

PDR



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

April 1, 1994

CHAIRMAN

The Honorable Howard M. Metzenbaum  
United States Senate  
Washington, D.C. 20510-3502

Dear Senator Metzenbaum:

On behalf of the Commission, I am providing a detailed response to the concerns you expressed in your December 21, 1993 letter regarding the December 15, 1993 Public Citizen report that indicated numerous differences exist between the Nuclear Regulatory Commission's Systematic Assessment of Licensee Performance (SALP) and the Institute of Nuclear Power Operations' (INPO) evaluations. In our initial response of January 25, 1994, we informed you that the NRC was reviewing the concerns raised and would send you the full results when available. The NRC has now completed its review, and the results are enclosed.

On the surface, a comparison of the SALP report findings and specific findings in the INPO evaluation may appear to show inconsistencies. However, as we indicated in our initial response, SALP reports and INPO evaluations differ significantly in their scope and detail. In comparing the NRC's overall assessment of licensee performance at the Davis-Besse plant with INPO's, we conclude that our assessments are in substantial agreement.

The INPO reports referred to in the Public Citizen report are the product of a single, intensive review over a two-week period. In addition to a summary assessment of licensee performance, INPO reports contain the detailed observations and findings made during this review. The NRC SALP reports, which were used in the Public Citizen comparisons, summarize and integrate results of numerous NRC inspections conducted at a nuclear facility over a 12 to 24 month period. Any detailed observations in a SALP report are intended to be examples of the more general evaluation rather than a comprehensive listing of NRC findings.

The detailed portion of an INPO evaluation report is more closely related to a specific NRC inspection report than to an NRC SALP report. Furthermore, NRC inspections, like the INPO reviews, look at a sample of the licensee's activities. Although the examples contained in INPO and NRC evaluations may differ, the overall assessment of safety performance by both NRC and INPO can be essentially the same. We conclude that this is the case for Davis-Besse.

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The results of our review were generally positive. INPO efforts at optimizing licensee performance complemented NRC activities to ensure the licensee operated the Davis-Besse Nuclear Power Station safely. However, as a result of our review, we identified an inconsistency with the implementation of the process for NRC review of INPO evaluation reports. Supervisors are required to review the INPO evaluation reports during periodic site visits. This particular INPO report was not reviewed by the appropriate Section Chief. Similar concerns were identified at other sites and corrective action has been initiated. Despite this oversight, the review determined that significant safety issues identified by the INPO report had received appropriate NRC attention at the Davis-Besse Nuclear Power Station.

We believe the enclosed report will help resolve your concerns about the SALP and INPO evaluation process. If you have any further questions, please contact me.

Sincerely,



Ivan Selin

Enclosure:

Review of NRC Activities in Response to Public Citizen's Comparison of NRC SALP Reports and INPO Evaluation Report Concerning Davis-Besse Nuclear Power Station

REVIEW OF NRC ACTIVITIES IN RESPONSE TO PUBLIC CITIZEN'S  
COMPARISON OF NRC SALP REPORTS AND INPO EVALUATION REPORT  
CONCERNING DAVIS-BESSE NUCLEAR POWER STATION

BACKGROUND:

On December 15, 1993, Public Citizen's Critical Mass Energy Project (Public Citizen) released a report comparing NRC assessments of nuclear utility operations at 56 facilities to evaluations of the same facilities performed by the Institute of Nuclear Power Operations (INPO). The Public Citizen report indicated that numerous disparities exist between INPO evaluation reports and the NRC's Systematic Assessment of Licensee Performance (SALP) reports.

Although the missions of both the NRC and INPO include the concept of ensuring safety, the overall missions of the two groups differ. The mission of the NRC is to ensure that nuclear power plants are operated safely. Some issues pursued by INPO relate to utility conformance with escalating standards to promote excellence. These differences make comparing overall findings of the two organizations potentially misleading.

Differences also exist between the purpose and content of NRC SALP reports and INPO evaluation reports. SALP reports summarize a licensee's integrated safety performance based on a compilation of 12 to 24 months of NRC inspection, licensing, and enforcement activities. The limited number of findings and observations that are presented in SALP reports are used to illustrate the basis for the assessment. INPO evaluations are based on a single, intensive assessment of licensee performance and operations for a period of approximately 2 weeks. INPO evaluation reports provide the specific findings identified during the evaluation with supporting examples and/or recommendations for improvement. Consequently, comparisons between SALP reports and INPO evaluations would likely result in some disparities.

Notwithstanding the differences noted above, in keeping with the NRC's Field Policy Manual, No. 9, "NRC Review of INPO Documents," the NRC must closely attend to significant safety issues identified by INPO to ensure their resolution. Therefore, upon receipt of the Public Citizen report, the NRC initiated a detailed review of the INPO evaluation issued in January 1993, the NRC SALP report for the period from December 1, 1991, to June 30, 1993, and NRC inspection reports pertaining to Davis-Besse that support the SALP report. The review was performed to determine if the process the NRC established for reviewing INPO reports has ensured that the existing disparities are appropriate and that significant INPO safety findings received proper NRC attention. The conclusions and results of this review follow.

It should be noted that the following statements extracted from NRC inspection reports and SALP reports that appear on the detailed comparison do not represent the entire scope of NRC activities and do not present a complete view of the licensee's performance. The statements are taken from the NRC reports to reflect that NRC identified and followed up on issues similar to those addressed by INPO. They do not reflect all of the issues considered by the NRC in assessing licensee performance.

## CONCLUSIONS:

For the SALP period from December 1991 to June 1993, the NRC conducted a broad range of inspection activities to identify and follow up on issues related to safety and to develop conclusions regarding the licensee's performance. The inspection activities conducted provided appropriate insights regarding licensee operations, and those insights were accurately reflected in the SALP report. A comparison of the NRC's assessment of overall performance, as documented in the SALP report and supporting inspection reports, with the results of the INPO evaluation conducted in January 1993, indicates that general agreement existed between the NRC's and INPO's determinations of the licensee's ability to safely operate the plant. In addition, those safety-significant issues that were identified by INPO were reviewed by NRC inspectors and received appropriate NRC attention.

During its evaluation, INPO identified five findings for Davis-Besse. None of these findings were viewed as significant enough by INPO to warrant inclusion in the executive summary for the Davis-Besse INPO plant evaluation report. The executive summary only addressed strengths in licensee performance. The Public Citizen report compared the INPO findings with the NRC's SALP report. Public Citizen indicated that of the five findings addressed by INPO, three were unaddressed by the NRC and two were contradicted in the NRC's SALP report. The results of our review of Public Citizen's findings are summarized below.

### IDENTIFIED BY PUBLIC CITIZEN AS UNADDRESSED

One of the INPO findings related to the conduct of operations at Davis-Besse, which was identified by Public Citizen as unaddressed in the NRC SALP report, was addressed in the preparation of the SALP report and was noted in several NRC inspection reports. NRC and INPO conclusions regarding licensee performance in this area were consistent. The other two findings, relating to untimely reporting of equipment failures to INPO's Nuclear Plant Reliability Data System (NPRDS) and the accuracy of the personnel dosimetry system in measuring dose equivalent were not addressed in the SALP report or in NRC inspection reports. The NRC's evaluation of each of the INPO findings that Public Citizen indicated were unaddressed follows:

#### Operations

INPO found that weaknesses in teamwork, verbal communications, and role and responsibility definition contributed to some difficulty experienced by operators responding to some simulated plant events. The NRC noted similar concerns in NRC inspection reports. In a complete assessment of licensee performance (NRC SALP), failure to follow procedures, inadequate attention to detail, and equipment misoperation were identified as the significant root causes for most of the licensee's events. Weaknesses in teamwork and communications were only identified as a root cause for a few events during the 18 month evaluation period and were therefore not highlighted in the SALP report.

Both the INPO and the NRC assessments of licensee performance related to this issue were consistent. The Public Citizen report was correct in stating that this issue was not addressed in the NRC SALP report. However, this finding was not addressed in the SALP report because it was not considered a major licensee weakness when considered in the context of performance of the operations department throughout the eighteen month evaluation period.

### Operational Experience

INPO found that the licensee did not report some reportable equipment failures to INPO's Nuclear Plant Reliability Data System (NPRDS) and that many of the reported failures were significantly delayed. This is an INPO requirement, not an NRC requirement.

The Public Citizen report was correct in stating that this issue was not addressed in the NRC SALP report.

### Radiological Protection

INPO found that the accuracy of the Davis-Besse personnel dosimetry system in measuring dose equivalent was not reliably determined. The NRC routinely inspects licensees' radiological controls programs and at Davis-Besse determined that the overall performance in this area was good. The NRC did not identify the specific concerns found by INPO; however, knowledge of these concerns would not have changed the SALP Category 2 rating for the radiological controls program at Davis Besse. The potential dosimetry inaccuracies found by INPO could have resulted in minor, unrecorded exposures of only a small fraction of the limits established for personnel protection and NRC requirements, and then only for beta radiation measurements. The maximum potential inaccuracy exhibited by 2 of almost 200 quality control measurements was 8% greater than recommended by the National Institute of Standards and Technology (NIST). This additional measurement inaccuracy is of minor safety and regulatory significance, in particular because the maximum beta dose recorded for workers at the Davis Besse plant was far below NRC limits. Initial NRC review of the INPO report determined that the licensee initiated prompt corrective action for the program deficiencies that allowed these inaccuracies to go undetected.

The INPO report discussed the specific licensee corrective actions for this finding that included (1) instituting documented controls and proceduralizing calculational methodologies, analysis, and acceptance of results, (2) establishing an interim investigational level of 20 percent pending the reanalysis of station acceptance criteria, and (3) monitoring and trending the performance of the dosimetry system.

The NRC senior resident inspector assigned to the Davis-Besse facility reviewed the INPO plant evaluation report in early 1993 and did not identify any INPO issues that had not been addressed by the licensee.



Public Citizen was correct in observing that this issue was not addressed in the NRC SALP report; however, the issue was not significant enough to change the overall SALP evaluation of the radiological controls program at Davis Besse, which was an assessment of the program over an eighteen month period.

#### IDENTIFIED BY PUBLIC CITIZEN AS CONTRADICTORY

Of the two INPO findings that the Public Citizen report stated were contradictory, both related to worker training. Both findings were adequately addressed by the NRC through its inspection program and SALP process. Overall performance was determined to be satisfactory by INPO and the NRC. The NRC's evaluation of each of the INPO findings that Public Citizen indicated were contradictory follows:

##### Worker Training

INPO found that many radiological control technicians were unaware of lessons learned from significant industry operating experience on unplanned, job-related overexposures. As stated in the INPO evaluation, this finding was based on a limited sample of radiological control technicians' knowledge of the lessons learned that are referenced in SOER 85-03, "Excessive Personnel Radiation Exposure." (Significant Operating Event Reports (SOERs) are issued by INPO and are not required by NRC regulations.) The NRC did not discuss the licensee's response to SOER 85-03 in NRC inspection reports or SALP reports. This is consistent with NRC Field Policy Manual, No. 9, "NRC Review of INPO Documents," which states, "INPO operating plant evaluation reports, performance indicators, assistance visit reports, Significant Operating Event Reports (SOERs), and Significant Event Reports (SERs) are an independent assessment of licensee activities and events. The specific findings, recommendations, and corrective actions should not normally be referenced or followed-up by the NRC. Only in those cases where a significant safety issue is identified should the NRC conduct independent follow-up of licensee actions."

The NRC noted mixed performance in the radiological controls area. Several examples were documented in inspection reports where radiological control technician performance and knowledge were good, but examples of poor performance were also noted. An assessment of licensee performance over an extended period of time indicates that the knowledge and performance of radiological control technicians were generally good.

The INPO and NRC assessments of licensee performance are not contradictory because the INPO finding represents only a spot check of the lessons learned from one INPO document. As stated above, INPO viewed none of its findings as significant enough to warrant inclusion in the executive summary of its evaluation report.

### Worker Training

INPO found that radiation workers are qualified without sufficient evaluation of their radiological work practice skills during general employee training. The NRC findings related to the performance of radiation workers were consistent with the INPO plant evaluation findings. The NRC did not specifically identify general employee training deficiencies as a root cause for the licensee performance weaknesses in this area. However, the NRC did identify some problems with radiation worker performance. Hence, training weaknesses were implied.

### OTHER FINDING

Although the NRC's assessment of pertinent INPO and NRC documents was generally positive, one concern was identified. NRC internal procedures require that resident inspectors review the INPO evaluation results when received by the licensee and that section chiefs review them during periodic site visits. However, the review by the section chief did not take place for Davis-Besse. A similar concern was identified at other sites and corrective action has been initiated. The reviewers did determine that the resident inspectors had evaluated the INPO report.

Despite the fact that the section chief had not reviewed the evaluation, the process the NRC established for reviewing INPO reports was effective in ensuring that significant safety issues identified by INPO at Davis-Besse received appropriate NRC attention.

### DETAILED RESULTS:

The statements related to the INPO findings are taken from the Public Citizen report when possible. Public Citizen reported the INPO findings accurately. A review of each INPO major finding follows.

### OPERATIONS

#### INPO Evaluation Report Finding:

Weaknesses in teamwork contributed to some difficulty experienced by operators responding to some simulated plant events. Weaknesses include shift supervisors bypassing the assistant shift supervisor in giving direction to control board operators and operating crew weaknesses in verbal communications. Also, operations management has not clearly defined the roles and responsibilities of shift supervisors and expectations for team member interface during abnormal conditions.

#### NRC Inspection Report Findings:

The following NRC inspection report discusses events in which communications and/or teamwork were identified as contributors to the events:

- NRC inspection report 50-346/93011: "The violation is of concern because it directly resulted in the inadvertent transfer of about 13,570 gallons of water from the reactor coolant system to the borated water storage tank. This violation is being issued because your corrective actions for a similar event in December 1992 were not adequate to prevent occurrence of this event. Both the April 3 and April 13 events are of concern because, during one or both events, a number of weaknesses during shutdown activities were demonstrated concerning monitoring of important plant parameters, operator cognizance of changing equipment status and its effects on interfacing systems, attention to detail, operator knowledge of the decay heat removal system, and communications."

"Additionally, the licensee was planning a program to address known deficiencies in communications, command and control, and knowledge of integrated systems operations, with the plant in Mode 6."

"The operations superintendent and operations manager discussed this event and the April 3, 1993, event with each shift supervisor who in turn discussed this event with their operating crews. The discussion focused on the use of plant drawings prior to executing system status changes and improving the quality of communications on shift. The licensee was also evaluating a procedure change to DB-OP-06012 to preclude flow initiation until well into the body of the procedure. Additionally, the licensee was developing a program to address known deficiencies in communications, command and control, and knowledge of integrated systems operations when the plant is shutdown."

"The inspectors noted that communications between the EO, RO, and AST were inadequate, since no one questioned the task being performed by the EO and no one was aware that steps were being performed out of sequence. Additionally, the RO was unaware that the lineup was being performed until the EO requested that control room operated valves be repositioned."

The following NRC inspection reports discuss events in which operator response was good:

- NRC inspection report 50-346/92003: "Upon subsequent escalation of power a maintenance activity resulted in a turbine trip and reactor trip from 40% power. A turbine bypass valve failed open after the trip complicating the post-trip plant response. Two turbine bypass valves were repaired and isolated and plant startup commenced March 2, 1992. Full power was achieved on March 3, 1992. The plant has operated at essentially full power since this startup. The operators response to the event was good."
- NRC inspection report 50-346/92014: "Operators alertly acted to avert an undesirable boron addition to the reactor coolant system (RCS) during makeup tank level system maintenance. A thorough pre-job brief contributed to the operators' outstanding response."



- NRC inspection report 50-346/92017: "Operators responded in a conservative and timely manner during an event in which control rod group 6 left its fully withdrawn position."
- NRC inspection report 50-346/93004: "The shutdown and cooldown of the unit to begin the eighth refueling outage was conducted in a controlled, conservative manner."
- NRC inspection report 50-346/93006: "Excellent response to an April 8 trip of decay heat removal (DHR) pump #2 was noted (paragraph 2.e). The pump was being used for shutdown cooling when it inadvertently tripped. Control room operators immediately recognized the pump had tripped and were able to start DHR pump #1 within about 8 minutes."

The following NRC inspection report discusses operator performance during requalification:

- NRC inspection report 50-346/93021: "The inspectors evaluated the operators' performance during the dynamic simulator examination for the crews in training. The inspectors concluded that operator performance on the requalification examinations was satisfactory. The performance of the on shift operating crew was superior to the staff crew evaluated."

#### NRC SALP:

The June 1993 SALP report (NRC inspection report 50-346/93001) rated the operations area as a Category 2. NRC Management Directive 8.6, "Systematic Assessment of Licensee Performance (SALP)" defines Category 2 as follows:

"Licensee attention and involvement are normally well focused and resulted in a good level of safety performance. Licensee programs and procedures normally provide the necessary control of activities, but deficiencies may exist. The licensee's self-assessments are normally good, although issues may escape identification. Corrective actions are usually effective, although some may not be complete. Root cause analyses are normally thorough."

The SALP report highlighted some continuing problems in the conduct of operations. These included instances of failure to follow procedures, inadequate attention to detail, and equipment misoperation. Weaknesses in teamwork were not highlighted in the SALP report. Licensee performance in the SALP functional area of operations was characterized as, "a conservative operating philosophy with good involvement and support by management; however, some implementation errors continued to occur." Specific examples of implementation errors listed in the SALP report include:

- "On occasion, operators failed to follow procedures. Examples included performing procedural steps out of sequence such that an inadvertent transfer of approximately 13,500 gallons of reactor coolant system inventory to the borated water storage tank occurred, and failing to obtain a required senior reactor operator sign-off upon completion of a

valve lineup, which contributed to running a clean waste monitor tank pump with its suction valve closed for about 5 hours. Additionally, two instances occurred during new fuel receipt operations when operators failed to maintain proper control due to poor attention to detail. Also, instances of equipment misoperation occasionally occurred. An example was improper operation of valves in the control room ventilation system."

- "Shift response to operational events at power was excellent with one exception. Control room operators, responding to a failure in the integrated control system late in the assessment period, took action that inadvertently caused reactor coolant system pressure to increase to its high pressure trip setpoint, causing the reactor to trip."
- "Operator cognizance of panel indications and equipment status was good. However, there were a few instances where operator cognizance was inadequate. For example, early in the assessment period, a hydrogen analyzer was inoperable for about 10 hours and a makeup pump was inoperable during a mode change near the end of the assessment period. Additionally, during the refueling outage, reactor vessel water level was allowed to increase, which resulted in borated water leaking past the reactor vessel head O-ring seals and wetting vessel heads stud holes resulting in additional unplanned radiation exposure."
- "Operator initial qualification pass rate was 94 percent; operator requalification pass rate was 88 percent. However, some weaknesses, relating to operator knowledge of equipment and system response during shutdown conditions, were self-identified."

#### Analysis:

In inspection report 50-346/93011, the NRC staff identified weaknesses in teamwork and communications that were consistent with those identified by INPO. The licensee initiated corrective actions to improve in these areas. Corrective actions included reinforcing "Command and Control Guidelines" usage during simulated and actual performance critiques, reinforcing the expectations for communication on shift, and implementing activities to improve teamwork among the members of the crew.

The NRC staff also identified several examples of good operator response during actual plant events. (INPO had based its finding on a single inspection during training on the simulator.) In a complete assessment of licensee performance (NRC SALP), failure to follow procedures, inadequate attention to detail, and equipment misoperation were identified as the significant root causes for most of the licensee's problems in the operations area. Weaknesses in teamwork and in communications were determined to be root causes for only a few events during the 18 month evaluation period and therefore, were not highlighted in the SALP report.

## OPERATIONAL EXPERIENCE

### INPO Evaluation Report Finding:

Some reportable equipment failures continue to not be reported to the Nuclear Plant Reliability Data System (NPRDS), and many of the reported failures are significantly delayed. Contributing to this problem is insufficiently effective management direction and oversight of the NPRDS reporting process. In addition, some station personnel responsible for monitoring and reporting equipment failures possess knowledge weaknesses in NPRDS reporting guidance.

### NRC Inspection Report Findings:

The following NRC inspection reports discuss issues related to the identification and resolution of safety issues:

- NRC inspection report 50-346/92011: "On July 15, 1992, the licensee distributed its first Windows Process Report. The Windows program is a site wide assessment program to evaluate the performance of all site departments in four designated areas. These designated areas are cost, personnel, equipment, and program. The Windows Report presents a visual summary by use of colors to identify site activities which are excelling or require improvement. The Windows program was compiled by a multi-disciplinary team of site employees which developed performance indicators and grading criteria. The report will be evaluated and distributed quarterly."
- NRC inspection report 50-346/92013: "The QA organization has implemented a new process in their review of site events to more accurately note emerging trends. Their use of statistical process controls is now used for their quarterly review process. The inspectors reviewed the initial report and felt that it was a good initiative and useful tool to note trouble areas and ensure corrective actions were taken in a timely manner."
- NRC inspection report 50-346/93012: "The potential condition adverse to quality reporting (PCAQR) system was well implemented overall during this inspection period. On one occasion, however, adequate followup actions were not implemented in a timely manner (paragraph 4.d). The identification of missing bolts from a diesel generator electrical panel was not corrected upon initial identification, but rather, was only corrected after being independently identified a second time by the plant manager and senior resident inspector."

### NRC SALP:

The SALP report addressed several issues related to the identification and resolution of safety issues. Specific examples include:

- "Performance was characterized by excellent management support for programs that identified, tracked, and resolved safety issues. Resolution of long-term issues was good."

- "Management support of the Potential Condition Adverse to Quality Reporting (PCAQR) system was evident. The PCAQR system was effectively used as the primary means of determining root causes and corrective actions to significant discrepant conditions identified at the facility. Additionally, the commitment tracking system was excellent, which resulted in quality updated safety analysis report revisions, schedules being met, and commitments being implemented."
- "The computerized tracking program implemented in the latter part of the assessment period was effectively used to trend the performance of individual departments and program areas. This program enhanced the licensee's ability to identify weaknesses and improve performance."
- "Quality Assurance (QA) audits and surveillances were performance-based and thorough in nature. Quality Assurance issues were tracked and addressed in a timely manner."

#### Analysis:

NRC inspection findings were not consistent with the INPO finding. The INPO finding related to timeliness of reporting certain failures to the NPRDS database. The NPRDS database is an industry system used to track equipment failures. It is not required by NRC regulations and is not typically inspected by the NRC. NRC's review of the licensee's performance in responding to regulatory reporting requirements indicated good performance.

The NRC inspects systems used for the timely identification and resolution of safety issues. The NRC SALP and inspection reports noted that the licensee employed several effective systems to ensure that corrective actions for safety issues were taken in a timely manner.

The licensee initiated corrective actions in response to the INPO finding by consolidating NPRDS reporting functions, appointing a new NPRDS coordinator, improving systems to ensure evaluation of potential failures and development of trends for reporting times, and initiating monthly management reviews.

### **RADIOLOGICAL PROTECTION**

#### INPO Evaluation Report Finding:

The accuracy of the personnel dosimetry system in measuring dose equivalent is not reliably determined. This is due to deficiencies in techniques for dosimetry quality control analysis.

Supporting examples included:

- As part of the routine dosimetry quality control program, dosimeters were exposed to known levels of radiation and processed to determine accuracy. The measured levels were not subjected to rigorous statistical analyses, but were only visually compared to the predicted values. Two of 180 measurements for beta radiation were greater than

the station's acceptance criteria of 50 percent (52 percent and 54 percent respectively). Those anomalies were not identified when station staff reviewed the dosimetry quality control reports.

- Because the station acceptance criteria of 50 percent is higher than normal dosimetry performance, dosimetry program deficiencies could exist for a period of time before being detected.
- Performance trends are not monitored to detect changes in the performance of the dosimetry system.

#### NRC Inspection Report Findings:

The statistical analyses of the personnel dosimetry system quality control measurements was not reviewed in NRC inspection reports.

#### NRC SALP:

The SALP report states that, "Good performance in the radiation safety program was the result of strong management support and a competent radiological controls staff."

#### Analysis:

While the NRC inspection program did not identify the specific dosimetry quality control issues noted by INPO, those concerns are not significant enough to detract from the overall NRC assessment of the licensee's radiological controls program.

The NRC inspected the licensee's radiological control program using NRC Inspection Procedure 83750, "Occupational Radiation Exposure," and did not identify concerns with the personnel dosimetry program during these inspections. The NRC did not discuss the reliability or the accuracy of the personnel dosimetry system in measuring dose equivalent in either the SALP report or in NRC inspection reports.

The NRC senior resident inspector assigned to the Davis-Besse facility reviewed the INPO plant evaluation report in early 1993 and documented his review in a memorandum to his section chief on March 15, 1993. He stated in his review that INPO identified no safety-significant issues or concerns that have not been addressed by the licensee. Recognizing the slight nature of the exceedances on a very few of the quality control measurements for beta radiation and the very low beta radiation doses experienced by station personnel, there is minimal health and safety concern associated with this matter.

The INPO report discussed the specific licensee corrective actions for this finding that included: (1) instituting documented controls and proceduralizing calculational methodologies, analysis, and acceptance of results; (2) establishing an interim investigational level of 20 percent pending the reanalysis of station acceptance criteria; and (3) monitoring and trending the performance of the dosimetry system.



The dosimetry acceptance criteria used at the Davis-Besse facility were consistent with the standard acceptance criteria set by the National Voluntary Laboratory Accreditation Program administered by the National Institute of Standards and Technology (NIST). Notwithstanding its compliance with the NIST criteria, the station reassessed its acceptance criteria for beta radiation and lowered it to 40 percent. The licensee's corrective actions adequately addressed the INPO finding.

## WORKER TRAINING

### INPO Evaluation Report Finding:

Many radiological control technicians were unaware of lessons learned from job-related significant industry operating experience on unplanned overexposures.

Supporting examples included:

- Several radiological control technicians were unaware of significant lessons learned from industry unplanned overexposure events.
- Training materials do not contain objectives and test questions on these events or their causes. Student retention is not measured.
- This finding was based on the licensee's knowledge and actions related to SOER 85-03.

### NRC Inspection Report Findings:

The following inspection reports discuss issues related to radiological control technician knowledge and performance:

- NRC inspection report 50-346/92003: "Tours conducted by radiological controls technicians of the Auxiliary Boiler room found that temporary hoses used to drain residual water from the auxiliary boiler blowdown tank were directed to the turbine storm drain system and not to the Turbine Building Drain System (TBDS). The TBDS is used for the disposal of potentially contaminated liquids whereas the storm drain system is used for disposal of nonradioactive liquids. Since the auxiliary boiler system is considered potentially contaminated, the drains should have been directed to the TBDS. Two Radiological Awareness Reports documented this condition. Even though no liquid was drained through this line, the potential existed for their to be an unplanned release of potentially radioactive fluids. The inspectors believe that the attention to detail demonstrated by the RC technicians during their routine tours, is considered a strength."
- NRC inspection report 50-346/92004 discusses licensee performance during the May 1992 emergency preparedness exercise. One exercise weakness was identified due to the failure to completely evaluate the internal exposure hazard to personnel assigned to inplant teams. The inspection

report states, "External exposure control was excellent; however, radiation protection personnel failed to completely evaluate the internal exposure hazard to inplant teams. Numerous inplant repair teams were sent into areas which contained airborne radioactivity without respiratory protection and without any air samples to make an informed decision on the necessity of respirators. Although the decision was made to issue potassium iodide to an inplant team, it did not appear that this decision was based on a reasonable estimation of the potential thyroid dose at the leaking valve."

- NRC inspection report 50-346/92019: "During a tour of the auxiliary building on December 18, 1992, the inspectors noted that the entrance way to the #2 Clean Waste Receiver Tank (CWRT) room was posted with a high radiation area sign due to draining reactor coolant water on the evening of December 14, 1992. The inspectors noted that the radiological survey map posted near the entrance was dated December 7, 1992, and as such, did not show the high radiation area.... the licensee agreed that all postings should be consistent and that actions would be taken to keep postings updated in an appropriate timeframe."
- NRC inspection report 50-346/93004: "At 4:03 p.m. on February 19, 1993, a security guard performing routine checks on locked doors, found that door number 360, access door to the containment emergency escape hatch, was not locked. The door was required to be locked since it accesses a high radiation area (i.e., containment). The door initially was believed to have been locked since it did not move when pulled, but upon further investigation, the dead bolt was not visibly in contact with the latch indicating that the locking mechanism was not engaged. The door was then opened to verify that the lock was not engaged, then locked closed. Since this door was alarmed, a review of the computer records was done that indicated the door had not been operated since the evening of February 17, 1993.

On February 17, at 7:22 p.m., after successful completion of the emergency escape hatch local leak rate test, door 360 was closed by security and two radiological controls technicians, all of which believed the door automatically locked when it was closed. They pulled on the door to confirm that the door had locked, then left the area. Hourly security checks of the door did not detect that the door was not locked until the afternoon of February 19, 1993.

The licensee documented this event in a Potential Condition Adverse to Quality Report (PCAQR 93-0057) and will evaluate corrective actions and reportability."

- NRC inspection report 50-346/93007 issued a non-cited violation for the unlocked high radiation area door (NRC inspection report 50-346/93004) because it violated TS 6.12 requirements.
- NRC inspection report 50-346/93007: "One specific job reviewed was the steam cleaning (decontamination) of a steam generator in the east "D" ring. Based on the pre-job evaluation the work was performed without

the use of respirators and the personal intakes of the workers involved with the job were consistent with the evaluation. While the job was in progress, outage management permitted opening of the containment equipment (hatch door) which resulted in airborne radioactivity from the steam cleaning to contaminate nearby portions of the auxiliary building and minor intakes and contamination of personnel working close by in the containment. Radiation protection stopped the job until it was reevaluated and subsequently wrote a condition report."

- NRC inspection report 50-346/93007: "It appeared lessons learned and historical job information, pre-job meetings, and ALARA briefings, were used for planning and implementation of engineering controls and were generally effective for this outage. As noted in section 10, the licensee also began a program to reduce, where practicable, the use of respirators and protective clothing in order to allow work in external fields to be done more efficiently and quickly and with reduced overall dose (person-rem). This initiative appeared to have been well planned and was progressing well."

#### NRC SALP:

The SALP report addressed the area of radiological controls training as follows:

- "Overall, staff levels, training, and qualifications were excellent. For example, about half of the radiological protection (RP) technicians and staff were certified by the National Registry of Radiation Protection Technology (NRRPT) at the end of the assessment period. Sufficient staff was available to provide coverage during routine and refueling outage operations. Training was provided to onsite personnel before implementation of the revised 10 CFR Part 20 requirements and was generally effective."
- "radiation work permits and local survey maps occasionally did not accurately reflect actual working and plant conditions."

#### Analysis:

The NRC did not discuss the licensee's response to SOER 85-03 in SALP reports or NRC inspection reports. This is consistent with the NRC policy stated in Field Policy Manual, No. 9, "NRC Review of INPO Documents." The Field Policy Manual states, "INPO operating plant evaluation reports, performance indicators, assistance visit reports, Significant Operating Event Reports (SOERs), and Significant Event Reports (SERs) are an independent assessment of licensee activities and events. The specific findings, recommendations, and corrective actions should not normally be referenced or followed-up by the NRC. Only in those cases where a significant safety issue is identified should the NRC conduct independent follow-up of licensee actions."

The NRC noted mixed performance in the radiological controls area. Several examples were documented in inspection reports where radiological control technician performance and knowledge were good, but examples of poor performance were also given.

As stated in the INPO evaluation, this finding was based on a limited sample of radiological control technicians' knowledge of lessons learned. Specifically, the lessons learned that are referenced in SOER 85-03, "Excessive Personnel Radiation Exposure," were reviewed. An assessment of licensee performance by the NRC over an extended period of time indicates that radiological control technician knowledge and performance were generally good.

The licensee initiated corrective actions for the INPO finding that included stressing the importance of evaluating and applying lessons learned, emphasizing ALARA, upgrading learning objectives and examination questions, and developing a "Radiation Protection Philosophy and Issues Handbook."

#### INPO Evaluation Report Finding:

Radiation workers are qualified with insufficient evaluation of their radiological work practice skills during general employee training. Weaknesses in the qualification process may be contributing to station personnel contaminations.

#### Supporting examples included:

- Evaluators frequently coached students, which detracted from their ability to grade individual student performance and knowledge.
- Many students helped each other during the graded radiological work practice practical examination. Individual student weaknesses may have been masked.
- One student passed with a score of 95 percent even though the student stood in the radiologically restricted area after removing his shoe liners, searched for an article in the contaminated trash barrel after removing his outer gloves, and removed his protective clothing in the wrong sequence.
- Although a goal of 50 or fewer contaminations was set, approximately 265 contaminations occurred. They were primarily due to human performance problems.
- Management has been insufficiently effective in identifying areas for improving performance in personnel contaminations.

### NRC Inspection Report Findings:

The following inspection reports discuss issues related to training and evaluation of radiological control technicians and radiation workers:

- NRC inspection report 50-346/92009: "All radiation protection (RP) supervisors and both senior and master RP testers meet ANSI N18.1-1971 requirements, with the testers averaging about 4 years experience."
- NRC inspection report 50-346/93007: "Housekeeping in the containment was generally not good; gloves, tools, face shields, and other personal equipment were observed laying outside step-off pads and laydown areas."

"The licensee has continued to encourage the health physics staff to participate in the in-house training program for NRRPT certification."

"The inspector observed members of the staff and contractor radiation protection technicians (RPTs) performing their duties during outage conditions. Based on these observations, review of training outlines, and discussions with station and contract workers about the quality of radiation protection training, it appears adequate to prepare individuals for work during outage conditions. The adequacy of the program was challenged during this outage because of the large number of first time workers and the implementation of the revised 10 CFR Part 20 requirements. Training has been provided to plant and contractor staff on the revised Part 20 and it appears comprehensive in scope and content. Station procedures and policies affected by the revision have been developed and in most cases been implemented."

"Except for comments on weaknesses related to documenting and tracking of personal contamination events, the audits indicated good performance overall."

"The contaminated area of the station increased from the preoutage level of about five percent. In 1992, there were about 45 personal contamination events (PCEs). During the first two weeks of the outage the licensee experienced a higher than expected number of PCEs owing mainly to poor work practices by inexperienced workers exacerbated by higher than normal containment levels. The inspector noted that after the licensee increased worker and supervisor awareness of the problem, the rate of PCEs decreased to an expected level. Many PCEs also resulted from licensee approval of reduced protective clothing use in contaminated areas. These measures were taken to improve industrial safety and reduce overall radiation exposure, consistent with ALARA. No problems were noted with these measures and improvements were made in response to weaknesses identified in the tracking and trending of the PCEs early in the outage."



### NRC SALP:

The SALP report did not address the area of general employee training. It only addressed the training of RP technicians and staff as shown in the previous finding.

The previous SALP report (November 1991, NRC inspection report 50-346,91001) identified the following issues:

- "Management efforts improved radiological controls during the recent outage. Poor work practices while changing a laundry filter and inadequate ventilation controls during work on a control rod drive mechanism led to personnel contaminations."
- "The number of personnel contamination events in 1990 was 160, but increased significantly to 265 in 1991, owing largely to poor control of contaminated protective clothing at the licensee's new wet-wash facility during the outage."

### Analysis:

The NRC findings related to the performance of radiation workers were consistent with the INPO findings. The NRC did not specifically identify general employee training deficiencies as a root cause for the licensee performance weaknesses in this area. The NRC identified poor work practices by inexperienced workers as a root cause. Hence, training weaknesses were implied.

The licensee initiated corrective actions for the INPO finding that included discussing weaknesses, performance expectations, and short-term improvements that are needed with the radiological controls training instructor, and reviewing and rewriting the trainee evaluation criteria so that it verifies that potential areas for improved human performance are emphasized and that individuals who do not demonstrate competency in radiological control practices will not pass.

# United States Senate

WASHINGTON, DC 20510-3802

December 21, 1993

Dr. Ivan Selin  
Chairman  
Nuclear Regulatory Commission  
Washington, D.C. 20555

Dear Ivan:

I recently read in the New York Times about a report published by the public interest group, Public Citizen. According to the article, the Nuclear Regulatory Commission (NRC) has published reports in the past that contradict the reports prepared by the nuclear industry's private auditing organization, the Institute of Nuclear Power Operations (INPO). The discrepancies between the reports as well as INPO's response to the disclosure concern me.

I have reviewed some of the differences in the reports prepared by INPO and the reports prepared by the NRC. In some instances, the NRC has taken a much more tolerant approach to weaknesses in plant operations than INPO. Moreover, in several reports, the information reported by the NRC has completely contradicted the information reported by INPO. For example, INPO noted with regard to radiological protection at the Davis-Besse plant in Ohio that: "The accuracy of the personnel dosimetry system in measuring dose equivalent is not reliably determined. This is due to deficiencies in quality control analysis and technical oversight of dosimetry performance." However, the NRC report on radiological protection at Davis-Besse stated that: "Management effectiveness in ensuring quality was good." I am troubled that the NRC could arrive at such a different conclusion examining the same facility during the same time frame.

The response of INPO to the publishing of the reports also concerns me. According to officials at Public Citizen, INPO plans to initiate legal action against Public Citizen as well as punish any employees responsible for releasing the reports to Public Citizen. I am not convinced that the public would be served by such action. I frankly believe that your intervention would bring about a more peaceful and constructive resolution. This conflict needs your leadership, and I know that you are capable of providing it.

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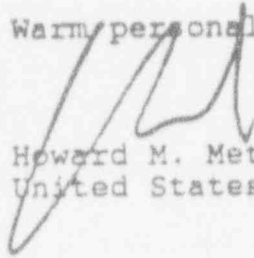
Dr. Ivan Selin

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While the report published by Public Citizen has sparked controversy, I believe they have rendered a public service in evaluating the discrepancies between the reports published by INPO and the reports published by the NRC. I hope that you can work with them and INPO to resolve their differences. More importantly, I hope that you will investigate why the reports prepared by the NRC differ from and contradict the reports prepared by INPO.

In the meantime, I appreciate your looking into this.

Warm personal regards,



Howard M. Metzenbaum  
United States Senator

HMM/daf