DEFENSE NUCLEAR FACILITIES SAFETY BOARD

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July 5, 1995

Mr. Mark Whitaker, EH-9
Department of Energy
1000 Independence Avenue, SW
Washington, D.C. 20585

Dear Mr. Whitaker:

Enclosed for your information and distribution are 20 Defense Nuclear Facilities Safety Board staff reports. The reports have been placed in our Public Reading Room.

Sincerely,

George W. Cunningham
Technical Director

Enclosures (20)

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 16, 1995

MEMORANDUM FOR: G. W. Cunningham, Technical Director

COPIES: Board Members

FROM: F. Bamdad

SUBJECT: Trip Report - Review of Derivation and Implementation of Hanford Tank Farm Operational Safety Requirements, December 12-15, 1994

1. **Purpose:** The purpose of this trip was to review the processes for derivation and implementation of the Operational Safety Requirements (OSRs) at Hanford Tank Farms. This review was performed by the Defense Nuclear Facilities Safety Board (Board) technical staff members F. Bamdad, J. Blackman, T. Dwyer, and R. Warther.

2. **Summary:** The staff performed a review of the conduct of operations, maintenance, engineering design, and safety programs for implementation of the OSRs in support of safe operation of the Hanford Tank Farms. The following observations were made:

   a. Westinghouse Hanford Company (WHC) is in the process of updating the Tank Farms OSRs. A review of the OSR development process revealed that the technical bases for the OSRs are just the original waste tank design requirements. Known abnormal conditions that exceeded the original design bases were not evaluated. For example, while high temperature concrete creep conditions were evaluated and considered as part of the OSR program, the evaluation appeared to be limited to consideration of the effect of a 350°F temperature excursion. Temperature excursions up to 600°F have occurred in one or more of the tanks during their operating life; this type of event does not appear to have been considered in determining the structural integrity of the tanks.

   b. The process of updating the OSRs will result in the removal of all of the requirements pertaining to protection of the environment from the consequences of an accident. WHC representatives stated that these environmental issues are covered by the 10 CFR 265 Part B permit process. The Board staff believes that this process is not consistent with the requirements of DOE Order 5480.23, *Safety Analysis Reports*, to protect the public, the workers, and the environment. Lack of guidance from the DOE Office of Environment, Safety and Health (EH) for protection of the

environment in support of the requirements of the Order has resulted in the DOE contractors not analyzing the environmental impact of an accident at their facilities.

c. WHC does not have a systematic method of ensuring that all OSRs are implemented and monitored. There are several different systems in place, such as the WHC Data Acquisition Group reviewing the log sheets, Technical Support personnel tracking tank level data, and the Occurrence Reporting and Processing system reporting known OSR violations. However, these systems are not integrated in order to provide management the assurance that they meet all the Operational Safety Requirements.

d. It appears that not all active OSRs are implemented at the Tank Farms, due to unavailability of the equipment. There are several systems that are required by the OSRs, however, they have not functioned for some time due to pending repair or calibration. The OSRs applicable to transfer lines, on the other hand, are only invoked immediately prior to a transfer using the corresponding lines. This indicates that in the case of an emergency, for example, severe leakage or rupture of a tank, immediate action can not be taken until the OSR requirements for the applicable lines are verified. This may take several weeks, and a significant amount of radioactive material may be released to the environment before any compensatory measures are taken.

3. **Background:** During a visit and tour of the Hanford Tank Farms on September 26 through 30, 1994, the staff observed several issues related to implementation of OSRs. For example, they observed a Tank Farms alarm on a control room panel with safety related items to be monitored, that cleared automatically after 60 seconds without operator acknowledgement of the alarm. In another example, equipment that was not functioning, due to maintenance, or being out of calibration, prevented WHC from monitoring OSR-required parameters, yet no OSR violation or compensatory measures had been initiated. A trip was, therefore, set up to review the process by which WHC and DOE-Richland Office derive, monitor, and ensure proper implementation of the OSRs at Hanford Tank Farms.

4. **Discussion/Observations:** The following is a summary discussion of the issues identified above:

a. In the effort to meet the requirements of DOE Order 5480.23, WHC is updating the Tank Farms OSRs. Implicit in the development of the bases of the technical requirements for an OSR program is the assumption that they are developed based on the most current and applicable data. For the Tank Farms, the most Limiting Condition of Operation should have been calculated using the past history of the

tanks, including any known abnormal conditions. A review of the OSR process revealed that the technical bases for the OSRs are just the original tank design requirements. It did not appear that all events during which the original design bases were exceeded were considered in the determination of new OSRs. For example, while high temperature concrete creep conditions were evaluated and considered as part of the OSR program, the evaluation appeared to be limited to consideration of 350°F thermal effects. Temperature excursions up to 600°F have occurred in one or more of the tanks during their operating life; this type of event does not appear to have been considered in determining the structural integrity of the tanks.

b. The Interim Operational Safety Requirements (IOSR) Implementation Plan (IP) prepared by WHC and approved by RL is comprised of six stages. The first three stages are related to those design parameters with sufficient technical support for immediate implementation, and will be complied with by spring of 1995, with the exception of equipment that is not functional. The fourth stage is related to structural design parameters discussed in item (b) above. Stage five deals with parameters that have been identified in the past for monitoring and controlling releases to the ground water and the environment. The IP proposes removal of these requirements from the OSR domain, leaving the monitoring of these parameters to the requirements in the Part B permit. The staff believes that this is not consistent with DOE Order 5480.23, *Safety Analysis Report*, which requires protection of the environment, along with the health and safety of the public and the workers. WHC representatives stated (correctly) that there is no guidance (from DOE) regarding protection of the environment from the consequences of an accident, and that, therefore, this approach is justified. The staff believes that EH, in support of the requirements of DOE Order 5480.23, should provide guidance and criteria for protection of the environment. Such guidance has not been developed, though the Order was issued almost three years ago.

c. All completed Tank Farms procedures are collected at the East/West Tank Farms Data Acquisition Groups. Tank Farms management requires operators to properly note anomalous or out of specification readings. The Data Acquisition Group personnel review all logs for proper log-keeping, noting discrepancies for inclusion in published Tank Farms Performance Indicator reports. This group, however, *does not* review procedures, Operational Safety Documents (OSDs), OSRs with any degree of regularity; no mechanism exists through this group to prevent a weekly, monthly, or quarterly round from being missed.

East/West Tank Farms Technical Support personnel track OSD/OSR related Tank level data, in order to maintain plots of these data. These personnel have issued discrepancy reports to bring missed milestones or discrepancies to the attention of

management and to identify corrective action. These personnel also maintain the Discrepancy Report Log, and publish a weekly East/West Tank Farms Technical Support Anomaly Report to highlight the status of open discrepancies. However, in comparing the latest Anomaly Report (12/8/94) to the Discrepancy Report Log, numerous errors were found, including incorrect Discrepancy Report Numbers, incorrect issue dates, anomalies not listed in the Discrepancy Report Log (as many as 24), and open discrepancies not listed in the Anomaly Report (as many as 12).

Copies of Tank Farms OSD/OSR violation-related Occurrence Reports, 1990 to 1994, were provided (37 total) by WHC management. These data were incomplete because: (1) not all OSD/OSR violations were noted or reported; (2) not all OSD/OSR violations that were noted were properly reported - for example, numerous Occurrence Reports from Tank Farms dated 1992 through 1994 containing indications of OSD/OSR violations were categorized as Off-Normal vice Unusual Occurrences; and (3) not all OSD/OSR violations that were reported in this time period were drawn for the data packet. For example, three known violations (involving a transfer from Plutonium Finishing Plant Tank D-5 [See Occurrence Reporting and Processing System (ORPS) report, *RL-WHC-Tank Farm-1994-0005*], and exceeding monitoring periodicities on Tank Temperature Tank Data [See ORPS reports, *RL-WHC-Tank Farm-1993-0078*, *RL-WHC-Tank Farm-1992-0085*] were not in the packet. An independent inquiry of ORPS data for the period 1992-1994 alone resulted in more than the 37 data points provided.

The staff concluded that WHC representatives were not integrating various program or methods to ensure that all the present OSR items are implemented.

d. Approximately 10,400 instruments are contained on the calibration cycle recall list. Of these, approximately 1,000 (10%) are needed for OSRs. Of these 1000 instruments, approximately 500-600 are required for various leak detection systems, which are not maintained in a calibrated state. Instead, they are calibrated prior to a transfer evolution, during the procedure walkdown. This indicates that in the case of an emergency, for example, severe leakage or rupture of a tank, immediate action can not be taken until the OSR requirements for the applicable lines are verified. This may take several weeks, and a significant amount of radioactive material may be released to the environment before any compensatory measures are taken.

The remaining 500 or so instruments record pressure, temperature, or other OSR related parameters. Most of these are maintained in a calibrated state. However, the Implementation Plan for the IOSRs identifies several safety related systems with applicable OSRs that have not been functioning for some time due to pending repair or being out of calibration. WHC has requested exemptions, and the request has been

approved by RLO, to continue Tank Farm operations until these systems become functional some time in the future. In other words, WHC does not meet the current OSRs, and will be in violation of their OSR requirements until these systems become functional.

5. Future Actions:

The staff will continue review of the development and use of OSRs at Hanford. Special attention will be paid to the issues related to the lack of compliance with all the OSR requirements, lack of implementation of the OSRs for the transfer lines, operability of the emergency transfer lines, structural analyses in support of the IOSRs, and implementation of the parameters pertinent to protection of the environment. Lack of guidance from EH for implementation of the DOE Order 5480.23 requirements will be taken up with EH Headquarters personnel.