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DEFENSE NUCLEAR FACILITIES SAFETY BOARD

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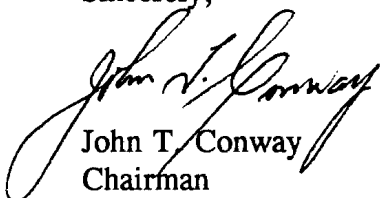
The Honorable Thomas P. Grumbly
Assistant Secretary for Environmental
Restoration and Waste Management
Department of Energy
Washington, D.C. 20585

Dear Mr. Grumbly:

Two Defense Nuclear Facilities Safety Board staff and an outside expert recently performed a conduct of operations and training and qualification review at the Idaho Chemical Processing Plant. This review was a followup to a review conducted in May 1993. A copy of their report is enclosed.

Although the report indicates that progress continues to be made in improving conduct of operations, it also provides a number of constructive suggestions for further improvement. The report is being provided for whatever actions you may deem appropriate in the furtherance of our mutual interests in safe operations.

Sincerely,


John T. Conway
Chairman

c: Mark Whitaker, Acting EH-6

Enclosure

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 29, 1993

MEMORANDUM FOR: G. W. Cunningham, Technical Director

COPIES: Board Members

FROM: Ralph Arcaro, Technical Staff

SUBJECT: Conduct of Operations and Training and Qualification Review at the Idaho Chemical Processing Plant, December 13-16, 1993

1. **Purpose:** This memorandum describes and provides comment on the status of the Conduct of Operations and Training and Qualification Programs at the Idaho Chemical Processing Plant (ICPP) of the Idaho National Engineering Laboratory (INEL). A review of these programs was conducted from December 13 to December 16 by DNFSB staff members Ralph Arcaro and Dermot Winters and Outside Expert David Boyd.
2. **Summary:** Although management at the Department of Energy Idaho Operations Office (DOE-ID) and the Westinghouse Idaho Nuclear Company (WINCO) recognize the need for strong programs in Conduct of Operations and Training and Qualification, the DNFSB review indicated that improvement is needed to fully comply with the DOE Orders that establish the requirements for these programs. The following were the most serious deficiencies noted:
 - a. WINCO lacks a consolidated assessment program to document assessment deficiencies, assign responsibilities for corrective action, evaluate results, and track progress to closure.
 - b. The training and qualification programs for supervisors require improvement to become compliant with the DOE training and qualification Order.
 - c. Deficiencies in conduct of operations were noted during observation of maintenance, operational, and training evolutions, including procedural compliance problems and poor radiological control practices. Specific comments resulting from review team observations of evolutions are included as an attachment.
3. **Background:** The DNFSB staff reviewed Conduct of Operations at ICPP in May 1993. The Board forwarded comments resulting from the May review to DOE in a staff trip

report dated July 20, 1993. The report cited progress in improving conduct of operations at ICPP but also provided areas of improvement indicating the need for follow-up review.

The follow-up review documented by this report was conducted by receiving briefings from appropriate management representatives, conducting tours with assigned DOE Facility Representatives, reviewing training and qualification records, and observing various operational evolutions.

4. Discussion/Observations:

a. Conduct of Operations:

- 1. Program:** The DNFSB review team was briefed on progress and accomplishments since the May 1993 review. At the earlier review, a WINCO report was provided which documented the results of self-assessments by ICPP departments of how well policies, programs and procedures conformed with the requirements of DOE Order 5480.19, *Conduct of Operations Requirements for DOE Facilities*. The report noted few instances of less than full conformance and in these cases there was action ongoing to correct the shortfalls.

Several measures to improve the conduct of operations program at ICPP since the DNFSB staff and outside expert review in May 1993 were described in briefs during this review. A summary and comments on some of these measures, reported as indicators of continuing management support and progress in implementing conduct of operations, follow:

- (a)** A conduct of operations assessment of plant utilities operations was completed in November 1993 and a draft report has been issued. The assessment was initiated following a fatality at the Hanford site while a worker was operating a utility system. This assessment was reported to cover both administrative and adherence order compliance.
- (b)** Area-of-inquiry guides are reportedly being written for various topical areas, including conduct of operations, to be used during management assessments. The guides are oriented toward assessing administrative rather than adherence order compliance. Discussion with various managers indicated an understanding of the need to conduct performance-based adherence reviews to verify field level compliance with DOE Order requirements. The DNFSB review team and WINCO managers discussed the need to expand the Conduct of Operations assessments to include adherence reviews.

- (c) In response to the death of a Hanford site worker while operating a utility system, the Westinghouse Corporation Vice President and General Manager for Government Operations Business units initiated a benchmarking review of non-nuclear conduct of operations performance at the five Westinghouse Government-owned Contractor-operated (GOCO) sites. A team of one or two representatives from each of the GOCO sites reviewed conduct of operations in utilities operations (steam, water, electrical power, etc.) at the five sites and, for comparison, a top-rated nuclear power plant. The product of this effort is a report which discusses 30 specific examples of best practices which can be utilized by the GOCO sites. The study was discussed with the WINCO representative on the benchmarking team, and the report dated October 1993 was reviewed. Although not brought out in the report, the practices and their underlying principles are also applicable to nuclear operations. The WINCO representative on the team had a rare opportunity to observe operations and bring back information on best practices at other sites. It is not clear that his experience and expertise in this area are being fully utilized at ICPP as there is no plan to apply results of the benchmarking review at ICPP.
 - (d) Basic conduct of operations training was completed for waste handling technicians. These personnel are assigned to new positions and did not receive training previously.
 - (e) Additional management oversight was maintained during CPP-603 fuel transfer startup activities and 2/3 cycle extraction cold chemical operations.
2. Management Overview Program: The report of the May 1993 DNFSB staff review of conduct of operations noted that the management overview program (MOP) appeared to be of limited effectiveness in assessing conduct of operations because it was relatively unstructured and did not specifically focus on conduct of operations. The WINCO response to this comment described various ongoing improvement efforts and reported that full implementation of the comprehensive program including the upgraded MOP is scheduled to be completed by June 30, 1994.
- (a) During the most recent DNFSB staff review, the subject of self-assessing conduct of operations performance was discussed with the operations department staff manager responsible for coordinating responses to DOE-ID surveillances including the status of corrective actions. This individual is familiar with WINCO procedures in assessments and efforts of the self-

assessment working group. It is not clear that any progress has been made since the May 1993 review, or even since December 1992 when several of the procedures became effective, to establish an effective process to accomplish independent assessments and line management self-assessments of administrative and adherence compliance with DOE Order 5480.19.

- (b) The relevant WINCO procedures, SOP WQ 18.3, 18.5, and 18.6 are difficult to follow and may hinder rather than support implementation of an effective program. Some sections of the operations department have established their own line management self-assessment programs, but these lack one or more elements of a structured program, including defined performance criteria, directed emphasis on areas of concern, coverage of all shifts and crews, trained assessors, documented findings, assigned responsibilities for corrective action, useful reports, assessment of results, or trending of performance indicators.

3. DOE Facility Representatives (FRs):

- (a) The FR for waste processing and the FR for the fuel storage area were individually accompanied and observed on routine tours of their facilities on December 14 and 15, 1993. These FRs were knowledgeable of processes and equipment; were alert to identify and document deficiencies in housekeeping, material condition and record keeping; communicated concerns to WINCO personnel; and displayed a professional attitude.
- (b) Both FRs are experienced in their duties and have completed Phase I of the DOE-ID FR training program, including various generic courses and self-study requirements, a written examination and an oral board examination. Completion of Phase I qualifies the FR to perform duties of his position. Phase II covers facility-specific processes, procedures, and safety documents. At present, the requirements for this phase consist of self-study as determined by the individual FR followed by written and oral examinations and a walk-through of assigned facilities. Deadlines for completing Phase II have been set and missed repeatedly.
- (c) FRs are expected to allocate 50% of their time to qualification, but reportedly because of operational responsibilities the actual is closer to 25%.

4. Operations Observations: The DNFSB review team observed several operational, maintenance, and training evolutions to determine if conduct of operations at

ICPP was in conformance with applicable orders and directives. The level of formality and acceptance of the requirements of formal conduct of operations of most personnel as well as the general attitude encountered indicate conduct of operations is generally good and improving. However, the following general comments provide evidence that continued improvement is needed. Specific comments from the various observations are provided in an Attachment.

(a) Procedural compliance problems were noted during performance of two separate evolutions.

(b) Poor initial planning prevented the scheduled performance of two maintenance jobs. (Although deficiencies in the execution of pre-job briefs were observed, it is noteworthy that pre-job briefs were effective in preventing premature performance of these evolutions.)

(c) Poor radiological control practices were noted during an incident that occurred just prior to the DNFSB review team arrival and during performance of a routine maintenance evolution.

(d) Recurrence of a Technical Specification/Standard violation raised questions about the effectiveness of root cause correction and lessons learned resulting from previous occurrences.

- b. **Training and Qualification:** The Idaho National Engineering Laboratory has endorsed Performance-Based Training for operators since before the issuance of DOE Order 5480.18A, *Accreditation of Performance-Based Training for Category A Reactors and Nuclear Facilities*, and DOE Order 5480.20, *Personnel Selection, Qualification, Training, and Staffing Requirements at DOE Reactor and Non-Reactor Nuclear Facilities* requiring it. As a result, the ICPP training and qualification program for operator includes many of the elements of an effective program, including fundamentals training, process specific classroom and on-the-job training, performance evaluations, and certification by line management. However, training and qualification programs for other positions are not as mature. The following comments detail this observation and indicate needed improvements in the operator training and qualification program:

(1) Supervisors are not trained to a technically higher standard than operators. Several concurrent efforts to correct this are underway including:

(a) transferring technical staff training materials to a supervisor program;

- (b) developing training for waste processing supervisors at the request of line management; and
- (c) transferring technical training material for DOE Facility Representatives to a supervisor program.

While these efforts indicate useful exchange of information, they may not be the most efficient method of rapidly achieving compliance with this important requirement of DOE Order 5480.20.

- (2) The ICPP Training Implementation Matrix (TIM), which schedules implementation of DOE Order 5480.20 was reviewed. The TIM provides conflicting information on the status of supervisor training. One requirement in the TIM indicates compliance with supervisory training requirements as of September 1992. Under the more general "Training Process" requirements, the TIM indicates supervisory training programs are to be implemented by September 1994. The requirement for supervisor training of increased depth is not addressed by the TIM.
 - (3) During observation of maintenance on a safety system, it was determined that the technician had not received training on the system, contrary to the requirements of DOE Order 5480.20.
 - (4) ICPP management uses an elaborate system of maintaining training records including a computerized database. However, no consolidated list of training and qualification requirements was available to quickly determine what was needed for particular positions. DOE Order 5480.20 requires that training records be easily auditable.
5. **Future Staff Actions:** The staff plans to continue its monitoring of Conduct of Operations improvements at the ICPP through continuing site reviews. All reviews of an operational nature will address conduct of operations to ensure DOE-ID and WINCO continue improvements. Reviews on a site-wide basis will cover programs at ICPP. These include an Order Compliance review in April 1994 and a Quality Assurance review in June 1994. The staff also plans to perform a site-wide review of training and qualification in April 1994.

Attachment 1

Specific Observations of
Conduct of Operations

1. Observation of Plant Utilities Senior Operator Performing Selected Steps of CPOP 4.4.2.2, Standby power Production GEN-UTI-601, on December 14, 1993. This portion of the procedure covers startup of the standby power diesel generator and auxiliary systems, operation under load and routine checks of generator operation. Performance of portions of this procedure was also observed during the May 1993 review and several comments on the procedure were included in the review report forwarded by DNFSB to DOE-HQ.
 - a. Observed steps of the procedure were performed successfully using a consumable copy of the current revision of the procedure.
 - b. Step 4.1.1h. concerning the warning light on the starting relay panel is confusing or incorrect. The operator performing the procedure agreed with this comment.
 - c. The operator was not knowledgeable in basic electrical theory associated with a.c. generator operation. This was indicated by answers to questions on changes in Kvar readings and changes in frequency when the Isoch/Droop switch is operated.
 - d. The operator was accompanied to the CPP-602 fan loft to observe performance of Step 4.3.11.s. When leaving the fan loft after completing the step, he failed to self-monitor for contamination despite a posted requirement to self-monitor on exiting a radioactive material area.

2. Observations of a Separations Operator Trainee Performing Selected Steps of CPOP 4.2.17.2, Startup, Operate, and Shutdown the Hexone Extraction System, Under Instruction as Part of On-the-Job Training (OJT) on December 15, 1993. Steps for Q-cell and P-cell in Sections 4.9, *Startup After Temporary Shutdown*, and 4.8, *Temporary Shutdown*, were observed.
 - a. Steps in Section 4.8.3 and 4.9.8 which activate alarms when performed, do not include notes to alert operators for expected alarms.
 - b. Steps in Section 4.9.8 which require coordination because of the concurrent startup of two cells are not marked to this effect.
 - c. Step 4.9.8.a.(5) was not performed in the procedure sequence.
 - d. Step 4.9.8.a.(6) does not include an expected value or range for steam trace pressure.

- e. Step 4.9.8.a.(4) 11. states "Adjust JV-15 to obtain a reading of between 0.4 and 0.6 psig on PI-6." The operator trainee was unable to adjust the pressure closer than 1.1 psig. He stated that the system engineer was aware of an equipment problem. There was no deficiency tag visible that documented the problem. The operator trainee (and his OJT instructor) did not stop the task and resolve procedural questions with the shift supervisor when a step of the procedure could not be performed as written. This violates Section 3.2.4 3) of procedure SOP PQ.16.A3, *Procedure Use*.
 - f. Open and close positions for RCV-Q-5 are not labeled on the corridor control panel.
 - g. The operator trainee had satisfied qualification standard knowledge requirements for the systems and equipment being operated, but he had difficulty explaining fundamentals of operation of components such as the evaporator thermosiphon loop and the effects of air pressure changes on interface control pot level, jackleg loop operation and interface position control.
 - h. The operator trainee could not clearly explain his own training process and his signature card package was missing some signatures for items already completed. There appeared to be confusion over special additional qualification requirements established for the next run. Several of the signed-off items did not indicate the level of accomplishment (perform, simulate, or discuss).
3. Observation of a Plant Services Instrument Specialist Performing Selected Steps of SOP 1.8.1.22, GA CAS Calibration, at CPP 603 on December 13, 1993. The criticality alarm system (CAS) components being calibrated are located in the graphite storage facility control room.
- a. Observed steps of the procedure were performed successfully using a consumable copy of the procedure. It did not indicate that it had been verified as the current revision.
 - b. It was not recognized at plan-of-the day meetings that planned videotaping of rack fuels in the CPP-603 south basin could not be accomplished concurrently with CAS calibration. The conflict was identified when shift operations personnel were conducting the pre-job brief for videotaping.
4. Observation of Operations Department Fuel Handling Operators Performing Selected Steps of Special Procedures at CPP-603 on December 14 and 16, 1993. These procedures were:
- PSM 310-93, Water Wand Preops.
 - PSM 264-93, Welch Allyn Shadowprobe Video Processor Operation.

PSM 286-93, Videotape Inspection of CPP-603 South Basin Rack Ports.
PSM 310-93, Transfer of Non-fuel Storing and Fuel Storing Yokes.

- a. Observed steps of the procedures were performed successfully using consumable copies of current revisions of the procedures.
 - b. The shift foreman was in charge of these activities and competently led the team effort.
5. Observation of Pre-Job Briefs on December 14 and 16, 1993 for Decon of the Containment Tent Over Tank Farm Valve Box C-2 and Decon of the Valve Box. As a result of these observations, a DNFSB review team member reviewed the construction safety work permit (CSWP) process for jobs performed by construction contractor personnel.
- a. Prior to the DNFSB review, two MK Ferguson of Idaho Company (MK-FIC) construction contractor workers received whole body radiation doses in excess of the WINCO weekly administrative dose guide of 300 mrem working in tank farm valve box C-2. The incident occurred because a radiation survey was not performed in the valve box shortly before the workers entered. The survey would have shown that radiological conditions had apparently changed since the previous survey was taken several days earlier. One of the workers also received skin contamination. This occurrence is reported in ORPS Report ID-WINC-WASTEMNGT-1993-0014. The DNFSB staff is monitoring DOE-ID's and WINCO's response to this event.
 - b. The pre-job brief to decontaminate the containment tent over valve box C-2 was observed at about 1800 on December 14, 1993. In accordance with SOP WE-2, *Construction Safety Work Permits*, the MK-FIC job supervisor is responsible for conducting the pre-job brief. He was ineffective in this role and had to be assisted by the WINCO operations department representative assigned to the project. The brief was adjourned without completion when it was learned that there was no detailed, specific decontamination procedure and input had not been obtained from radiological engineering. Questions and comments from briefing participants identified planning inadequacies and general lack of preparation that did not appear to be recognized by the MK-FIC job supervisor.
 - c. The pre-job brief to decontaminate valve box C-2 was observed at about 0900 on December 16, 1993. By this time the containment tent over the valve box had been successfully decontaminated.
 - 1) The review and approval sequence for the CSWP did not conform to the CSWP flow chart in Attachment II to SOP WE-2. Some reviews specified to be

accomplished prior to the pre-job brief were actually completed at or after the brief.

- 2) At the brief, questions about the decontamination operation such as the expected amount of water to use, the location of the sump, removal of a basket in the sump and where to aim the washdown stream were raised because the procedure did not include this information.
- d. There are deficiencies in the CSWP, form ID-F-5480.1H (Rev. 10-86), the instructions to complete the form given in Attachment I to DOE-ID Supplemental Directive 5480.9 and in Attachments I and II to SOP WE-2, and in the process to review and approve the CSWP. These deficiencies can contribute to less control over construction contractor work in radiological areas than is provided by the corresponding process for work by WINCO personnel in radiological areas which uses the radiation work permit (RWP), form WINCO-5642.
- 1) The CSWP flow chart in Attachment II to SOP WE-2 places plant shift manager review and approval for work in radiological areas or industrial safety hazardous areas before the radcon technician surveys the work area, determines level of risk due to radiation and contamination, and specifies anti-c clothing and dosimetry requirements. In the case of the RWP for work by WINCO personnel, the area shift supervisor reviews and approves after radcon information has been completed on the form.
 - 2) Item 6 on the CSWP form is designated "Radiation Zone I __, II __, III __." This is confusing because zones refer to surface contamination levels, not radiation levels. The instructions for completing the form provided in Attachment I to ID 5480.9 state that the radcon technician will enter the type of contamination anticipated to be present on the job. The form and the instructions are inconsistent.
 - 3) Item 7 on the CSWP form is designated "Contamination" with blanks for different types of contamination, and the instructions for completing the form state that the radcon technician will enter the radiation levels to be expected on the job. These instructions do not match the form. On the completed form that was reviewed, the blanks were filled in with check marks, not levels of radiation or contamination.
 - 4) The instructions for completing the CSWP form state that Item 9, the protective requirements column, applies to both Sections II and III. The CSWP form,

however, shows by an outline that Item 9 is in Section III. The guidelines for completing the form contained in Attachment I to SOP WE-2 state that Section III is to be completed by the construction safety representative. Since Item 9 includes anti-c clothing requirements, it clearly has to be completed also by the WINCO radcon technician.

6. Observation of a Fact-Finding Critique on December 16, 1993. This meeting resulted from a Technical Specification/Standard (TS/S) violation identified earlier in the day. Group I conductivity instruments associated with the CPP-666 basin water recirculation system were discovered out of service without clearly visible tags reporting this status.
 - a. In this occurrence, the CPP-666 basin water recirculation system was shut down for modifications and maintenance. The system includes two Group I conductivity instruments for use in meeting the TS/S 5.6.B.5 requirement that conductivity of the basin water not exceed 10 uMho/cm. CPOP-4.5.3.7, *Start Up and Shut Down Basin Water Recirculation System CPP-666*, specifies that when basin water flow past the instruments is interrupted, these instruments shall be considered to be out of service. TS/S 15.B.2 states that all Group I instrumentation that is inoperable shall have a clearly visible tag. The instruments were not tagged due to oversight by shift operations personnel.
 - b. This is the third violation of TS/S 15.B.2 at ICPP since May 1993. Investigations of the other occurrences have not been completed to identify root causes and develop lessons learned. The investigation process appears to be too slow to support conduct of operations requirements in the facilities.
 - d. Immediate actions after discovery of the occurrence included tagging the instruments out of service, sampling basin water for conductivity, initiating a documents change request to the procedure stating the requirement to tag the conductivity instruments out of service when the basin recirculation system is shut down, writing a note for the POD describing the circumstances and tasking the facility manager to develop a case study on the occurrence. There did not appear to be any discussion of more comprehensive actions to prevent a recurrence such as directing a review of all operating procedure to identify those which include Group I instruments to ensure the requirement to visibly tag inoperable and out-of-service Group I instruments is addressed.