NRC PDR

September 4, 1985

MEMORANDUM FOR: William J. Dircks
Executive Director for Operations

FROM: C. J. Heltemes, Jr., Director
Office for Analysis and Evaluation
of Operational Data

SUBJECT: STAFF ACTIONS RESULTING FROM THE INVESTIGATION OF THE JUNE 9, 1985 DAVIS-BESSE EVENT

Your August 5, 1985 memorandum requested that an in-depth and searching reappraisal be conducted in each program area in light of the lessons from the June 9 Davis-Besse event, and that the status and schedule be provided for the items listed in the enclosure to your memorandum.

In response to these requests, the results of the AEOD reappraisal are provided in Enclosure 1. The status and schedule for the specific AEOD assigned items are provided in Enclosure 2.

I will be pleased to discuss this information at your planned September 5 meeting and to provide any additional information or clarification you may desire.

Original signed by:
C. J. Heltemes, Jr.

C. J. Heltemes, Jr., Director
Office for Analysis and Evaluation
of Operational Data

Enclosures:
As Stated

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9/4/85

Enclosure 1

## Results of AEOD Reappraisal

AEOD has conducted an appraisal of our program based upon a number of lessons and implications of the June 9, 1985 Davis-Besse event. In particular, the information contained in NUREG-1154 served as the principal input to our assessment.

From our perspective, the following fundamental lessons from Davis-Besse impact AEOD programs:

I. There is a need to focus more intensively and directly on individual component failures in order to: (a) identify potential common mode failures; and (b) identify when reliability of plant equipment has become degraded. At Davis-Besse, an important safety system was defeated by at least two common mode failures and some 14 component failures and malfunctions were experienced. AEOD actions in this regard are to:

   a. Emphasize the need for high levels of licensee participation in NPRDS. This industry-supported component failure reporting system is the only means of collecting individual component failures and, thus, full participation by all plants is vital.

   b. Expand AEOD's review on evaluating the failures of single (key) components, principally through the systematic review of NPRDS data. Through trends and patterns analysis of NPRDS data and assessment of safety system unavailability, place a higher importance on identification of component problems and request prompt corrective action through input to SALP.

   c. Specifically and carefully review all key component failures reported in LERs with regard to the potential for common mode failure, and continue to emphasize the LER requirement for licensees to report real and potential common mode failures of safety-related equipment.

   d. If NPRDS participation is not sufficient, recommend whether the NRC should require licensees to report certain single failures of key safety-related components such as resulting in train failures.

II. There is a need to focus more directly on human performance considerations and their contributions to operating events. The Davis-Besse event pointed out deficiencies in training, procedures, labeling, equipment layout which must be assessed as part of the operating experience program. AEOD actions in this regard are to:

   a. Work with other offices towards obtaining specific information on deficiencies affecting human performance.

b. Include in AEOD studies an evaluation of conditions and deficiencies which contributed to or resulted in human error. This focus will be incorporated into the continuation of the AEOD study of wrong unit/ wrong train/wrong component events.

c. Increase the number of site visits by AEOD personnel in order to observe and assess the conditions which may have resulted in human error. Place a higher priority on discussion of such conditions in the resulting AEOD reports.

III. There is a need for increased attention and assessment on the effectiveness of licensee and NRC efforts devoted to the collection, analysis, and feedback of operational data. At Davis-Besse, the lessons of experience seemed not to be effectively used and, as a result, the root cause of problems were not identified and corrected. AEOD actions in this regard are to:

a. Assess operational assessment programs of the NRC, industry, and licensees and increase the effectiveness of such programs through improved NRC feedback. AEOD intends to work closely with other NRC offices, particularly IE in this regard.

b. Work to help focus NRC assessments, such as SALP and regional inspection activities, more directly on the effectiveness of licensee operational experience programs.

Enclosure 2

## Status and Schedule of Specific AEOD Items

The enclosure to the August 5, 1985 memorandum from Mr. Dircks entitled, "Staff Actions Resulting From the Investigation of the June 9, 1985 Davis-Besse Event," assigned AEOD the following two generic items:

| Number | Item |
|---|---|
| 6i | Conduct a review of failures of safety-related motor-operated valves and provide an assessment of pertinent failure modes affecting valve performance under design basis conditions. |
| 8f | Conduct a review of past operating experience and determine the causes for overspeed turbine trips. |

### Status and Schedule

The above two studies are currently in progress. The Davis-Besse event highlighted a previously recognized safety concern regarding the performance/reliability and common mode failure potential of (safety-related) motor-operated isolation valves under off-normal (transient/accident) conditions. As a result, one recently initiated AEOD technical study was expanded and revised to focus directly on the type of valve failures that occurred during the June 9 Davis-Besse event. This study will incorporate new data from signature tracing techniques and will discuss valve operability under accident/off-normal conditions. If appropriate, recommendations for further action will be developed.

The June 9 event also identified a common-mode failure of the auxiliary feedwater turbine-driven pumps. As a result, AEOD has initiated a special study of this safety concern based upon operating experience. This study will identify the major causes of reported overspeed turbine trips and develop recommendations, as appropriate, for prevention or reduction of overspeed trips. This effort will include visits to vendors and plant sites.

As noted previously, both of these studies are currently in progress. They are expected to be completed and issued in April 1986. For background, the AEOD/ROAB branch milestone schedules for both of these studies are attached.

___ Eng Eval
_X_ Case Study
___ T&P Study
___ Special Study

Subject: A Review of Motor Operated Valve Performance

Final Rpt #: ____

Objective: Conduct a review of failures of safety-related MOVs and provide an assessment of pertinent failure modes affecting valve under design basis conditions. Provide a current status and AEOD assessment of Valve Operability (operator) problems, and if appropriate, recommendations for further action.

Scope: Review the recommendations from Case Study C203, the test data from the RES signature tracing research program, and other studies to develop a current understanding of valve operability. Consider also operability under accident conditions. Also review cause and type of MOV failures that occurred in Davis Besse.

Justification: Action item 6i of Staff Action Resulting from the Investigation of the June 9 Davis-Besse Event.

Approved: (TI approved) Date: 3/21/85 Assignment #: R-85-03
Assigned to: E. Brown

Comments:

Schedule:

| Milestone | Initial Target Date | Current Target Date | Actual Date Completion | Status/Remarks |
|---|---|---|---|---|
| 1. Identification of needed data/info | 5/10/85 | | | |
| 2. Complete collection of data/info | 6/15/85 | | | |
| 3. Review/analysis of data/info | 8/15/85 | | | |
| 4. Justify continuance of study | 9/13/85 | | | |
| 5. Start draft report | 9/20/85 | | | |
| 6. Complete draft report | 11/01/85 | | | |
| 7. SC/Tech Ed. review draft report | 11/07/85 | | | |
| 8. BC review draft report | | | | |
| 9. DD/OD review of draft report | 11/14/85 | | | |
| 10. Issue report for peer review | 11/31/85 | | | |
| 11. Review comments & revise report | 1/31/86 | | | |
| 12. SC/Tech Ed. review revised draft report | 2/15/86 | | | |
| 13. BC review revised draft report | | | | |
| 14. DD/OD review revised draft report | 2/30/86 | | | |
| 15. Issue final report | 3/30/86 | | | |

Additional Remarks:
(Provide information related to slipped schedules, problem areas and plans to resolve problems. Reference the milestone that applies by number.)

ROAB 8/25/85 jz

___ Eng Eval
___ Case Study
___ T&P Study
X Special Study

Subject: Overspeed Trip of Turbine-Driven Pumps

Final Rpt #: ____

Objective: Conduct a review of past operating experience to determine the root causes of overspeed turbine trips, and to provide, as appropriate, recommendations to gain improvement.

Scope: Based on review, analysis, and evaluation of operating data, identify major causes of overspeed turbine trips and develop recommendations as appropriate for prevention or reduction of unwanted overspeed trips. This will include visits to vendors and plant sites.

Justification: This task is one of the staff actions resulting from the investi- of the June 9 Davis-Besse event (NUREG-1154). Ref. Memo from William J. Dircks to Directors of NRR, IE, RES, and AEOD, and R III Administrator, dated August 5, 1985.

Approved: _____ Date: 8/5/85 Assignment #: _____

Assigned to: C. Hsu

Comments:

Schedule:

| Milestone | Initial Target Date | Current Target Date | Action Date Completion | Status/Remarks |
|---|---|---|---|---|
| 1. Identification of needed data/info | 8/16/85 | | | |
| 2. Complete collection of data/info | 9/14/85 | | | |
| 3. Review/analysis of data/info | 9/30/85 | | | |
| 4. Justify continuance of study | | | | |
| 5. Start draft report | 10/7/85 | | | |
| 6. Complete draft report | 11/15/85 | | | |
| 7. SC/Tec Ed. review draft report | | | | |
| 8. BC review draft report | 11/20/85 | | | |
| 9. DD/OD review of draft report | 11/25/85 | | | |
| 10. Issue report for peer review | 11/31/85 | | | |
| 11. Review comments & revise report | 1/31/86 | | | |
| 12. SC/Tech Ed. review revised draft report | | | | |
| 13. BC review revised draft report | 2/15/86 | | | |
| 14. DD/OD review revised draft report | 2/30/86 | | | |
| 15. Issue final report | 3/30/86 | | | |

Additional Remarks:

ROAB 8/28 jz