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SUBJECT: Application for amend to license NPF-21,revising TS to support hydrostatic testing.

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WASHINGTON PUBLIC POWER SUPPLY SYSTEM

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February 17, 1994
G02-94-042

Docket No. 50-397

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D.C. 20555

Gentlemen:

Subject: **WNP-2, OPERATING LICENSE NPF-21
REQUEST TO AMEND TECHNICAL SPECIFICATIONS TO SUPPORT HYDROSTATIC TESTING**

Reference: Letter GO2-93-180, dated July 9, 1993 JV Parrish (SS) to NRC, "Request for Amendment to the Facility Operating License and Technical Specifications to Increase Licensed Power Level from 3323 MWt to 3486 MWt with Extended Load Line and a Change in Safety Relief Valve Setpoint Tolerance"

In accordance with the Code of Federal Regulations, Title 10, Parts 50.90 and 2.101, the Supply System hereby requests an amendment to the WNP-2 Technical Specifications. Specifically, the Supply System requests: 1) addition of a Special Test Exception applicable during inservice leak and hydrostatic testing; 2) addition of a new minimum reactor vessel metal temperature versus reactor vessel pressure (P/T) curve, applicable up to 8 Effective Full Power Years (EFPY); and 3) deletion of Table B 3/4.4.6-1, "Reactor Vessel Toughness," from the Bases section of the Technical Specifications.

The requested Technical Specification changes, the Special Test Exception and the 8 EFPY P/T curve, are necessary to support the first interval 10-year hydrostatic test in accordance with the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code Section XI. This test is scheduled for refueling outage R9. R9 is currently scheduled to begin April 29, 1994, with hydrostatic testing to begin as early as June 12, 1994. The Supply System requests, therefore, that the amendment be issued in time to support the scheduled testing. The requested changes are discussed individually below.

Special Test Exception

Inservice hydrostatic testing and system leakage pressure tests required by Section XI of the ASME Boiler and Pressure Vessel Code are performed prior to the reactor going critical after a refueling outage. Pump operation and a water solid RPV (except for an air bubble for pressure control) are used to achieve the necessary temperatures and pressures required for these tests. The minimum temperatures (at the required pressures) allowed for these tests are determined from the RPV P/T limits required by Limiting Condition For Operation (LCO) 3.4.6.1, "Reactor Coolant System (RCS) Pressure and Temperature Limits." These limits are conservatively calculated based on the fracture toughness of the reactor vessel, taking into account anticipated vessel neutron fluence.

With increased reactor vessel fluence over time, the minimum allowable vessel temperature corresponding to a given pressure increases. Periodic updates to the RPV P/T limit curves are performed as necessary, based upon the results of analyses of irradiated surveillance specimens removed from the vessel. The current 32 EFPY curves in the Technical Specifications require a reactor vessel metal temperature of approximately 236°F for hydrostatic testing. This temperature exceeds the 200°F average reactor coolant temperature limit of OPERATIONAL CONDITION 4. .Therefore, in order to conduct the inservice hydrostatic and system leakage pressure tests, an 8 EFPY P/T curve and a Special Test Exception to exceed 200°F without meeting all operational conditions required for OPERATIONAL CONDITION 3 are necessary.

The proposed Special Test Exception permits operation in OPERATIONAL CONDITION 4 with an average RCS temperature of greater than 200°F but ≤ 212°F. The Special Test Exception requires that certain LCO's supporting the conditions for testing, including secondary containment, be satisfied. The Special Test Exception also permits suspension of LCO 3.4.9.2 "Reactor Coolant System - Cold Shutdown" requirements, which requires a shutdown cooling loop of residual heat removal (RHR) to be operating. An operating shutdown cooling loop would remove heat from the reactor and negate the conditions (increased temperature) necessary to conduct the testing.

As WNP-2 transitions from OPERATIONAL CONDITION 4 to 3 additional Technical Specifications become applicable. Of particular concern on entry into OPERATIONAL CONDITION 3 are specifications 3.5.1 and 3.6.1.1. Technical Specification 3.5.1 "ECCS-Operating" requires ECCS Divisions 1, 2, and 3 to be OPERABLE in OPERATIONAL CONDITION 3 while Technical Specification 3.5.2 "ECCS-Shutdown" only requires two of five ECCS systems to be OPERABLE in OPERATIONAL CONDITIONS 4 and 5. This allows outage related maintenance to be performed on the ECCS systems not required to be operable. Applying OPERATIONAL CONDITION 4 requirements to the ECCS systems during the testing would permit outage activities on the ECCS equipment to continue and would minimize the duration of the outage.

Technical Specification 3.6.1.1 requires PRIMARY CONTAINMENT INTEGRITY to be maintained in OPERATIONAL CONDITION 3. Maintaining Primary Containment Integrity significantly restricts access to primary containment during operations and would restrict the ability to inspect the RCS during the hydrostatic and leak tests. OPERATIONAL CONDITION 4 does not require PRIMARY CONTAINMENT INTEGRITY. Applying OPERATIONAL CONDITION 4 requirements on primary containment during testing will allow full access to primary containment to conduct the inspections required by the testing.

Because the RCS is isolated during leak or hydrostatic tests, temperature control is dependent on ambient loss, decay heat and mechanical input which makes temperature control difficult. As stated below, with the use of 8 EFPY P/T curves the reactor metal temperature will have to be greater than 180°F for the testing. These tests require several hours to complete during which metal temperature must be maintained above the 180°F value. A 200°F limit on reactor water temperature for OPERATIONAL CONDITION 4 will not provide sufficient margin to establish adequate metal temperatures and avoid exceeding the pressure temperature curve limits. Therefore the Special Test Exception LCO would allow the OPERATIONAL CONDITION 4 temperature limit to increase to a maximum of 212°F to provide sufficient margin to establish test parameters and maintain the plant within Technical Specification pressure temperature limits.

In summary, allowing the reactor to be considered in OPERATIONAL CONDITION 4 during inservice leak and hydrostatic testing with a reactor coolant temperature of ≤ 212°F provides an exception to OPERATIONAL CONDITION 3 requirements, including OPERABILITY of Primary Containment and the full complement of redundant Emergency Core Cooling Systems. This allows primary containment to be open for frequent unobstructed access to perform inspections. It will also allow outage activities on various systems to continue while remaining consistent with OPERATIONAL CONDITION 4 applicable requirements that are in effect immediately prior to and following inservice leak and hydrostatic testing. The hydrostatic test or inservice leak test is performed near water solid, all rods in and temperature ≤ 212°F. The stored energy in the reactor will be very low (approximately 43 days at shutdown conditions and partial core replacement due to refueling) and the potential for failed fuel and a subsequent increase in coolant activity above LCO 3.4.5, "RCS Specific Activity" limits is minimal. In addition, secondary containment, including the automatic isolation valves and the Standby Gas Treatment System (SGTS), will be OPERABLE and capable of handling airborne radioactivity from leaks that could occur during the performance of the tests. Airborne activity would not be significant in the event of a leak because RCS temperature is limited to ≤ 212°F and there would be no airborne due to coolant flashing to steam. Requiring the secondary containment to be OPERABLE will conservatively assure that potential airborne radiation leaks will be filtered through the SGTS, thereby, further limiting radiation releases to the environment.

In the event of a large primary system leak, the RPV would rapidly depressurize allowing the low pressure injection systems to operate. The capability of the Low Pressure Coolant Injection and Core Spray subsystem, as required in OPERATIONAL CONDITION 4 by LCO 3.5.2, "ECCS-Shutdown" would be adequate to keep the core flooded under this condition. Inspections which would detect small leaks before significant inventory loss occurs are included as part of the hydrostatic test program.

For the purposes of this test, the protection provided by normally required OPERATIONAL CONDITION 4 LCO's, in addition to the operability requirements of the Special Test Exception LCO, will ensure plant safety during normal hydrostatic and inservice leakage test conditions and will ensure acceptable consequences during postulated accident conditions.

This Special Test Exception provides both the relief necessary to support testing, and the compensatory measures needed to ensure safety. In addition, the proposed Special Test Exception Technical Specification is consistent with NUREG-1433, "Standard Technical Specifications, General Electric Plants, BWR/4" dated September 28, 1992, and similar to an amendment recently approved by the NRC (amendment 53, dated November 12, 1993) for Nine Mile Point Unit 2.

8 EFPY Pressure/Temperature Curves

The addition of P/T curves based on 8 EFPY of neutron fluence at the power uprate conditions of the reference is the second part of this amendment request. These curves are intended only for use during testing and non-nuclear heatup of the RPV.

The referenced letter proposed new P/T curves under power uprate conditions for 32 EFPY and documented that the curves were based on contractor proprietary information. This basis is not repeated herein. The 8 EFPY curves in this submittal were developed using the same methodology as that used in the referenced letter except that the A' curve in this submittal does not include the thermal, K_T, term that was conservatively included in the A' curve of the reference. The A' curve applies to hydrostatic conditions alone. Thermal stresses, represented by the K_T term are overly conservative when used in the derivation of an A' curve that is required for hydrostatic conditions alone. Therefore the 8 EFPY curves in this submittal are also valid for the power uprate conditions proposed in the reference. Further, they are conservative for the current rated thermal power level because they are based on the proposed increased power level and correspondingly higher neutron fluence, not the lower fluence that the reactor pressure vessel (RPV) has experienced to date.

The alternative to using these proposed curves is to utilize either the existing curves, or the curves proposed in the reference, both of which are based on 32 EFPY. The proposed 8 EFPY curves, because of the lower total fluence level in 8 EFPY compared to that for 32 EFPY supports use of a lower minimum reactor metal temperature at the required test pressure. The required minimum temperature for testing, based on the 8 EFPY curves, will be 180°F. This is approximately 56°F lower than that required by the 32 EFPY curves. The 180°F reactor metal temperature will correspond to approximately a 200-210°F average RCS temperature, depending on the heat-up rate achieved and the time spent at the hydrostatic test temperature and pressure. The lower temperature of the 8 EFPY curves therefore provides a greater margin of safety (lower reactor water temperatures, higher remaining heat sink capacity and avoidance of steam flashing) than would be provided using a temperature from either of the 32 EFPY curves.

The use of the proposed 8 EFPY P/T curves, verses the 32 EFPY curves proposed in the reference, will result in approximately a 56°F decrease in the minimum RPV metal temperature required during the first 10-year hydrostatic test. WNP-2 will have operated for slightly less than 6 EFPY at the time of the first 10-year hydrostatic test. In order to be consistent with the request made in the reference to replace Figure 3.4.6.1 with Figures 3.4.6.1.A and 3.4.6.1.B, the new 8 EFPY curves are labeled Figure 3.4.6.1.C.

Reactor Vessel Toughness Bases

This submittal also requests deletion of Table B 3/4.4.6-1 from the Bases section of the Technical Specifications. Table B 3/4.4.6-1 contains specific reactor vessel material composition design information that does not provide the Operator additional clarification of the P/T curves. Removal of this Table is consistent with the guidance provided in Generic Letter 91-08, and NUREG-1433. Removal of this information will result in an easier to use, more streamlined Bases for Technical Specification 3.4.4.6. Similar information, but in greater detail, is provided in FSAR Tables 5.3-1a, 5.3-1b, 5.3-2, 5.3-3, 5.3-4, 5.3-5, 5.3-6, 5.3-7, and 5.3-8. Hence, there is no additional benefit gained by maintaining the information in the Bases and it can be removed without affecting the adequacy of the Technical Specifications.

In addition references to the proposed 8 EFPY P/T curves are also added to the Bases. As stated above, in order to be consistent with the request made in the reference to replace Figure 3.4.6.1 with Figures 3.4.6.1.A and 3.4.6.1.B, the new 8 EFPY curves are labeled Figure 3.4.6.1.C.

Significant Hazards Evaluation

The Supply System has evaluated these proposed changes per the requirements of 10 CFR 50.92 and determined they do not represent a significant hazard consideration.

Special Test Exception

With respect to the proposed addition of the Special Test Exception LCO, this change does not represent a significant hazards consideration because it does not:

1) Involve a significant increase in the probability or consequences of an accident previously evaluated. The proposed change provides allowance to perform this testing in OPERATIONAL CONDITION 4 at temperatures >200°F but ≤ 212°F. However, this allowance is only provided if OPERATIONAL CONDITION 3 secondary containment requirements are met. The OPERATIONAL CONDITION 3 requirements compensate for the allowed temperature increase and assure the consequences of a potential leak will be conservatively bounded by the consequences of existing FSAR accident analyses.

   The consequences of an accident during the testing are not significantly increased because the test is performed near water solid, all rods in and temperature ≤ 212°F. The stored energy in the core will be very low (approximately 43 days of shutdown conditions and partial core replacement during refueling) and the potential for failed fuel and a subsequent increase in coolant activity above Technical Specification limits is minimal. In addition, secondary containment will be OPERABLE and capable of handling airborne radioactivity from leaks that could occur during the performance of the testing. Maintaining temperature ≤ 212°F will ensure that any leak will not flash to steam and thereby increase the potential for airborne activity. Requiring the SGTS to be OPERABLE will conservatively ensure that any airborne radiation from leaks will be processed by the SGTS thereby limiting releases to the environment.

   Existing pipebreak analysis are bounding. In the event of a large leak, the reactor would rapidly depressurize, allowing the low pressure ECCS subsystems to operate. The capability of the subsystems that are required for OPERATIONAL CONDITION 4 would be adequate to keep the core flooded under this condition. Small system leaks would be detected by leakage inspections before significant inventory loss occurred. This is an integral part of the hydrostatic test program.

   Based on the foregoing, the addition of the Special Test Exception will not involve a significant increase in the probability or consequences of an accident previously evaluated.

2) Create the possibility of a new or different kind of accident from any previously evaluated. The proposed change introduces no credible mechanisms for unacceptable radiation release nor does it require physical modification to the plant. Allowing the reactor to be in OPERATIONAL CONDITION 4 during inservice leak or hydrostatic testing with reactor coolant temperature ≤212°F provides an exception to

OPERATIONAL CONDITION 3 requirements only during hydrostatic testing. As stated previously the stored energy in the core will be very low (approximately 43 days of shutdown conditions and partial core replacement during refueling) and the potential for failed fuel and a subsequent increase in coolant activity above Technical Specification limits is minimal. In addition, secondary containment will be OPERABLE and capable of handling airborne activity or leaks that could occur as a result of the hydrostatic test. The inservice leak or hydrostatic test conditions remain unchanged. The potential for a system leak remains unchanged because the reactor coolant system is designed for temperatures exceeding 500°F with similar pressures. There are no alterations of any plant systems that cope with the spectrum of design bases accidents. The only difference is that a different subset of systems would be used for accident mitigation from those of OPERATIONAL CONDITION 3. Based on the foregoing, the use of the special test exception will not create the possibility of a new or different kind of accident from any previously evaluated.

3) Involve a significant reduction in a margin of safety. The proposed special test exception allows inservice leak and hydrostatic testing to be performed with reactor coolant temperature $\leq$212°F and the reactor in OPERATIONAL CONDITION 4. Because secondary containment integrity will be maintained and all systems required in OPERATIONAL CONDITION 4 will be operable the proposed change will not significantly impact design bases accidents or safety limits. The hydrostatic or inservice leak testing is performed near water solid, all rods in and temperature $\leq$ 212°F. The stored energy in the core is very low (again, approximately 43 days of shutdown conditions and partial core replacement during refueling) and the potential for failed fuel and a subsequent increase in coolant activity would be minimal. In the unlikely event that a large leak occurred, the RPV would depressurize rapidly and the low pressure injection systems normally operable in OPERATIONAL CONDITION 4 would be adequate to keep the core flooded. This would ensure that the fuel would not exceed the 2200°F peak clad temperature limit. Moreover, requiring secondary containment, including isolation capability, to be operable will assure that potential airborne activity can be filtered through the SGTS. Small leaks would be detected by inspection before significant inventory loss has occurred. Based on the foregoing, use of this Special Test Exception will not involve a significant reduction in a margin of safety.

8 EFPY Pressure/Temperature Curves

The proposed addition of the 8 EFPY P/T curves for testing and non-nuclear heating does not represent a significant hazards consideration because it does not:

1) Involve a significant increase in the probability or consequences of an accident previously evaluated. The proposed 8 EFPY curves were developed using the same methodology as that used in the current 32 EFPY curves. This methodology is consistent with the guidance provided in Regulatory Guide 1.99, Revision 2. Assumptions and input parameters were used with the exception of neutron fluence and deletion of the K_T thermal term in developing the A' hydrostatic curve. Inservice leak or hydrostatic testing is not assumed to be an initiator of analyzed events. Use of the 8 EFPY curves on or before attainment of 8 EFPY of operation is equivalent to the already approved use of the 32 EFPY curves on or before attainment of 32 EFPY of operation. The removal of the K_T thermal term from the A' curve derivation does not represent a nonconservative impact because the A' curve addresses hydrostatic concerns only. As described in the Standard Review Plan (SRP 5.3.2, Pressure Temperature Limits), as applied to WNP-2, the K_T thermal term is not required to be included in the A' curve calculations. Based on the foregoing, this change will not involve a significant increase in the probability or consequences of an accident previously evaluated.

2) Create the possibility of a new or different kind of accident from any previously evaluated. The proposed change introduces no credible mechanisms for unacceptable radiation release nor does it require physical modification to the plant. The 8 EFPY curves are consistent with the already approved 32 EFPY curves. Based on the foregoing, this change does not create the possibility of a new or different kind of accident from any previously evaluated.

3) Involve a significant reduction in a margin of safety. The accident analyses for the plant as described in the FSAR are not affected by this proposed change. The 8 EFPY curves were developed using the same methodology as the 32 EFPY curves and thus involve no reduction in a margin of safety as previously evaluated. The margin of safety, relative to the available heat sink in the RCS, is actually increased by use of the proposed curves due to the lower allowed test temperature. Based on the foregoing, the margin of safety for the plant will not be reduced as a result of implementing the new 8 EFPY P/T curves.

Reactor Vessel Toughness Bases

Deletion of Table B 3/4.4.6-1 from the Bases section of the Technical Specifications does not represent a significant hazards consideration because it does not:

1) Involve a significant increase in the probability or consequences of an accident previously evaluated. Deletion of design information that is duplicated in plant design documents does not have a credible impact on the possibility or consequences of a previously evaluated accident. The Table does not provide information to the operator that will aid in operating the plant. Deletion of the table does not result in any hardware or operating procedure changes. The design information is for a passive plant feature and cannot credibly be considered to be an initiator of any analyzed event. Hence deletion of the table cannot increase the probability of a previously evaluated accident. Because deletion of the table does not involve any equipment modifications or operating mode changes the consequences of an accident occurring does not change with deletion of the table. Based on the foregoing, deletion of the table will not alter the probability or consequences of a previously evaluated accident.

2) Create the possibility of a new or different kind of accident from any accident previously evaluated because deletion of the table does not introduce any new mode of plant operation nor does it require physical modification of the plant. Hence the possibility of a new or different kind of accident than those previously evaluated is not created by deletion of the table.

3) Involve a significant reduction in a margin of safety. Deletion of the table is an administrative change that has no impact on the operation of the plant and therefore can not significantly impact the margin of safety created by the affected Specifications. Deletion of the Table removes information that 1) is readily available in other Plant design documents, and 2) does not enhance the operator's ability to maneuver the plant or respond to plant events. Because deletion of the information from the Bases, yet retaining it in other plant design documents, does not have a technical or operational impact the margin of safety created by the affected specifications (P/T curves and adherence to temperature limits) is not significantly affected by deleting the table.

As discussed above, the Supply System considers that the proposed changes do not involve a significant hazards consideration, nor is there a potential for a change in the types or increase in the amount of any effluents that may be released offsite, nor do they involve an increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed changes meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, per the requirements of 10 CFR 51.22(b), an environmental assessment of these changes is not required.

For these reasons, there is reasonable assurance that the changes that would be authorized by the proposed amendment can be implemented without endangering the health and safety of the public and are consistent with common defense and security.

This Technical Specification change has been reviewed and approved by the WNP-2 Plant Operations Committee and the Supply System Corporate Nuclear Safety Review Board. In accordance with 10 CFR 50.91, the State of Washington has been provided a copy of this letter.

The inservice or hydrostatic testing is a critical path test in the forthcoming refueling outage. Therefore, to minimize impact on the refueling outage schedule, the Supply System requests that this submittal be given a priority review in order to effect the desired changes and support the R9 refueling outage.

Very truly yours,

J.V. Parrish,
Assistant Managing Director, Operations

DAS/bfk
Attachments

cc: KE Perkins - NRC
NS Reynolds - Winston & Strawn
W Bishop - EFSEC
JW Clifford - NRR
DL Williams - BPA
NRC Site Inspector - 901A

STATE OF WASHINGTON)
)
COUNTY OF BENTON)

Subject: Request for Amend to Tech Spec to Support Hydrostatic Testing

I. J. V. PARRISH, being duly sworn, subscribe to and say that I am the Assistant Managing Director, Operations for the WASHINGTON PUBLIC POWER SUPPLY SYSTEM, the applicant herein; that I have the full authority to execute this oath; that I have reviewed the foregoing; and that to the best of my knowledge, information, and belief the statements made in it are true.

DATE 17 February, 1994

J. V. Parrish, Assistant Managing Director
Operations

On this date personally appeared before me J. V. PARRISH, to me known to be the individual who executed the foregoing instrument, and acknowledged that he signed the same as his free act and deed for the uses and purposes herein mentioned.

GIVEN under my hand and seal this 17 day of February 1994.

Notary Public in and for the
STATE OF WASHINGTON

Residing at Kennewick, WA

My Commission Expires 4/28/94