PSEG Nuclear LLC
P.O. Box 236, Hancocks Bridge, New Jersey 08038-0236

PSEG
Nuclear LLC

APR 0 3 2002

LRN-02-0087
LCR H02-05

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001
Gentlemen:

REQUEST FOR CHANGE TO TECHNICAL SPECIFICATIONS
REACTOR COOLANT CHEMISTRY
HOPE CREEK GENERATING STATION
FACILITY OPERATING LICENSE NPF-57
DOCKET NO. 50-354

Pursuant to 10 CFR 50.90, PSEG Nuclear LLC (PSEG) hereby requests a revision to the Technical Specifications for the Hope Creek Generating Station. In accordance with 10CFR50.91(b)(1), a copy of this submittal has been sent to the State of New Jersey.

The proposed amendment will relocate the portions of the "Reactor Coolant System – Chemistry" Technical Specification (TS) 3/4.4.4 from the TS to the Hope Creek Updated Final Safety Analysis Report (UFSAR) that is controlled by the 10CFR50.59 process. These changes are being requested to support Noble Metal Chemical Addition during the April 2003 refueling outage.

PSEG has evaluated the proposed changes in accordance with 10CFR50.91(a)(1), using the criteria in 10CFR50.92(c), and has determined this request involves no significant hazards considerations. The proposed amendment also meets the eligibility criteria for categorical exclusion set forth in 10CFR51.22(c)(9). An evaluation of the requested changes is provided in Attachment 1 to this letter. The marked up Technical Specification pages affected by the proposed changes are provided in Attachment 2.

The proposed changes are similar to changes submitted by the Vermont Yankee Nuclear Power Corporation on May 23, 2000 and approved by the NRC in Amendment 190 on July 18, 2000.

PSEG requests approval of the proposed License Amendment by November 30, 2002 to be implemented within 60 days.

A001

Should you have any questions regarding this request, please contact Mr. Brian Thomas at 856-339-2022.

Sincerely,

David F. Garchow
Vice President - Operations

Attachments (2)

I declare under penalty of perjury that the foregoing is true and correct.

Executed on 4/3/02

D. F. Garchow
Vice President - Operations

C

Mr. H. J. Miller, Administrator - Region I
U. S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406

U. S. Nuclear Regulatory Commission
ATTN: Mr. G. Wunder, Licensing Project Manager - Hope Creek
Mail Stop 08B3
Washington, DC 20555-0001

USNRC Senior Resident Inspector - HC (X24)

Mr. K. Tosch, Manager IV
Bureau of Nuclear Engineering
PO Box 415
Trenton, NJ 08625

HOPE CREEK GENERATING STATION
FACILITY OPERATING LICENSE NPF-57
DOCKET NO. 50-354

EVALUATION OF REVISIONS TO THE TECHNICAL SPECIFICATIONS FOR REACTOR COOLANT SYSTEM CHEMISTRY

REQUEST FOR CHANGE TO TECHNICAL SPECIFICATIONS
REACTOR COOLANT SYSTEM CHEMISTRY

Table of Contents

REQUEST FOR CHANGE TO TECHNICAL SPECIFICATIONS REACTOR COOLANT SYSTEM CHEMISTRY

1. DESCRIPTION

The proposed amendment would revise the Hope Creek Technical Specifications (TS) contained in Appendix A to the Operating License to relocate the Reactor Coolant System Chemistry TS to the Updated Final Safety Analysis Report (UFSAR).

2. PROPOSED CHANGE

The current requirements stipulated in Specification 3/4.4.4 and the associated bases will be relocated from the TS to the UFSAR. The marked up Technical Specification pages are included in Attachment 2.

Relocation of the subject TS to the UFSAR is acceptable based on the criteria of 10CFR50.36 and the considerations of NRC's Final Policy Statement of Technical Specification Improvements.

3. BACKGROUND

The proposed change will support Hope Creek's plan for the application of Noble Metal Chemical Addition (NMCA), which is scheduled to occur at the end of the current operating cycle (April 2003). Hope Creek intends to inject noble metal compounds into the reactor vessel to ameliorate the potential for crack initiation and to mitigate crack growth in the reactor vessel surfaces, internal components and piping because of intergranular stress corrosion cracking. NMCA also serves to reduce radiation fields occurring from implementation of hydrogen water chemistry.

The application of noble metals at Hope Creek will be similar to the processes previously used at a number of operating boiling water reactors. Coolant conductivity should temporarily increase and pH will fluctuate during the injection of noble metal solutions due to reaction products. To account for these variations in conductivity and pH, the specifications relocated to the UFSAR may be changed as necessary to provide temporary allowances for higher levels of conductivity and an increased range of pH during and immediately following NMCA. Any change to the UFSAR will be strictly controlled in accordance with the provisions of 10CFR50.59. The increase in conductivity and the pH variation should only occur for a relatively short period until the reactor water cleanup system reduces the conductivity and brings pH back into its pre-application levels. Conforming changes are also being made to the associated TS Bases by relocating the associated section to the UFSAR.

4. TECHNICAL ANALYSIS

TS 3/4.4.4 provides the chemistry limits for the reactor coolant system under all operational modes. The chemistry limits for the reactor coolant system are established to prevent damage to reactor materials in contact with the coolant. To prevent stress corrosion cracking of the stainless steel, coolant chloride limits are specified. The effect of chloride is not as great when the oxygen concentration of the coolant is low, thus, the higher limit on chlorides during power operations. During shutdown and refueling outages, the temperature necessary for stress corrosion to occur is not present, so higher concentrations of chlorides are not considered harmful during these periods.

Metals in the primary system are primarily austenitic stainless steel and Zircaloy cladding. The reactor water chemistry limits are established to provide an environment favorable to these materials. Conductivity is monitored on a continuous basis since this parameter is a good overall indicator of coolant chemistry and will indicate abnormal conditions and the presence of unusual materials in the reactor coolant. When the conductivity is in its normal range, pH, chlorides and other impurities affecting conductivity will also be within their acceptable limits. Samples of the coolant are taken periodically and serve as a reference for calibration of the conductivity monitors.

When conductivity becomes abnormal, chloride measurements are made to determine whether or not these factors are also out of their normal operating values. However this would not necessarily be the case, conductivity could be high due to the presence of a neutral salt which would not have an effect on pH or chloride concentration.

In boiling water reactors where near neutral pH is maintained, conductivity provides a good and prompt measure of the quality of the reactor water. Significant changes in conductivity provide the operator with a warning mechanism to allow the operator to investigate and remedy the condition before reactor water limits are reached. Methods available to the operator for correcting the off-standard condition include operation of the reactor water cleanup system, reducing the input of impurities and placing the reactor in a cold shutdown condition.

During reactor startup and hot standby, the dissolved oxygen content of reactor water may be higher than during normal power operation. During this period more restrictive limits are placed on chloride ion concentration. After power operation has been established, boiling deaerates the reactor water thus reducing the influence of oxygen on potential chloride stress corrosion cracking.

The NRC's regulatory requirements related to the content of TS are set forth in 10CFR50.36. In promulgating this rule, the NRC determined that the purpose of the TS is to impose only those conditions or limitations upon reactor operations necessary to obviate the possibility of an abnormal situation or event giving rise to an immediate threat to the public health and safety. TS that do not meet the screening criteria for retention as TS may be relocated to another licensee controlled document. The four criteria defined in 10CFR50.36 are applied to the current TS for reactor coolant chemistry parameters as follows:

A) *Criterion 1.* Installed instrumentation that is used to detect, and indicate in the control room, a significant abnormal degradation of the reactor coolant pressure boundary.

The reactor coolant chemistry parameters of conductivity, chloride concentration and pH are not used to detect, and indicate in the control room, a significant abnormal degradation of the reactor coolant pressure boundary. The current TS provide limits on particular chemical properties and surveillance requirements to monitor these properties to ensure that degradation of the reactor coolant pressure boundary is not exacerbated by poor chemistry. However, degradation of the reactor coolant pressure boundary due to changes in reactor coolant chemistry parameters is a long-term process. Other regulations and TS provide direct means to monitor and correct the degradation of the reactor coolant pressure boundary; for example, inservice inspection and primary coolant leakage limits.

(B) *Criterion 2.* A process variable, design feature, or operating restriction that is an initial condition of a design basis accident or transient analysis that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

The reactor coolant chemistry parameters of conductivity, chloride concentration, and pH are not used as an initial condition of a design basis accident or transient analysis that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

(C) *Criterion 3.* A structure, system, or component that is part of the primary success path and which functions or actuates to mitigate a design basis accident or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

The reactor coolant chemistry parameters of conductivity, chloride concentration, and pH are not SSCs used as part of the primary success path and do not function or actuate to mitigate a design basis accident or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

(D) *Criterion 4.* A structure, system, or component which operating experience or probabilistic risk assessment has shown to be significant to public health and safety.

Operating experience or probabilistic safety assessments have not shown reactor coolant chemistry parameters of conductivity, chloride concentration, and pH to be significant to public health and safety.

The relocation of TS 3/4.4.4 from the TS to the UFSAR will continue to provide adequate assurance that conductivity limits, chloride concentration and pH will continue to be met, monitored, and acted upon as appropriate. The proposed change is consistent with NUREG-1433, Standard Technical Specifications, General Electric Plants, BWR/4, Revision 2, dated April 2001. NUREG-1433 does not contain reactor coolant chemistry limits for conductivity, chlorides and pH.

In summary, the relocated requirements do not meet the criteria of 10CFR50.36 for retention in the TS and are not required to obviate the possibility of an abnormal situation or event giving rise to an immediate threat to the public health and safety. Following relocation to the UFSAR, the provisions of 10CFR50.59 will provide adequate regulatory control over any future changes to these coolant chemistry requirements.

The changes being proposed in this request are similar to changes requested by Vermont Yankee Power Corporation on May 23, 2000 and subsequently approved as Amendment 190 on July 18, 2000.

5. REGULATORY SAFETY ANALYSIS

5.1 No Significant Hazards Consideration

PSEG Nuclear LLC (PSEG) has evaluated whether or not a significant hazards consideration is involved with the proposed amendment by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment" as discussed below:

1. Does the proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?

   Response: No.

   The proposed change is administrative in nature and does not involve the modification of any plant equipment or affect basic plant operation. Conductivity, chloride, and pH limits are not assumed to be an initiator of any analyzed event, nor are these limits assumed in the mitigation of consequences of accidents.

Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the proposed change create the possibility of a new or different kind of accident from any accident previously evaluated?

   Response: No.

   The proposed change does not involve the modification of any plant equipment and does not change the method by which any safety-related system performs its function. The current safety analysis assumptions are not altered as a result of this change.

   Therefore, the proposed changes do not create the possibility of a new or different kind of accident from any previously evaluated.

3. Does the proposed change involve a significant reduction in a margin of safety?

   Response: No.

   The proposed change represents the relocation of current TS requirements to the UFSAR based on regulatory guidance and previously approved changes for other stations. The proposed change is administrative in nature, does not negate any existing requirement, and does not adversely affect existing plant safety margins or the reliability of the equipment assumed to operate in the safety analysis. Margins of safety are unaffected by requirements that are retained but relocated from the TS to the UFSAR.

   Therefore, the proposed change does not involve a significant reduction in a margin of safety.

Based on the above, PSEG concludes that the proposed changes present no significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and accordingly, a finding of "no significant hazards consideration" is justified.

5.2 Applicable Regulatory Requirements/Criteria

The NRC's regulatory requirements related to the content of TS are set forth in 10CFR50.36. In promulgating this rule, the NRC determined that the purpose of the TS is to impose only those conditions or limitations upon reactor operations necessary to obviate the possibility of an abnormal situation or event giving rise to an immediate threat to the public health and safety. TS that do not meet the screening criteria for retention as TS may be relocated to another licensee controlled document.

The relocated requirements do not meet the criteria of 10CFR50.36 for retention in the TS and are not required to obviate the possibility of an abnormal situation or event giving rise to an immediate threat to the public health and safety. Following relocation to the UFSAR, the provisions of 10CFR50.59 will provide adequate regulatory control over any future changes to these coolant chemistry requirements.

In conclusion, based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

6. ENVIRONMENTAL CONSIDERATION

PSEG has determined the proposed amendment would change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, or would change an inspection or a surveillance requirement. The proposed amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluents that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), an environmental assessment of the proposed change is not required.

7. REFERENCES

1. USNRC "Final Policy Statement on Technical Specification Improvements for Nuclear Power Reactors, " 58FR39132, dated July 22, 1993.

2. NUREG-1433, Revision 2, "Standard Technical Specifications for General Electric Plants, BWR/4," dated April 30, 2001.

3. Hope Creek Updated Final Safety Analysis Report.

HOPE CREEK GENERATING STATION
FACILITY OPERATING LICENSE NPF-57
DOCKET NO. 50-354
REVISIONS TO THE TECHNICAL SPECIFICATIONS

TECHNICAL SPECIFICATION PAGES WITH PROPOSED CHANGES

The following Technical Specifications for Facility Operating License No. NPF-57 are affected by this change request:

Technical Specification	Page
Index	X
3/4.4.4	3/4 4-15 3/4 4-16 3/4 4-17
B 3/4.4.4	B 3/4 4-3 B 3/4 4-4

LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS

3/4.4.4 ~~CHEMISTRY~~ DELETED

~~LIMITING CONDITION FOR OPERATION~~

3.4.4 The chemistry of the reactor coolant system shall be maintained within the limits specified in Table 3.4.4-1.

APPLICABILITY: At all times.

ACTION:

a. In OPERATIONAL CONDITION 1:

   1. With the conductivity, chloride concentration or pH exceeding the limit specified in Table 3.4.4-1 for less than 72 hours during one continuous time interval and, for conductivity and chloride concentration, for less than 336 hours per year, but with the conductivity less than 10 μmho/cm at 25°C and with the chloride concentration less than 0.5 ppm, this need not be reported to the Commission and the provisions of Specification 3.0.4 are not applicable.

   2. With the conductivity, chloride concentration or pH exceeding the limit specified in Table 3.4.4-1 for more than 72 hours during one continuous time interval or with the conductivity and chloride concentration exceeding the limit specified in Table 3.4.4-1 for more than 336 hours per year, be in at least STARTUP within the next 6 hours.

   3. With the conductivity exceeding 10 μmho/cm at 25°C or chloride concentration exceeding 0.5 ppm, be in at least HOT SHUTDOWN within 12 hours and in COLD SHUTDOWN within the next 24 hours.

b. In OPERATIONAL CONDITION 2 and 3 with the conductivity, chloride concentration or pH exceeding the limit specified in Table 3.4.4-1 for more than 48 hours during one continuous time interval, be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

c. At all other times:

   1. With the:

      a) Conductivity or pH exceeding the limit specified in Table 3.4.4-1, restore the conductivity and pH to within the limit within 72 hours, or

      b) Chloride concentration exceeding the limit specified in Table 3.4.4-1, restore the chloride concentration to within the limit within 24 hours, or

      perform an engineering evaluation to determine the effects of the out-of-limit condition on the structural integrity of the reactor coolant system. Determine that the structural integrity of the reactor coolant system remains acceptable for continued operation prior to proceeding to OPERATIONAL CONDITION 3.

   2 The provisions of Specification 3.0.3 are not applicable.

SURVEILLANCE REQUIREMENTS

4.4.4 The reactor coolant shall be determined to be within the specified chemistry limit by:

a. Measurement prior to pressurizing the reactor during each startup, if not performed within the previous 72 hours.

b. Analyzing a sample of the reactor coolant for:

   1. Chlorides at least once per:

      a) 72 hours, and

      b) 8 hours whenever conductivity is greater than the limit in Table 3.4.4-1.

   2. Conductivity at least once per 72 hours.

   3. pH at least once per:

      a) 72 hours, and

      b) 8 hours whenever conductivity is greater than the limit in Table 3.4.4-1.

c. Continuously recording the conductivity of the reactor coolant, or, when the continuous recording conductivity monitor is inoperable, obtaining an in-line conductivity measurement at least once per:

   1. 4 hours in OPERATIONAL CONDITIONS 1, 2 and 3, and

   2. 24 hours at all other times.

d. Performance of a CHANNEL CHECK of the continuous conductivity monitor with an in-line flow cell at least once per:

   1. 7 days, and

   2. 24 hours whenever conductivity is greater than the limit in Table 3.4.4-1.

THIS PAGE IS INTENTIONALLY BLANK

TABLE 3.4.4-1

REACTOR COOLANT SYSTEM
CHEMISTRY LIMITS

OPERATIONAL CONDITION	CHLORIDES	CONDUCTIVITY (μmhos/cm @25°C)	PH
1	≤ 0.2 ppm	≤ 1.0	5.6 ≤ pH ≤ 8.6
2 and 3	≤ 0.1 ppm	≤ 2.0	5.6 ≤ pH ≤ 8.6
At all other times	≤ 0.5 ppm	≤ 10.0	5.3 ≤ pH ≤ 8.6

THIS PAGE IS INTENTIONALLY BLANK

3/4.4.3 REACTOR COOLANT SYSTEM LEAKAGE

3/4.4.3.1 LEAKAGE DETECTION SYSTEMS

The RCS leakage detection systems required by this specification are provided to monitor and detect leakage from the reactor coolant pressure boundary. These detection systems are consistent with the recommendations of Regulatory Guide 1.45, "Reactor Coolant Pressure Boundary Leakage Detection Systems", May 1973 and Generic Letter 88-01, "NRC Position on IGSCC in BWR Austinitic Stainless Steel Piping."

Proceduralized, manual quantitative monitoring and calculation of leakage rates, found by the NRC staff, in GL 88-01, Supp. 1, to be an acceptable alternative during repair periods of up to 30 days, should be demonstrated to have accuracy comparable to the installed drywell floor and equipment drain sump monitoring system.

3/4.4.3.2 OPERATIONAL LEAKAGE

The allowable leakage rates from the reactor coolant system have been based on the predicted and experimentally observed behavior of cracks in pipes. The normally expected background leakage due to equipment design and the detection capability of the instrumentation for determining system leakage was also considered. The evidence obtained from experiments suggests that for leakage somewhat greater than that specified for UNIDENTIFIED LEAKAGE the probability is small that the imperfection or crack associated with such leakage would grow rapidly. However, in all cases, if the leakage rates exceed the values specified or the leakage is located and known to be PRESSURE BOUNDARY LEAKAGE, the reactor will be shutdown to allow further investigation and corrective action.

The Surveillance Requirements for RCS pressure isolation valves provide added assurance of valve integrity thereby reducing the probability of gross valve failure and consequent intersystem LOCA. Leakage from the RCS pressure isolation valves is IDENTIFIED LEAKAGE and will be considered as a portion of the allowed limit.

The limit placed upon the rate of increase in UNIDENTIFIED LEAKAGE meets the guidance of Generic Letter 88-01, "NRC Position on IGSCC in BWR Austinitic
Stainless Steel Piping."

3/4.4.4 ~~CHEMISTRY~~ This section has been deleted.

~~The water chemistry limits of the reactor coolant system are established to prevent damage to the reactor materials in contact with the coolant. Chloride limits are specified to prevent stress corrosion cracking of the stainless steel. The effect of chloride is not as great when the oxygen concentration in the coolant is low, thus the 0.2 ppm limit on chlorides is permitted during POWER OPERATION. During shutdown and refueling operations, the temperature necessary for stress corrosion to occur is not present so a 0.5 ppm concentration of chlorides is not considered harmful during these periods.~~

CHEMISTRY (Continued)

Conductivity measurements are required on a continuous basis since changes in this parameter are an indication of abnormal conditions. When the conductivity is within limits, the pH, chlorides and other impurities affecting conductivity must also be within their acceptable limits. With the conductivity meter inoperable, additional samples must be analyzed to ensure that the chlorides are not exceeding the limits.

The surveillance requirements provide adequate assurance that concentrations in excess of the limits will be detected in sufficient time to take corrective action.

3/4.4.5 SPECIFIC ACTIVITY

The limitations on the specific activity of the primary coolant ensure that the 2 hour thyroid and whole body doses resulting from a main steam line failure outside the containment during steady state operation will not exceed small fractions of the dose guidelines of 10 CFR 100. The values for the limits on specific activity represent interim limits based upon a parametric evaluation by the NRC of typical site locations. These values are conservative in that specific site parameters, such as site boundary location and meteorological conditions, were not considered in this evaluation.

The ACTION statement permitting POWER OPERATION to continue for limited time periods with the primary coolant's specific activity greater than 0.2 microcuries per gram DOSE EQUIVALENT I-131, but less than or equal to 4.0 microcuries per gram DOSE EQUIVALENT I-131, accommodates possible iodine spiking phenomenon which may occur following changes in THERMAL POWER. Monitoring the iodine activity in the primary coolant and taking responsible actions to maintain it at a reasonably low level will aid in ensuring the accumulated time of plant operation with high iodine activity will not exceed 800 hours in a consecutive 12-month period. The results of all primary coolant specific activity analyses which exceed the limits of Specification 3.4.5 will be documented pursuant to Specification 6.9.1.5.

Information obtained on iodine spiking will be used to assess the parameters associated with spiking phenomena. A reduction in frequency of isotopic analysis following power changes may be permissible if justified by the data obtained.

Closing the main steam line isolation valves prevents the release of activity to the environs should a steam line rupture occur outside containment. The surveillance requirements provide adequate assurance that excessive specific activity levels in the reactor coolant will be detected in sufficient time to take corrective action.