MASTER

DUQUESNE LIGHT COMPANY
SHIPPINGPORT ATOMIC POWER STATION

TEST RESULTS

DLCS 1550103
T-612080

EXAMINATION OF COMPONENTS FOR CRUD AND CORROSION

1C REACTOR COOLANT PUMP D/P CELL

CORE I SEED 1

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Purpose

To observe and document the extent and location of crud deposits and corrosion or any other defect in components of the Reactor Coolant System and its auxiliaries. This particular performance involves a ruptured bellows of the 1C reactor coolant pump D/P cell.

Conclusions

The 1C reactor coolant pump D/P cell was removed from service and a small hole was found in the bellows assembly of the cell. The cause of this bellows damage is not known. A reddish, uniformly distributed crud deposit was found on components of the D/P cell which had come in contact with the reactor coolant water. The specific activity of this crud was very low, indicating that very little reactor coolant water was circulated in the pressure sensing lines.

Description of Test Equipment and Test Procedure

The 1C reactor coolant pump D/P cell was removed from service after efforts to calibrate the cell were unsuccessful. In conjunction with the required maintenance work the D/P cell was disassembled and a visual inspection was made of the components which had come in contact with the reactor coolant water to determine the extent of crud and corrosion.

Results

The 1C reactor coolant pump D/P cell (No. 310991) was removed from the Reactor Coolant System on January 22, 1959. The last previous operation of the D/P cell was on November 3, 1958. At that time, the Station was shut down for maintenance. The cell was disassembled in order to determine the reason that the calibration had failed. Examination of the components revealed that the bellows assembly had a small hole in the welded seam at the upper end of the bellows. The cause of this bellows damage is not known.

The D/P cell was also examined for crud and corrosion. A red crud deposit was distributed over the components which had come in contact with the reactor coolant water. This deposit was similar to the crud formed in lower temperature areas (Fe_2O_3 as opposed to Fe_3O_4). The crud was easily removed with a smear paper and the metal surface beneath the crud was free from corrosion and pitting. The

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radio-chemical analysis of this crud is given in Table I. A comparison of the specific activity of Co^{60} in this crud sample with the specific activity of Co^{60} in fresh crud from the coolant taken in November, 1958, indicates that the concentration of "fresh crud" in this sample is 0.01 per cent. This low activity is probably due to the fact that, although the D/P cell had been in service since the initial fill of the Reactor Coolant System, the circulation of water in the pressure sensing lines was very small or non-existent.

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POWER STATIONS DEPARTMENT
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TABLE I

SPECIFIC ACTIVITY OF CRUD
1C Reactor Coolant Pump D/P Cell

Nuclide	Specific* Activity
Co ⁶⁰	1.4×10^3
Fe ⁵⁹	3.9×10^2
Mn ⁵⁴	2.5×10^2
Co ⁵⁸	1.7×10^2

Last date of D/P cell service - November 3, 1958

Date of D/P cell removal - January 22, 1959

Date of crud analysis - March 6, 1959

* DPM/Mg

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