

July 18, 2000

Mr. J. V. Parrish
Chief Executive Officer
Energy Northwest
P.O. Box 968 (Mail Drop 1023)
Richland, WA 99352-0968

SUBJECT: COMPLETION OF LICENSING ACTION FOR GENERIC LETTER 96-06
CONCERNING WATERHAMMER, TWO-PHASE FLOW, AND EXPANSION OF
ENTRAPPED WATER IN PIPING - WNP-2 (TAC NO. M96886)

Dear Mr. Parrish:

On September 30, 1996, the NRC staff issued Generic Letter (GL) 96-06, "Assurance of Equipment Operability and Containment Integrity During Design-Basis Accident Conditions," to holders of operating licenses for nuclear power reactors, except those that have been amended for a possession-only status.

The purpose of the GL was to: (1) notify addressees about safety-significant issues that could affect containment integrity and equipment operability during accident conditions, (2) request that all addressees submit certain information relative to the issues that have been identified and implemented as appropriate to address these issues, and (3) require that all addressees submit a written response to the NRC relative to implementation of the requested actions.

The following issues were identified as ones of concern:

1. Cooling water systems serving the containment air coolers may be exposed to the hydrodynamic effects of waterhammer during either a loss-of-coolant accident (LOCA) or a main steamline break (MSLB). These cooling water systems were not designed to withstand the hydrodynamic effects of waterhammer and corrective actions may be needed to satisfy system design and operability requirements.
2. Cooling water systems serving the containment air coolers may experience two-phase flow conditions during postulated LOCA and MSLB scenarios. The heat removal assumptions for design-basis accident scenarios were based on single-phase flow conditions. Corrective actions may be needed to satisfy system design and operability requirements.
3. Thermally induced overpressurization of isolated water-filled piping sections in containment could jeopardize the ability of accident-mitigating systems to perform their safety functions and could also lead to a breach of containment integrity via bypass leakage. Corrective actions may be needed to satisfy system operability requirements.

Licenseses were requested to determine: (1) if containment air cooler cooling water systems are susceptible to either waterhammer or two-phase flow conditions during postulated accident conditions; and (2) if piping systems that penetrate the containment are susceptible to thermal expansion of fluid so that overpressurization of piping could occur. The GL requested the licenseses:

1. Provide a 30-day response identifying (a) whether or not the requested actions will be completed, (b) whether or not the requested information will be submitted, and (c) whether or not the requested information will be submitted within the requested time period.
2. Provide a 120-day response providing a written summary report stating (a) actions taken in response to the requested actions noted above, (b) conclusions that were reached relative to susceptibility for waterhammer and two-phase flow in the containment air cooler cooling water system and overpressurization of piping that penetrates containment, (c) the basis for continued operability of affected systems and components as applicable, (d) corrective actions that were implemented or are planned to be implemented, and (e) if systems were found to be susceptible to the conditions that are discussed in this GL, the systems affected and specific circumstances involved.

Energy Northwest provided the 30-day response by letter dated October 30, 1996, and the 120-day response by letter dated January 28, 1997, for WNP-2. Additional information was provided in letters dated May 29, 1997, September 30, 1998, May 10, 2000, and in the December 31, 1998, annual operating report.

Thermally-Induced Overpressurization

The January 28, 1997, letter stated that all containment penetrations were reviewed for the potential thermal overpressurization. Three penetrations were identified as being subject to a pressure increase due to entrapped fluid. The penetrations involved were: a demineralized water (DW) supply line, a manually isolated process sample radioactive (PSR) line, and a reactor water closed cooling water (RCC) line. These penetrations were evaluated for operability and they were determined to be operable. The DW supply line penetration was confirmed to be drained of fluid and a revised valve line up was implemented to preclude refilling the line during plant operation. The PSR line penetration and the RCC line penetration were determined to be operable based on criteria in the American Society of Mechanical Engineers Code. In the May 29, 1997, letter you committed to implementing a design modification for the RCC penetration to address the potential for thermal overpressurization during the 1998 refueling outage. The 1998 annual operating report, submitted on December 31, 1998, stated that a bypass line with a spring loaded check valve was installed in the RCC line to relieve pressure in this line. In the May 29, 1997, letter, you committed to replacing the containment isolation valves in the PSR line which will eliminate the need to manually isolate the line. By letter dated May 10, 2000, you informed the staff that the valves had been replaced during the 1997 refueling outage.

The staff finds that your corrective actions provide an acceptable resolution for the issue of thermally-induced pressurization of piping runs penetrating containment.

Waterhammer and Two-Phase Flow

By letters dated January 28, 1997, and September 30, 1998, you provided your assessment of the issues related to waterhammer and two-phase flow issues for WNP-2 in cooling water systems that serve containment air coolers. Based on the information provided it is our understanding that: (a) the containment air coolers are not required for accident mitigation, and (b) Energy Northwest will modify the Emergency Operating Procedures so that the RCC system will not be used during the event scenarios of interest after the RCC containment isolation valves have automatically closed without first performing appropriate analyses to ensure that containment integrity will be maintained. The staff is satisfied with the licensee's response and concludes the waterhammer and two-phase flow in the cooling water systems that serve the containment air coolers at WNP-2 is closed.

All requested information has been provided. The staff has reviewed the information and concluded that GL 96-06 requirements are met. We consider GL-96-06 closed for WNP-2. If you have any questions regarding this matter, please contact me at 301-415-1424.

Sincerely,

/RA/

Jack Cushing, Project Manager, Section 2
Project Directorate IV & Decommissioning
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-397

cc: See next page

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Jack Cushing, Project Manager, Section 2
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WNP-2

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