

March 30, 2004

MEMORANDUM TO: William D. Travers
Executive Director for Operations

FROM: Stephen D. Dingbaum/**RAI**
Assistant Inspector General for Audits

SUBJECT: MEMORANDUM REPORT: REVIEW OF NRC'S REACTOR
OPERATING EXPERIENCE TASK FORCE REPORT
(OIG-04-A-13)

As part of the Office of the Inspector General's (OIG) current audit of NRC's commercial nuclear power plant baseline inspection program, OIG examined NRC's effort to effectively obtain and use information from operating experience. In addition, as a result of lessons-learned from significant performance deficiencies at the Davis-Besse nuclear power plant,¹ NRC initiated its own task force review of the use of operating experience. Rather than duplicate NRC's evaluation, OIG reviewed the operating experience task force's final report.² Because NRC will be implementing task force recommendations in the near future, this memorandum report is being issued so that you can use the results of OIG's review in your implementation of the task force report.

BACKGROUND

Operating experience is a broad term that has evolved to describe NRC and licensee evaluation and use of operational safety data. NRC's systematic collection and evaluation of such data is an important part of its mission to protect public health and safety. Operating experience in this context includes a broad range of information about events and conditions at power plants. This includes, among other sources, information gathered from: Title 10, Code of Federal

¹ *NRC's Oversight of Davis-Besse Boric Acid Leakage and Corrosion During the April 2000 Refueling Outage*, NRC OIG Event Inquiry, Case No. 03-02S, October 17, 2003.

² Memorandum dated November 26, 2003, from Charles Ader, Manager, Operating Experience Task Force, to the members of the task force steering committee, Subject: *Reactor Operating Experience Task Force Report*.

Regulations (10 CFR) Part 50.72 notifications,³ 10 CFR Part 50.73 Licensee Event Reports,⁴ 10 CFR Part 21 reports,⁵ component failure data, inspection reports, industry reports, and foreign operating experience reports. Lessons learned from evaluating operating experience provide a unique and valuable tool to (1) prevent recurrence of past safety-significant events and (2) identify and resolve new safety issues and, thereby, avoid more serious events in the future. Operating experience information is also important in evaluating the effectiveness of NRC's regulatory programs and for informing the public about NRC licensees' performance. To be effective, the agency's operating experience program must support and work in concert with agency programs involved in licensing and oversight of nuclear power plants.

Analysis and Evaluation of Operational Data

In July 1979,⁶ following the accident at the Three Mile Island Nuclear Power Plant⁷ and a critical General Accounting Office report,⁸ the Commission approved the creation of an agency-wide Operational Data and Analysis Group, which reported directly to the Executive Director for Operations. Subsequently, NRC created an independent Office for Analysis and Evaluation of Operational Data (AEOD) with the responsibility for analyzing and evaluating operational safety data associated with all NRC activities. AEOD was also charged with providing feedback on the lessons of experience to improve the safety of licensed operations, assessing the "effectiveness of the agency-wide program," and acting as a focal point for interaction with outside organizations for operational safety data analysis and evaluation. Also in 1979, the

³ 10 CFR Part 50.72, *Immediate notification requirements for operating nuclear power reactors*, generally requires operating reactors to notify the NRC Operations Center via the Emergency Notification System of (1) the declaration of any of the Emergency Classes specified in the licensee's approved Emergency Plan, or (2) certain identified non-emergency events that occurred within three years of the date of discovery.

⁴ 10 CFR Part 50.73, *Licensee event report system*, specifies when, and how, nuclear power plant license holders must notify NRC of plant events. Licensees must submit a Licensee Event Report to NRC within 60 days after the discovery of any of the events specified in this regulation.

⁵ 10 CFR Part 21 requires certain individuals who obtain information reasonably indicating: (a) that a facility, activity or basic component supplied to such facility or activity fails to comply with the Atomic Energy Act of 1954, as amended, or any applicable rule, regulation, order, or license of the Commission relating to substantial safety hazards or (b) that the facility, activity, or basic component supplied to such facility or activity contains defects, which could create a substantial safety hazard, to immediately notify the Commission unless he has actual knowledge that the Commission has been adequately informed.

⁶ U.S. Nuclear Regulatory Commission, memorandum from S. Chilk to L. Gossick, Subject: SECY-79-371 – Recommendations on Operational Data Analysis and Evaluation for Nuclear Power Plants (Task Force Report), July 12, 1979.

⁷ U.S. Nuclear Regulatory Commission, M. Rogovin et al., "Three Mile Island, A Report to the Commissioners and to the Public," January 1980.

⁸ United States General Accounting Office, "Reporting Unscheduled Events At Commercial Nuclear Facilities: Opportunities to Improve Nuclear Regulatory Commission Oversight," January 1979. GAO found that NRC had no systematic, defined, or dedicated program to analyze operating experience and feed back the lessons of experience to licensees and to the nuclear industry.

nuclear industry took its own action and created the Institute of Nuclear Power Operations, in part to provide an independent capability to evaluate operational experience and feed back lessons learned to licensees.

In 1998, the Commission approved a staff proposal for consolidating AEOD functions into other program offices. The Commission also recognized that the lessons learned from the independent assessment of operational events must continue to be shared with the nuclear industry to help improve the safety of licensed operations and to assess the effectiveness of agency-wide programs. The Commission further noted that it is important that these functions continue with a degree of independence and, in particular, remain independent of licensing functions.⁹

Davis-Besse Lessons Learned Task Force

A significant event at the Davis-Besse Nuclear Power Station, located in Oak Harbor, Ohio, again raised questions regarding the effectiveness of NRC's operating experience program. During February and March 2002, the licensee for Davis-Besse conducted inspections of nozzles entering the head of the reactor pressure vessel, the specially designed container that houses the reactor core and the control rods that regulate the power output of the reactor. The licensee found that three nozzles had indications of cracking, resulting in leakage from the reactor's pressure boundary, which created a large cavity in the reactor pressure vessel head. Subsequently, NRC determined that the reactor pressure vessel head degradation and control rod drive mechanism nozzle cracking resulted from significant performance deficiencies at the plant.

As a result of this event, the agency established the Davis-Besse Lessons Learned Task Force (DBLLTF). The DBLLTF generated a report that contained recommendations for operating experience program improvements. The DBLLTF noted that, following previous program evaluations, NRC had reduced in scope or eliminated a number of specific operating experience programs. However, NRC had not systematically assessed the impact of those changes on the effectiveness of the operating experience program. Subsequently, as part of the action plan to address the recommendations of the DBLLTF, NRC formed the Reactor Operating Experience Task Force (ROETF) to evaluate NRC's reactor operating experience program and to recommend specific program improvements.

In November 2003, the ROETF issued its final report which contained assessments of:

- the reactor operating experience program,
- the scope and adequacy of NRC requirements governing the licensee review of operating experience, and
- the effectiveness of the generic issues program.

⁹ U.S. Nuclear Regulatory Commission, Staff Requirements Memorandum, "SECY-98-228 – Proposed Streamlining and Consolidation of AEOD Functions and Responsibilities," December 10, 1998.

The ROETF made 21 recommendations to improve the reactor operating experience program and 3 recommendations to improve the generic issues program. The ROETF concluded that the scope and adequacy of NRC requirements related to licensee review of operating experience were currently acceptable and made no specific recommendations in that area.

Results of OIG Report Review

Overall, the ROETF report is comprehensive. The conclusions and recommendations are adequate to address the program weaknesses that the ROETF identified, as well as many of the weaknesses OIG has identified to date during current audit work in the baseline inspection program area. However, there are areas where the report's recommendations should be strengthened.

- Program Objectives (Page 9)¹⁰

The ROETF recommends three objectives for the agency's reactor operating experience program. However, the objectives have no measurable performance aspects. For example, Objective 1 states that operating experience is collected, evaluated, communicated, and applied to support the agency goal of ensuring safety. This objective should be revised to include measurable aspects of performance. The description of this objective, provided in the report, would itself make a better objective - "The agency will have an effective, coordinated program to systematically collect and evaluate OE [operating experience], identify and resolve safety issues in a timely manner, and apply lessons learned from OE to support the agency goal of ensuring safety."

In addition, to ensure management-level focus on this important area, the activities should be specifically captured in the Office of Nuclear Reactor Regulation's operating plan with performance measures and targets. Although agency guidance requires performance measures and targets to gauge program *effectiveness*, the current operating plan does not contain any performance measures or targets for the operating experience program. In addition, the agency should work to develop measures and targets for other performance aspects of the program, such as quality and timeliness.

RECOMMENDATIONS

OIG recommends that the Executive Director for Operations:

- (1) Revise the program objectives to include measurable performance aspects.
- (2) Create performance measures and targets for the operating experience program, in accordance with agency guidance.

¹⁰ Page numbers shown with the topics correspond to the *Reactor Operating Experience Task Force Report*.

- Independence (Pages 17-18)

Following the accident at Three Mile Island, an agency task force noted that the role of independence was an important consideration in the evaluation of operating experience. The task force found a strong need for a dedicated independent group for the analysis of operating experience. The task force was concerned that otherwise the likelihood was “unacceptably high that the required competence and perspective will inevitably be compromised by other demands on their resources and independence.” The task force could not reach a consensus recommendation on the location of the operational experience analysis and evaluation function. However, it did recognize the need for balance between the benefit from closeness to the user offices and the independent perspective gained from a separate organization.

The ROETF stated that it continues to believe that independence is important and that the primary operating experience functions require dedicated resources that are not vulnerable to being redirected due to other “problems of the day.” However, the ROETF came to no clear conclusion regarding the degree of independence of the operating experience function stating that it believes that the independence of perspective for the analysis and evaluation functions continues to be an important element of an operating experience program. The ROETF indicated that a decision on the location of these functions involves a balancing of the importance of an independent perspective with the challenges in obtaining buy-in from the operating experience users. Since addressing organizational issues regarding the operating experience program was outside the scope of its charter, the ROETF made no recommendation regarding this concern.

The ability of staff to effectively obtain and objectively evaluate operating experience for its impact on NRC oversight programs may be compromised if the independence of the function is not clearly defined. In all matters related to evaluation of operating experience, staff assigned should be free both in fact and appearance from personal, external, and organizational impairments to independence. The operational experience staff must maintain independence so that opinions, conclusions, judgments, and recommendations will be impartial and will be viewed as impartial by knowledgeable third parties.

RECOMMENDATION

OIG recommends that the Executive Director for Operations:

- (3) Establish an independent operating experience function and locate that function at the appropriate organizational level.

- Sources of Operating Experience (Page 20)

The ROETF reviewed the Agencywide Documents Access and Management System (ADAMS) for sources of operating experience information and identified a number of problems. For example, the task force found instances of:

- incorrectly categorized documents,
- overlapping document types,
- general document types with a wide variety of topics, and
- difficulty retrieving relevant legacy documents.

OIG also identified similar difficulties with the retrieval of information from ADAMS. For example:

- One program official told OIG that, in one instance, finding a specific document in ADAMS took more than 40 minutes of searching even when the existence and nature of the document was known.
- Another program official told OIG that it takes three to four tries to find anything, even when the official knows exactly what he is looking for. In addition, the official said that he has a level of comfort about what he finds only when he knows a document should be there. If he is searching for documents of which he may not be actually aware, then he is never comfortable that his search efforts found all of the relevant documents.
- OIG reported previously that inspection staff repeatedly cited ADAMS as a concern and stated that it is difficult to locate information in ADAMS.¹¹

Although the report notes that some of the ROETF concerns might be addressed by existing plans for ADAMS improvements, the task force made no recommendations to correct the identified deficiencies.

In recognition of its increasing attention to the importance of operating experience, NRC has developed an internal operating experience web site. Additionally, the agency has a multi-office effort underway to develop a publicly available external web site. OIG analysis indicates that management has not made clear decisions as to whether all operating experience information in ADAMS will be replicated on the web sites or vice versa. It is important that members of the public have access to operating experience information. However, it is vital that NRC staff be able to effectively and efficiently locate and retrieve operating experience data to ensure they can evaluate the impact of the information on critical regulatory functions, such as inspections. Therefore, the following OIG recommendations are focused on improvements for NRC staff.

RECOMMENDATIONS

OIG recommends that the Executive Director for Operations:

- (4) Develop and implement an action plan to enhance the ability of staff to retrieve operating experience information from ADAMS, including identified issues associated with data entry and categorization.

¹¹ OIG-03-A-10, *Headquarters Action Needed on Issues Identified from Regional Audits*, February 26, 2003, Page 11.

- (5) Provide staff clear guidance as to whether operating experience information should be obtained from ADAMS or from other sources, such as the operating experience web sites.
- Retrievability of Operating Experience (Page 21)

The ROETF report concludes that:

“The NRC Web site is improving the access to OE [operating experience], but it currently does not include some of the OE databases and information sources that could enhance an OE program and **it does not yet have an easy search and retrieval capability.**” [emphasis added]

It is critical that compiled operating experience information made available on the web site have a user-friendly search and retrieval capability. Numerous inspectors confirmed to the ROETF and OIG that the ability to readily locate and retrieve operating experience was important to conducting effective inspections. However, the ROETF recommendations related to this conclusion do not speak directly to ensuring user-friendly search and retrieval capability for operating experience information made available on the web site.

RECOMMENDATION

OIG recommends that the Executive Director for Operations:

- (6) Improve the usability and accessibility of NRC's operating experience web pages by applying best practices in web design.
- Communication (No page reference)

OIG's own Event Inquiry into the incident at Davis-Besse (see footnote 1) determined that there was ineffective communication among cognizant NRC managers concerning boric acid leakage and corrosion, which was critical operating experience information. OIG found that the NRC resident inspectors at Davis-Besse reported numerous instances of boric acid leakage and its corrosive effects on reactor components to their immediate supervisor. However, these issues were not raised and discussed during daily management meetings. Consequently, the recurring reports of boric acid leakage and corrosion were not provided to the senior managers and NRC Headquarters representatives evaluating potential problems at the plant.

The ROETF made several recommendations to improve various aspects of communication related to operating experience. In addition, NRC has responded to OIG's Event Inquiry. OIG's review of the ROETF report and NRC's response leads us to conclude that it is important that NRC continue to work toward improving communications between, and among, headquarters and regional staff regarding operating experience issues.

AGENCY COMMENTS

At an exit meeting on March 16, 2004, OIG discussed the report's content with NRC officials. While NRC officials generally agreed with the report, they provided some editorial suggestions which OIG incorporated, as appropriate.

SCOPE AND METHODOLOGY

During its on-going audit of the baseline inspection program, OIG discussed operating experience with more than 100 inspection program staff and licensee officials, as well as with members of the ROETF. OIG also reviewed the operating experience web site, numerous agency documents related to the use of operating experience, and the lessons-learned from the Davis-Besse event. OIG conducted this work between January 7, 2004 and February 12, 2004, in accordance with generally accepted Government auditing standards.

Please provide information on the actions taken in response to the recommendations directed to your office by April 30, 2004. Actions taken or planned are subject to OIG follow up. See attached instructions for responding to OIG report recommendations.

If you have any questions or concerns regarding this report, please contact Russ Irish at 415-5972 or me at 415-5915.

Attachment: As stated

cc: Chairman Diaz
Commissioner McGaffigan
Commissioner Merrifield

R. McOsker, OCM/RAM
B. Torres, ACMUI
B.J. Garrick, ACNW
M. Bonaca, ACRS
J. Larkins, ACRS/ACNW
P. Bollwerk III, ASLBP
K. Cyr, OGC
J. Cordes, OCAA
E. Merschoff, CIO
J. Funches, CFO
P. Rabideau, Deputy CFO
J. Dunn Lee, OIP
D. Rathbun, OCA
E. Hayden, OPA
A. Vietti-Cook, SECY
W. Kane, DEDH/OEDO
C. Paperiello, DEDMRS/OEDO
W. Dean, OEDO
P. Norry, DEDM/OEDO
M. Springer, ADM
J. Dyer, NRR
G. Caputo, OI
P. Bird, HR
C. Kelley, SBCR
M. Virgilio, NMSS
S. Collins, DEDR
A. Thadani, RES
P. Lohaus, STP
F. Congel, OE
M. Federline, NMSS
R. Zimmerman, NSIR
R. Wessman, IRO
H. Miller, RI
L. Reyes, RII
J. Caldwell, RIII
B. Mallett, RIV
OPA-RI
OPA-RII
OPA-RIII
OPA-RIV
M. Malloy, OEDO
P. Tressler, OEDO