~~Enclosure 4.~~

UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

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Memo to Files

THRU: J. B. Henderson, Chief, Construction Branch, RO

BABCOCK & WILCOX (B&W) REPORT NO. BAW-1402 DTD 1/73
INCOMPLETE DOCUMENTATION OF WELD METAL USED IN REPAIR OF
STEAM GENERATORS

The subject report was reviewed and evaluated by TAB:RO and Technical Review, L. The report evaluates the "carbon equivalent" of the weld metal with unknown mechanical properties with the known strengths of materials with the same "carbon equivalent". The "carbon equivalent" is calculated by weldability formulas that permit considerable variation in chemistry, and is more a measure of crack susceptibility of the alloy composition rather than the strength of materials. Experience has demonstrated that the tensile and impact properties of 70XX and 80XX materials almost always meet the ASTM minimum requirements. However, conditions of welding or heat treatment of the 11018-M material could produce variations in tensile values; therefore, B&W was requested to perform comparative hardness tests across representative weld repairs which were made with 11018-M material for correlation with material strength based on carbon equivalents.

The results of such tests were provided by phone by Mr. J. F. Mallay on April 11, 1973. The test was conducted on a test weld using 11018-M material, subsequently heat treated in a manner consistent with the heat treatment for the steam generators, and was measured to Rockwell hardness A Scale (60 kgf). The results were:

1/4 point	Base Metal	44, 45, 45, 46
	HAZ	46, 46, 46, 46
	Weld Metal	54, 54, 55, 54, 54
1/2 point	Base Metal	46, 46, 46, 46
	HAZ	46, 46, 46, 46
	Weld Metal	55, 55, 55, 55, 55

The chemistry of the 11018-M material with unknown tensile and impact strengths was found to meet the requirements of SFA-5.5 (AWS-A5.5-69 - replaces ASTM A316).

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~~Enclosure 4~~

APR 2 3 1973

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Based on the comparative analysis of material with known properties and those of certain unknown properties, further supported by the hardness tests of the more sensitive 11018-M material, we conclude that there is reasonable assurance that the suspect materials will have acceptable tensile and impact properties.

On these bases we believe that the weld repairs of the steam generators discussed in the report are acceptable for their intended service, and have no further questions concerning this matter.

Original signed by
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