Central files
memo 4

NOV 7 1977

MEMORANDUM FOR: D. G. Eisenhut, Assistant Director for Operational Technology, Division of Operating Reactors

FROM: L. C. Shao, Chief, Engineering Branch, Division of Operating Reactors

SUBJECT: CHEMICAL CLEANING PWR STEAM GENERATORS: UNITED NUCLEAR INDUSTRIES INTERIM REPORTS 3 & 4, DN'S 50-3/247

Attached herewith for your information are copies of Interim Reports 3 and 4 covering the steam generator cleaning solvent development for Indian Point No. 1 and 2. Reports 1 and 2 have not been transmitted to the staff because during these reporting periods major effort was devoted to making up test equipment and testing.

The preliminary data (note Report No. 4) shows that the Citrosolv process is the leading candidate with respect to Magnitite removal and lack of corrosiveness of steam generator materials.

If you have any comments on the information transmitted herewith please forward them to D. C. DiIanni.

L. C. Shao, Chief
Engineering Branch
Division of Operating Reactors

cc w/o enclosure: V. Stello
P. Erickson
[redacted]

cc: W. Butler
M. Fairtile
F. Almeter
W. Hazelton
J. Weeks, BNL
L. Barrett
B. Grimes
R. Stuart

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OFFICE	EB:DOR	EB:DOR	EB:DOR			
SURNAME	DCDiIanni:dr	WHazelton	LCShao			
DATE	10/17/77	10/ /77	10/ 8/77			

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

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UNITED NUCLEAR INDUSTRIES, INC.
A SUBSIDIARY OF UNITED NUCLEAR CORPORATION

COMMERCIAL DIVISION

1201 JADWIN AVENUE RICHLAND, WASHINGTON 99352 (509) 946-7661

September 26, 1977

Consolidated Edison Company of New York
4 Irving Place
New York, New York 10003

Attention: Mr. Paul F. McTigue

Dear Mr. McTigue:

Enclosed are six copies of the second reporting of results from our laboratory evaluation program for selecting a solvent to clean the secondary sides of the Indian Point steam generators. This report represents UNI's fourth progress report to Consolidated Edison.

Analysis of the data, in the attached reports, show that at this point in time the Citrosolv process is the leading candidate in terms of magnetite removal effectiveness and lack of corrosiveness to the steam generator materials of construction. Our favored solvent prior to the initiation of the test program, the Citrox process, exhibited less corrosiveness and more effective magnetite removal than the Citrosolv process; however, considerable iron oxalate precipitation occurred on steel surfaces in crevice areas, and this has led us to discard this solvent from future testing. Various chelant-base solvents were either too corrosive or not very effective in magnetite removal but some are being tested further where the potential warrants.

Our pressure autoclave tests are completed and the data are being evaluated. Results will be reported shortly.

The procedures for conducting the steam generator cleaning are nearly all drafted and we will be sending you a comment copy in a few days.

We have had our cleaning approach, laboratory testing program and results to date, and our procedures reviewed by our consultant, Sheppard T. Powell Associates. Sheppard T. Powell Associates have been providing chemical cleaning consulting services to the industry for several decades. Their review was favorable in all respects and in addition they contributed many helpful suggestions to make the cleaning operation safer, faster, and more effective.

Our mockup for testing the alternate wetting and drying technique, flash evaporation to dry tube support crevices, and ultrasonic aids has been fabricated, installed and testing initiated. These tests will continue for a few weeks and as outlined in the technical program plan the results from the more complicated tests will be available for the IP-2 cleaning. Our laboratory test program is in the final wrap-up stages; we are in the process of optimizing solvent conditions such as temperature, inhibitor, inhibitor concentration, surfactant, etc., with these tests being conducted with the Citrosolv solvent. Please indicate if you concur with this choice after you have read the attached report.

Paul, we feel we have accomplished a tremendous amount of work in a very short time on this project, all of which is highly beneficial to you in your cleaning demonstration program. We are looking forward to applying these results to a successful on-reactor demonstration. If you have any questions on the results to date please call me, or perhaps we can get together for another review session at your convenience.

Very truly yours,

A P Larrick

A. P. Larrick
Project Manager

cc: John P. Dusch
Sam Rothstein
Paul L. Silliman