



UNITED STATES  
 NUCLEAR REGULATORY COMMISSION  
 REGION III  
 789 ROOSEVELT ROAD  
 GLEN ELLYN, ILLINOIS 60137

DEC 24 1991

MEMORANDUM FOR: R. A. Westberg, Team Leader, Perry Augmented  
 Inspection Team (AIT)

FROM: Edward G. Greenman, Director, Division of  
 Reactor Projects

SUBJECT: AIT CHARTER - PERRY CIRCULATING WATER  
 FIBERGLASS PIPING BREAK

Enclosed for your implementation is the final Charter developed for the inspection of the events associated with the Perry circulating water line break which occurred on December 22, 1991. This Charter was prepared in accordance with the NRC Incident Investigation Manual and the Manual Chapter 0325 AIT implementing procedure issued for use on April 18, 1991, and is based on the discussions you had with Region III personnel on December 22, 1991. As stated, the objectives of the AIT are to communicate the facts surrounding this event to regional and headquarters management, to identify and communicate any generic safety concerns related to this event to regional and headquarters management, and to document the findings and conclusions of the onsite inspection.

If you have any questions regarding these objectives or the enclosed Charter, please do not hesitate to contact either Hub Miller or myself.

Edward G. Greenman, Director  
 Division of Reactor Projects

Enclosure: AIT Charter

cc w/enclosure:

A. B. Davis, RIII  
 C. J. Paperiello, RIII  
 F. J. Miraglia, NRR  
 J. G. Partlow, NRR  
 C. E. Rossi, NRR  
 G. M. Holahan, NRR  
 A. E. Chaffee, NRR  
 J. A. Zwolinski, NRR  
 G. E. Grant, EDO  
 P. L. Hiland, SRI

2. Probable root cause(s).
  - 2.1 What was the root cause of the event?
3. Performance history and maintenance on circulating water piping.
  - 3.1 What is the material condition of the affected piping?
  - 3.2 Has there been any history of leakage in the affected line or any related maintenance activities?
  - 3.3 Were there any activities that could have been precursors to the event?
  - 3.4 Had there been any reported damage to the piping during either construction or operation?
4. Operator response to the event, including use of the Plant Emergency Instructions (PEIs).
  - 4.1 What operator actions were taken during the event? Were they appropriate?
5. Effects of flooding.
  - 5.1 Identify all effected equipment.
    - 5.1.1 Electrical: cables, switch gear, MCC, etc
    - 5.1.2 Mechanical: pumps, valves, etc.
  - 5.2 Identify the extent of water damage.
  - 5.3 Radiological consequences.
    - 5.3.1 Extent of contamination from floor drain backup.
    - 5.3.2 Offsite releases, if any.
6. Event classification and reporting.
  - 6.1 Was the event properly classified and were required notifications made in a timely manner?
7. Corrective actions and evaluations.
  - 7.1 What are the licensee's short term and long term corrective actions and evaluations?
    - 7.1.1 Circulating water piping

7.1.2 Electrical components such as cable trays, switchgear, MCC's, and failure of L11 to transfer.

7.1.3 Effected mechanical components including SDV valve and motor feed pump.

7.1.4 Radiological consequences, if any

8. Conclusions.

8.1 Examine generic implications to other plants and advise NRC management subsequent to the site inspection.

8.2 Document inspection findings in accordance with ML 0325 and RP 0610A.

PERRY CIRCULATING WATER LINE BREAK

DRAFT AUGMENTED INSPECTION TEAM (AIT) CHARTER

INVESTIGATE:

1. The break of the 36" fiberglass circulating water line and subsequent flooding.
2. Probable root cause(s).
3. Performance history and maintenance on circulating water piping.
4. Operator response to the event, including use of the Plant Emergency Instructions (PEIs).
5. Effects of flooding.
6. Event classification and reporting.
7. Corrective actions.
8. Conclusions.

QUESTIONS FOR PERRY AIT:

1. The break of the 36" fiberglass circulating water line and subsequent flooding (12/22/91).
  - 1.1 What was the sequence of events?
  - 1.2 How much water was pumped from the break and where did it go?
  - 1.3 What was the flood path (internal and external to the plant)?
  - 1.4 Did the flood path conform to the USAR assumed flood paths and magnitude?
  - 1.5 What was the safety significance of the event (Include any PRA insights, to the extent practicable)?
  - 1.6 Determine why did the scram discharge volume (SDV) not drain? Why were the instrument air compressors running continuously? Why did the motor feed pump not start following the scram? Did any damage occur due to repeated starts? Why did Bus L11 fail to automatically transfer to Bus L10?

Br 3 files

ATTACHMENT 2

DEC 24 1991

CONFIRMATORY ACTION LETTER

Docket No. 50-440

CAL-R111-91-016

Centerior Service Company  
ATTN: Mr. Michael D. Lyster  
Vice President  
Nuclear - Perry  
c/o The Cleveland Electric  
Illuminating Company  
10 Center Road  
Perry, OH 44081

Dear Mr. Lyster:

This letter confirms the telephone conversation between Mr. R. C. Knop of this office and Mr. R. A. Stratman of your office on December 24, 1991, regarding the failure of the 36" fiberglass circulating water line at the Perry Nuclear Power Plant which occurred on December 22, 1991. Water from the pipe break caused some minor flooding of areas inside the plant with water also being observed in the auxiliary and intermediate buildings. Reactor operators manually scrammed the reactor from 73 percent power and successfully placed the unit in a cold shutdown condition in accordance with station procedures.

While no safety related equipment appeared to be affected, I have established an Augmented Inspection Team (AIT) to fully investigate the circumstances surrounding the event because of the potential significance of the incident.

With regard to these events, we understand that you will:

1. Implement the attached Recovery Plan presented to the NRC during the AIT entrance meeting held on December 22, 1991. Changes to the Recovery Plan should be coordinated with the AIT team leader.
2. Conduct a management critique of the event to determine the root cause(s) of the piping failure and those steps that are and will be taken to preclude recurrence. Conduct an evaluation of structures and equipment which may have been effected by the circulating water pipe break and associated flooding and the intrusion of water into the buildings. Additionally, you will identify and address the root causes of other identified equipment failures including the failure of bus L11 to transfer, the failure of the motor driven reactor feedwater pump to start, the failure of the scram discharge volume drain valve, and the apparent excessive instrument air usage.
3. Prior to making a mode change from cold shutdown, you plan to advise the NRC Region III office of the results of your critique of the events that occurred and what actions are being taken as a result of your analysis.

CONFIRMATORY ACTION LETTER

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CONFIRMATORY ACTION LETTER

Centerior Service Company

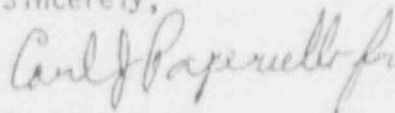
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4. Within 30 days of making the initial mode change, submit to NRC Region III, a formal report of all significant issues involved in this event including short term and long term corrective actions.

None of the actions specified herein should be constructed to take precedence over those actions which you feel necessary to ensure plant and personnel safety.

If your understanding differs from that set forth above, please call me immediately. Issuance of this Confirmatory Action Letter does not preclude issuance of an order formalizing the above commitments or requiring other actions on the part of Centerior Service Company. Nor does it preclude NRC from taking enforcement action for violations of NRC requirements that may have prompted the issuance of this letter.

Sincerely,



A. Bert Davis  
Regional Administrator

Attachment: As stated

cc w/attachment:

F. R. Stead, Director, Nuclear  
Support Department  
R. A. Stratman, General Manager,  
Perry Nuclear Power Plant  
Kevin P. Donovan, Manager,  
Licensing and Compliance Section  
S. F. Kensicki, Director, Perry  
Nuclear Engineering Dept.  
H. Ray Caldwell, General  
Superintendent Nuclear Operations  
DCD/DCB (RIDS)  
Licensing Fee & Debt Collection  
Branch  
Resident Inspector, RIII  
Terry J. Lodge, Esq.  
James R. Williams, State of Ohio  
Robert E. Owen, Ohio  
Department of Health  
A. Grandjean, State of Ohio,  
Public Utilities Commission  
Clinton SRI  
J. H. Sniezek, DEDR  
J. Lieberman, OE  
J. G. Partlow, NRR

CONFIRMATORY ACTION LETTER

# RECOVERY PLANS

1. DETERMINE DAMAGE / ASSESS
  - a. IDENTIFY ENTRY POINTS TO BUILDINGS
  - b. IDENTIFY DAMAGE CAUSED BY WATER INSIDE PLANT BUILDINGS
  - c. EVALUATE ADEQUACY OF ITEMS TO PREVENT ENTRY OF WATER INTO PLANT BUILDINGS
  - d. IDENTIFY DAMAGE CAUSED BY WATER EXTERNAL TO PLANT BUILDINGS
    - N71 PIPE
    - N71 PIECES OF DISLODGED PIPING
    - SOIL SUPPORT
    - IDENTIFY ROOT CAUSE OF BROKEN PIPE AND APPROPRIATE CORRECTIVE ACTION

# RECOVERY PLANS

## 2. NON-RADIATION FOLLOW-UP ACTIVITIES FOR RECOVERY

- a. DISPOSE OF GASES IN CONDENSER
- b. RADIOLOGICAL SURVEYS OF WETTED AREAS
- c. DETERMINE NEEDS FOR PROCESSING RAD WASTE
- d. CHANGE D17 FILTERS
- e. POST SHUTDOWN CONTAINMENT INSPECTION
- f. ANALYZE REACTOR COOLANT (POST SCRAM)
- g. RESTORE RWCU
- h. PUMP DOWN ELECTRICAL MANHOLES
- i. EVALUATE WATER TRANSPORT DURING EVENT  
COMPARE WITH USAR ANALYSIS



# RECOVERY PLANS

## 3. EQUIPMENT MALFUNCTIONS

- a. RESOLVE TRIPS OF MAIN FEED PUMPS
- b. AIR SYSTEM:
  - U2 AIR COMPRESSOR CYCLED ON/OFF W/O ALARMS
  - SYSTEM PERFORMANCE UNSAT; COULD NOT MAINTAIN PRESSURE > 85 # WITH 2 COMPRESSORS ON WITH SCRAM IN AND CYCLING 1 SRV
- c. DETERMINE CAUSE OF L11 FAILURE TO TRANSFER
- d. INVESTIGATE SEISMIC ALARM
- e. INVESTIGATE ABLITY TO DRAIN SDV
- f. INVESTIGATE ADDITIONAL IDENTIFIED PROBLEMS

# RECOVERY PLANS

## 4. ADMINISTRATIVE FOLLOW-UP

a. SCRAM EVALUATION REPORT

b. LER'S

c. NOTIFICATIONS

ATTACHMENT 3

Personnel contacted

Cleveland Electrical Illuminating Company

P. Volza, Radiation Protection Manager, CEI  
J. Anderson, Onsite EP Coordinator, CEI  
R. Gaston, Compliance Engineer, LCS  
H. Hegrat, Supervisor-Compliance, CEI/LCS  
R. Stratman, General Manager, CEI/PNPP  
S. Kensicki, Director, PNED, CEI/PNPP  
W. Kanda, Manager EDS/PNED, CEI/PNED  
B. Beyer, Director, CEI/PASD  
B. Coleman, Manager QAS, CEI/PNAD  
D. Conran, Compliance Engineer, PNSO/LCS/CEI  
F. Vanann, MEU Supervisor, PNED/SES/CEI  
F. Stead, Director, PNSD/CEI  
J. Emley, Licensing Engineering, PNSD/LCS/CEI  
J. Eppich, Manager, Mechanical Design, PNED-MDS/CEI  
M. Gmynek, Generation Manager, PNPPD/CEI  
R. Stratman, General Manager, PNPP/CEI  
R. Gaston, PNSD/CEI  
J. Anderson, Onsite Emergency Planning Coordinator, PASD/EPU  
R. Vondrasek, Manger, Emergency Planning & Cost, PASD/EPCS

Nuclear Regulatory Commission

R. Westberg, Reactor Inspector, Team Leader, NRC  
J. Neisler, Reactor Inspector, NRC  
A. Vogel, Resident Inspector, NRC  
J. Schapker, Reactor Inspector, NRC  
R. Landsman, Project Engineer, NRC  
P. Hiland, Senior Resident Inspector, NRC  
J. Tatum, Reactor Engineer, NRC



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 789 ROOSEVELT ROAD  
 GLEN ELLYN, ILLINOIS 60137

Docket No. 50-440

CONFIRMATORY ACTION LETTER

CAL-RIII-91-016A

Centerior Service Company  
 ATTN: Mr. Michael D. Lyster  
 Vice President  
 Nuclear - Perry  
 c/o The Cleveland Electric  
 Illuminating Company  
 10 Center Road  
 Perry, OH 44081

SUBJECT: CONFIRMATORY ACTION LETTERS (CALs) RIII-91-016 AND RIII-91-016A

Dear Mr. Lyster:

This letter acknowledges the actions taken in response to our Confirmatory Action Letter (CAL) dated December 24, 1991, regarding the Perry Nuclear Power Plant 36" fiberglass auxiliary circulating water line failure which occurred on December 22, 1991. This letter also confirms the telephone conversation between Messrs. E. G. Greenman and H. J. Miller of my staff and Mr. R. A. Stratman of your office on December 31, 1991, regarding actions you plan to take to ensure that the repairs made as a result of the failure are adequate.

Based on a review of the findings identified in your response to the CAL, the corrective actions taken during your outage, and our inspections of these activities, I believe that all significant issues regarding the evaluation of structures and equipment which may have been affected by the circulating water pipe failure, the associated flooding, and the intrusion of water into the buildings have been resolved. You have adequately identified and addressed the root causes of other equipment failures as delineated in your recovery plan. We will continue to monitor your progress on completing the remaining corrective actions. Item 4 of CAL RIII-91-016 (formal report within 30 days of the initial mode change) will be completed as indicated below. Accordingly, CAL RIII-91-016 is considered closed.

Based on our discussions and questions with regard to the modified circulating water pipe anchors and the fiberglass elbow, we understand that you plan to:

1. Prior to startup, instrument the auxiliary circulating water system inlet flange and the new base plate to measure any movement.
2. Determine quantitative acceptance criteria for movement of the fiberglass to steel flanged portion of the auxiliary circulating water piping prior to startup. Subsequent to plant startup, if you determine that these acceptance criteria have been exceeded, proceed with an orderly shut down as follows:
  - a. Within 1 hour, initiate action to proceed to Cold Shutdown in an orderly fashion and,

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 CONFIRMATORY ACTION LETTER

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CONFIRMATORY ACTION LETTER

Centerior Service Company

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- b. Within the next 12 hours be in at least Hot Shutdown and,
- c. Within the following 24 hours be in Cold Shutdown.

Should one or more of the monitoring instruments become inoperable, repair or replace it within a schedule to be mutually agreed upon; otherwise, proceed with an orderly shut down as described above.

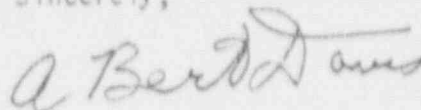
- 3. Within 30 days of making the initial mode change, provide an analysis of the stresses in those portions of the auxiliary circulating water piping system potentially involved with, or affected by, repairs and pipe support modifications.
- 4. Within 30 days of making the initial mode change, submit to NRC Region III, a formal report of all significant issues involved in this event, including short term and long term corrective actions.
- 5. Prior to the end of the refueling outage currently planned for March 1992, make any modifications to piping and pipe supports which are indicated as necessary, if any, as a result of the analyses addressed in item 3.

Based on a discussion held on January 1, 1992, we understand that plant startup will proceed in accordance with your schedule. We also agreed that we would meet with you following completion of your design analysis to discuss additional steps, if any, that are appropriate.

None of the actions specified herein should be construed to take precedence over those actions which you feel necessary to ensure plant and personnel safety.

If your understanding differs from that set forth above, please call me immediately. Issuance of this Confirmatory Action Letter does not preclude issuance of an order formalizing the above commitments or requiring other actions on the part of Centerior Service Company. Nor does it preclude NRC from taking enforcement action for violations of NRC requirements that may have prompted the issuance of this letter.

Sincerely,



A. Bert Davis  
Regional Administrator

Attachment: As stated

See Attached Distribution

CONFIRMATORY ACTION LETTER

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CONFIRMATORY ACTION LETTER

Centerior Service Company

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Distribution

cc w/attachment:  
F. R. Stead, Director, Nuclear  
Support Department  
R. A. Stratman, General Manager,  
Perry Nuclear Power Plant  
Kevin P. Donovan, Manager,  
Licensing and Compliance Section  
S. F. Kensicki, Director, Perry  
Nuclear Engineering Dept.  
H. Ray Caldwell, General  
Superintendent Nuclear Operations  
DCD/DCB (RIDS)  
Licensing Fee & Debt Collection  
Branch  
Resident Inspector, R111  
Terry J. Lodge, Esq.  
James R. Williams, State of Ohio  
Robert E. Owen, Ohio  
Department of Health  
A. Grandjean, State of Ohio,  
Public Utilities Commission  
Clinton SRT  
J. H. Sniezek, DEDR  
J. Lieberman, OE  
J. G. Partlow, NRR

CONFIRMATORY ACTION LETTER