ACCIDENT INVESTIGATION BOARD
REPORT ON THE MAY 14, 1997,
CHEMICAL EXPLOSION AT THE
PLUTONIUM RECLAMATION FACILITY,
HANFORD SITE,
RICHLAND, WASHINGTON
RELEASE AUTHORIZATION

Document Number: DOE/RL-97-63, Revision 0


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A-6001-400.2 (09/94)
On May 16, 1997, I formally established an Accident Investigation Board to investigate the May 14, 1997, chemical explosion at the Plutonium Reclamation Facility at the Hanford Site, Richland, Washington. The analysis, identification of contributing and root causes, conclusions, and recommendations reached during the investigation were performed in accordance with DOE Order 225.1, *Accident Investigations*.

I accept the findings of the Board and authorize the release of this summary report for general distribution.

Lloyd L. Piper, Deputy Manager,
acting for John D. Wagoner, Manager,
U.S. Department of Energy, Richland Operations Office
1 Introduction

Purpose

This report is a summary of the Accident Investigation Board Report on the May 14, 1997, Chemical Explosion at the Plutonium Reclamation Facility, Hanford Site, Richland, Washington (DOE/RL-97-59). The referenced report provides a greater level of detail and includes a complete discussion of the facts identified, analysis of those facts, conclusions derived from the analysis, identification of the accident's causal factors, and recommendations that should be addressed through follow-up action by the U.S. Department of Energy (DOE) and its contractors. This companion document provides a concise summary of that report, with emphasis on management issues.

Evaluation of emergency and occupational health response to, and radiological and chemical releases from, this accident was not within the scope of this investigation, but is the subject of a separate investigation and report (see DOE/RL-97-62).

Background

The DOE Richland Operations Office (RL) provides oversight of operations at the Hanford Site. Since October 1, 1996, Fluor Daniel Hanford, Inc., under contract to RL, manages and integrates the scope of work defined in the Project Hanford Management Contract. The B&W Hanford Company manages and operates the Plutonium Finishing Plant, which includes the Plutonium Reclamation Facility (hereafter referred to as Facility), under subcontract to Fluor Daniel Hanford, Inc. The Westinghouse Hanford Company operated the Facility from June 1987 through September 1996, as the managing and operating contractor for the Hanford Site. During contractor change-over, the Facility line management staff remained intact.

The Facility was designed to recover plutonium from plutonium-bearing scrap. The Facility began full operation in 1964 and discontinued plutonium recovery activities in 1987, when it was placed in interim standby status pending restart. Facility management planned for and, in September 1992, began activities to demonstrate readiness for restart, but these activities were not completed.

Room 40 of the Facility contains several chemical makeup tanks that were used to mix and store non-radioactive chemicals that were transferred to, and used in, the plutonium processing areas. Tank A-109, the tank involved in the accident, was located in Room 40 and contained a chemical solution of hydroxylamine nitrate in water-diluted nitric acid, also known as complexant concentrate column extractant (hereafter referred to as solution). This solution was prepared in the tank as part of the demonstration of readiness for Facility restart. The final batch of 370 gallons of solution was prepared on June 17, 1993.

On December 10, 1993, the tank was placed into weekend (short-term) shutdown. On December 22, 1993, the demonstration of readiness activities were officially suspended and RL directed that the Facility be shut down because of mission changes. Contrary to the historical operating practices of the Facility, the solution was not drained from the tank when activities were suspended. The solution was to be used for future clean-up activities, for example, the flushing of process lines at the Facility. Although some of the solution was subsequently used, the tank had not been completely drained since the final batch of solution was prepared.

Since December 1993, work activities at the Facility, including those affecting the tank involved in the accident, have been conducted to support and maintain the facility in long-term shutdown in preparation for deactivation, and eventual decontamination and decommissioning activities.
The Accident

The accident occurred on May 14, 1997, at about eight o’clock in the evening. The accident was the result of a spontaneous (autocatalytic) chemical reaction of the solution stored in Tank A-109 (in Room 40 of the Facility - see Exhibit 1).

The unused solution in the tank had been slowly evaporating since June 17, 1993. The loss of water through evaporation concentrated the solution until conditions were reached that caused the normally stable solution to undergo a spontaneous chemical reaction. The reaction created a rapid release of gases, which built up pressure inside the tank. The pressure blew the lid off the tank, severely damaged Room 40 (see Exhibits 2 and 3), and cut a small fire-suppression water line. Structural damage included deformation of a wall, and damage to interior doors (see Exhibit 4) and the roof.

Environmental releases associated with the explosion included a yellow-brown colored plume emitted from the Facility’s main exhaust stack and water that was discharged from the cut water line. It is likely that some gases escaped through holes in the damaged roof. Laboratory studies conducted after the accident revealed that the airborne releases would likely have consisted of a mixture of gases including nitric acid, nitrogen, nitrous oxide (laughing gas), various oxides of nitrogen, and water vapor. Of these, nitric acid and the oxides of nitrogen are the only ones recognized to pose a potential health hazard. Real-time measurement for concentrations of chemicals released was not possible. Therefore, dispersion modeling was performed to estimate maximum chemical concentrations at ground level. The modeling results indicated that releases from the damaged roof would have generated the highest concentrations of chemicals; these levels were below applicable occupational exposure limits. Results of extensive sampling, contamination surveys, and stack monitoring data, show that no detectable airborne radioactivity was released from the Facility.

Water from the cut water line flooded the building, and some of it flowed out through various Facility exit doors. Extensive surveys conducted inside and outside of the building revealed radioactive contamination on the first floor of the Facility, and a small area of slightly above background levels of radioactive contamination outside that was isolated and immobilized. The contamination found outside was likely the result of water flowing across walls and floors of contaminated areas of the Facility, carrying radioactive material outside the building.

The investigation concluded that no other chemicals in Room 40, or other Facility components, were involved in environmental releases. Additional information regarding the evaluation of the radiological and chemical releases resulting from this accident may be found in DOE/RL-97-62.

No one was in, or near, Room 40 of the Facility at the time of the accident. During the initial stages of the emergency response to this accident, eight construction workers, who were on a break in a trailer outside the Facility, unknowingly passed under the plume path when directed to report to the on-scene Facility emergency center. These eight workers were evaluated and released from a local medical center. Later, several other employees who reported symptoms were evaluated. Ongoing occupational health evaluation is being provided as necessary (see DOE/RL-97-62).

The Washington State Department of Ecology is conducting an independent investigation to determine if state laws or regulations were violated. The State of Washington Department of Health is also conducting an independent investigation of the potential for radioactive airborne releases from this accident.
Exhibit 1.

Exhibit 2.
Room 40 of the Facility after May 14, 1997.
Exhibit 3.
Tank A-109 and Separated Lid.

Exhibit 4.
Damage to Interior Doors That Lead to Room 40 of the Facility.
Board Appointment

On May 16, 1997, Lloyd L. Piper, Deputy Manager, acting for John D. Wagoner, Manager, RL, formally established an Accident Investigation Board (hereafter referred to as the Board) to investigate the explosion in accordance with DOE Order 225.1, Accident Investigations. However, the Board began its investigation on May 15, 1997, completed the investigation on July 2, 1997, and submitted its findings to the Manager, RL, on July 24, 1997.

Results of the Investigation

Physical Characteristics of the Chemical Reaction

The solution of hydroxylamine nitrate and nitric acid in the tank was not maintained in its original dilute concentration. The design of the ventilation system for the tank allowed water to evaporate, thereby concentrating the solution. The normally stable dilute solution ultimately reached a concentration that created conditions necessary for a spontaneous chemical reaction to occur. Independent laboratory experiments conducted after the investigation found that similar concentrated solutions will spontaneously react, especially at higher temperatures, or at lower temperatures with the addition of metal catalysts. It is possible that the temperature of the solution in the tank was higher than room temperature because of the heat produced by the chemical reaction. It is likely that the solution contained a metal catalyst, such as iron, that came from the stainless steel tank as it corroded during the years of storage. Analytical results of samples collected from the tank after the explosion include iron as a constituent of the tank contents. However, there are no data available on the temperature of the tank contents.

Accident Precursors and Use of Lessons Learned

Precursors are events that precede and signal the potential occurrence of similar events. A lesson learned is defined as a good work practice, or innovative approach, that is captured and shared to promote repeat application. A lesson learned may also be an adverse work practice or experience that is captured and shared to avoid a similar event from occurring again.

A precursor of this accident was a December 1996 Savannah River Site event that involved the same chemicals as those in this accident. The report for that event was disseminated throughout DOE, but identified "management issues" as the significant cause, and not the reaction hazard of the chemicals. Therefore, that report was incorrectly judged to not be applicable at Hanford, and no action was taken to control the hazard.

Similar precursor events involving hydroxylamine nitrate and nitric acid have occurred within the DOE complex, including Hanford. However, the Board found no evidence that information and lessons learned from these events and the associated hazards were incorporated into the current safety authorization documentation for Facility operations.

In 1989, an event occurred at the Hanford Plutonium Uranium Extraction Facility (PUREX) that involved a solution of hydroxylamine nitrate and nitric acid with
hydrazine that had become concentrated because of evaporation, resulting in a spontaneous chemical reaction that over-pressurized an isolated process line, rupturing a gasket. A report was published and lessons learned were disseminated. Facility management was aware of the PUREX event; however, this hazard information was not included in the current safety authorization documentation for Facility operations.

In 1994, DOE issued the Chemical Safety and Vulnerability Assessment, and established a working group to review and identify chemical safety vulnerabilities within the DOE complex. In March 1994, PFP completed a chemical safety vulnerability self-evaluation checklist, which recognized that chemical makeup tanks may contain residual chemicals, and stated that “All these tanks should be inspected and the contents verified”. The Board found no evidence that Facility line management ever inspected or verified the contents of the tanks.

The Board found that problems existed in implementing corrective actions, follow-up to lessons learned, and previous evaluations of safety at the Facility. Lessons learned from previous accidents involving chemicals similar to those in this accident were not incorporated into the training and qualification process for Facility technical and operations staff. While these corrective actions may not have directly prevented the accident, the Board found that, had these actions been implemented more effectively, heightened awareness may have led to identification of the hazard.

Procedures

Procedures are the key mechanisms that are used by management to ensure consistently safe operations.

In late 1993, the tank was placed in short-term (usually less than two weeks) shutdown status. The shutdown plan, a plan developed to identify requirements to place the Facility in long-term shutdown, did not address the chemical makeup tanks in Room 40, including the tank involved in the accident. The fact that the chemicals in Room 40 were not addressed in the shutdown plan was not an oversight, but rather a conscious decision to defer that activity to some (unspecified) time in the future. This decision resulted in converting the storage of solution in the tank from a short-term to a long-term basis. As a result, the solution was stored in the tank for almost four years, contrary to the intent of the short-term shutdown procedure.

Additionally, a contractor site management procedure for transitioning facilities from operational status to shutdown required an evaluation to ensure that the shutdown plan met safety requirements. Facility line management did not adequately implement the transition procedure, which may have led to the recognition of the hazard associated with long-term storage of the solution.

The Facility had a long-term shutdown procedure, but it was not implemented. The long-term shutdown procedure specified that the solution be removed from the tank and transferred to approved storage containers. Implementation of the long-term shutdown procedure for the Facility would have prevented the accident.

Hazard Identification and Analysis

Federal regulations and DOE policy require identification, analysis, and control of hazards associated with chemicals in process systems and in storage. The safety documentation that authorizes operation of nuclear facilities defines the scope of work to be conducted, and systematically identifies, analyzes, and controls the hazards associated with that work.

When activities are identified that are outside the scope of the safety authorization documentation, an unreviewed safety question determination must be performed. This
determination identifies and analyzes the hazards, and establishes controls for those hazards associated with any work that is not covered under the existing safety authorization documentation.

Short-term storage of solution in the tank was included in the scope of the Facility safety authorization documentation. Long-term storage of the solution in the tank was an activity that was not included in the scope of the existing safety authorization documentation. The long-term storage of solution in the tank was part of Facility operations when the safety documentation was written; therefore, it was not included. Since the shutdown plan did not include the chemicals in Room 40, that became a decision to change storage of the solution in the tank from a short-term to long-term basis, but nothing triggered an unreviewed safety question determination. Therefore, the long-term storage activity was not analyzed for hazards, and controls were not identified associated with long-term storage of solution in the tank.

Additionally, the contractor site management procedure for transitioning facilities (discussed in Procedures, above) required appropriate revision of the safety authorization documentation for transition from operations to shutdown status. Therefore, even though the unreviewed safety question determination process was circumvented, the applicability of the transition procedure was clear and direct. Implementation of this procedure would have generated an analysis of the hazards associated with long-term storage, and a recognition of the hazards would likely have led to draining the solution from the tank, per the long-term shutdown procedure. Since the long-term storage of solution in the tank was not within the scope of the existing Facility safety authorization documentation, this activity should not have been allowed before an analysis of the hazards was conducted.
The five core functions of integrated safety management, shown schematically in the figure below, are:

- define the scope of work,
- identify and analyze the hazards associated with the work,
- develop and implement hazard controls,
- perform work safely within controls, and
- provide feedback and adequacy of the controls and continuous improvement in defining and planning the work.

These five functions provide the necessary structure for any work activity that could potentially affect workers, the public, and the environment. The degree of rigor needed to address these functions will vary, based on the type of work activity and the hazards involved. This section presents an analysis of management issues pertinent to the accident in the context of the core functions. The applicable “work” is maintaining the Facility in safe standby/shutdown status.
Define the Scope of Work

In December 1993, RL directed that the Facility be shut down. Facility line management proposed a set of interim actions to shutdown the Facility that did not include draining the solution from the tank. It is the judgment of the Board that Facility line management inappropriately omitted actions to drain the tank from the shutdown plan, thus contributing to the accident.

Identify and Analyze Hazards Associated with the Work

The long-term storage of chemicals in the tank was not included in the scope of the safety authorization documentation for operations when the Facility transitioned from operations to shutdown, nor was management aware of the potential hazard created by storing the solution in the tank. Therefore, the hazard of storing the solution was not identified nor analyzed. It is the opinion of the Board that a properly conducted hazards analysis, performed by experienced engineering and operations personnel, likely would have identified the hazards associated with long-term storage of the solution, and precluded the accident from occurring.

Develop and Implement Hazard Controls/Perform Work Safely Within Controls

Since the hazard was not identified, controls for mitigating the hazard were not developed or implemented, and long-term chemical storage was conducted without appropriate safety controls. This was a causal factor in the accident.

Provide Feedback and Adequacy of the Controls and Continuous Improvement in Defining and Planning the Work

Several previous events, similar to this accident, have occurred in DOE and were evaluated during this investigation. The depth of investigation and reporting in each case was sufficient for management to take actions to prevent the exact specific event from occurring again, but the overall understanding of the chemistry of these events (i.e., reactive chemicals and catalysts) was not always clear. The Board found a general DOE-wide lack of knowledge of chemical concentrations, conditions, catalysts, etc., for ensuring safe, long-term storage of chemicals with the potential for a spontaneous reaction. The Board found that more detailed technical information is necessary to provide adequate feedback to management. Insufficient technical detail provided in lessons learned from previous events contributed to management’s failure to identify the hazard prior to this accident.

Although the legacy for many of the weaknesses identified during the investigation belongs to the previous operating contractor, opportunities by the current contractor to correct the problem were also missed. The investigation also confirmed that work still remains to be done to assure that the benefits of a robust integrated safety management system are reflected in safe work performance at the Facility.
5  Causal Factors

Direct Cause

The direct cause of the accident was the concentration by evaporation of the dilute solution in the tank to the point where a spontaneous reaction occurred, creating a rapid gas evolution that over-pressurized the tank beyond its physical design limitations.

Root Causes

There were three root causes of this accident (the fundamental causes that if eliminated or modified, would prevent recurrence of this and similar accidents), which were the primary reasons that the chemical reaction was allowed to occur.

- Facility line management did not implement the long-term shutdown procedure for Room 40, including the tank containing the chemical solution. Even if the hazards of storing the solution were not recognized, the normal practice was to remove chemicals from the tank upon termination of the process that used them.

- Facility line management did not comply with procedural requirements for Facility shutdown planning that could have ensured that the Facility was maintained within the scope of the safety authorization documentation during transition from operations to shutdown. Facility shutdown planning resulted in long-term storage of chemicals in the tank, which was outside the scope of the safety authorization documentation.

- Oversight performed by RL line management did not ensure that work conducted by the contractor for the Facility remained within the scope of the safety authorization documentation during the transition from operations to shutdown. When RL line management oversight approved the contractor’s plan to place the Facility into shutdown status, storing chemicals in the tank was not recognized as being outside the safety authorization documentation.

Contributing Causes

The Board also identified six contributing causes (causes that increased the likelihood of the accident without individually causing the accident, but that are important enough to require corrective action); these are:

- Facility line management did not perform a safety evaluation prior to allowing the long-term storage of solution in the tank as required by procedure. Had the shutdown planning procedure been adequately followed, the required safety evaluation should have identified the hazard of long-term storage, resulting in draining the tank, or providing adequate controls.

- Facility line management did not adequately monitor and evaluate conditions to ensure that the solution in the tank was maintained in a safe, known configuration. Changes in the Facility equipment parameters were not monitored and evaluated to ensure that changes over time were known and understood to ensure safety.

- RL line management failed to provide appropriate and comprehensive oversight of Facility line management to ensure that
actions taken to correct significant procedural non-compliance issues were effectively implemented. Non-compliance with procedures is a long-standing problem at the Facility.

- **Facility line management failed to implement corrective actions from lessons learned from the 1989 PUREX 2BX event.** Corrective actions were identified but not implemented. Tracking of corrective actions to closure was not performed.

- **The training and qualification process for Facility technical and operations staff did not effectively use hazard information or lessons learned from previous, similar events involving the same chemicals.** Hazards with hydroxylamine nitrate were identified as early as 1970, and reports of various accidents were available to the facility. However, these hazards were not included in training and qualification programs to heighten awareness of the chemical hazards.

- **The DOE Occurrence Reporting and Processing System did not present adequate summary information in a manner from which site coordinators could effectively determine occurrence applicability.** Very significant and timely lessons learned were not provided to the Facility that could possibly have led to hazard recognition and development of controls for hydroxylamine nitrate and nitric acid solutions.

### Summary

Analysis of the root and contributing causes indicates that the accident’s origins began with events in September 1992 that, through a series of oversights and missed opportunities, continued to the date of the accident. Some of the historical problems that precipitated and contributed to the accident persist and have not been corrected by the Facility management systems of the previous or current contractors, or by RL line management oversight. The potentially hazardous condition that precipitated this accident was overlooked and the relevance of precursors and other similar events was not recognized. Thus, the lessons learned from other events and precursors were never fully applied, nor were the hazards mitigated.

Missed opportunities include: omission of chemical makeup tanks from the Facility shutdown plan developed in late 1993; not performing a safety evaluation of the shutdown plan as required by the transition procedure; inadequate follow-up to the corrective actions proposed in the RL response to the 1994 DOE Chemical Safety Vulnerability Assessment; and the inspections that were conducted during the Project Hanford Management Contract transition in September 1996.
The major conclusions and associated recommendations determined by the Board are presented in Table 6.1 below. Recommendations made by the Board, if adequately implemented, should strengthen the management system, thus assisting in preventing similar accidents from occurring.

### Table 6.1 Conclusions and Recommendations

<table>
<thead>
<tr>
<th>Conclusions</th>
<th>Recommendations</th>
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<tr>
<td>Shutdown planning failed to maintain the Facility in a safe condition, consistent with the approved safety authorization documentation.</td>
<td>Fluor Daniel Hanford, Inc. and the B&amp;W Hanford Company need to ensure that procedures for long-term shutdown of their facilities are adequate and implemented.</td>
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<td>• The long-term shutdown procedure was not implemented by Facility line management after the demonstration of readiness activities were suspended in 1993. This procedure required that the solution in the tank be drained into plastic drums, for later use or disposal, at the time that the Facility was placed in long-term shutdown.</td>
<td>• Fluor Daniel Hanford, Inc. and the B&amp;W Hanford Company need to ensure that only activities within the scope of the safety authorization documentation are conducted.</td>
</tr>
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<td>• Shutdown planning proposed by Facility line management, with RL approval, deferred addressing chemicals in Room 40 to a later, unspecified, time. This decision eventually led to long-term storage of chemicals in the tank, an activity that was outside of the safety authorization documentation.</td>
<td>• Fluor Daniel Hanford, Inc. and the B&amp;W Hanford Company need to ensure that corporate management procedures for shutdown planning are adequate, and are implemented by Facility line management.</td>
</tr>
<tr>
<td>• Facility line management failed to comply with the site contractor management shutdown planning procedure requirements for safety evaluations, written guidance on safe shutdown by safety organizations, and requirements to revise the safety authorization documentation.</td>
<td>• The B&amp;W Hanford Company needs to define safe concentrations and conditions of process chemical solutions on a periodic basis, with appropriate documentation to ensure that changes over time are known and hazards are understood and controlled.</td>
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<td>• Facility line management failed to maintain the solution in the tank in a known, safe configuration.</td>
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<tr>
<td><strong>Conclusions</strong></td>
<td><strong>Recommendations</strong></td>
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<td>RL line management oversight did not ensure that the Facility was maintained within the safety authorization documentation during the transition from operations to shutdown.</td>
<td>RL line management oversight needs to ensure that Facility line management adequately maintains, and operates within, the safety authorization documentation.</td>
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<tr>
<td>Facility line management did not adequately implement lessons learned from previous events with similar chemicals into the staff training and qualification process; therefore, the hazards were not sufficiently recognized and controlled.</td>
<td>Fluor Daniel Hanford, Inc. and the B&amp;W Hanford Company need to ensure that a system is in place to ensure lessons learned are effectively developed (as applicable), identified for applicability, and addressed in operations.</td>
</tr>
<tr>
<td>Facility line management did not incorporate safety authorization documentation hazard information and lessons learned from previous accidents involving the chemicals that reacted in this accident into the training and qualification process for Facility technical and operations staff.</td>
<td>• The B&amp;W Hanford Company needs to incorporate information obtained from previous incidents/accidents, as well as hazard information from these events, into its operational training and qualification program; this information should be specifically directed at its applicability to Facility operations.</td>
</tr>
<tr>
<td>• The DOE Office of Environment, Safety and Health needs to enhance the Occurrence Reporting and Processing System to ensure that it will provide sufficient summary information to allow the users to accurately determine the applicability of occurrence data to specific facilities and operations.</td>
<td>• The DOE Office of Environment, Safety and Health needs to ensure that, if hydroxylamine nitrate and nitric acid solutions will continue to be used by the complex, a study is conducted to define safe use and storage parameters, and that this information is distributed to the DOE complex.</td>
</tr>
<tr>
<td>Conditions necessary for a spontaneous reaction of the stored hydroxylamine nitrate and nitric acid solution are not well documented. The roles of temperature and catalysts are not well understood with respect to how they promote spontaneous reactions.</td>
<td>The DOE Office of Environment, Safety and Health needs to ensure that, if hydroxylamine nitrate and nitric acid solutions will continue to be used by the complex, a study is conducted to define safe use and storage parameters, and that this information is distributed to the DOE complex.</td>
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**Supplemental Conclusion**

Although not directly a result of this investigation, the Board identified a supplemental conclusion that may provide information that could further enhance an overall safety management system, shown in Table 6.2.

Table 6.2  Supplemental Conclusion and Recommendation

<table>
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<th>Supplemental Conclusion</th>
<th>Recommendations</th>
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| Explosions may be preceded by abnormal facility conditions, such as smoke, heat, vibration, and unusual sounds. Fortunately, no one was in the room when the explosion occurred. However, if someone would have been in the room, unusual conditions such as the sounds of gas escaping, or the sight of smoke, might have led the worker to investigate the cause, putting the worker in harm’s way. A review of Facility worker training indicated that clear guidance is not provided for worker response upon observing unusual facility conditions. | • There is a need for RL to ensure that worker training programs provide adequate consideration of appropriate response to observation of unusual facility conditions.  
• There is a need for RL to evaluate worker training and emergency preparedness to ensure that procedures and training exist on:  
  - when to report abnormal facility conditions to supervisors,  
  - the need for protective equipment when investigating, and  
  - when urgently exiting the building may be appropriate. |
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U. S. Department of Energy,  
Richland Operations Office

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Accident Investigation Board Member  
Fluor Daniel Hanford, Inc.  
Office of Environmental Integration

Date: 7-26-97

Date: 7-25-97

Date: 7-25-97

Date: 7/26/97
This report is an independent product of the Accident Investigation Board that was appointed by Lloyd L. Piper, Deputy Manager, acting for John D. Wagoner, Manager, U.S. Department of Energy, Richland Operations Office.

The board was appointed to perform an investigation of this accident and to prepare an investigation report in accordance with DOE Order 225.1, Accident Investigations.

The discussion of facts, as determined by the Board, and the views expressed in the report do not assume, and are not intended, to establish the existence of any duty at law on the part of the U.S. Government, its employees or agents, contractors, their employees or agents, or subcontractors at any tier, or any other party.

This report neither determines nor implies liability.