System Nuclear Project No. 2 prior to completion of this qualification poses no safety hazard because a redundant, single failure proof equipment path exists which provides safe shutdown without HPCS for those accidents for which HPCS is designed to operate. This alternate safe shutdown path to provide core cooling would be accomplished by vessel depressurization through ADS coupled with the low pressure LPCI mode of RHR operation and/or LPCS.

EPN: MS-V-22A,B,C,D; MS-AO-22A,B,C,D; MS-SPV-22A,B,C,D series
MS-V-28A,B,C,D; MS-AO-28A,B,C,D; MS-SPV-28A,B,C,D series

Description: The equipment is the main steam isolation valves and operators. They are large 26" isolation valves with air operators that fail shut in the event of loss of air. The operators are equipped with large springs that return the valve to its closed (safe) position.

Safety Function: These valves serve to provide main steam line isolation in the event of LOCA, MSLB, or breach of fuel accidents. The safe position of these valves is closed for all design basis events.

Justification: Dynamic qualification of these valves and operators to seismic and hydrodynamic loads has been achieved to IEEE-344, 1971. A program to upgrade the valve and operator qualification to meet the criteria of IEEE-344, 1975, is in progress; however, final upgrade, including operability demonstration documentation, may not be available prior to fuel load. System testing has confirmed the operability of these valves to normal conditions which, in themselves, produce large vibratory forces. Stress factors associated with the seismic and hydrodynamic loads have already been considered and found acceptable. In addition, in-plant static deflection testing at maximum seismic and hydrodynamic loads has successfully been completed demonstrating operability. Based on this, we believe that these valves will accomplish their safety function (i.e., closed on demand) when required as these valves spring return to close upon loss of air pressure.

Operation of WNP-2 is justified based on the initial qualification to IEEE-344, 1971, the fail-safe design of the valves, and demonstrated normal and faulted service operability testing as part of the Startup System Testing Program.

JIO-S-2 - Continued

Justification: (Continued)

Sections 6.3.2.2.2, 6.3.2.2.3 and 6.3.2.2.4 of the FSAR describe operation of this alternate shutdown path. In addition, Sections 7.3.1.1.1-2, 7.3.1.1.1.3 and 7.3.1.1.1.4 of the FSAR discuss the controls and instrumentation in detail.

Completion of the qualification documentation defined in the attached list will achieve seismic qualification of this alternate shutdown path. These components will be completed prior to fuel load.

QID	EPN	Description
233011	LPCS-P-1	Low Pressure Core Spray Pump
213064	LPCS-M-P/1	Motor for LPCS-P-1
297009	MS-RV-1A-1D MS-RV-2A-2D MS-RV-3A-3D MS-RV-4A-4D MS-RV-5B,5C	Main Steam Relief Valves MS-RV-3D,4A,4B,4C,4D 5B & 5C Perform the ADS Function
018008	MS-AO-13M,13N 13P,13Q,13S 13U,13V	Air Operators to ADS Main Steam Relief Valves
315008	MS-SPV-3DA 3DB 4AA 4AB 4BA 4BB 4CA 4CB 4DA 4DB 5BA 5BB 5CA 5CB	Solenoid Pilot Valves that Actuate to Provide Control Air to Operate the Main Steam Relief Valve . Operators that Provide the ADS Function.

JIO-S-4

EPN: See Attached.

Description: See Attached.

Safety Function: These components are part of a scram discharge modification package. They contribute to ensuring proper control of control rod drive discharge water in the event of a reactor scram.

Justification: Qualification testing and analysis of these components are scheduled to be complete prior to the fuel load schedule of WNP-2. However, the final report documenting all the tests and analysis that have been performed will not be available from the supplier until the first quarter of 1984. This change is part of the BWR Owners Group Modification package and deferral of receipt of final documentation until after fuel load is consistent with requirements for other NTOLs.

QID	EPN	Description	Safety Function
361501	CRD-V-180	Valve	
	CRD-V-181	Valve	
018005	CRD-AO-180	Air Operator	
	CRD-AO-181	Air Operator	
315026	CRD-SPV-9	Solenoid Pilot Valve	
	CRD-SPV-182	Solenoid Pilot Valve	
050101	CRD-LIS-601A	Level Indicating Switch	
	CRD-LIS-601B		
	CRD-LIS-601C		
	CRD-LIS-601D		

EPN: CRD-AO-10,11

Description: Air Operators

Safety Function: Containment isolation and provide proper control of CRD water to allow reactor scram function.

Justification: Static analysis has been completed on the yoke assembly for CRD-V-10 and -11. However; required supplementary seismic qualification covering the air operators (-AO-) has not been completed because of insufficient manufacturer's documentation. Based upon the valve yoke qualification, a successful in-situ static deflection operability test was performed to the actual piping loads. We are investigating potential procurement of complete valve assembly qualification data from another utility.

Interim operation of WNP-2 is justified based on the successful static deflection operability demonstration test.

EPN: SW-CP-HTP-8A/AA
SW-CB-H1,H2,H3

Description: Heat Trace Control Panel

Safety Function: The safety function of this panel is to control the electrical heat trace to the Standby Service Water System cooling lines to the emergency diesel generators.

System Justification: This panel is seismically mounted and structurally qualified. However, internal component qualification is not complete. Failure of this control panel may result in failure of the heat trace for the service water lines. During the winter months, this may result in freezing of the cooling water lines with loss of cooling water to the emergency diesels.

Each heat trace is provided with a temperature monitor which initiates an annunciator in the main control room if the temperature at the trace becomes too low. With this indication, the operator will actuate the service water pump supplying these lines. Keeping the water moving in these lines prevents freezing until the heat trace is functional again.

Based on alarm indication and operator action in the event of failure of the power supply, WNP-2 can be operated safely.

EPN: SW-LTD-1A, -1B, -1C, -1D

Description: Spray Pond Level Monitors

Safety Function: The safety function of these instruments is to monitor spray pond water level and control makeup water supply from the Tower Makeup System such that a 30-day inventory (technical specification requirement) always exists in the ponds. Each pond is provided with two level monitors.

Justification: The detectors are installed in support tubes which assure they are placed at the proper depth in the spray pond. There is clearance between the support tube and detector assembly which could allow impact between the detectors and the support tubes during a seismic event. The qualification testing did not duplicate the support tube/detector interface conditions and, thus, does not represent field conditions.

A design modification is being implemented to add space fillers between the detector and the support tube to prevent impacts from occurring. This will then allow use of previous test data.

This package is being held open pending completion of the field modification.

The spray ponds always have a 30-day water supply. This supply will exist at the time a seismic event occurs. If both level sensors in each pond fail at this time, a sufficient water inventory is available in the ponds necessary to supply cooling water to those systems responding to accidents for a sufficient period even with the automatic makeup system not functioning. In the event that detector damage occurs, operator action will be utilized to manually control makeup water to the ponds.

EPN: See Attached.

Description: See Attached.

Safety Function: See Attached.

Justification: The qualification packages for these components are complete with the exception of addressing fatigue. The seismic and hydrodynamic maximum loads have been addressed and these components are capable of performing to these levels. Incomplete in the existing documentation is the addressing of the number of cycles and the resulting fatigue.

The WNP-2 qualification process has identified six component types for which adequate fatigue life cannot be demonstrated for the load combinations specifically required for WNP-2. The general fatigue evaluation conservatively requires that each component subject to seismic and hydrodynamic loads be capable of withstanding 13,500 cycles of SRV transient, 60 cycles of SSE transient and a reserve of 2,000 cycles for postulated LOCA transient.

The Supply System is committed to dynamically qualify components identical or similar to the affected components to demonstrate adequate fatigue life for complete 40-year operation. In the interim, the following criteria will be used to justify two-year operation:

1. 20 cycles of SSE transient;

2. 675 cycles of SRV transient;

3. 0 cycles of LOCA transient.

A detailed discussion of each transient is presented below.

The number of cycles of peak response to be considered for a single seismic event is ten cycles. The required 60 cycles represents 5 OBE transients combined with 1 SSE transient. The Supply System will commit to reevaluate the affected equipment should two seismic events occur prior to completion of the indicated fatigue testing.

The total number of cycles of SRV transient to be considered for fatigue is 13,500 for the life of the plant. This is equivalent to 675 cycles of transient in a two-year period. This number of cycles correlates to approximately 110 SRV transients fro the two years considered. Should more than 100 SRV transients be required in the two-year interval, the equipment will be reevaluated.

The postulated loss-of-coolant accident transient loadings are based on low probability, large break area, high energy line breaks. Recent materials and fracture mechanics technological developments have demonstrated that these large breaks will not occur instantaneously but will instead leak before they break. Fracture mechanics evaluations have demonstated repeatedly that large margins exist between the development of detectable leaks and complete pipe rupture. It is recognized that systems subjected to material erosion and intergranular stress corrosion may not exhibit these large margins; however, these deteriorating mechanisms require substantial time to affect the system integrity.

Based on this discussion, and the fact that WNP-2 piping has been subjected to induction heat stress improvement at locations susceptible to stress corrosion, the Supply System feels that the potential of a low probability postulated large break LOCA occurrence within the first two years of

operation is negligible and, therefore, feels that not considering the transient in the interim fatigue evaluation for the affected components will not compromise the overall safety of the plant.

QID	EPN	Description	Safety Function
248002	CSP-POS-V/8/P10 11 12 13 2 3 4 9 -V/10/P1 P2 P3 P4 P9 P10 P11 P12 P13 -V/7/P1 P11 P12 P13 -V/7/P2 P3 P4 P9 -V/8/P1	Position Switch	Reg. Guide 1.97 Cat. 1
277007	CMS-RE-27E, -27F	Radiation Element	Reg. Guide 1.97, Cat. 2
324006	RHR-V-60A, B -75A,B RRC-V-20	Solenoid Valve	Primary and secondary containment isolation of sample lines.
361009	HY-V-20A,B -36A, B CAS-V-453	Solenoid Valve	Primary and secondary containment isolation of hydraulic system lines
382003	E-X-103A,B,C,D	Electrical Penetration	Provide conduction path into primary containment and isolate primary containment
382003	E-TRB-X104A/0 B C D -X107A/0/1 B/0/1 -X105A/0/1 2 -X105B/0/1 2 -X105C/0/1 2	Terminal Blocks in primary containment electrical penetration	Provide electrical conductivity

QID	EPN	Description	Safety Function
382003 (cont)	E-TRB-X1050/0/1 2 -X107A/0/1 -X107A/0/2 E-TRE-X104A/I B/I C/I D/I -X105A/I B/I C/I D/I -X107A/I B/I		
110004	CAC-EHO-FCV/1A, 1B /2A /2B /3A /3B /4A /4B /5A /5B CAC-M-FCV/1A,1B /2A,2B /3A,3B /4A,4B /5A,5B	Electrical/Hydraulic valve operator	Containment atmosphere control

EPN:	CMS-LT-3, -4, -5 CMS-LE-3A, -3B, -4A, -4B, -5A, -5B
Description:	Wetwell Level Monitors and Level Elements
Safety Function:	Provide operator indication of suppression pool water level post-accident condition.
Justification:	See attached justification from Environmental Qualification Report, which dismisses CMS-LE-3A,B, but also applies to the other EPNs listed above.

EQUIPMENT JUSTIFICATION #7

1.0 COMPONENT IDENTIFICATION

EPN: CMS-LE-3A, 3B

Description: Suppression Pool Wide Range Level Monitoring

Component Type: Pressure Transducer

Manufacturer/Model: ElectroSyn/962

2.0 ACCIDENT CONDITIONS*

	Temperature	Relative Humidity
Accident Profile:	#1	#2

Rev. 2

Use Code: 1

Operability Time: 4320 Hours

Radiation Zone: C500

Zone Dose: 9.0×10^7 Rads

* The following exceptions apply to CMS-LE-3A only:

Temperature:	200°F max
Pressure:	Dependent on suppression pool level
Humidity:	Submerged
Radiation Zone:	C435
Zone Dose:	3.7×10^6 rads

3.0 COMPONENT SAFETY FUNCTION

CMS-LE-3A and CMS-LE-3B provide verification of suppression pool water level and long-term surveillance in accordance with the guidelines of Regulatory Guide 1.97. Water level indication provides verification of the availability of water for the ECCS and a diverse indication of breach of the primary system (LOCA).

CMS-LE-3A measures pressure at the bottom of the suppression pool, and CMS-LE-3B measures pressure in the suppression chamber air space. The signal from each of these pressure transducers is sent to an electronics package in the control room which determines the suppression pool water level which corresponds to the indicated differential pressure.

4.0 QUALIFICATION STATUS

4.1 Summary of Qualification Status

The level monitoring system is being custom built for WNP-2. The qualification plan is currently being completed, and testing to verify qualification is scheduled.

This system is scheduled for installation prior to fuel load, but it will not be demonstrated to be qualified prior to installation.

This level monitoring system has been designed to function in normal and accident environments. Radiation and temperature resistant materials have been specified for the transducer seals, lead wires, cable (and shrink tubing), junction box gasket, and connections. The flexible and rigid conduits containing the transducers and cables are water-tight. The junction box is above the water level and is designed to protect the connectors from any postulated water spray. Based on this design, the level monitoring system is expected to perform its function.

4.2 Parameters Requiring Justification

Radiation dose, temperature, pressure, relative humidity, and submergence.

5.0 JUSTIFICATION FOR INTERIM OPERATION

The conditions for which suppression pool water level would require wide range level instrumentation involves the long-term passive failure of an ECCS inside the primary containment coincident with a LOCA. Since this assumes a passive failure in addition to the accident scenario, which is not considered in JIO, CMS-LE-3A and CMS-LE-3B are not required. The suppression pool water level can therefore be continuously monitored with narrow range level instrumentation.

Qualified suppression pool narrow range instrumentation is available at this time. CMS-LT-1 and CMS-LT-2 are qualified and provide suppression pool level indication over the range of 31' $\pm$ 27". The suppression pool normal operating level is 31' $\pm$ 2".

6.0 CONCLUSION

Interim operation is justified on the basis:

Since no single active or additional long-term passive failure was assumed for the suppression pool, its water level will remain within the narrow range instrumentation. In other words, water is not lost due to a break in the ECCS. The qualified suppression pool narrow range instrumentation system will provide adequate level monitoring until environmental testing can be completed on the wide range instrumentation. Rev. 2