

P21 94026



CONAX BUFFALO CORPORATION • 2300 WALDEN AVENUE, BUFFALO, NEW YORK 14225
716-684-4500 • 1-800-223-2389 • FAX: 716-684-7433

IMI

January 19, 1994

NRC Operations Center
U. S. Nuclear Regulatory Commission
Washington, DC 20555

**SUBJECT: NOTIFICATION OF POTENTIAL DEFECT
CONAX BUFFALO QUALIFIED "Nuclear
Service Connectors" (Quick Disconnects)**

Gentlemen:

The purpose of this letter is to provide notification regarding a potential defect in certain models of Conax Buffalo Nuclear Service Connectors (NSC) used in quick-disconnect applications which are sensitive to fluctuations in resistance.

This formal notification is submitted in compliance with the requirements of 10CFR21. The following information is provided to the extent known to date.

I.) Reporting Individual:

R. A. Fox, President
Conax Buffalo Corporation
2300 Walden Avenue
Buffalo, NY 14225
(716) 684-4500

II.) Component Supplier

Conax Buffalo Corporation
2300 Walden Avenue
Buffalo, NY 14225

"Excellence By Choice.....Not By Chance"

III.) Nature of Potential Defect

The nature of the potential defect is a variable (i.e., "Noisy") electrical resistance for NSC circuits with copper conductors when measured at the conductors across the NSC electrical contacts (pins and/or sockets). This variance could pose problems for applications which are sensitive to fluctuations in electrical resistance.

This situation was brought to Conax Buffalo's attention by Mr. Larry M. Potochnik of Westinghouse Electric Corporation, Process Control Division, in a telephone conversation with Mr. John D. MacDonald of Conax Buffalo Corporation on November 15, 1993. Mr. Potochnik reported that approximately 15% of the NSCs tested at the Sizewell B Plant in England were exhibiting fluctuating resistances during post-installation electrical testing, and that two (2) of the NSCs were being returned to Conax Buffalo for analysis. These NSCs with fluctuating resistances were all mechanically crimped to copper conductors. Westinghouse found no problems with NSCs which were mechanically crimped to thermocouple conductors.

IV.) Cause

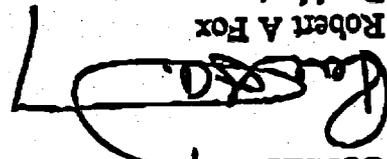
Conax Buffalo first performed resistance measurements on the returned NSCs, then had a sectioned pin specimen analyzed by Scanning Electron Microscope (SEM) and Energy Dispersive X-ray (EDX). The resistance measurements taken at Conax Buffalo on the returned Westinghouse specimens did not reveal any erratic readings, however the SEM/EDX analysis revealed oxides to be present in the crimp joint region, which was a possible indication that a good, intimate contact between the conductor and the contact crimp barrel was lacking. Application of a mechanical crimp is the method of attachment for the conductors to the NSC electrical contacts (pins and sockets). Conax Buffalo subsequently performed testing on various crimp joint configurations ("W" crimp, Hex crimp, etc.) on both inconel (which is the returned Westinghouse NSC contact material) and silver plated copper contacts, since both materials are in service in the field on NSCs with copper conductors. After exposure to temperatures between 150°F and 550°F and agitating the copper conductor, some of the test specimens exhibited erratic resistance readings ranging from approximately .003Ω to 7.3Ω for silver plated copper (maximum peak: 66.8Ω) and from approximately .009Ω to 4.1Ω for inconel (maximum peak: 25.9Ω).

cc: W. C. Fedetick, V.P. - Nuclear Products Division
 I. D. MacDonald, Product Manager - Nuclear Products Division
 B. J. Jankowski, Director, International Marketing/Sales - Nuclear Products Division
 T. P. Schaefer, Chief Engineer - Nuclear Products Division
 R. F. Dulski, QA Manager

/dh

President

Robert A Fox



CONAX BUFFALO CORPORATION

Sincerely,

For further clarification of our position or any additional information, please contact Mr. N. A. Oszaszewski, Conax Buffalo Corporation, at (716) 684-4500, ext. 326.

Conax Buffalo will provide notification of these findings to all utilities which have been supplied NSCs with copper conductors and recommend that system requirements be analyzed on a case by case basis to determine if these resistance fluctuations can be tolerated. Within the next 30 days, Conax Buffalo will prepare a final report which will list all utilities which have been supplied NSCs with copper conductors and 2) provide a recommended design for applications where replacement may be required.

V.) Corrective Action