NMC
Committed to Nuclear Excellence

Palisades Nuclear Plant
Operated by Nuclear Management Company, LLC

May 30, 2006

10 CFR 50.91(a)(5)

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

Palisades Nuclear Plant
Docket 50-255
License No. DPR-20

License Amendment Request Regarding Tubesheet Inspection Depth for Steam Generator Tube Inspections

Pursuant to 10 CFR 50.91(a)(5), Nuclear Management Company, LLC (NMC) requests Nuclear Regulatory Commission (NRC) review and approval of a proposed license amendment for the Palisades Nuclear Plant (PNP). The proposed amendment revises Technical Specification (TS), section 5.5.8, "Steam Generator Program," to modify the steam generator (SG) provisions for tube inspections, as contained in the PNP TS Surveillance Requirements, section 5.5.8.d. The purpose of these changes is to define the depth of the required tube inspections. WCAP-16208-P, "NDE Inspection Length for CE Steam Generator Tubesheet Region Explosive Expansions," Revision 1, provided recommended tubesheet region inspection lengths for plants with Combustion Engineering (CE) supplied SGs with explosive expansions. This inspection length is referred to as C* ("C-Star"). NMC intends to implement the C* inspection methodology for PNP.

By letter dated February 16, 2006, NMC submitted a license amendment request (LAR) regarding SG tube integrity. Specifically, the LAR incorporated Technical Specification Task Force (TSTF) Standard Technical Specification Change Traveler, TSTF-449, "Steam Generator Tube Integrity." NMC is anticipating NRC issuance of this license amendment request for PNP shortly, and therefore, the TS pages 5.5.8-11 and 5.5.8-12, from the TSTF-449 license amendment, have been marked up and are provided as Enclosure 3 to this LAR.

Enclosure 1 provides a detailed description of the proposed change, Background and Technical Analysis, No Significant Hazards Consideration Determination, Applicable Regulatory Criteria and Environmental Review Consideration. Enclosure 2 provides the revised TS page reflecting the proposed change. Enclosure 3 provides the annotated TS page showing the changes proposed.

27780 Blue Star Memorial Highway • Covert, Michigan 49043-9530
Telephone: 269.764.2000

A001

Enclosure 4 provides Westinghouse Proprietary Report, LTR-CDME-06-80-P, "Palisades Tubesheet Inspection Depth," dated May 2006, which accounts for additional allowances on T_{hot} temperature difference effects for PNP compared to the WCAP-16208 analysis, and for potential differences associated with use of first slip pullout loads compared to peak pullout loads of test specimens described in WCAP-16208. As Enclosure 4 contains information proprietary to Westinghouse Electric Company LLC, it is supported by an affidavit signed by Westinghouse, the owner of the information. Included in Enclosure 4 is a Westinghouse authorization letter, CAW-06-2145, accompanying affidavit, Proprietary Information Notice and Copyright Notice. The affidavit sets forth the basis on which the information may be withheld from public disclosure by the Commission and addresses with specificity the considerations listed in 10 CFR 2.390. Accordingly, it is requested that the information which is proprietary to Westinghouse be withheld from public disclosure in accordance with 10 CFR 2.390. Enclosure 5 provides Westinghouse Non-Proprietary Report, LTR-CDME-06-80-NP, "Palisades Tubesheet Inspection Depth," dated May 2006.

Enclosure 6 provides the Westinghouse Proprietary Report, LTR-CDME-06-40-P, "Comments on the Application of WCAP-16208-P, Revision 1, 'NDE Inspection Length for CE Steam Generator Tubesheet Region Explosive Expansions,' to the Palisades Nuclear Power Plant," dated May 2006. This report provides a compilation of requests for additional information (RAIs) that have been issued to various utilities that have submitted C* LARs. The responses to the RAIs that are applicable to PNP are provided in bold font. As Enclosure 6 contains information proprietary to Westinghouse Electric Company LLC, it is supported by an affidavit signed by Westinghouse, the owner of the information. Included in Enclosure 6 is a Westinghouse authorization letter, CAW-06-2144, accompanying affidavit, Proprietary Information Notice and Copyright Notice. The affidavit sets forth the basis on which the information may be withheld from public disclosure by the Commission and addresses with specificity the considerations listed in 10 CFR 2.390. Accordingly, it is requested that the information which is proprietary to Westinghouse be withheld from public disclosure in accordance with 10 CFR 2.390. Enclosure 7 provides the Westinghouse Non-Proprietary Report, LTR-CDME-06-40-NP.

Correspondence with respect to the copyright or proprietary aspects of the items listed above or the supporting Westinghouse affidavits should reference the authorization letter CAW-06-2144, or CAW-06-2145, and be addressed to B.F.Maurer, Acting Manager, Regulatory Compliance and Plant Licensing, Westinghouse Electric Company LLC, P.O. Box 355, Pittsburgh, Pennsylvania 15230-0355. Lynchburg, VA 24506.

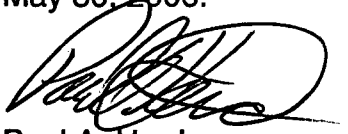
NMC requests approval of this proposed license amendment by May 2007. NMC further requests a 60-day implementation period following amendment approval.

A copy of this request has been provided to the designated representative of the State of Michigan.

Summary of Commitments

This letter contains no new commitments and no revisions to existing commitments.

I declare under penalty of perjury that the foregoing is true and correct. Executed on May 30, 2006.



Paul A. Harden
Site Vice-President, Palisades Nuclear Plant
Nuclear Management Company, LLC

Enclosures (7)

cc: Administrator, Region III, USNRC
Project Manager, Palisades, USNRC
Resident Inspector, Palisades, USNRC

ENCLOSURE 1
DESCRIPTION OF REQUESTED CHANGES

1.0 DESCRIPTION

Nuclear Management Company, LLC (NMC) requests to amend Operating License DPR-20 for the Palisades Nuclear Plant (PNP). The proposed change would modify Technical Specification (TS) 5.5.8, "Steam Generator Program."

2.0 PROPOSED CHANGE

The proposed amendment revises TS, section 5.5.8, "Steam Generator Program," to modify the steam generator (SG) provisions for tube inspections, as contained in the PNP TS Surveillance Requirements, section 5.5.8.d. The purpose of these changes is to define the depth of the required tube inspections. WCAP-16208-P, "NDE Inspection Length for CE Steam Generator Tubesheet Region Explosive Expansions," Revision 1, provided recommended tubesheet region inspection lengths for plants with Combustion Engineering (CE) supplied SGs with explosive expansions. This inspection length is referred to as C* ("C-Star"). NMC intends to implement the C* inspection methodology for PNP.

NMC proposes to revise TS 5.5.8.d, "Provisions for SG tube inspections," for PNP. By letter dated February 16, 2006, NMC submitted a license amendment request (LAR) regarding SG tube integrity. Specifically, the LAR incorporated Technical Specification Task Force (TSTF) Standard Technical Specification Change Traveler, TSTF-449, "Steam Generator Tube Integrity." NMC is anticipating NRC issuance of this LAR for PNP shortly, and therefore, the TS pages 5.5.8-11 and 5.5.8-12, from the TSTF-449 license amendment, have been marked up and are provided as Enclosure 3 to this LAR. The current section 5.5.8.d (from LAR dated February 16, 2006 on TSTF-449) reads as follows:

d. Provisions for SG tube inspections. Periodic SG tube inspections shall be performed. The number and portions of the tubes inspected and methods of inspection shall be performed with the objective of detecting flaws of any type (e.g., volumetric flaws, axial and circumferential cracks) that may be present along the length of the tube, from the tube-to-tubesheet weld at the tube inlet to the tube-to-tubesheet weld at the tube outlet, and that may satisfy the applicable tube repair criteria. The tube-to-tubesheet weld is not part of the tube. In addition to meeting the requirements of d.1, d.2, and d.3 below, the inspection scope, inspection methods, and inspection intervals shall be such as to ensure that SG tube integrity is maintained until the next SG inspection. An assessment of degradation shall be performed to determine the type and location of flaws to which the tubes may be susceptible and, based on this assessment, to determine which inspection methods need to be employed and at what locations.

The revised section 5.5.8.d will read as follows:

d. Provisions for SG tube inspections. Periodic SG tube inspections shall be performed. The number and portions of the tubes inspected and methods of inspection shall be performed with the objective of detecting flaws of any type (e.g., volumetric flaws, axial and circumferential cracks) that may be present along the length of the tube, from 12.5 inches below the tube to tubesheet expansion transition inlet to the tube-to-tubesheet weld at the tube outlet, and that may satisfy the applicable tube repair criteria. The tube-to-tubesheet weld is not part of the tube. In addition to meeting the requirements of d.1, d.2, and d.3 below, the inspection scope, inspection methods, and inspection intervals shall be such as to ensure that SG tube integrity is maintained until the next SG inspection. An assessment of degradation shall be performed to determine the type and location of flaws to which the tubes may be susceptible and, based on this assessment, to determine which inspection methods need to be employed and at what locations.

3.0 BACKGROUND

By letter dated August 30, 2004, the Nuclear Regulatory Commission (NRC) transmitted Generic Letter (GL) 2004-01, "Requirements for Steam Generator Tube Inspections." The GL requested PWR licensees to submit information concerning their SG tube inspections. By letter dated October 29, 2004, as supplemented by letters dated August 22, 2005, and March 20, 2006, NMC responded to Generic Letter 2004-01. The response stated that the PNP SG tube inspection methods are not consistent with the NRC's current position as stated in GL 2004-01, relative to inspections performed within the tubesheet. This condition was entered into the corrective action program at PNP.

For the 2003 refueling outage SG inspection, NMC utilized the Combustion Engineering Owners Group (CEOG) WCAP-15720, "NDE Inspection Strategy for Tubesheet Regions in CE Designed Units," as the technical basis to limit the SG tubesheet inspection to five inches minimum. Each of the SG eddy current +Point™ calibration groups in the 2003 refueling outage were reviewed to define an average inspection depth for each calibration group. This study showed that the average inspection depth below the top of tubesheet was eight inches, with some tubes examined to a depth of fourteen inches below the top of tubesheet.

For the 2004 refueling outage SG inspection, NMC again utilized the CEOG WCAP-15720, as the technical basis to limit the SG tubesheet inspection depth below the top of tubesheet to eight inches. At the time of the 2004 refueling outage, Westinghouse topical report WCAP-16208, was being jointly developed for five plants with CE SGs that would change the depth of the required tube inspections and plugging criteria within the tubesheet. The technical basis for these changes was initially documented in WCAP-16208-P, Revision 0.

For the 2004 refueling outage SG inspection 100% of the active tubes in both SG hot leg tubesheets were +Point™ probe inspected. The eight inch inspection depth was based on a distance from the top of tubesheet to six inches below the top of tubesheet being defined as the critical area, which is an area of steam generator tubing which, on the basis of inspection results, engineering evaluation and related experience, is defined by the type, cause and boundary of the degradation. The length from 5.01 to 8 inches below the top of tubesheet was defined as a buffer zone, which is a tube population immediately adjacent to a defined critical area and equal to a minimum of 20% of the critical area tube population. The buffer zone was used for 100% of the active tubes in both steam generator hot leg tubesheets. The critical area and buffer zone are from the EPRI guideline document from NEI 97 -06, "Steam Generator Program."

By letter dated January 20, 2006, the NRC issued Generic Letter (GL) 2006-01, "Steam Generator Tube Integrity and Associated Technical Specifications." The GL described the NRC concern that current TS requirements may not be sufficient to ensure that SG tube integrity can be maintained in accordance with current licensing and design basis. By letter dated February 17, 2006, NMC responded to the GL, describing that TSTF-449 was submitted for the NMC PWR plants, including PNP.

By letter dated March 20, 2006, NMC revised a commitment to allow use of the C* SG tubesheet inspection depth in the 2006 refueling outage. WCAP-16208, "NDE Inspection Length for CE Steam Generator Tubesheet Region Explosive Expansions," Revision 1, defines an inspection length below the bottom of the expansion transition of 11.6 inches for PNP. During a teleconference with the NRC Staff on March 14, 2006, the NRC indicated that the applied inspection distance should include additional allowances for T_{hot} temperature difference effects for PNP compared to the WCAP-16208 analysis, and for potential differences associated with the use of first slip pullout loads compared to peak pullout loads of test specimens described in WCAP-16208.

4.0 TECHNICAL ANALYSIS

4.1 Design

The SGs that are currently in use at PNP are replacement CE Model 2530 and were installed in the fall of 1990. The tube material is mill annealed Alloy 600 with a 0.75-inch outside diameter and a 0.042-inch tube wall thickness. Each SG has 8219 tubes. The tubes were expanded through the full depth of the tube sheet using an explosive process. The resultant interference fit between each of the tubes and tubesheet provides structural integrity to resist tube pull-out, and a leak resistant boundary between the primary and secondary systems. A seal weld joins the tube end to the cladding on the primary face of the tubesheet. The tube bundle is supported by stainless steel eggcrate lattice-type supports comprised of horizontal eggcrate supports, vertical straps and diagonal straps. Tube rows 1-18 are u-bends and rows 19-165 are square bends.

Prior to the installation of these SGs, CE advised Consumers Energy that the area around the center stay cylinder region was potentially susceptible to fretting wear at the bat wing locations. As a result, 308 tubes in SG A and 309 tubes in SG B were preventatively plugged. After initial service SG A was designated SG E-50A and SG B was designated SG E-50B.

After ten cycles of operation, 94 additional tubes in SG E-50A have been plugged, for a total of 402 tubes plugged. After ten cycles of operation, 64 additional tubes in SG E-50B have been plugged, for a total of 373 tubes plugged. SG E-50A has 7817 active tubes with 4.89% of its tubes plugged. SG E-50B has 7846 active tubes with 4.54% of its tubes plugged.

4.2 Inspection Practices/Results

The PNP Steam Generator Program requires that a degradation assessment (DA) be performed prior to each refueling outage. The purpose is to determine the susceptible areas of the tubing to be inspected, and select the appropriate eddy current techniques for the inspection of each area. Data gathered during the inspection is utilized as input to the subsequent condition monitoring (CM) and operational assessments (OA). The PNP Steam Generator Program satisfies the intent of NEI 97-06.

The PNP 2003 and 2004 SG tube inspections included bobbin probe examinations of all active tubes, and sample inspections with a rotating +Point™ Probe for low row u-bends and dings (i.e., local geometry variations due to manufacturing, installation and maintenance). All bobbin indications of potential corrosion degradation were further interrogated using rotating probes.

In 2003, all active tube hot legs were inspected with rotating probes from +3 inches to -5 inches, referenced to the secondary faces of the tubesheets, to ensure that a minimum tube to tubesheet engagement length was examined. Each of the SG eddy current +Point™ calibration groups in the 2003 refueling outage was reviewed to define an average inspection depth for each calibration group. This study shows that the average inspection depth below the top of tubesheet was 8 inches, with some tubes examined to a depth of 14 inches below the top of tubesheet.

In 2004, all active tube hot legs were inspected with rotating probes from +3 inches to -8 inches, referenced to the secondary faces of the tubesheets, to ensure that a minimum tube to tubesheet engagement length was examined. Each of the SG eddy current +Point™ calibration groups in the 2004 refueling outage was reviewed to define an average inspection depth for each calibration group. This study shows that the average inspection depth below the top of tubesheet in SG E-50A was examined to a depth of 9.35 inches and SG E-50B was examined to a depth of 9.16 inches below the top of tubesheet, while the 95th percentile inspection depths were 10.46 and 10.33 inches below the top of the tubesheet for SG E-50A and SG E50B.

Degradation below the top of tubesheet has been limited to one axial flaw, which was identified in the 2003 refueling outage. This single axial flaw had a severity of 1.67 volts, and a length of 0.280 inches. There were no indications identified in the 2004 refueling outage inspection, which inspected 100% of the hot leg side of the tubesheet to a depth of eight inches for 7854 tubes in SG E-50A and 7859 tubes in SG E-50B.

The single axial flaw identified within the tubesheet at PNP is limited to a depth of two inches below the top of tubesheet, whereas the inspection zone for the tubesheet extended to a depth of eight inches in the 2003 and 2004 inspections. This defect was plugged upon detection and the suspected failure mechanism for this defect was primary water stress corrosion cracking (PWSCC). All indications of tube wall degradation, with the exception of wear, were repaired upon detection. Wear indications were repaired if they exceeded 40% of the tube wall thickness.

In 2006, all active tube hot legs were inspected with rotating probes from +3 inches to -13.5 inches, referenced to the secondary faces of the tubesheets, to ensure that a minimum tube to tubesheet engagement length was examined. A total of three PWSCC indications were identified in the SG E-50A tubesheet. There were two single axial indications (SAI) in tube R24 C109, and one SAI in R34 C47, both at the tubesheet hot location. The largest reported voltage for the indications of this type was 0.52 volts from the +Point™ probe. None these indications were located greater than 0.97 inches below the hot leg top of tubesheet. Neither tube required in situ pressure testing. Both tubes were removed from service by tube plugging. No indications were identified in the SG E-50B tubesheet.

4.3 Analysis

SG tubes function as an integral part of the primary coolant pressure boundary and, in addition, serve to isolate radiological fission products in the primary coolant from the secondary coolant and the environment. Because of the importance of SG tube integrity, periodic inservice inspections of the SG tubes is required. These inspections detect degradation in the tubes resulting from interaction with the SG operating environment. In addition, these inspections provide a means of characterizing the nature and cause of any tube degradation so that corrective measures can be taken. Tubes with degradation that exceed the tube repair limits specified in the TSs are removed from service by plugging. The TSs provide the acceptance criteria related to the results of SG tube inspections.

The requirements for the inspection of SG tubes are intended to ensure that this portion of the primary coolant system maintains its integrity. Tube integrity means that the tubes are capable of performing these functions in accordance with the plant design and licensing basis. Tube integrity includes both structural and leakage integrity. Structural integrity refers to maintaining adequate margins against gross failure, rupture, and collapse of the SG tubes. Leakage integrity

refers to limiting primary-to-secondary leakage during normal operation, plant transients, and postulated accidents to ensure that the radiological dose consequences are within acceptable limits.

A joint industry test program WCAP-16208-P was conducted by Westinghouse to determine the recommended inspection length (C*) in the tubesheet region of CE design SGs that would ensure the structural and accident-induced leakage criteria of NEI 97-06 are met. Specifically, the tube to tubesheet joints must resist burst with an internal pressure of 3 x NODP (normal operating differential pressure) or 1.4 x MSLB (main steam line break) conditions, and they must maintain primary to secondary accident-induced leakage below 1 gpm/SG. It should be noted that C* is intended to define the minimum tube engagement length within the tubesheet. As such, this distance is referenced from the bottom of the hot leg expansion transition.

Tube burst is precluded for a tube with defects in the tubesheet region because of the constraint provided by the tubesheet. Therefore, tube pullout would be a prerequisite for tube burst under the limiting internal pressure conditions of NEI 97-06. WCAP-16208-P evaluated the minimum joint length required to preclude tube pull-out at a load of 3 x NODP, which bounds 1.4 x MSLB differential pressure. Also, the tube burst and collapse criteria of NRC Regulatory Guide 1.121, "Basis for Plugging Degraded PWR Steam Generator Tubes," continues to be satisfied.

The NEI 97-06 primary to secondary accident-induced leakage criteria of 1 gpm/SG exceeds the LCO and accident analysis leakage limits for most participating plants, including the PNP limit of 0.3 gpm/SG. To account for this disparity and to allow margin for other possible leak sources, WCAP-16208-P evaluated the minimum joint length required to maintain primary to secondary accident-induced leakage at 0.1 gpm/SG, assuming that 100% of the SG tubes were leaking below the C* depth. The NMC TSTF-449 submittal to the NRC provided the PNP SG tube integrity related TS LAR. LCO 3.4.13, item d., "PCS Operational Leakage," states that operational leakage through any one SG shall be limited to 150 gallons per day. The UFSAR Chapter 14.14-6 accident induced leakage limit assumption based on MSLB is 0.3 gallons per minute (432 gallons per day). Therefore, the LCO leakage limit is conservatively less than the design basis accident-induced leakage limit.

WCAP-16208-P generated empirical pullout load and leakage rate test data for a number of tube to tubesheet joint mock-up samples. The testing determined that the joint length required to satisfy the pull-out criteria was bound by that required to satisfy the leakage rate criteria. Analytical methods were utilized to correct the empirical data for tubesheet deflection effects on both the joint strength and leakage resistance. Axial position uncertainties associated with eddy current examinations were also accounted for by adding a correction factor to the data. An additional conservatism was introduced by assuming that 100% of the SG tubes were severed by a 360° circumferential crack immediately below the C* inspection length. The final result of WCAP-16208-P for PNP was a C* value of 11.6 inches.

The C* inspection distance was reanalyzed to include additional allowances for T_{hot} temperature difference effects for PNP compared to the WCAP-16208 analysis, and for potential differences associated with use of first slip pullout loads compared to peak pullout loads of test specimens described in WCAP- 16208-P. The re-calculated C* inspection distance including the above effects has increased the inspection depth to 12.5 inches below the bottom of the expansion transition. Enclosure 4 provides the Westinghouse Proprietary Report, LTR-CDME-06-80-P, "Palisades Tubesheet Inspection Depth," dated May 2006, which provides the analysis for the re-calculated C* inspection depth for PNP. Enclosure 5 provides the Westinghouse Non-Proprietary Report, LTR-CDME-06-80-NP, "Palisades Tubesheet Inspection Depth," dated May 2006.

The PNP SG tube inspection methods meet the TS requirements in conjunction with 10 CFR Part 50, Appendix B. The rotating +Point™ probe employed in the tubesheet region is fully capable of detecting axial and circumferential flaws and all tubes exhibiting degradation within the C* length of the tubesheet region are plugged upon detection.

5.0 REGULATORY SAFETY ANALYSIS

5.1 No Significant Hazards Consideration

Nuclear Management Company, LLC (NMC) 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 amendment involve a significant increase in the probability or consequences of an accident previously evaluated?

   Response: No.

   The proposed amendment does not involve a significant increase in the probability of an accident previously evaluated because the modification to TS Section 5.5.8.d maintains the existing design limits and would not increase the probability or consequences of an accident involving tube burst or primary to secondary accident-induced leakage, as previously analyzed in the UFSAR. Also, the tube burst and collapse criteria of NRC Regulatory Guide 1.121, "Basis for Plugging Degraded PWR Steam Generator Tubes," would continue to be satisfied.

   Tube burst is precluded for a tube with defects within the tubesheet region because of the constraint provided by the tubesheet. As such, tube pullout resulting from the axial forces induced by primary to secondary differential pressures would be a prerequisite for tube burst to occur. A joint industry test program, WCAP-16208-P, has defined the non-degraded tube to tubesheet joint length required to preclude tube pullout

(C*) and maintain acceptable primary to secondary accident-induced leakage, assuming a 360° circumferential through wall crack existed immediately below this length. For PNP, C* is 12.5 inches. Any degradation below C* is shown by empirical test results and analyses to be acceptable, thereby precluding an event with consequences similar to a postulated tube rupture event.

WCAP-16208-P incorporates an assumed primary to secondary accident-induced leakage value of 0.1 gpm/SG. The NMC TSTF-449 submittal to the NRC provided the PNP SG tube integrity related TS. LCO 3.4.13, item d., "PCS Operational Leakage," states that operational leakage through any one SG shall be limited to 150 gallons per day. The UFSAR Chapter 14.14-6 accident-induced leakage limit assumption based on MSLB is 0.3 gallons per minute (432 gallons per day). Therefore, the LCO leakage limit is conservatively less than the design basis accident induced leakage limit.

In summary, the proposed modifications to the PNP Technical Specifications maintain existing design limits and do not involve a significant increase in the probability or consequences of an accident previously evaluated in the UFSAR.

Therefore, operation of the facility in accordance with the proposed amendment would not involve a significant increase in the probability or consequences of an accident previously evaluated.

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

   Response: No.

   The proposed amendment does not create the possibility of a new or different kind of accident from any accident previously evaluated because SG tube leakage and structural integrity will continue to be maintained during all plant conditions upon implementation of the proposed inspection scope to the PNP TSs. The revised inspection scope does not introduce any new mechanisms that might result in a different kind of accident from those previously evaluated. Even with the limiting circumstances of a complete circumferential separation (360° through wall crack) of a tube below the C* length, tube pullout is precluded and leakage is predicted to be maintained within the TS limits during all plant conditions.

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

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

Response: No.

The proposed amendment does not involve a significant reduction in a margin of safety. The requirements for the inspection of SG tubes are intended to ensure that this portion of the primary coolant system maintains its integrity. Tube integrity means that the tubes are capable of performing these functions in accordance with the plant design and licensing basis. Tube integrity includes both structural and leakage integrity. The proposed tubesheet inspection depth of 12.5 inches will ensure tube integrity is maintained because any degradation below C* is shown by empirical test results and analyses to be acceptable. In addition, operation with potential tube degradation below the C* inspection length continues to meet the margin of safety as defined by RG 1.121, "Basis for Plugging Degraded PWR Steam Generator Tubes," and RG 1.83, "Inservice Inspection of Pressurized Water Reactor Steam Generator Tubes." Therefore, the proposed modifications do not involve a significant reduction in a margin of safety.

Based on the evaluation above, NMC concludes that the proposed amendment presents 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

Regulatory Guide 1.121, "Basis for Plugging Degraded PWR Steam Generator Tubes" - The tube burst and collapse criteria of RG 1.121 would continue to be satisfied with the proposed changes. Operation of the SGs with potential tube degradation below the C* inspection length would continue to meet the margin of safety as defined by RG 1.121.

Regulatory Guide 1.83, "Inservice Inspection of Pressurized Water Reactor Steam Generator Tubes" - Operation of the SGs with potential tube degradation below the C* inspection length would continue to meet the margin of safety as defined by RG 1.83.

10 CFR 50.36

Section 182a of the Atomic Energy Act (the Act) requires applicants for nuclear power plant operating licenses to include TSs as part of the license. The licensee provides TSs in order to maintain the operational capability of structures, systems, and components that are required to protect the health and safety of the public. The staff of the NRC used the regulatory requirements for TS changes set forth in 10 CFR 50.36 for this evaluation. Specifically, 10 CFR 50.36(c)(1) specifies safety limits, limiting safety systems settings and control settings, 10 CFR 50.36(c)(2) specifies

the requirements for limiting conditions for operation, 10 CFR 50.36(c)(3) specifies the surveillance requirements, 10 CFR 50.36(c)(4) specifies the design requirements, and 10 CFR 50.36(c)(5) specifies the administrative controls.

The NRC provided guidance for the specific contents of the TSs in Final Policy Statement, 58 FR 39133, "Final Policy Statement on Technical Specifications Improvements for Nuclear Power Reactors," dated July 22, 1993. The Final Policy Statement established four criteria for determining the items required for inclusion in the TSs:

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.

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

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 the fission product barrier.

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

These criteria have been codified in 10 CFR 50.36(c)(2)(ii). See Final Rule, "Technical Specifications," 60 FR 36953 (July 19, 1995). As a result, TS requirements which fall within or satisfy any of the criteria in the Final Policy Statement must be retained in the TS.

In conclusion, based on the considerations described 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.

6.0 ENVIRONMENTAL CONSIDERATION

NMC has determined that 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 surveillance requirement. However, 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 effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

7.0 PRECEDENT

By letter dated November 8, 2004 (ADAMS Accession ML043150399), as supplemented March 31, 2005 (ADAMS Accession ML050960513) and February 13, 2006 (ADAMS Accession ML060480061), Florida Power and Light submitted a LAR for St. Lucie Plant, Unit No. 2. The license amendment revised the TSs at St. Lucie to modify the SG provisions for tube inspections. The purpose of the changes was to define the depth of the required tube inspections. WCAP-16208-P provided the recommended tubesheet region inspection length for the St. Lucie Plant, Unit No. 2, along with the technical basis for the recommended inspection length. St. Lucie revised the TS to redefine the terms "plugging limit" and "tube inspection." The definitions were revised to incorporate the C* inspection methodology. By letter dated April 11, 2006 (ADAMS Accession ML060790216) the NRC issued the safety evaluation approving the amendment for St. Lucie.

NMC is submitting a similar license amendment for PNP. The proposed amendment revises the Technical Specifications at PNP to modify the steam generator provisions for tube inspections. The purpose of these changes is to define the depth of the required tube inspections. WCAP-16208-P provided the recommended tubesheet region inspection length for PNP, along with the technical basis for the recommended tubesheet inspection length. PNP proposes to revise the technical specification pages from the TSTF-449 amendment, as submitted by letter dated February 16, 2006. Specifically, TS 5.5.8.d, "Provisions for SG tube inspections," is being revised to incorporate the C* inspection methodology.

ENCLOSURE 2

LICENSE AMENDMENT REQUEST REGARDING TUBESHEET INSPECTION DEPTH FOR STEAM GENERATOR TUBE INSPECTIONS AT PALISADES NUCLEAR PLANT

REVISED TECHNICAL SPECIFICATION PAGES
5.5.8-11, 5.5.8-12
AND
OPERATING LICENSE PAGE CHANGE INSTRUCTIONS

3 Pages Follow

ATTACHMENT TO LICENSE AMENDMENT NO.

FACILITY OPERATING LICENSE NO. DPR-20

DOCKET NO. 50-255

Remove the following page of Appendix A Technical Specifications and replace with the attached revised page. The revised page is identified by amendment number and contains marginal lines indicating the areas of change.

REMOVE	INSERT
5.5.8-11	5.5.8-11
5.5.8-12	5.5.8-12

5.5 Programs and Manuals

5.5.8 Steam Generator (SG) Program

b. Performance criteria for SG tube integrity. (continued)

1. Structural integrity performance criterion: All in-service SG tubes shall retain structural integrity over the full range of normal operating conditions (including startup, operation in the power range, hot standby, and cool down and all anticipated transients included in the design specification) and design basis accidents. This includes retaining a safety factor of 3.0 against burst under normal steady state full power operation primary-to-secondary pressure differential and a safety factor of 1.4 against burst applied to the design basis accident primary-to-secondary pressure differentials. Apart from the above requirements, additional loading conditions associated with the design basis accidents, or combination of accidents in accordance with the design and licensing basis, shall also be evaluated to determine if the associated loads contribute significantly to burst or collapse. In the assessment of tube integrity, those loads that do significantly affect burst or collapse shall be determined and assessed in combination with the loads due to pressure with a safety factor of 1.2 on the combined primary loads and 1.0 on axial secondary loads.

2. Accident induced leakage performance criterion: The primary to secondary accident induced leakage rate for any design basis accident, other than a SG tube rupture, shall not exceed the leakage rate assumed in the accident analysis in terms of total leakage rate for all SGs and leakage rate for an individual SG. Leakage is not to exceed 0.3 gpm.

3. The operational LEAKAGE performance criterion is specified in LCO 3.4.13, "PCS Operational LEAKAGE."

c. Provisions for SG tube repair criteria. Tubes found by inservice inspection to contain flaws with a depth equal to or exceeding 40% of the nominal tube wall thickness shall be plugged.

d. Provisions for SG tube inspections. Periodic SG tube inspections shall be performed. The number and portions of the tubes inspected and methods of inspection shall be performed with the objective of detecting flaws of any type (e.g., volumetric flaws, axial and circumferential cracks) that may be present along the length of the tube, from 12.5 inches below the tube-to-tubesheet expansion transition inlet to the tube-to-tubesheet weld at the tube outlet, and that may satisfy the applicable tube repair criteria. The tube-to-tubesheet weld is not part of the tube. In addition to meeting the requirements of d.1, d.2, and d.3 below, the inspection scope, inspection methods, and inspection intervals shall be such as to ensure that SG tube integrity is maintained until the next SG inspection. An assessment of degradation shall be performed to determine the type and location of flaws

5.5 Programs and Manuals

5.5.8 Steam Generator (SG) Program

d. Provisions for SG tube inspections. (continued)

to which the tubes may be susceptible and, based on this assessment, to determine which inspection methods need to be employed and at what locations.

1. Inspect 100% of the tubes in each SG during the first refueling outage following SG replacement.

2. Inspect 100% of the tubes at sequential periods of 60 effective full power months. The first sequential period shall be considered to begin after the first inservice inspection of the SGs. No SG shall operate for more than 24 effective full power months or one refueling outage (whichever is less) without being inspected.

3. If crack indications are found in any SG tube, then the next inspection for each SG for the degradation mechanism that caused the crack indication shall not exceed 24 effective full power months or one refueling outage (whichever is less). If definitive information, such as from examination of a pulled tube, diagnostic non-destructive testing, or engineering evaluation indicates that a crack-like indication is not associated with a crack(s), then the indication need not be treated as a crack.

e. Provisions for monitoring operational primary to secondary LEAKAGE.

ENCLOSURE 3

LICENSE AMENDMENT REQUEST REGARDING TUBESHEET INSPECTION DEPTH FOR STEAM GENERATOR TUBE INSPECTIONS AT PALISADES NUCLEAR PLANT

MARK-UP OF TECHNICAL SPECIFICATION PAGE
5.5.8-11, 5.5.8-12
(showing proposed changes)
(additions are highlighted; deletions are strikethrough)

2 Pages Follow

5.5 Programs and Manuals

5.5.8 Steam Generator (SG) Program

b. Performance criteria for SG tube integrity. (continued)

1. Structural integrity performance criterion: All in-service SG tubes shall retain structural integrity over the full range of normal operating conditions (including startup, operation in the power range, hot standby, and cool down and all anticipated transients included in the design specification) and design basis accidents. This includes retaining a safety factor of 3.0 against burst under normal steady state full power operation primary-to-secondary pressure differential and a safety factor of 1.4 against burst applied to the design basis accident primary-to-secondary pressure differentials. Apart from the above requirements, additional loading conditions associated with the design basis accidents, or combination of accidents in accordance with the design and licensing basis, shall also be evaluated to determine if the associated loads contribute significantly to burst or collapse. In the assessment of tube integrity, those loads that do significantly affect burst or collapse shall be determined and assessed in combination with the loads due to pressure with a safety factor of 1.2 on the combined primary loads and 1.0 on axial secondary loads.

2. Accident induced leakage performance criterion: The primary to secondary accident induced leakage rate for any design basis accident, other than a SG tube rupture, shall not exceed the leakage rate assumed in the accident analysis in terms of total leakage rate for all SGs and leakage rate for an individual SG. Leakage is not to exceed 0.3 gpm.

3. The operational LEAKAGE performance criterion is specified in LCO 3.4.13, "PCS Operational LEAKAGE."

c. Provisions for SG tube repair criteria. Tubes found by inservice inspection to contain flaws with a depth equal to or exceeding 40% of the nominal tube wall thickness shall be plugged.

d. Provisions for SG tube inspections. Periodic SG tube inspections shall be performed. The number and portions of the tubes inspected and methods of inspection shall be performed with the objective of detecting flaws of any type (e.g., volumetric flaws, axial and circumferential cracks) that may be present along the length of the tube, from 12.5 inches below the tube-to-tubesheet expansion transition inlet ~~weld at the tube inlet~~ to the tube-to-outlet, and that may satisfy the applicable tube repair criteria. The tube-to-tubesheet weld is not part of the tube. In addition to meeting the requirements of d.1, d.2, and d.3 below, the inspection scope, inspection methods, and inspection intervals shall be such as to ensure that SG tube integrity is maintained until the next SG inspection. An assessment of degradation shall be performed to determine the type and location of flaws

5.5 Programs and Manuals

5.5.8 Steam Generator (SG) Program

e. Provisions for SG tube inspections. (continued)

~~determine the type and location of flaws~~ to which the tubes may be susceptible and, based on this assessment, to determine which inspection methods need to be employed and at what locations.

1. Inspect 100% of the tubes in each SG during the first refueling outage following SG replacement.

2. Inspect 100% of the tubes at sequential periods of 60 effective full power months. The first sequential period shall be considered to begin after the first inservice inspection of the SGs. No SG shall operate for more than 24 effective full power months or one refueling outage (whichever is less) without being inspected.

3. If crack indications are found in any SG tube, then the next inspection for each SG for the degradation mechanism that caused the crack indication shall not exceed 24 effective full power months or one refueling outage (whichever is less). If definitive information, such as from examination of a pulled tube, diagnostic non-destructive testing, or engineering evaluation indicates that a crack-like indication is not associated with a crack(s), then the indication need not be treated as a crack.

e. Provisions for monitoring operational primary to secondary LEAKAGE.

ENCLOSURE 4

LICENSE AMENDMENT REQUEST REGARDING TUBESHEET INSPECTION DEPTH FOR STEAM GENERATOR TUBE INSPECTIONS AT PALISADES NUCLEAR PLANT

PROPRIETARY VERSION

LTR-CDME-06-80-P, 'PALISADES TUBESHEET INSPECTION DEPTH' TO THE PALISADES NUCLEAR PLANT," DATED MAY 2006

WESTINGHOUSE AUTHORIZATION LETTER, CAW-06-2145, ACCOMPANYING AFFIDAVIT, PROPRIETARY INFORMATION NOTICE AND COPYRIGHT NOTICE

26 Pages Follow

Westinghouse Electric Company
Nuclear Services
P.O. Box 355
Pittsburgh, Pennsylvania 15230-0355
USA

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

Direct tel: (412) 374-4419
Direct fax: (412) 374-4011
e-mail: maurerbf@westinghouse.com

Our ref: CAW-06-2145

May 16, 2006

APPLICATION FOR WITHHOLDING PROPRIETARY INFORMATION FROM PUBLIC DISCLOSURE

Subject: LTR-CDME-06-80-P, Rev. 1, "Palisades Tubesheet Inspection Depth,"(Proprietary)

The proprietary information for which withholding is being requested in the above-referenced report is further identified in Affidavit CAW-06-2145 signed by the owner of the proprietary information, Westinghouse Electric Company LLC. The affidavit, which accompanies this letter, sets forth the basis on which the information may be withheld from public disclosure by the Commission and addresses with specificity the considerations listed in paragraph (b)(4) of 10 CFR Section 2.390 of the Commission's regulations.

Accordingly, this letter authorizes use of the accompanying affidavit by Nuclear Management Company.

Correspondence with respect to the proprietary aspects of the application for withholding or the Westinghouse affidavit should reference this letter, CAW-06-2145, and should be addressed to B. F. Maurer, Acting Manager, Regulatory Compliance and Plant Licensing, Westinghouse Electric Company LLC, P.O. Box 355, Pittsburgh, Pennsylvania 15230-0355.

Very truly yours,

D. D. Haas for

B. F. Maurer, Acting Manager
Regulatory Compliance and Plant Licensing

Enclosures

cc: G. Shukla

CAW-06-2145

AFFIDAVIT

STATE OF CONNECTICUT:

ss Windsor

COUNTY OF HARTFORD:

Before me, the undersigned authority, personally appeared M. J. Gancarz, who, being by me duly sworn according to law, deposes and says that he is authorized to execute this Affidavit on behalf of Westinghouse Electric Company LLC (Westinghouse), and that the averments of fact set forth in this Affidavit are true and correct to the best of his knowledge, information, and belief:

Michael J. Gancarz

M. J. Gancarz, Operations Manager
Nuclear Services
Westinghouse Electric Company, LLC

Sworn to and subscribed
before me this 16th day
of May, 2006

Laurie J. White
Notary Public

My Commission Expires: 8/31/09

(1) I am Operations Manager in Nuclear Services, Westinghouse Electric Company LLC (Westinghouse), and as such, I have been specifically delegated the function of reviewing the proprietary information sought to be withheld from public disclosure in connection with nuclear power plant licensing and rule making proceedings, and am authorized to apply for its withholding on behalf of Westinghouse.

(2) I am making this Affidavit in conformance with the provisions of 10 CFR Section 2.390 of the Commission's regulations and in conjunction with the Westinghouse "Application for Withholding" accompanying this Affidavit.

(3) I have personal knowledge of the criteria and procedures utilized by Westinghouse in designating information as a trade secret, privileged or as confidential commercial or financial information.

(4) Pursuant to the provisions of paragraph (b)(4) of Section 2.390 of the Commission's regulations, the following is furnished for consideration by the Commission in determining whether the information sought to be withheld from public disclosure should be withheld.

(i) The information sought to be withheld from public disclosure is owned and has been held in confidence by Westinghouse.

(ii) The information is of a type customarily held in confidence by Westinghouse and not customarily disclosed to the public. Westinghouse has a rational basis for determining the types of information customarily held in confidence by it and, in that connection, utilizes a system to determine when and whether to hold certain types of information in confidence. The application of that system and the substance of that system constitute Westinghouse policy and provide the rational basis required.

Under that system, information is held in confidence if it falls in one or more of several types, the release of which might result in the loss of an existing or potential competitive advantage, as follows:

(a) The information reveals the distinguishing aspects of a process (or component, structure, tool, method, etc.) where prevention of its use by any of

Westinghouse's competitors without license from Westinghouse constitutes a competitive economic advantage over other companies.

(b) It consists of supporting data, including test data, relative to a process (or component, structure, tool, method, etc.), the application of which data secures a competitive economic advantage, e.g., by optimization or improved marketability.

(c) Its use by a competitor would reduce his expenditure of resources or improve his competitive position in the design, manufacture, shipment, installation, assurance of quality, or licensing a similar product.

(d) It reveals cost or price information, production capacities, budget levels, or commercial strategies of Westinghouse, its customers or suppliers.

(e) It reveals aspects of past, present, or future Westinghouse or customer funded development plans and programs of potential commercial value to Westinghouse.

(f) It contains patentable ideas, for which patent protection may be desirable.

There are sound policy reasons behind the Westinghouse system which include the following:

(a) The use of such information by Westinghouse gives Westinghouse a competitive advantage over its competitors. It is, therefore, withheld from disclosure to protect the Westinghouse competitive position.

(b) It is information that is marketable in many ways. The extent to which such information is available to competitors diminishes the Westinghouse ability to sell products and services involving the use of the information.

(c) Use by our competitor would put Westinghouse at a competitive disadvantage by reducing his expenditure of resources at our expense.

(d) Each component of proprietary information pertinent to a particular competitive advantage is potentially as valuable as the total competitive advantage. If competitors acquire components of proprietary information, any one component may be the key to the entire puzzle, thereby depriving Westinghouse of a competitive advantage.

(e) Unrestricted disclosure would jeopardize the position of prominence of Westinghouse in the world market, and thereby give a market advantage to the competition of other countries.

(f) The Westinghouse capacity to invest corporate assets in research and development depends upon the success in obtaining and maintaining a competitive advantage.

(iii) The information is being transmitted to the Commission in confidence and, under the provisions of 10 CFR Section 2.390, it is to be received in confidence by the Commission.

(iv) The information sought to be protected is not available in public sources or available information has not been previously employed in the same original manner or method to the best of our knowledge and belief.

(v) The proprietary information sought to be withheld in this submittal is that which is appropriately marked in LTR-CDME-06-80-P, Rev. 1, "Palisades Tubesheet Inspection Depth," being transmitted by Nuclear Management Company letter and Application for Withholding Proprietary Information from Public Disclosure, to the Document Control Desk. The proprietary information as submitted by Westinghouse for use by Palisades Nuclear Plant enables Westinghouse to support utilities in identifying and applying a steam generator tubesheet inspection model and, in particular, to determine the tubesheet inspection length appropriate for the Palisades Nuclear Plant steam generators, including:

(a) The identification of important factors relevant to determining the recommended steam generator tubesheet inspection length, and

(b) Development of a generic methodology for applying the inspection length model to utilities with NSSS plants.

Further, this information has substantial commercial value as follows:

(a) Westinghouse plans to sell the use of similar information to its customers for purposes of meeting NRC requirements for licensing documentation.

(b) Westinghouse can sell support and defense of the inspection model.

(c) The information requested to be withheld reveals the distinguishing aspects of a methodology which was developed by Westinghouse.

Public disclosure of this proprietary information is likely to cause substantial harm to the competitive position of Westinghouse because it would enhance the ability of competitors to provide similar inspection models and licensing defense services for commercial power reactors without commensurate expenses. Also, public disclosure of the information would enable others to use the information to meet NRC requirements for licensing documentation without purchasing the right to use the information.

The development of the technology described in part by the information is the result of applying the results of many years of experience in an intensive Westinghouse effort and the expenditure of a considerable sum of money.

In order for competitors of Westinghouse to duplicate this information, similar technical programs would have to be performed and a significant manpower effort, having the requisite talent and experience, would have to be expended.

Further the deponent sayeth not.

CAW-06-2145

PROPRIETARY INFORMATION NOTICE

Transmitted herewith are proprietary and/or non-proprietary versions of documents furnished to the NRC in connection with requests for generic and/or plant-specific review and approval.

In order to conform to the requirements of 10 CFR 2.390 of the Commission's regulations concerning the protection of proprietary information so submitted to the NRC, the information which is proprietary in the proprietary versions is contained within brackets, and where the proprietary information has been deleted in the non-proprietary versions, only the brackets remain (the information that was contained within the brackets in the proprietary versions having been deleted). The justification for claiming the information so designated as proprietary is indicated in both versions by means of lower case letters (a) through (f) located as a superscript immediately following the brackets enclosing each item of information being identified as proprietary or in the margin opposite such information. These lower case letters refer to the types of information Westinghouse customarily holds in confidence identified in Sections (4)(ii)(a) through (4)(ii)(f) of the affidavit accompanying this transmittal pursuant to 10 CFR 2.390(b)(1).

COPYRIGHT NOTICE