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January 27, 1997

U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Attn: Document Control Desk

Subject: Zion Station Units 1 and 2
Application for Amendment to Facility
Operating Licenses DPR-39 and DPR-48
NRC Docket Nos. 50-295 and 50-304

- References:
- a) Letter from J. H. Mueller, Commonwealth Edison, to U. S. Nuclear Regulatory Commission, dated September 3, 1996
 - b) Letter from C. Y. Shiraki, NRC, to I. Johnson, Commonwealth Edison dated October 29, 1996
 - c) Letter from J. H. Mueller, Commonwealth Edison, to U. S. Nuclear Regulatory Commission, dated January 2, 1997

This letter transmits, pursuant to 10 CFR 50.90, an application for an amendment to Appendix A of Zion Unit 1 and 2 Facility Operating Licenses, DPR-39 and DPR-48. This amendment request proposes a revision to the Technical Specifications, such that use of the entire ABB/Combustion Engineering Topical Report, CEN-629-P, would be authorized as the governing document for installing Combustion Engineering (CE) sleeves in steam generator tubes. ComEd's agreement to submit this amendment request was documented by the NRC in a letter approving a previous amendment which allowed use of four sections of the Topical Report. Addendum 1 to the Topical Report has been included as an attachment to this amendment request to document the compatibility of tube sleeves with an increase in steam generator tube plugging limits.

This amendment application is comprised of the following attachments to this letter:

Attachment A provides a detailed Description and Safety Analysis for the proposed amendment.

Attachment B provides a copy of the affected pages of Supplement 9 to the Improved Technical Specifications (ITS), annotated to show the changes proposed by this amendment request, and provides a clean copy of the affected pages with the proposed changes incorporated. The proposed amendment is based on the ITS, since replacement of the current Technical Specifications with the ITS is expected to occur prior to NRC approval of this amendment request. The final supplement to the ITS is Supplement 9 which was submitted via Reference (c).

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Change *LTR* *Encl*
NRC PDR *1* *1 w/o PR op.*

Attachment C provides an evaluation of Significant Hazards Considerations for the proposed changes in accordance with 10 CFR 50.92.

Attachment D provides an evaluation of the need for an Environmental Assessment Statement of the proposed changes, in accordance with 10 CFR 51.21 and 10 CFR 51.22.

Attachment E provides a proprietary ABB/Combustion Engineering Report CEN-629-P Revision 02, entitled "Repair of Westinghouse Series 44 and 51 Steam Generator Tubes Using Leak Tight Sleeves."

Attachment F provides a non-proprietary ABB/Combustion Engineering Report CEN-629-NP Revision 02, entitled "Repair of Westinghouse Series 44 and 51 Steam Generator Tubes Using Leak Tight Sleeves."

Attachment G provides a proprietary ABB/Combustion Engineering Report CEN-629-P, Addendum 1, entitled "Repair of Westinghouse Series 44 and 51 Steam Generator Tubes Using Leak Tight Sleeves."

Attachment H provides a non-proprietary ABB/Combustion Engineering Report, CEN-629-NP, Addendum 1, entitled "Repair of Westinghouse Series 44 and 51 Steam Generator Tubes Using Leak Tight Sleeves."

Attachment I provides an ABB/Combustion Engineering affidavit that sets forth the basis upon which the information contained in Attachments E and G may be withheld from public disclosure.

Topical Report CEN 629-P, and Addendum to 1 that report (Attachments E and G) contain information proprietary to ABB/Combustion Engineering (ABB/CE), as indicated by an affidavit (Attachment I) signed by ABB/CE, the owner of the information. 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 Paragraph (b)(4) of Section 2.790 of the Commission's regulations. Accordingly, it is respectfully requested that the information which is proprietary to ABB/CE be withheld from public disclosure in accordance with 10 CFR 2.790.

This proposed amendment has been reviewed and approved by Zion Station On-Site and Off-Site Review Personnel in accordance with ComEd procedures. To the best of my knowledge and belief, the statements contained in this amendment application are true and correct.

Commonwealth Edison is notifying the State of Illinois of this application for amendment by transmitting a copy of this letter and its attachments to the designated state official.

Please direct any questions you may have concerning this submittal to this office

Respectfully,



J.H. Mueller
Site Vice President
Zion Station

Subscribed and Sworn to before me, a Notary Public in and
for the State of _____ and County of _____
this _____ day of _____, 1997

Notary Public

Attachments:

cc: NRC Regional Administrator - RIII
Zion Station Project Manager - NRR
Senior Resident Inspector - Zion Station
Office of Nuclear Facility Safety - IDNS
Zion NLA
Master Files
Reg. Assurance Files
DCD Licensing

ATTACHMENT I

ZION NUCLEAR GENERATING STATION

**ABB/COMBUSTION ENGINEERING AFFIDAVIT THAT SETS
FORTH THE BASIS UPON WHICH THE INFORMATION
CONTAINED IN ATTACHMENTS E AND G MAY BE WITHHELD
FROM PUBLIC DISCLOSURE**

**PROPOSED CHANGE
TO FACILITY OPERATING LICENSES
DPR-39 and DPR-48**

AFFIDAVIT PURSUANT

TO 10 CFR 2.790

I, Philip J. Curtis, depose and say that I am the Vice President, Engineering Operations, of Combustion Engineering, Inc., duly authorized to make this affidavit, and have reviewed or caused to have reviewed the information which is identified as proprietary and referenced in the paragraph immediately below. I am submitting this affidavit in conjunction with the application of Commonwealth Edison Co. and in conformance with the provisions of 10 CFR 2.790 of the Commission's regulations.

The information for which proprietary treatment is sought is contained in the following documents:

1. CEN-629-P, Rev. 02, "Repair of Westinghouse Series 44 and 51 Steam Generator Tubes Using Leak Tight Sleeves," November 1996.
2. Addendum 1 to CEN-629-P, "Repair of Westinghouse Series 44 and 51 Steam Generator Tubes Using Leak Tight Sleeves," January 1997.

These documents have been appropriately designated as proprietary.

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

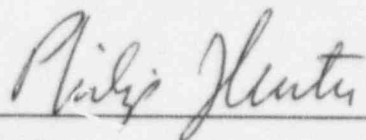
Pursuant to the provisions of paragraph (b) (4) of Section 2.790 of the Commission's regulations, the following is furnished for consideration by the Commission in determining whether the information sought to be withheld from public disclosure, included in the above referenced document, should be withheld.

1. The information sought to be withheld from public disclosure, is owned and has been held in confidence by Combustion Engineering. It consists of information concerning the steam generator tube repair process of sleeving, including qualification program results and analyses.
2. The information consists of test data or other similar data concerning a process, method or component, the application of which results in substantial competitive advantage to Combustion Engineering.
3. The information is of a type customarily held in confidence by Combustion Engineering and not customarily disclosed to the public. Combustion Engineering 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 details of the aforementioned system were provided to the Nuclear Regulatory Commission via letter DP-537 from F. M. Stern to Frank Schroeder dated December 2, 1974. This system was applied in determining that the subject document herein is proprietary.
4. The information is being transmitted to the Commission in confidence under the provisions of 10 CFR 2.790 with the understanding that it is to be received in confidence by the Commission.
5. The information, to the best of my knowledge and belief, is not available in public sources, and any disclosure to third parties has been made pursuant to regulatory provisions or proprietary agreements which provide for maintenance of the information in confidence.
6. Public disclosure of the information is likely to cause substantial harm to the competitive position of Combustion Engineering because:
 - a. A similar product is manufactured and sold by major pressurized water reactor competitors of Combustion Engineering.

- b. Development of this information by Combustion Engineering required tens of thousands of dollars and thousands of manhours of effort. A competitor would have to undergo similar expense in generating equivalent information.
- c. In order to acquire such information, a competitor would also require considerable time and inconvenience to develop an understanding of welded steam generator tube sleeve installation problems and evaluate specific examples based on test or pulled steam generator tube data and develop and qualify a steam generator tube sleeving program.
- d. The information consists of a description of the steam generator tube repair process of sleeving, including qualification program results and analyses, the application of which provides a competitive economic advantage. The availability of such information to competitors would enable them to modify their product to better compete with Combustion Engineering, take marketing or other actions to improve their product's position or impair the position of Combustion Engineering's product, and avoid developing similar data and analyses in support of their processes, methods or apparatus.
- e. In pricing Combustion Engineering's products and services, significant research, development, engineering, analytical, manufacturing, licensing, quality assurance and other costs and expenses must be included. The ability of Combustion Engineering's competitors to utilize such information without similar expenditure of resources may enable them to sell at prices reflecting significantly lower costs.

- f. Use of the information by competitors in the international marketplace would increase their ability to market nuclear steam supply systems by reducing the costs associated with their technology development. In addition, disclosure would have an adverse economic impact on Combustion Engineering's potential for obtaining or maintaining foreign licensees.

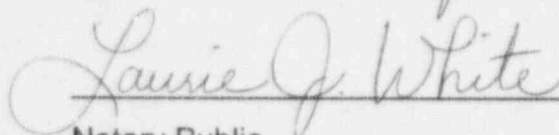
Further the deponent sayeth not.



Philip J. Curtis, Vice President
Engineering Operations

Sworn to before me

this 21st day of January, 1997



Notary Public

My commission expires: 8/31/99

ATTACHMENT A
ZION NUCLEAR GENERATING STATION
DESCRIPTION AND SAFETY ANALYSIS
PROPOSED CHANGE TO
FACILITY OPERATING LICENSES
DPR-39 AND DPR-48

Description of the Proposed Changes

Commonwealth Edison Company (ComEd) proposes to change Section 5.5.7.d.1 of the Improved Technical Specification (ITS) to reference, in its entirety, Combustion Engineering (CE) Report CEN-629-P, Revision 02 (provided as Attachment E), as defining an acceptable process for re-establishing the serviceability of steam generator tubes by utilizing welded CE sleeves.

In a previous amendment request (Reference (a)), ComEd proposed incorporating portions of Revision 00 of Topical Report CEN-629-P into its authorized CE tube sleeving process. These portions pertained to tube brushing, cleaning equipment, nondestructive examination, sleeve examination program and cleaning qualification. The NRC approved the proposed amendment via Reference (b). Reference (b) also documented ComEd's agreement to submit another proposed amendment which, after approval, would authorize the entire Topical Report as defining the process for installing CE sleeves.

Revisions 01 and 02 of Topical Report CEN-629-P have since been issued reflecting additional enhancements. In addition to implementing these enhancements, the proposed change would also authorize three types of sleeve installations that were not included in the portions of the Topical Report previously authorized in Reference (b).

Description of Current Requirements

Since replacement of the current Technical Specifications with Improved Technical Specifications is expected to occur prior to approval of this amendment request, this change is presented as a proposed amendment to the ITS final supplement (Supplement 9), which was submitted to the NRC via Reference (c).

ITS Surveillance Requirement 3.4.13.2 requires that steam generator tube integrity be verified in accordance with the SG Tube Surveillance Program. Requirements for the SG Tube Surveillance Program are contained in ITS 5.5.7. In accordance with the SG Tube Surveillance Program, if a degraded tube is identified, the tube must either be removed from service by plugging, or repaired to restore the structural integrity of the tube and to assure adequate leak tightness. Section 5.5.7.d. of the SG Tube Surveillance Program authorizes three different processes, provided by three different contractors, for repairing steam generator tubes by installing sleeves.

The currently authorized Combustion Engineering (CE) process is that described in Report CEN-331-P, Revision 1-P, along with Sections 4.5.3, 4.5.7, 5.0, and 9.3.1 of ABB/CE Report CEN-629-P, Revision 00. This process utilizes a Full Depth Tube Sheet (FDTS) sleeve that is up to 30 inches long and spans the full length of the tube within the tube sheet. The upper and lower ends of the sleeve are welded to the tube, and inspected, to form leakage barriers.

Bases for the Current Requirements

The existing SG Tube Surveillance Program ensures that the structural integrity of the steam generator tubes and sleeves will be maintained. Draft Regulatory Guide (RG) 1.121, "Bases for Plugging Degraded PWR Steam Generator Tubes," August 1976, serves as the bases for determining structural integrity requirements and safety margins. The inservice inspection of the tubes and sleeves is based on a modification of RG 1.83, Revision 1, July 1975. Inservice inspection of steam generator tubing and sleeving is essential in order to detect evidence of progressive degradation of the pressure boundary. Inservice inspection of the tubing and sleeving provides a means to identify the nature and cause of any degradation so corrective measures can be promptly taken.

The sleeving processes reestablish the primary to secondary pressure retaining boundary of a tube that contains degradation exceeding the repair limit. Installation of a sleeve provides a leak tight boundary that spans a defective area and restores the structural integrity of the tubing to satisfy the draft RG 1.121 requirements. The sleeves are designed to allow inservice inspection of the pressure boundary of the sleeve and tubing behind the sleeve. The plugging limit for the sleeve is derived from draft RG 1.121 analysis and utilizes an allowance for eddy current uncertainty and additional degradation growth.

The currently authorized CE tube sleeving process is based on steam generator operating normal and accident parameters that could result from a maximum of 15% of the tubes being plugged.

Reason for Requesting an Amendment

A previous Technical Specification amendment approved the use of Sections 4.5.3, 4.5.7, 5.0, and 9.3.1 of a new ABB/CE Topical Report, CEN-629-P, Revision 00, governing the steam generator tube sleeve installation process. The approved sections encompassed tube brushing, tube cleaning equipment, nondestructive examination, the sleeve examination program, and cleaning qualification. In the letter approving the amendment (Reference (b)) the NRC noted ComEd's agreement to submit another amendment request that would reference the complete new Topical Report in the Technical Specifications.

This proposed amendment will fulfill ComEd's agreement to reference the entire new Topical Report. The proposed amendment will also provide ComEd with three additional sleeving options for repairing degraded steam generator tubes. These options are, sleeves with bottom joints that are hard rolled rather than welded, sleeves that are slightly curved to allow installation in peripheral tubes, and sleeves installed at tube support plates.

The proposed amendment would also support an increase in the steam generator tube plugging limit above that currently authorized, by including Addendum 1 to ABB/CE Topical Report CEN-629-P in the documentation that provides the basis of the proposed change. An increase in the steam generator tube plugging limit, which will likely be requested in the near future, will affect the value of certain steam generator operational parameters that were assumed in analyzing the currently authorized CE sleeving process. Addendum 1 to the Topical Report demonstrates that the changes resulting from an increase in the steam generator tube plugging limit to 30%, do not affect the acceptability of previously installed sleeves and sleeves that may be installed in the future in accordance with the Topical Report.

Description of Proposed Requirements

ITS Section 5.5.7.d.1, which specifies the acceptable CE process for sleeving steam generator tubes, would be changed to reference ABB/CE Topical Report CEN-629-P, Revision 02. The existing reference to Report CEN-331-P, Revision 1-P, and sections 4.5.3, 4.5.7, 5.0, and 9.3.1 of ABB/CE Report CEN-629-P, Revision 00 would be deleted.

These changes are shown in Attachment B to this amendment request, which consists of a copy of affected pages of the currently proposed ITS, annotated to show the proposed changes, and a clean copy of the pages with proposed changes incorporated.

By referencing the entire ABB/CE Topical Report CEN-629-P, Revision 02 in the Technical specifications, the proposed amendment would allow the use of three additional types of sleeves not previously used at Zion Station. One of these is a FDTS sleeve similar to the type previously used, except that the sleeve is designed to be hard rolled at the lower end rather than welded. The lower end of the sleeve has a band of nickel and a band of metal oxide around the outside to facilitate hard rolling. The hard roll process expands the lower end of the sleeve against the inside of the tube, which is backed by the tube sheet, to form a leakage barrier. This sleeve design has been previously approved by the NRC for application with 3/4 inch tubes (Zion has 7/8 inch tubes) at another plant.

The second type of sleeve which would be authorized by the proposed amendment is another variation of the FDTS sleeve. This sleeve is slightly curved to allow it to be installed in the peripheral tube locations, i.e., in the tubes on the outside of the tube bundle where the curvature of the primary head precludes insertion of a straight tube. The sleeve is installed by inserting a short length into the tube, and then applying lateral force to the uninserted portion of the sleeve such that a portion of the upper end is straightened. The sleeve is then inserted another short distance and the process is repeated until the sleeve is fully inserted. The upper sleeve end is welded and the lower end is welded or hard rolled. The variation with the welded lower end has been previously approved by the NRC for installation at the Kewanee and Ginna nuclear power plants which use the same Westinghouse Model 51 steam generators that are installed at Zion Station. The NRC approved installation procedures for Kewanee and Ginna are CE Topical Reports CEN 413-P, dated January 1992, and CEN 320-P, Addendum 2-P, dated November 1988, respectively.

The third type of sleeve which would be authorized by the proposed amendment is the Tube Support (TS) sleeve. This sleeve is about 9 inches long and is installed above the tube sheet, either at a tube support plate or in a free span section of tube. The upper and lower ends are welded. This sleeve design has been previously approved by the NRC for application with 3/4 inch tubing at another plant.

Bases of the Proposed Change

The technical bases and qualification of all sleeve types which would be authorized by the proposed amendment are described in ABB/CE Topical Report CEN-629-P, Revision 02, and Addendum 1. Proprietary versions of this report and addendum are provided as Attachments E and G to this amendment request. The Topical Report documents the structural and mechanical tests and analyses that have been performed on the sleeve-tube assemblies to establish integrity under normal and accident conditions with appropriate margins of safety.

The results of the analytical and test programs described in the Topical Report demonstrate that all ABB/CE sleeve types authorized for use at Zion Station provide leak tight pressure boundaries that meet or exceed all established design criteria and margins of safety. The SG Tube Surveillance Program described in ITS Section 5.5.7 will continue to ensure that the structural integrity of the steam generator tubes and sleeves is maintained, and Zion Station will continue to use draft RG 1.121, August 1976, as the bases for determining structural integrity requirements and safety margins for normal operating and faulted conditions. The program for inservice inspection of the tubes and sleeves will continue to be based on RG 1.83, Revision 1, July 1975. The sleeve design conforms to the stress limits and margins of safety specified in Section III of the ASME Boiler and Pressure Vessel Code.

The effect of all CE sleeve types authorized by the proposed amendment on the performance of the steam generator was analyzed for heat transfer, flow restriction, and steam generation capacity. The installation of sleeves can result in a reactor coolant flow restriction, but it is significantly less than plugging a tube. Sleeve installation is therefore a preferable alternative to plugging when considering core safety margins based on minimum reactor coolant system flow rates. The evaluation of the installation of sleeves was based on the determination that loss of coolant accidents (LOCA) evaluations for the licensed minimum reactor coolant flow bound the combined effect of tube plugging and sleeving that is equivalent to the plugging limit in effect at that time. The sleeving installation will result in a resistance to primary coolant flow through the tube for other evaluated accidents.

Addendum 1 of the CE topical Report analyzes the effect of an increase primary to secondary differential pressure resulting from a tube plugging limit of up to 30%. This analysis demonstrates that, even with this increased differential pressure, the previously installed sleeves, and sleeves installed in the future in accordance with the Topical Report, will continue to meet the requirements of ASME Section III NB and draft RG 1.121.

The CE Topical Report provides the option of stress relieving welded sleeve/tube joints. Industry operating experience with welded CE sleeves has shown that, regardless of whether or not the sleeves have been stress relieved, no sleeve failures have occurred due to service induced degradation. Also, Eddy Current inspection of the approximately 10,000 welded sleeves in service industry wide, using the latest technology (the Plus Point probe), has identified no service related degradation in either stress relieved or as-welded sleeves. This industry wide experience is consistent with the examination results from five stress relieved sleeves pulled at Prairie Island, and six as-welded sleeves pulled at the Ringhals plant. Neither the stress relieved nor the as-welded sleeves showed any service induced degradation.

At Zion Station, welded CE sleeves have been installed since 1986, and all of these sleeves have been installed without stress relieving. Eddy Current inspections of the over 1200 previously installed sleeves, using the Plus Point probe, have identified no service related degradation. Based on the excellent history of CE welded sleeves both at Zion Station and industry wide, and on Zion Station's relatively low hot leg temperature of 594 °F, ComEd intends to utilize the as-welded sleeve option. ComEd will continue monitoring industry operating experience.

As noted in the CE Topical Report, the tooling and methods described in the report represent the current technology for leak tight sleeve installation and inspection. As technological advances are made in sleeve installation and/or inspection techniques, the new tooling, and/or processes, may be utilized after they have been laboratory-verified to provide improved sleeve installation methods, or after a suitable qualification program has demonstrated equivalent or superior performance. Such advances/improvements may be implemented provided that they do not involve alternative joining technology or alternative sleeve material, and provided that the 10 CFR 50.59 process has demonstrated that no unreviewed safety question will be created. The 10 CFR 50.59 process will be performed under ComEd's established program.

Schedule Requirements:

Zion Station Unit 1 is currently scheduled to shut down for a refueling outage on April 5, 1997. To allow application of the improved sleeving process during that outage, it is requested that the proposed license amendment be approved and issued prior to March 21, 1997.