JUN 16 1975

Docket Nos. 50-508 & 509
MS 24-11

R. C. DeYoung, Assistant Director
for Light Water Reactors, Group 1
Division of Reactor Licensing

WASHINGTON PUBLIC POWER SUPPLY SYSTEM, DOCKET NOS. 50-508 & 509

Plant Name: Washington Nuclear Project No. 3 (WNP-3) and No. 5 (WNP-5)
Docket Nos.: 50-508 & 509
Licensing Stage: PSAR
Responsible Branch and Project Manager: LWR 1-3, P. O'Reilly
Responsible TR Branch and Technical Reviewers: MEB, F. Cherny, P. Chen
Requested Completion Date: 6/16/75
Description of Response: Safety Evaluation Report
Review Status: Partially Complete - Awaiting Information

The PSAR submitted by the applicant, including Amendment 17, has been reviewed by the Mechanical Engineering Branch, Division of Technical Review. The Mechanical Engineering Branch area of review concerns the design criteria of Sections 3.6, 3.9, 3.10, 4.2, 5.2 and 5.5 of the Standard Format (Regulatory Guide 1.70) dated October 1972. Since the WNP-3 and 5 PSAR references CESSAR, only non-CESSAR portions of these sections have been reviewed. Accordingly, only non-CESSAR sections of the SER have been prepared.

Attached to this letter are SER sections 3.9.1.1, 3.9.1.2, a portion of 3.9.2, 3.10, 5.2.8.7.

Per agreement with P. O'Reilly, sections of 3.6, 3.9.1.3 and the final portion of 3.9.2 (3.9.2.5) will be furnished after our review of information to be supplied by the applicant in a future amendment. We understand that this information is expected at NRC the week of 6/16/75. A satisfactory resolution of these items is required prior to issuance of these sections.

Original signed by
R. R. Maccary

R. R. Maccary, Assistant Director
for Engineering
Division of Technical Review

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DATE ▶	6/12/75	6/16/75	6/16/75	6/16/75	6/16/75

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Docket Files 50-508 & 509
NRR Reading File
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3.9 Mechanical System and Components

3.9.1 Dynamic System Analysis and Testing

3.9.1.1 Vibration Operational Test Program

The applicant has agreed to perform a preoperational piping vibrational and dynamic effects test program to confirm that dynamic loadings on piping from operational transient conditions have been properly accounted for in the design and analysis of piping systems and restraints classified as ASME Class 1 and 2 components. This program will provide adequate assurance that the piping and piping restraints of the system have been designed to withstand vibrational dynamic effects due to valve closures, pump trips and operating modes associated with the design operational transients. The tests, as planned, will develop loads similar to those experienced during reactor operation. A commitment to proceed with such a program constitutes an acceptable design basis at the PSAR stage in partial fulfillment of the requirement of NRC General Design Criterion 15.

3.9.1.2 Dynamic Testing and Analysis of Mechanical Equipment

The applicant has proposed acceptable dynamic testing and analysis procedures to confirm the adequacy of all Seismic Category I mechanical equipment, including their supports, to function during and after an earthquake of magnitude up to and including the SSE at the site. Subjecting the equipment and supports to these dynamic testing and analysis procedures provides reasonable

assurance that in the event of an earthquake at the site, the Seismic Category I mechanical equipment will continue to function during and after a seismic event. Implementation of these dynamic testing and analysis procedures constitutes an acceptable basis for satisfying the requirements of NRC General Design Criteria 2 and 14.

3.9.2 ASME Code Class 2 and 3 Components

All Seismic Category I pressure retaining systems, components and equipment outside of the reactor coolant pressure boundary, including active pumps and valves, are designed to sustain normal loads, anticipated transients, the Design Basis Earthquake, and the Safe Shutdown Earthquake within stress limits which are comparable to those outlined in Regulatory Guide 1.48, "Design Limits and Loading Combinations." The specified design basis combinations of loading as applied to the design of the safety-related ASME Code Class 2 and 3 pressure-retaining components in systems classified as Seismic Category I provide reasonable assurance that in the event (a) an earthquake should occur at the site, or (b) an upset, emergency or faulted plant transient should occur during normal plant operation, the resulting combined stresses imposed on the system components may be expected not to exceed the allowable design stress and strain limits for the materials of construction. Limiting the stresses under such loading combinations provides a conservative basis for the design of the system components

to withstand the most adverse combinations of loading events without gross loss of structural integrity. The design load combinations and associated stress and deformation limits specified for all ASME Code Class 2 and 3 components, including the active pumps and valves, constitute an acceptable basis for design in satisfying the General Design Criteria 1, 2 and 4 and are consistent with recent Regulatory positions.

The applicant has agreed to utilize an operability assurance program, in addition to the limits on stress and deformation, to qualify active ASME Class 2 and 3 Seismic Category I pumps and valves. Such a program will include component testing, or a combination of tests and predictive analysis supplemented by seismic qualification testing of motors, operators, and component appendages to provide assurance that such components can withstand postulated seismic loads in combination with other significant loads without loss of structural integrity, and can perform the "active" function (i.e., valve closure or opening or pump operation) when a safe plant shutdown is to be effected , or the consequences of an accident are to be mitigated. A commitment to develop and utilize a component operability assurance program satisfactory to the staff constitutes an acceptable basis for implementing the requirements of General Design Criterion #1 as related to operability of ASME Code Class 2 and 3 active pumps and valves.

3.10 Seismic Qualification of Category I Instrumentation and Electrical Equipment

Operability of the instrumentation and electrical equipment is essential to assure the capability of such equipment to initiate protective actions in the event of a safe shutdown earthquake (SSE) as necessary for the operation of engineered safety features and standby power systems. The proposed seismic qualification program which will be implemented for Seismic Category I instrumentation and electrical equipment and supports will provide assurance that such equipment may be expected to function properly and that structural integrity of the supports will be maintained during the excitation and vibratory forces imposed by the safe shutdown earthquake under the conditions of post-accident operation. The applicant referenced IEEE Standard 344, 1971 for the seismic qualification of Category I electrical equipment, and in addition his program contains features which recognize and provide solutions for standard test program inadequacies, consistent with Regulatory Standard Review Plan Section 3.10 "Seismic Qualification of Category I Instrumentation and Electrical Equipment." This program constitutes an acceptable basis for satisfying the applicable requirements of General Design Criterion 2.

5.2.8.7 Inservice Testing of Pumps and Valves

To ensure that all ASME Code Class 1, 2 and 3 pumps and valves will be in a state of operational readiness to perform necessary safety functions throughout the life of the plant, the applicant has committed to a test program which will include baseline preservice testing and periodic inservice testing. Such a program will provide for both functional testing of the components in the operating state and for visual inspection for leaks and other signs of distress.

The applicant has stated that the inservice test program for all Code Class 1, 2 and 3 pumps and valves will meet the requirements of the ASME Code, Section XI, 1974 edition, Subsections IWP and IWV, respectively. Specific details of the testing program will be evaluated during the review of the Final Safety Analysis Report.

Compliance with the referenced code requirements constitutes an acceptable basis for satisfying the applicable portions of General Design Criteria 37, 40, 43 and 46.