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NORTHEAST UTILITIES



THE CONNECTICUT LIGHT AND POWER COMPANY
WESTERN MASSACHUSETTS ELECTRIC COMPANY
HOLYOKE WATER POWER COMPANY
NORTHEAST UTILITIES SERVICE COMPANY
NORTHEAST NUCLEAR ENERGY COMPANY

General Offices • Seiden Street, Berlin, Connecticut

P.O. BOX 270
HARTFORD, CONNECTICUT 06141-0270
(203) 665-5000

January 8, 1992

Docket No. 50-336
A10024

Re: Employee Concerns

Mr. Charles W. Hehl, Director
Division of Reactor Projects
U.S. Nuclear Regulatory Commission
Region I
475 Allendale Road
King of Prussia, PA 19406

Dear Mr. Hehl:

Millstone Nuclear Power Station, Unit No. 2
RI-91-A-0278

We have completed our review of an identified issue concerning activities at Millstone Unit No. 2. As requested in your transmittal letter of November 19, 1991, our response does not contain any personal privacy, proprietary, or safeguards information. The material contained in this response may be released to the public and placed in the NRC Public Document Room at your discretion. The NRC transmittal letter and our response have received controlled and limited distribution on a "need-to-know" basis during the preparation of this response.

The response to this allegation was originally due on December 24, 1991. Additional time in which to respond was granted in telephone conversations with the Region I Staff on December 19, 1991, and January 7, 1992.

ISSUE:

"The Unit 2 non-safety related turbine and computer battery procedures are deficient. The inter-cell connectors are required to be checked clean and tight, but the procedures as written fail to provide specific requirements for:

1. "Inter-cell and end-cell connecting bar bolt torque and re-torque frequency;
2. "Acceptable values for inter-cell electrical connection resistance, test method (voltage drop or resistance measurements) and test frequency; and
3. "Electrical connection bar temperature measurements during battery performance discharge test.

"The manufacturer recommends inspecting connector integrity at least four times per year. This inspection includes cleanliness, torque values and inter-cell voltage drop or resistance (IEEE Standard 450-1980 discusses inter-cell resistance).

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PDR FOIA
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"As these specific requirements should also apply to the Unit 2 safety related station batteries (201A and 201B), those procedures may also be deficient. In particular, the specific requirements in these procedures for periodically rechecking connecting bar fastener tightness and measuring electrical connection bar temperature during load testing were questioned."

REQUEST:

"Please provide your review of the above assertions. In particular, address if:

1. "Terminal bolt torque checks are required;
2. "Terminal resistance checks are required; and
3. "Inspection for hot spots during a test discharge are required.

"Also please provide what specific directions are given to the technicians for both the non-safety related (reference: procedure MP 2720F1) and safety related (reference: procedure MP 2720F2 and SP 2736E) batteries.

"If the above concerns are valid, notify us of the corrective actions you have taken to prevent recurrence. Also provide us with an assessment of the safety significance of any identified deficiencies, including generic considerations."

RESPONSE:

This assertion is partly valid. As discussed below, the battery is tested periodically for high resistance connections and hot spots, and connectors are verified to be tight. However, we are considering revising the test frequency and will revise the torque criteria.

1. Terminal bolt torque: The issue of terminal bolt torque values was initially brought to our attention on October 10, 1991. Following discussions with the Millstone Unit No. 2 Engineering Department, a change which provided specific retorquer values was made to Procedure SP 2736A--"Battery Pilot Cell Surveillance." This change to SP 2736A became effective November 7, 1991. Procedure MP2720F2-- "Battery Terminal Inspection and Cleaning"--contains specific retorquing values to be used when batteries are disassembled for cleaning.

On November 4, 1991, the Millstone Unit No. 2 Maintenance Department requested assistance from the Millstone Unit No. 2 Engineering Department in evaluating the remaining procedures dealing with battery surveillance and testing to ensure these procedures are consistent in addressing torque values and torquing check frequency. The information provided by the Engineering Department will be utilized to revise the battery service test procedures prior to the next service test, currently scheduled for the next refuel outage.

2. Terminal resistance checks: Terminal resistance checks are required and are provided for in SP2736E-- "Battery Service Test"--by the measurement and recording of voltage drops across the terminals of a battery cell. Loose

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battery terminals will result in a high resistance path which would be detected by a corresponding unacceptably high voltage drop across the connections of the affected cell. We have not detected any high cell connection voltage drops during discharge testing of the batteries.

Discussions with the battery manufacturer have indicated that the voltage drop method of resistance checking is effective only when the battery being monitored is being discharged at a known rate as in the discharge testing surveillances. Recommendations that supplemental resistance checks be performed have resulted from discussions between the battery manufacturer and the Millstone Unit No. 2 Maintenance and Engineering departments. Millstone Unit No. 2 Maintenance will work with Millstone Unit No. 2 Engineering to establish test methods for resistance checks, frequency, and acceptance criteria to be incorporated into appropriate maintenance procedures prior to the next battery service test.

3. Inspection for hot spots: As hot spots are caused by high resistances during battery discharge, we consider the cell connection voltage drop measurements made during discharge testing to be adequate and specific inspection for hot spots is not required. The combination of visual inspections of battery connections (done weekly under Procedure MP2720F1--"Computer and Turbine Battery Inspections"), retorquing, resistance checks, and cell connector voltage drops during testing, are considered sufficient to prevent "hot spots."

Specific directions for technicians performing the above practices are contained in the applicable procedures.

After our review and evaluation of this issue, we find that this issue did not present any indication of a compromise of nuclear safety, nor were there any generic implications associated with the issues discussed herein. We appreciate the opportunity to respond and explain the basis of our actions. Please contact my staff if there are further questions on any of these matters.

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY



J. F. Opeka
Executive Vice President

- cc: W. J. Raymond, Senior Resident Inspector, Millstone Unit Nos. 1, 2, and 3
E. C. Wenzinger, Chief, Projects Branch No. 4, Division of Reactor Projects
E. M. Kelly, Chief, Reactor Projects Section 4A
J. T. Shedlosky, U.S. Nuclear Regulatory Commission, Millstone

RECORD OF ALLEGATION PANEL DECISIONS

SITE: Mills tone 2 PANEL ATTENDEES:

ALLEGATION NO.: RI-91-A-0228 Chairman - Wiggins

DATE: 210C791 (Panel No. 1 2 3 4 5) Branch Chief - _____

PRIORITY: High Medium Low Section Chief (AOC) - Kelly

SAFETY SIGNIFICANCE: Yes No Unkn Sr. Allegation Coord (SAC) Fuhrmeister

CONCURRENCE TO CLOSEOUT: DD BC SC OI Representative - _____

CONFIDENTIALITY GRANTED: Yes No (Other) Durr, Raymond (1)

(See Allegation Receipt Report)

IS THERE A HARASSMENT/DISCRIMINATION ISSUE: Yes No

IF YES,

1) has the individual been informed of the DOL process and the need to file a complaint within 30 days Yes No

2) has the individual filed a complaint with DOL Yes No

3) has a letter been sent to the complainant seeking any safety concerns Yes No

IS A CHILLING EFFECT LETTER WARRANTED: Yes No

IF YES, HAS IT BEEN SENT Yes No

HAS THE LICENSEE RESPONDED TO THE CHILLING EFFECT LETTER: Yes No

ACTION: RESP ECD

- 1) Turnover to NU in letter ask about, DEP 2010091
- 2) a) Terminal bolt torque checks
- 3) b) terminal resistance checks
- 4) c) looking for hot spots during test discharge
- 5) ask specifically what direction is given the technicians with regard to these - cite the procedure MP-2720F1

NOTES: _____

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ENCLOSURE

Issue 91-A-278:

The Unit 2 non-safety related turbine and computer battery procedures are deficient. The inter-cell connectors are required to be checked clean and tight, but the procedures as written fail to provide specific requirements for:

- (1) Inter-cell and end-cell connecting bar bolt torque and re-torque frequency;
- (2) Acceptable values for inter-cell electrical connection resistance, test method (voltage drop or resistance measurements) and test frequency; and
- (3) Electrical connection bar temperature measurement during battery performance discharge tests.

The manufacturer recommends inspecting connector integrity at least four times per year. This inspection includes cleanliness, torque values and inter-cell voltage drop or resistance (IEEE Standard 450-1980 discusses inter-cell resistance).

As these specific requirements should also apply to the Unit 2 safety related station batteries (201A and 201B), those procedures may also be deficient. In particular, the specific requirements in these procedures for periodically rechecking connecting bar fastener tightness and measuring electrical connection bar temperature during load testing were questioned.

Request:

Please provide your review of the above assertions. In particular, address if:

- (1) Terminal bolt torque checks are required;
- (2) Terminal resistance checks are required; and
- (3) Inspection for hot spots during a test discharge are required.

Enclosure Page 1

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Also please provide what specific directions are given to the technicians for both the non-safety related (reference: procedure MP-2720F1) and safety related (reference: procedure MP-2720F2 and SP-2736E) batteries.

If the above concerns are valid, notify us of the corrective actions you have taken to prevent recurrence. Also provide us with an assessment of the safety significance of any identified deficiencies, including generic considerations.

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December 13, 1991
EN2-91-453

TO: Don Wampole
C&D
(215) 828-9000 Ext. 323
Fax (215) 834-7306

FROM: J. M. Scheeler
Millstone Unit 2 Engineering
(Extension 4459)

SUBJECT: Telecon concerning Station Safety Related Battery
Call Date: 12/10/91 @ 1630 and 12/11/91 @ 1630

- Reference: (1) C&D Installation and Operating Instructions
for Station Batteries (#12-600)
(2) C&D Standby Battery Flooded Cell Installation
and Operating Instructions #12-800.

I called C&D concerning inquiries of Maintenance for clarification of Station Battery Procedures. I spoke to Don concerning the station batteries on 12/10 and he called me back on 12/11 to confirm or verify the following. I informed Don we have battery cell type LCU-33.

1. Discussed with Don torque values for cell connectors. Informed Don we appear to have the stainless steel intercell connecting hardware, type C of figure 4.2 reference 2. Don informed me that this would be the type connecting hardware used for our type cell. Reference 1 on file for Millstone 2 batteries gives torque values for LC-33 in table 2, page 10 as 160(-)0,+10 in-lbs. with retorque value of 125 in-lbs.. Reference 2, for a LCR-33 type cell, which Don verified would be comparable to our LCU-33 for torque applications, specifies a torque value of initial 160 in.-lbs. with a subsequent retorque value of 125 in.-lbs.. Don verified the tolerance of (-)0,+10 in.lbs. is acceptable for the retorque values.
2. Discussed with Don when the "initial" torque values are to be used and when the "retorque" values are to used. Don informed me the initial torque is upon installation of connection or after removal of connection for cleaning and upon re-installation of the connection. The retorque value is applicable when performing a maintenance torque check of connections. Don informed me if a connection is found which appears "loose" on visual inspection, the connection should be tightened to the "retorque" value as long as there is no visible evidence of corrosion on the post or terminal. This retorque is a minimum acceptable value of a clean connection which has been previously torqued to an initial torque value to remove any irregularities between contacting surfaces. If corrosion appears at a "loose" connection this should be removed, cleaned, prepared, and torqued to the initial torque value in accordance with the

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C&D operating instructions. Don informed me the retorquer is, again, a torque to verify minimum torque of the connection, not to verify initial torque value. Therefore, a connection is not required to be loosened, and then torqued, to the retorquer value during maintenance check. Just verify the connection is at this minimum maintenance torque value.

Reference 1 recommends a maintenance torque performed quarterly; reference 2 recommends the maintenance torque be performed semi-annually. I spoke to Don and it is recommended the maintenance torque be performed quarterly, though it would be acceptable if performed semi-annually. Don noted the maintenance torque should not be performed immediately after discharge test as the connections are still warm as a result of the test.

3. I informed Don the connections on the posts which utilize the terminal plate are connected to the posts with stainless steel hardware. The connection of the cable lug to the terminal plate (PT-423) is made using a type B (Figure 4.2 of reference 2) bolt assembly. This is a brass stud and brass inserted cast lead nuts. I informed Don that we would like to replace this type of connection bolt hardware with a Type C (Figure 4.2 pg. 10 of ref. 2) stainless steel bolt and hardware similar to that used on the intercell connections. Don verified this is acceptable and it is C&D's recommendation to change-out to the stainless steel hardware. The torque to be used for the existing connection hardware using the brass stud and brass cast lead nuts is 150 (-)0, +10 in. lbs. with subsequent retorquer to 125 (-)0, 10 in. lbs.. Don informed me the torque to be used is based on the post type not the connecting hardware type as seems to be suggested in the table 3, page 11 of reference 2.
4. Discussed with Don our existing testing. I informed Don we currently perform Voltage Drop tests of our intercell and interrow connections to verify connection integrity. This is performed during a rated discharge test of 290 amps for 8 hours with our acceptance criteria of <25mv for intercell or <80mv for inter-tier connections. This is in accordance with reference 1 and 2. I asked Don if it is recommended that during this test, if the voltage drops are out of the specified criteria, should the test be halted and the connection repaired. Don informed me it is recommended the test be halted and the connection inspected. The required action would be per item 2 above i.e., torque to retorquer tightness if the connection is clean with no corrosion, or remove connection and clean and torque to initial values, in accordance with C&D operating if corrosion appears at connection. Test should not continue due to the possibility of a high resistance connection which may cause further damage to the battery system.

- 5. I informed Don that we do not now, nor during initial installation, require a measurement of connection resistance as per recommended in reference 1 and 2 and IEEE 480. Don informed me it is recommended to perform this resistance check to verify connection integrity. Although no initial baseline data is available from initial battery installation, Don informed me the criteria for acceptance can be established by performing this testing and noting those connections with resistance values that exceed the average by 20%.
- 6. Talked to Don concerning monitoring of connection terminal temperature during a discharge test such as with a Infrared thermometer. Don informed me this seems to something which is being used more often in the field. I asked Don what temperature values we should be looking at. He said we should be looking at connections which are out ~~the~~ of average of the connections being monitored and not a specific temperature. With the resistance test, maintenance torque tests, and voltage drop tests being performed, the temperature monitoring of the connections is just another "tool" but not required.
- 7. I inquired of Don spare parts availability. I informed Don of our current drawing part numbers and Don verified part numbers as follows:

Intercell connector - PK2627
 Auxiliary Intercell connector - PK2635
 Terminal Plate - PT-423 Replace by PT-429

PT-449

Jerry M. Schuber
 Recorded by

12/13/91
 Date

Donald K. Whitely
 C&D concurrence

12-16-91
 Date

NORTHEAST UTILITIES



THE CONNECTICUT LIGHT AND POWER COMPANY
WESTERN MASSACHUSETTS ELECTRIC COMPANY
HOLYOKE WATER POWER COMPANY
NORTHEAST UTILITIES SERVICE COMPANY
NORTHEAST NUCLEAR ENERGY COMPANY

December 16, 1991
EN2-91-456

TO: John Humphreys
MP2 Maintenance

FROM: J. M. Scheeler *jsb 12/18/91*
Unit 2 Engineering
(Extension 4459)

SUBJECT: MP2 Station Batteries

- Reference: (1) Memo MM-91-160, John Humphreys to Ralph Bates dated November 4, 1991.
- (2) Memo EN2-91-453, Jeffery Scheeler to Don Wampole, C&D Battery, dated 12/13/91

In response to reference 1, Engineering has reviewed the concerns and contacted the vendor for recommendations and clarifications. Note that the following is specific to the station safety related batteries DB1 and DB2. The recommendations or clarifications may be derived for the computer and turbine battery from below response and actions taken as deemed necessary.

Item 1a: Is it necessary to stop the Surveillance Test if the intercell or inter-tier connection voltage drops are out of spec? Should cleaning and re-torquing be specified.

Response: Yes, if voltage drops are out of spec. the test should be stopped and corrective action taken:

- If the connection is clean and no corrosion present, torque the connection to the appropriate retorquing value.
- If the connection has evidence of corrosion, disassemble the connection, clean and re-assemble the connection and torque to the initial torque requirements.

Item 1b: Is measuring voltage drops sufficient? Should the connections be ductored and if so, what is the acceptance criteria? Should the connection temperatures be monitored during testing?

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Response: Measuring voltage drops during the discharge is sufficient to determine a satisfactory connection integrity.

The voltage drop test and the ductor test are both methods to determine the integrity of the battery connections. The disadvantage of the voltage drop test is that it must be performed during rated discharge of the battery.

Engineering recommends a ductor test be performed on a refueling basis. This will allow verification of battery connections integrity without performing a discharge of the battery following maintenance on a battery connection.

The acceptance criteria shall be established so that no individual connection resistance can exceed the overall connection average resistance by greater than 20%.

In order to determine base line resistance values it is recommended the ductor test, subsequent to performing a maintenance retorquer, be performed prior to the next scheduled discharge test .

Monitoring of the connection temperatures during testing has been discussed with C&D and is not one of their requirements. The preferred checks on connection resistance, voltage drops, and maintenance torque checks, in addition to visual inspections, provide reliable indications of connection integrity.

Item 2a: Is the torque value specified in MP2720F2 correct or should the retorquer value of 125 in-lbs be used?

Response: This procedure is for removal and cleaning of connections. If connections are removed they should be torqued to initial torque values when re-assembled. The retorquer value only applies to a check performed on a previously made connection. The following torque values have been verified with the vendor:

	<u>Turbine Battery</u>	<u>Station Battery</u>
Initial Torque(in-lbs)	110 +10, (-)0	160 +10, (-)0
Retorquer (in-lbs)	100 +10, (-)0	125 +10, (-)0

Item 2b: Should retorque values be specified in other battery procedures in lieu of "tight"

Response: The retorque values should be specified in the procedures in lieu of "tight" when performing a maintenance torque check. Again, if a connection has been re-assembled, the initial torque requirement should apply.

Engineering recommends a maintenance torque check of the battery connections to the retorque values be performed on a quarterly basis.

Item 2c: Is retorquing a check of the minimum tightness or must the connection be loosened the retorqued to the specified value?

Response: Retorquing is a maintenance torque check of the connection for connection integrity. This is a minimum torque, and the connection should not be loosened when performing this maintenance check.

I would recommend that Maintenance and Engineering set a meeting in order to discuss the above items and their impact to existing procedures. Please contact me when available.

cc: B. J. Duffy
J. W. Riley
R. W. Bates
R. Rowe
File

RECORD OF ALLEGATION PANEL DECISIONS

SITE: Millstone PANEL ATTENDEES:

ALLEGATION NO.: R7-91-A-0287 Chairman - Wiggins

DATE: 6/00/91 (Panel No. 0 2 3 4 5) Branch Chief - _____

PRIORITY: High Medium Low Section Chief (AOC) - Kelly

SAFETY SIGNIFICANCE: Yes No Unkn Sr. Allegation Coord (SAC) Fuhrmeister

CONCURRENCE TO CLOSEOUT: DD BC SC OI Representative - Wilson, Monroe

CONFIDENTIALITY GRANTED: Yes No (Other) Whanning, Barkley

(See Allegation Receipt Report)

IS THERE A HARASSMENT/DISCRIMINATION ISSUE: Yes No

IF YES,

1) has the individual been informed of the DOL process and the need to file a complaint within 30 days Yes No

2) has the individual filed a complaint with DOL Yes No

3) has a letter been sent to the complainant seeking any safety concerns Yes No

IS A CHILLING EFFECT LETTER WARRANTED: Yes No

IF YES, HAS IT BEEN SENT Yes No

HAS THE LICENSEE RESPONDED TO THE CHILLING EFFECT LETTER: Yes No

ACTION: RESP ECD

- 1) Close, letter to state "we understand you have SAC 2000/91 been notified of DOL provisions, and have not elected to not pursue this issue. We therefore plan no action on this matter."
- 2) _____
- 3) _____
- 4) _____
- 5) _____

NOTES: _____

5/2/91

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ALLEGATION RECEIPT REPORT

Date/Time Received: November 4, 1991 1510 Allegation No. EI-91-A-0289

Name: Address: Phone: City/State/Zip:

Confidentiality: Was it requested? No

Allegor's Employer: NNECO Position/Title: Instrumentation and Control Department Technician

Facility: Millstone Unit 2 Locket No.: 50-336

Allegation Summary: I&C Department Instrument "Loop Folder" and maintenance data base both lack information on a liquid radioactive effluent path flow instrument.

Number of Concerns: 1

Employee receiving allegation: J. T. Shedlosky

Type of regulated activity: Reactor

Functional Area(s): Operations

Detailed Description of Allegation: All components of a flow instrument channel are not documented within the I&C Department instrument "loop folder" and within the Production Maintenance Management System (PMS) data base. Specifically, data for a flow transmitter, 2-CND-FIT-246, associated with monitoring the effluent flow from the Condensate Polishing Facility (CPF) neutralized waste tank discharge, was found to be missing from the applicable instrument "loop folder." Additionally, the instrument is not entered in the PMS computer data base.

Inspector's Note: This sub-system process the liquid waste generated during condensate demineralizer resin regeneration. The activity of the waste neutralization tanks, TK-10 and TK-11, is generally at or below the lower limit of detection for the Chemistry Department radioisotopic analysis (approximately 1.0E-07 microcurie per ml. for Co-60 or Cs-137).

S/246

RECORD OF ALLEGATION PANEL DECISIONS

SITE: Millstone 2 PANEL ATTENDEES:

ALLEGATION NO.: RI-91-A-0280 Chairman - Mehl

DATE: 13 Nov 91 (Panel No. 1 2 3 4 5) Branch Chief - Ruland

PRIORITY: High Medium Low Section Chief (AOC) - Barkley

SAFETY SIGNIFICANCE: Yes No Unkn Sr. Allegation Coord (SAC) Fuhrmeister

CONCURRENCE TO CLOSEOUT: DD EC SC OI Representative -

CONFIDENTIALITY GRANTED: Yes No (Other) Blumberg, Robertscu
(See Allegation Receipt Report) Shedlosky (r)

IS THERE A HARASSMENT/DISCRIMINATION ISSUE: Yes No
IF YES,

1) has the individual been informed of the DOL process and the need to file a complaint within 30 days Yes No

2) has the individual filed a complaint with DOL Yes No

3) has a letter been sent to the complainant seeking any safety concerns Yes No

IS A CHILLING EFFECT LETTER WARRANTED: Yes No
IF YES, HAS IT BEEN SENT Yes No

HAS THE LICENSEE RESPONDED TO THE CHILLING EFFECT LETTER: Yes No

ACTION: RESP ECD

- 1) Turnover to NU. Ask about significance of flow transmitter, and if it serves any safety function
- 2) _____
- 3) _____
- 4) _____
- 5) _____

NOTES: _____

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