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L.C. ROGERS
TMI I & II (NSS 5.6)

T
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W.E. WILSON
R.P. WILLIAMSON

SUBJECT
SI # 56/29

RECOMMENDED ACTION FOR SUSPECTED LOOSE PARTS
IN THE RCS

DATE 6/29/78

FOLD - MESSAGE

PLEASE REPLY TO THE ATTACHED S.I.P.
AND FORWARD RESPONSE TO NUCLEAR SERVICE
TECHNICAL SUPPORT, NSSE
LYNCHBURG, VA.

ORIGINATOR DO NOT WRITE BELOW THIS LINE

REPLY TO

SIGNED

Michael D. Hamman

REPLY

RESPONSE APPROVED:

M.E. Fisher 1-4-79
ORIGINATOR DATE

ORIGINAL PART SHEET HAS NOT BEEN LOCATED, WHEN FOUND IT WILL BE FILED WITH
THIS SET MDT#

RETURN THIS COPY TO SENDER

8002 100059 P

Babcock & Wilcox

Power Generation Group

P.O. Box 1260, Lynchburg, Va. 24505

Telephone: (804) 384-5111

June 29, 1978

SOM-II-166

REM-I-362

Mr. L. L. Lawyer
Manager, Generation Operations
Metropolitan Edison Company
Post Office Box 542
Reading, PA 19603

Mr. G. P. Miller
Station Superintendent
Metropolitan Edison Company
Post Office Box 480
Middletown, PA 17057

Mr. J. P. O'Hanlon
Superintendent, Unit I
Metropolitan Edison Company
Post Office Box 480
Middletown, PA 17057

Subject: Recommended Actions for Suspected Loose Parts in the Reactor Coolant System

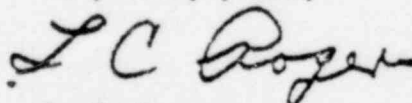
Gentlemen:

The attached contains standard recommendations to the B&W Nuclear Steam Supply System operating utility. It consists of immediate actions to be taken should the loose parts monitor indicate a loose part in the Reactor Coolant System.

These recommendations apply regardless of the supplier of the loose parts monitors.

If you have any further questions, please do not hesitate to contact me.

Very truly yours,



L. C. Rogers
Site Operations Manager

LCR/SFM/bay

L. L. Lawyer
G. P. Miller
J. P. O'Marlon

-2-

6/29/78

cc: L. R. Pletke
W. H. Spangler
G. K. Wandling
J. G. Herbein
R. M. Klingaman
J. B. Logan
J. L. Seelinger
J. T. Janis
J. D. Phinney
G. A. Kunder

bcc: D. G. Culberson (SIP #6/229)

RECOMMENDED ACTIONS FOR A SUSPECTED LOOSE PART

Due to the serious consequences of potential material damage in the event of a loose part inside the Reactor Coolant System, it is strongly recommended that a plan of action be developed by each utility to cover this situation. Quick and decisive action by the operations personnel is required in the event of a suspected loose part to place the unit into a safe condition to avoid the potential of several months of repair.

Loose Parts Monitoring (LPM) Systems supplied by B&W are designed and calibrated to detect unusual noises above the normal system background. The Loose Parts Monitoring System is set to alarm for detected noises having the characteristics of metal-to-metal impacts. Regardless of the supplier of the Loose Parts Monitoring System, B&W recommends that immediate action be taken to determine the validity of the alarm. The alarm should be assumed to be the result of a loose part until proven to be otherwise. If the alarm cannot be invalidated, the plant should be shutdown, cooled down, and placed into the decay heat removal mode to minimize the damage that could be sustained due to the presence of a loose part(s).

The types of questions that must be answered to determine the validity of the alarm include but are not limited to:

1. What were the plant operations immediately prior to the Loose Parts Monitoring alarm? Did anything change abruptly or in a manner that could have caused the noise or that could have dislodged a loose part?
2. Was the plant undergoing a significant evolution at or near the time when the alarm occurred (reactor trip, turbine trip, feedwater flow transient, etc.)? Could the evolution attribute to the noise or cause a loose part to become dislodged?
3. Do other plant instruments indicate abnormal readings that may be related to the noise?
4. Are other Loose Parts Monitoring channels alarming? Do the relative magnitudes of the signals from the various Loose Parts Monitoring channels indicate the location of the noise?

If the answers to the above questions confirm a loose part or fail to promote justification to ignore the alarm, the plant administrative procedures should call for (a) notification to key plant personnel of the presence of a potential loose part and (b) the timely shutdown of the plant. The manner in which the reactor is shutdown (i.e., orderly, reactor trip, reactor and reactor coolant pump trip, etc.) should be dictated by the potential consequences of the particular alarm situation.

RECOMMENDED ACTIONS FOR A SUSPECTED LOOSE PART

The preservation of plant integrity should take precedence over data acquisition in all cases; however, during the evaluation period, it is desirable that the following data be taken to provide a historical record of the alarm for action, justification, and later comparisons and analyses:

1. Log all alarm conditions, high or low, on an alarm record sheet (see Attachment 1).
2. Reset the alarm and log the tape recorder digital counter.
3. If required, adjust the amplifier gain for the maximum output without overload (adjust so average signal is 20-40 percent full scale). Tag the new gain setting and tape digital counter.
4. For a low alarm condition, defeat the low alarm option of the specific alarmed module.
5. If any individual high alarm occurs within 30 minutes of a previous high alarm, the shift supervisor and technical staff engineer should be notified.
6. Upon notification of the Loose Parts Monitoring System alarms, the shift supervisor or the technical staff engineer should review the Loose Parts Monitoring System alarm record. The locations of the alarmed sensors should be cross-referenced with the plant conditions at the time of the alarm.
7. Review the automatically recorded tapes and determine the peak-to-peak "G" levels of the recorded impacts. The operability and calibration of the tape auto start system should also be periodically checked.
8. Use the audio module, oscilloscope, or spectrum analyzer to characterize the signals from the alarmed sensors. The points of interest should include metal-to-metal impact noises, the delay time matrix if more than one sensor indicates the noise, and the amplitude of the impacts (i.e., in "G's").
9. Evaluate the cause of the alarm:
 - a. Electrical: Most of the electrical noises are found to be periodic in nature and usually have individual wave forms with spike shapes and no amplitude decay.
 - b. Mechanical, and if so, what is the probability that it was caused by normal plant operation?

RECOMMENDED ACTIONS FOR A SUSPECTED LOOSE PART

- 'c. Loose Part: Take immediate action to preclude further damage and contact B&W.
- 10. Log the sensor gain setting, if changed, on the alarm record sheet to allow accurate correlation with the recorded tape.

11/196; 1/229, 1263; 196
11/105; 12,13/20; 14/297

THE BABCOCK & WILCOX COMPANY
POWER GENERATION GROUP

SITE INSTRUCTION NO. _____

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To Distribution

RESPONSE REQD FROM 3,4,5,6,7,8,9,11,12,13,14

APPROVED J.D. Phinney 6/29/78

From W. E. Wilson
R. P. Williamson

W.E. Wilson
R.P. Williamson

Wilson for W.H. Spangler 6/29/78

BDS 663.5

Cust. DPCO, Met Ed, JCP&L, FPC, AP&L, SMUD, CPCO, TECO

File No. NSS-3,4,5,6,7,8,9,
or Ref. 11,12,13,14 / T3.72

Subj. Recommended Actions for Suspected Loose Parts in the RCS

Date June 14, 1978

This letter is cover one customer and one subject only.

Distribution

- | | |
|----------------|---------------|
| C. D. Russell | R. C. Luken |
| J. T. Janis | C. E. Mahaney |
| L. C. Rogers | F. R. Faist |
| G. T. Fairburn | |

The attached contains recommendations to utility customers for the immediate actions to be taken should the loose parts monitor indicate a loose part. These recommendations apply regardless of the supplier of the LPM.

Please transmit the attached to your customers. Any questions or requests for additional information should be directed to W. E. Wilson.

WEW/RPW/cs

- cc: J. D. Phinney
W. H. Spangler
H. A. Baker
L. R. Pletke
R. L. Brown - Midland
A. H. Lazar
W. E. Perks
J. R. Bohart
R. J. Baker
G. R. Skillman
J. C. Deddens
P. E. Perrone
Records Center
D. F. Hallman

(Handwritten mark)

REVIEWED FOR ACCURACY	
ENGINEERING: <i>[Signature]</i>	DATE: <i>6/25/78</i>
NI EAR SERVICE: <i>[Signature]</i>	DATE: <i>6/28/78</i>

RECOMMENDED ACTIONS FOR A SUSPECTED LOOSE PART

Due to the serious consequences of potential material damage in the event of a loose part inside the RCS, it is strongly recommended that a plan of action be developed by each utility to cover this situation. Quick and decisive action by the operations personnel is required in the event of a suspected loose part to place the unit into a safe condition to avoid the potential of several months of repair.

Loose Parts Monitoring (LPM) Systems supplied by B&W are designed and calibrated to detect unusual noises above the normal system background. The LPM system is set to alarm for detected noises having the characteristics of metal-to-metal impacts. Regardless of the supplier of the LPM system, B&W recommends that immediate action be taken to determine the validity of the alarm. The alarm should be assumed to be the result of a loose part until proven to be otherwise. If the alarm cannot be invalidated, the plant should be shutdown, cooled down, and placed into the decay heat removal mode to minimize the damage that could be sustained due to the presence of a loose part(s).

The types of questions that must be answered to determine the validity of the alarm include but are not limited to:

1. What were the plant operations immediately prior to the LPM alarm? Did anything change abruptly or in a manner that could have caused the noise or that could have dislodged a loose part?
2. Was the plant undergoing a significant evolution at or near the time when the alarm occurred (reactor trip, turbine trip, feedwater flow transient, etc.)? Could the evolution attribute to the noise or cause a loose part to become dislodged?
3. Do other plant instruments indicate abnormal readings that may be related to the noise?
4. Are other LPM channels alarming? Do the relative magnitudes of the signals from the various LPM channels indicate the location of the noise?

If the answers to the above questions confirm a loose part or fail to promote justification to ignore the alarm, the plant administrative procedures should call for (a) notification of key plant personnel of the presence of a potential loose part and (b) the timely shutdown of the plant. The manner in which the reactor is shutdown (i.e., orderly, reactor trip, reactor and RC pump trip, etc.) should be dictated by the potential consequences of the particular alarm situation.

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2. Reset the alarm and log the tape recorder digital counter.
3. If required, adjust the amplifier gain for the maximum output without overload (adjust so average signal is 20-40 percent full scale). Tag the new gain setting and tape digital counter.
4. For a low alarm condition, defeat the low alarm option of the specific alarmed module.
5. If any individual high alarm occurs within 30 minutes of a previous high alarm, the shift supervisor and technical staff engineer should be notified.
6. Upon notification of LPMS alarms, the shift supervisor or the technical staff engineer should review the LPMS alarm record. The locations of the alarmed sensors should be cross referenced with the plant conditions at the time of the alarm.
7. Review the automatically recorded tapes and determine the peak-to-peak "G" levels of the recorded impacts. The operability and calibration of the tape auto start system should also be periodically checked.
8. Use the audio module, oscilloscope, or spectrum analyzer to characterize the signals from the alarmed sensors. The points of interest should include metal-to-metal impact noises, the delay time matrix if more than one sensor indicates the noise, and the amplitude of the impacts (i.e., in "Gs").
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 - A) Electrical; Most of the electrical noises are found to be periodic in nature and usually have individual wave forms with spike shapes and no amplitude decay.
 - B) Mechanical and, if so, what is the probability that it was caused by normal plant operation?
 - C) Loose Part; Take immediate action to preclude further damage and contact B&W.
10. Log the sensor gain setting, if changed, on the alarm record sheet to allow accurate correlation with the recorded tape.

EXAMPLE

LOOSE PARTS MONITORING SYSTEM ALARM RECORD SHEET

TIME OF ALARM	CHANNELS ALARMED	REMARKS	RECORDED BY
Date/Day/Hour/Minute	First Out/Others Alarmed	Operator Actions, Sensor Gain & Tape Digital Counter	Signature