



Commonwealth Edison

1400 Opus Place
Downers Grove, Illinois 60515

February 11, 1994

Dr. Thomas E. Murley, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Attention: Document Control Desk

Subject: Additional Information Regarding Westinghouse Laser Welded
Sleeving History and Operating Experience in Support of the
Byron/Braidwood Steam Generator Tube Sleeving Proposed License
Amendment, Dated August 13, 1993

Byron Station Units 1 and 2
(NPF-37/66; NRC Docket Nos. 50-454/455)

Braidwood Station Units 1 and 2
(NPF-72/77; NRC Docket Nos. 50-456/457)

- References:
1. J. A. Bauer Letter to T. E. Murley dated August 13, 1993 transmitting a Byron/Braidwood Proposed License Amendment Regarding Steam Generator Tube Sleeving Methodology
 2. WCAP-13698 Revision 1, "Laser Welded Sleeves For 3/4 Inch Diameter Tube Feeding-Type And Westinghouse Preheater Steam Generators"
 3. NRC and Westinghouse Electric Corporation Teleconference on February 9, 1994 Regarding Westinghouse Laser Welded Sleeving History and Operating Experience

Dear Dr. Murley:

This letter formally transmits additional information requested by Mr. Don Naujack of your Staff related to the review of WCAP-13698 Revision 1, "Laser Welded Sleeves For 3/4 Inch Diameter Tube Feeding-Type And Westinghouse Preheater Steam Generators". This information summarizes the Westinghouse laser welded sleeving history and operating experience as was discussed during a telephone conference between Mr. Naujack and Westinghouse personnel. This documentation is being submitted in support of the Byron/Braidwood Steam

150129

k:nla:byron:slevrai2:1

9402160266 940211
PDR ADDCK 05000454
P PDR

ADD 1

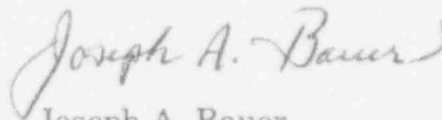
February 11, 1994

Generator Tube Sleeving Proposed License Amendment, Dated August 13, 1993.

To the best of my knowledge and belief, the statements contained in this document are true and correct. In some respects these statements are not based on my personal knowledge, but on information furnished by other CECOs employees, contractor employees, and/or consultants. Such information has been reviewed in accordance with company practice, and I believe it to be reliable.

Please address any comments or questions regarding this matter to this office.

Respectfully,



Joseph A. Bauer
Nuclear Licensing Administrator

JAB/gp

Attachment: Westinghouse Laser Welded Sleeving History and
Operating Experience

cc: R. R. Assa, Braidwood Project Manager - NRR
G. F. Dick, Byron Project Manager - NRR
D. Naujack, Materials and Chemical Engineering Branch - NRR
H. Peterson, SRI - Byron
S. G. Dupont, SRI - Braidwood
B. Clayton, Branch Chief - Region III
Office of Nuclear Facility Safety - IDNS

WESTINGHOUSE LASER WELDED SLEEVING HISTORY AND OPERATING EXPERIENCE

Since 1988 a total of 914 laser sleeve welds have been made by the Westinghouse processes and placed in service. This includes 54 welds made with the CO₂ laser welding process and 860 made with the pulsed YAG laser welding process as summarized in Table 1. There have been no reported operational problems with these sleeves. Details of the operating experience and post operation examinations performed on the laser welded sleeves are provided below.

DOEL UNIT 3

The first laser welded sleeves installed by Westinghouse were tubesheet sleeves installed in Doel Unit 3 in the Summer of 1988. These were welded with the CO₂ laser welding process. The welds in the upper end of the tubesheet sleeve were stress relieved after welding with a tungsten filament bulb as the heat source and the welds were ultrasonically examined prior to returning the plant to operation.

Because of some questions arising from the initial ultrasonic examination, i.e., the condition of the weld surface was such that it was difficult to interpret the NDE results, two tubes were pulled in 1989 after one cycle of service. The tubes were subjected to extensive destructive examinations to evaluate weld geometry, weld integrity and tube integrity (Ref. 1). The weld integrity was determined to be good although the weld geometry in one tube, while adequate as evidenced by the acceptable service, was not consistent with the design geometry. The Reference did state that "there is no evidence of degradation" of the welds or the tubes after the one cycle of service.

The remaining sleeved tubes had been in service in Doel 3 since the sleeves were installed in 1988 until the steam generators were replaced in 1993. There were no reported problems with the sleeves during this period.

FARLEY UNITS 1 AND 2

Laser welded sleeving has also been performed in Farley Units 1 and 2 commencing with the 1992 spring outage of Unit 2. Since that time a total of 860 support plate and top of tubesheet sleeve welds have been placed in service in sleeved tubes in the Farley steam generators. These laser welds were made with the pulsed YAG laser welding process, were stress relief heat treated, and were ultrasonically examined. Of the 860 welds, 153 have been in service since the Spring of '92, 329 have been in service since the Fall of '92 and 378 have been in service since the Fall of '93.

In the Spring of 1992 and the Fall of 1992, the newly installed sleeves in Farley Units 1 and 2 were UT examined for weld integrity and with a 0.620 inch diameter crosswound bobbin probe supplied by Zetec. In the Fall of 1993 the 153 previously installed (Spring 1992) sleeve welds were also examined with the crosswound coil; no report of degradation was recorded for any of the sleeved tubes which had been in service for approximately 18 months.

Reference 1. Expertise Des Tubes R22 C50 et R23 C68 Extraits

En September, Laboralec Document C-ChL/cg/CO1-07183-003, January 15, 1990.

Table 1. Summary of Westinghouse Laser Welded Sleeve Installations Placed in Service

Plant	Time	Number of Sleeves		Number of Welds
		Support Plate	Tubesheet (1)	
Farley Unit 2	Spring '92	62	29	153
Farley Unit 2	Fall '93	121	136	378
Farley Unit 1	Fall '92	142	45	329
Doel Unit 3	Summer '88		54(2)	54
<p>NOTE: 1. The support plate sleeves have two welds, one positioned at each end. The tubesheet sleeves for these applications also have two welds but only the upper sleeve weld is heat treated. Only the upper weld of the tubesheet sleeve is included in this tabulation.</p> <p>2. The laser sleeve welds in Doel 3 were made with the CO2 laser weld process. All others were made with the pulsed YAG laser weld process.</p>				