



**Department of Energy**  
Germantown, MD 20874-1290

September 24, 1998

Mr. John T. Conway, Chairman  
Defense Nuclear Facilities Safety Board  
625 Indiana Avenue, NW  
Suite 700  
Washington, DC 20004

Dear Mr. Conway:

This responds to your letter of September 10, 1998, in which you requested a status report on the responses received to date from Department of Energy (DOE) Field Elements to the May 14, 1998, Secretarial Memorandum on Fire Safety Programs. Your letter noted that your staff had already received copies of the responses from Savannah River, Oak Ridge, and Rocky Flats. With this letter, we are transmitting a copy of the response from Hanford and committing ourselves to send you copies of the responses from the other sites that are under the Board's statutory jurisdiction as soon as we receive them. It is also our intention to send you a copy of the final summary report for the Department, along with copies of all of the responses, when we have completed our review. We anticipate that this will be sometime in late October or early November.

You mentioned several facilities of specific interest to determine their reporting status. The response from the Idaho National Engineering and Environmental Laboratory (INEEL) is delayed due to follow-on activities related to the recent fatality. The responses from Pantex, Los Alamos, Lawrence Livermore National Laboratory, and the Nevada Test Site are in various stages of completion/transmission. Other than INEEL, we expect to receive the remaining reports of interest within the next 30 days.

If you have any specific questions on any of the reports, please feel free to contact Dr. Harry Pettengill on 301-903-5639.

Sincerely,

A handwritten signature in black ink, appearing to read "Peter N. Brush", with a long horizontal flourish extending to the right.

Peter N. Brush  
Acting Assistant Secretary  
Environment, Safety and Health

F.L.F-1325.6 (02/88)

United States Government

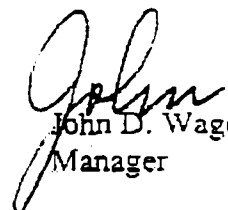
Department of Energy  
Richland Operations (**memorandum**

DATE: SEP 1 1998  
REPLY TO: QSH:CPC/98-QSH-287  
ATTN OF:  
SUBJECT: FIRE SAFETY PROGRAMS  
TO: Elizabeth A. Moler  
Deputy Secretary of Energy

Reference is made to your memorandum to the Field Offices and Operations Offices, dated May 14, 1998, same subject. As requested, a review of the fire safety program at the Richland Operations Office (RL) has been conducted to address the adequacy and effectiveness of the program both at the RL level and the contractor level. The results of the review are contained in the enclosures.

Our conclusion is that RL and its contractors have a very effective and active fire protection program operating at Hanford. Fire protection facility evaluations, the baseline fire department assessment, fire hazard analyses integrated with other authorization basis documentation, policies and procedures, and other work are being performed consistent with DOE fire safety requirements and expectations.

There are areas for improvement in the fire safety program, and these areas are identified in the enclosures along with an appropriate action plan. If you have any questions, please contact me, or your staff may contact Paul W. Kruger, Director of the Office of Environmental Safety and Health, on (509) 376-7387.

  
John D. Wagoner  
Manager

## Enclosures:

1. RL Comments
2. Ltr 8/6/98 D. L. Jackson, FDH  
to S. J. Veitenheimer, RL, w/attach
3. Ltr 8/10/98 R. S. Watkins, PNNL  
to R. F. Christensen, RL, w/attach
4. Ltr 8/12/98 M. C. Hughes, BHI  
to S. J. Veitenheimer, RL, w/attach

## cc w/encls:

William G. Boyce, EM-4  
Peter N. Brush, EH-1  
Joseph E. Fitzgerald, Jr., EH-5  
Dennis J. Kubicki, EH-5  
James M. Owendoff, EM-1

9/19

**U.S. DEPARTMENT OF ENERGY (DOE)  
RICHLAND OPERATIONS OFFICE (RL) COMMENTS**

Introduction:

The May 14, 1998, memorandum from Elizabeth A. Moler, Deputy Secretary of Energy, to Fire Offices and Operations Office, on Fire Safety Programs requested a response to a number of individual program elements. The program elements that were delineated in the memorandum are listed below, along with the RL review analysis response to each element and status of the fire protection program at RL.

Adequate Fire Safety Program Element 1:

Defines critical fire safety management authorities, systems, and capabilities (including the involvement of cognizant fire safety and emergency response professionals); implements accurate fire safety performance measures; and defines minimum response capabilities to site emergencies ("Baseline Needs").

RL Review Analysis of Program Element 1:

RL prime contracts require contractors and subcontractors to include fire protection requirements necessary to support safe and efficient operations in their policies, standards, management systems, requirements, and guidelines. These requirements are delegated in DOE 5480.7A, Fire Protection, and RL Implementing Directive (RLID) 5480.7, Fire Protection. Additionally, fire protection roles and responsibilities for RL Management and Federal personnel are included in RLID 5480.7, and the RL Functions, Responsibilities, and Authorities Manual, Section 12. RLID 5480.7 requires RL and its contractors to maintain, or have access to, an adequate fire protection staff, including one or more qualified fire protection engineers to accomplish the objectives of the fire protection program. Furthermore, RLID 5480.7 requires the contractor to provide a fire department that includes fire suppression, rescue, emergency medical and ambulance services, and hazardous material responses that are capable of dealing with and terminating emergency situations, which could threaten the operations, employees, environment or property on the Hanford Site. A fire department baseline needs assessment was completed and documented by the contractor in 1996. The needs assessment documentation was reviewed and approved by RL, and the contractor developed an implementation plan for actions that must be completed to comply with the needs assessment. To stay current with changing site conditions and missions, the fire department baseline needs assessment will be updated in Fiscal Year (FY) 2000, and a milestone has been added to the FY 1999 fire department program plan which included planning to update the needs assessment.

RL has also implemented fire safety performance measures using DOE-STD-1048-92, Performance Indicators Guidance Document. This provides a Deming statistical method for tracking performance indicators using control charts. The concept is to measure leading indicators that provide for corrective actions prior to the occurrence of a major fire. RL believes that measuring dollar loss associated with a fire is a useful tool, but it is not an indicator that allows for changes in a system to be made prior to the occurrence of a major fire. Most DC facilities are provided with automatic suppression systems, fire alarm systems, and life safety systems that afford a certain degree of fire protection. But a major fire could result in significant consequences if these integrated safety features are not properly functioning. RL has identified a number of leading indicators that measure the status of these fire safety features to show what particular problem is occurring so that problem may be corrected prior to a fire. The leading indicators that are measured for performance include fire system device failures (devices that do not perform their intended function during inspection and testing), fire protection system unavailability (systems that are impaired, including both a system restriction which is defined as a system impairment that does not preclude it from operating or transmitting alarm and an emergency impairment which is defined as an unplanned condition that causes all or part of a system to be inoperable), non-fire alarms ("false alarms" such as water surges, foreign matter in detectors, and accidental trips due to lack of work planning), and fire protection corrective actions (deficiencies in facilities identified in fire hazard analyses and facility fire protection assessments which measure conditions opened, conditions closed, and total number of open conditions). Data and analyses from these performance measures are made by the contractor and reported to DOE on a quarterly basis in the Environment, Safety, Health, and Quality Assurance Performance Indicator Report.

#### Adequate Fire Safety Program Element 2:

Assures performance of comprehensive fire safety assessments on a regular basis and the maintenance of up-to-date fire hazards analyses (FHAs) for all significant facilities.

#### DOE Richland Review Analysis of Program Element 2:

RLID 5480.7 requires the contractor to perform program and facility assessments at a frequency required by DOE 5480.7A. The contractors are performing those assessments (see contractor responses) as well as maintaining FHAs on all existing nuclear facilities and new facilities, required by DOE 5480.7A. A deficiency that has been noted from the 1997 Environment, Safety, and Health Management System Appraisal of the Pacific Northwest National Laboratory (PNNL) was that an FHA had yet to be completed on the Building 325 nuclear facility. As noted in the PNNL response, the FHA for Building 325 is in progress and near completion. DOE Facility Representatives perform fire protection surveillance as required by the RL Facility Representative Program Performance Assessment Guide FPA 12.1, Fire Protection. In January 1997, RL Performance Assessment Division (PAD) completed a fire protection ap

of the PNNL fire protection program following the assessment criteria contained in DOE 5480.7A. In FY 1999, the RL PAD assisted by fire protection support from the Quality, Safety and Health Programs Division (QSH) will perform fire protection appraisals of the Fluor Dan Hanford, Inc. (FDH), and Bechtel Hanford, Inc. (BHI) Fire Protection Programs.

Adequate Fire Safety Program Element 3:

Adopts a comprehensive set of fire safety policies, program requirements, standards, and procedures, coupled with other measures such as active and passive fire protection systems, appropriate to the activities and hazards present, as part of a defense-in-depth approach to fire protection.

RL Review Analysis of Program Element 3:

RL has a comprehensive set of fire safety policies, program requirements, standards, and procedures that implement DOE fire protection requirements, policies and responsibilities for RL, RL contractors, and DOE facilities and programs. These policies and program requirements are delineated in RLID 5480.7, and include active and passive fire protection systems, appropriate to the activities and hazards present, as part of a defense-in-depth approach to fire protection as well as site-specific fire protection criteria. These requirements are also reflected in facility Standards/Requirements Inventory Documents (S/RIDs) which have been incorporated into the contractor requirements.

As previously stated, RLID 5480.7 implements the RL Fire Protection Program required by DOE 5480.7A, assigns responsibilities, and provides requirements for an effective fire protection program at RL.

The RL Fire Protection Program encompasses the objective of minimizing the consequences of fire and related perils. Fire should not cause an onsite or offsite release of radiological or other hazardous material that will threaten worker and/or public safety or health or the environment. Facilities must be designed and operated so that no undue hazards result to personnel, as a consequence of fire. Process control and safety systems, designed to mitigate design basis accidents or ensure safe shutdown of a facility, must not be functionally degraded as a result of fire and its effects. Vital DOE programs must not suffer unacceptable delays, and property damage will not exceed the acceptable levels as a result of fire.

The basic philosophy of the RL Fire Protection Program is to prevent fire from occurring and to limit any damage as a result of fire. Since DOE does not purchase property insurance, DOE must bear the burden of the loss when a fire occurs. The RL Fire Protection Program encompasses the philosophy that, since DOE is uninsured, a higher level of fire protection must be provided when fire could cause an unacceptable loss to the Government. Losses could

include, but are not limited to, injury or loss of life, property loss, release of hazardous materials, or unacceptable program delays.

The RL Fire Protection Program meets and in many cases exceeds the minimum requirements established by the National Fire Protection Association (NFPA). Basic requirements of a fire protection program include: a reliable water supply of acceptable capacity for fire suppression; noncombustible or fire resistive construction of an acceptable nature for the occupancy of the facility; automatic fire extinguishing systems; a fully staffed, trained, equipped emergency response force; a means to summon the emergency response force in the event of a fire; and a means to notify and evacuate building occupants in the event of a fire. In areas subject to significant life safety risks, serious property damage, program interruption, or loss of safety class equipment, as defined in the relevant facility Safety Analysis Report, additional protection measures are provided as determined by the authority having jurisdiction. This level of protection also includes: administrative procedures encompassing control of hazardous substances/processes; inspection, maintenance, and testing of fire protection equipment; and other programmatic fire safety activities.

#### Adequate Fire Safety Program Element 4:

Assures performance feedback through routine DOE oversight and contractor self-assessment, including the collection and analysis of complete and accurate fire protection program statistics, and an effective issues management system that demonstrates validation and corrective measures.

#### RL Review Analysis of Program Element 4:

As required by RLID 5480.7, a monthly contractors program interface meeting is conducted with all site contractors, fire department, and the RL Fire Protection Engineer to provide routine feedback to ensure fire protection programs at Hanford are operating at an acceptable level. Data and analyses from developed performance measures following Deming statistical process control are reported by the contractor to DOE on a quarterly basis in the Environment, Safety, Health, and Quality Assurance Performance Indicator Report. RL reviews the report for indicators that may have an adverse effect on fire safety.

Fire protection program data and statistics that are delineated in DOE requirements are collected and reported in conjunction with the DOE Annual Fire Protection Program Summary and the Computerized Accident/Incident Reporting System and Occurrence Reporting Program System. The data and statistics collected are evaluated to identify trends as well. The DOE and RL track deficiencies that result from internal and external assessments and appraisal. Deficiencies are tracked including planned corrective actions and corrective action start dates. Deficiencies are not closed until the corrective actions have been completed.

As previously noted, DOE Facility Representatives perform fire protection surveillance as required by the FPA 12.1. In January 1997, RL PAD completed a fire protection appraisal of the PNNL fire protection program following the assessment criteria contained in DOE 5480.7A. In FY 1999, RL PAD assisted by fire protection support from RL QSH will perform fire protection appraisals of the FDH and BHI Fire Protection Programs.

Summary:

The RL Fire Protection Program is a comprehensive fire safety program as defined in DOE Fire Safety Criteria. The RL Fire Protection Program meets the DOE requirements, and in many cases exceeds the minimum requirements established by the National Fire Protection Association. Fire protection programs and policies are being implemented in contractor operated facilities, facility assessments are being completed, and most all of the fire hazard analyses for existing nuclear facilities have been completed.

QSH:CPC/8-28-98

**FLUOR DANIEL**

Fluor Daniel Hanford, Inc.  
P.O. Box 1000  
Richland, WA 99352

August 6, 1998

FDH-9850

Mr. S. J. Veitenheimer, Director  
Quality, Safety & Health Programs Division  
U.S. Department of Energy  
Richland Operations Office  
Post Office Box 550 AS-55  
Richland, Washington 99352

Dear Mr. Veitenheimer:

**FIRE SAFETY PROGRAMS**

- References: (1) Letter, S.J. Veitenheimer, RL, to R.D. Hanson, Acting President, FDH, "Contract No. DE-AC06-96RL13200 - Fire Safety Programs", 98-QSH-2 dated July 14, 1998.
- (2) Letter, Elizabeth A. Moler, to DOE Secretarial Officers, etl., "Fire Safety Programs", dated May 14, 1998.

This letter is in response to Reference 1 which requested an evaluation of the adequacy of our fire safety program. The evaluation has reaffirmed our belief that our fire safety program includes the necessary elements to ensure the protection of workers, the public, property, and environment. We will continue regular reviews and field checks of the program to ensure its effectiveness, and we will continue to seek improvement opportunities. The areas for improvement identified in the attached response will be tracked until resolved or completed. This response correlates to the program elements listed in the memorandum from the Deputy Secretary of Energy (Reference 2).

If there are any questions on this topic please call me on 373-1289, or J. R. Bell of my staff at 372-2791.

Sincerely,

  
D. L. Jackson, Director  
Occupational Safety & Health  
Office of Environment, Safety & Health

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Attachment:

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**PART I. Key elements of a fire safety program include:**

1. *A firm management commitment to fire safety.*

**Review:**

Fluor Daniel Hanford (FDH) and its subcontractors commitment to the implementation of a comprehensive environment, safety, and health program is provided in several source document including the Project Hanford Management System (PHMS) Procedures. The importance of fire protection and prevention under the Project Hanford Management Contract (PHMC) is emphasized by the fire safety policy statement provided in HNF-PRO-341, "Fire Protection Policy Statement". Management's commitment to the program is further demonstrated by the implementation of 28 fire protection program procedures which address numerous aspects of the fire safety program to ensure the goals of the program are achieved. Management support is also demonstrated by the presence of a fully staffed and trained onsite fire department and medical response services.

Based on the above review, we believe the element is being satisfied.

2. *An adequate staff of qualified fire protection professionals.*

**Review:**

FDH and its subcontractors are staffed with qualified fire protection professionals to provide technical input and assistance with implementation of the fire safety program. Their responsibilities are documented in HNF-PRO-342, "Responsibilities", and include performing and reviewing fire hazards analysis, conducting fire protection facility assessments, document reviews, and providing technical assistance to line management and the other engineering and operations disciplines. Fire protection expertise is obtained through consultants when workloads require additional resources beyond the current staffing levels. The Hanford Fire Department (HFD) staffing needs are addressed in the fire department baseline "Needs Assessment", (Document # HNF-SP-1180, Rev.0).

Based on the above review, we believe the element is being satisfied.

3. *Adherence to existing DOE fire safety policies and other appropriate fire safety criteria and guidelines.*

**Review:**

FDH and its subcontractors comply with existing DOE fire safety policies and criteria as delineated in the PHMC. Areas where compliance can not be achieved, or is not practical due to the marginal increase in safety provided versus the expense, or where an equivalent level of

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protection has been provided, are appropriately documented in exemption, equivalency, and deviation requests. This process is implemented by HNF-PRO-344, "Exemptions and Equivalencies". The fire protection criteria that must be followed is documented in HNF-PRO-349, "Fire Protection Design Criteria", and further implemented by the other 28, HNF-PRO protection procedures.

Based on the above review, we believe the element is being satisfied.

**PART II. In addition, an adequate fire safety program:**

- 1. Defines critical fire safety management authorities, systems, and capabilities (including the involvement of cognizant fire safety and emergency response professionals); implements accurate fire safety performance measures; and defines minimum response capabilities to site fire emergencies ("Baseline Needs").*

**Review:**

The fire safety management authorities and responsibilities are clearly outlined in HNF-PRO-342, "Responsibilities", HNF-PRO-372, "Hanford Fire Department", and the U.S. Department of Energy, Richland Operations Office (RL) issued Hanford Fire Marshal Charter. The emergency plans and implementing procedures are clearly listed in DOE 0223, "U.S. Department of Energy Richland Operations Office Emergency Plan Implementing Procedure". These Procedures identify the authorities and involvement the fire protection personnel, management, and other employees have relative to the fire protection program.

The HFD interfaces regularly with the Emergency Preparedness Department through exercises and drills which enable those involved with emergency response to enhance and hone their Incident command and interface responsibilities are clearly defined to ensure reliable and timely communications and response capabilities. This information is contained in DOE 0223.

A fire department baseline "Needs Assessment" was completed in April 1996 and identified minimum emergency services needs for the Hanford Site. The Assessment thoroughly evaluated the emergency services organization, apparatus, communications, pre-planning, emergency response, training, and other pertinent areas of providing emergency services. Approximately 80% of the recommendations resulting from the review have been addressed, and the remaining items are being tracked with a scheduled completion date. The Assessment is considered a document that will change to accommodate the specific site emergency service needs. The Assessment is planned for a formal update during Fiscal Year 2000.

Fire Safety Performance Indicators (PI's) are reported as required by DOE 5484.1 and DOE 231.1 as part of the Annual Industrial Summary of Fire and Other Property Damage Experience Report. These include items such as the fire loss rate based on the total dollar value of property managed, and the costs for fire protection resources. Additional PI's have also been developed

to assist in measuring the effectiveness of the fire protection program. These PI's account for: the number of non-fire alarm responses as a percentage of total alarm responses; the number of fire system devices that fail to pass their scheduled test; the percent of time in which a fire system is inoperable; the percent of time a fire system is impaired but still capable of operating; and the number of new and completed corrective action items resulting from fire protection reviews and assessments. Additional fire safety PI's will continue to be considered and developed where meaningful information can be obtained to further evaluate program effectiveness, and as required by contract documents.

Based on the above review, we believe the elements of Item 1 are being satisfied, however there were isolated cases where improvement is necessary to ensure fire protection involvement in document reviews. See "Areas for Improvement" (item 2).

2. *Assures performance of comprehensive fire safety assessments on a regular basis and the maintenance of up-to-date fire hazards analyses (FHA's) for all significant facilities.*

#### Review:

Fire safety assessments are completed in several areas to evaluate and confirm the effectiveness of the fire protection program. Fire Protection Facility Assessments are completed on a regular schedule at frequencies required by DOE directives. The assessment reports address each of the elements required by DOE 5480.7A, "Fire Protection". These assessments serve as one means of evaluating field conditions at facilities and verifying implementation of the program requirements. They are implemented by HNF-PRO-684, "Fire Protection Facility Assessments".

Assessments are also performed of fire protection Standards Requirements Identification Documents (SRID's) to ensure these requirements are appropriately identified and implemented at both the Program and Facility levels. Fire protection program reviews are also performed on selective elements of the program, e.g. fire barrier maintenance program, water supply analysis, etc., and integration reviews are performed to evaluate how well the baseline program requirements are being implemented by subcontractors within their specific areas of responsibility. Additionally, the HFD performs internal self evaluations to review the effectiveness of their program elements such as emergency response operations, fire prevention, pre-fire planning, inspection and testing, and maintenance activities.

Fire Hazards Analyses (FHA) have been prepared for all existing nuclear facilities as required by DOE 5480.7A, and the related guidance documents. FHA's are also prepared for new facilities to ensure the fire protection goals and criteria are achieved. The FHA's are updated as needed to reflect and/or evaluate facility, process, and/or operation changes that may impact the conclusions of the original analysis. The preparation and updates are performed by or under the direction of a qualified fire protection engineer. The FHA's are also submitted to DOE-RL for review and approval by their fire protection engineer (or representative) within the Quality, Safety & Health Programs Division. The FHA requirements are implemented by HNF-PRO-

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350, "Fire Hazards Analysis Requirements".

Based on the above review, we believe the elements of Item 2 are being satisfied.

3. *Adopts a comprehensive set of fire safety policies, program requirements, standards, and procedures, coupled with other measures such as active and passive fire protection systems, appropriate to the activities and hazards present, as part of a defense-in-depth approach to fire protection.*

**Review:**

The fire protection program consists of several elements to ensure its effectiveness. The requirements for fixed automatic fire suppression systems, detection and alarm systems, and passive fire protection measures such as fire barriers, are provided as required by DOE directives, FHAs, and/or national consensus standards such as the National Fire Protection Association. These fixed facility protection features are coupled with a comprehensive set of protection procedures which address items such as, Controlling Hotwork, Control of Combustibles, Employee Fire Protection Training, Fire Protection Design Criteria, Fire Protection Corrective Actions, Flammable/Combustible Liquids, Hazardous Material Storage, Fire Protection System Testing, Inspection, and Maintenance, etc. and serve as an integral part of the program. These Procedures are documented as part of the Project Hanford Management System Fire Protection Procedures, e.g. HNF-PRO-349, "Fire Protection Design Criteria", HNF-PRO-356, "Controlling Hotwork", HNF-PRO-359, "Control of Combustibles", etc.

The fire prevention program at Hanford is administered by the HFD, Hanford Fire Marshal, under DOE-RL charter. The Fire Marshal issues permits for occupancy use of facilities, for heating equipment, non-emergency use of fire hydrants, use of explosives, and fuel gases, etc. to ensure fire prevention is maintained and existing fire protection features are not compromised. The Fire Marshal also reviews fire system acceptance test procedures, assists with employee fire prevention training, and provides overview of the water supply systems for fire protection to ensure fire suppression needs are met and maintained. The Fire Marshal also serves the Hanford Site as a focal point for fire safety and coordination with the fire protection engineers on matters concerning fire protection. The Fire Marshal charter is implemented by HNF-PRO-372, "Hanford Fire Department".

The water supply system serving selected areas of the Site has been upgraded to ensure a reliable and adequate supply is maintained for fire suppression purposes. This, coupled with the above fire protection features and programs, and a fully staffed and trained fire department which provides fire suppression, search and rescue, hazardous material response, medical ambulance response, and overall incident command, delivers a comprehensive fire protection program to protect property, the environment, and to provide life safety for personnel and minimize program impacts.

Based on the above review, we believe the elements of Item 3 are being satisfied.

4. *Assures performance feedback through routine DOE oversight and contractor self-assessments, including the collection and analysis of complete and accurate fire protection program data and statistics, and an effective issues management system that demonstrates validation and closure of corrective measures.*

**Review:**

Monthly interface meetings are held with the local DOE-RL Operations Office to discuss and provide updates on matters concerning fire protection. This is one opportunity for DOE-RL to provide constructive feedback and inquire about the fire protection program or specific issues at hand. This meeting also provides opportunity to discuss the fire protection data and statistics gathered from the PI's. The PI's are provided to DOE-RL on a monthly frequency. Fire safety program data and statistics are also collected and reported as delineated by DOE 5484.1 and DOE 231.1 as part of the Annual Industrial Summary of Fire and Other Property Damage Experience Report, and the Computerized Accident/Incident Reporting System.

The Hanford Fire Protection Forum, which includes representatives from most of the Hanford Site contractors and the DOE-RL fire protection engineer, is another means for feedback. This Forum primarily serves to address sitewide fire protection issues and to provide recommendations to the DOE-RL fire protection engineer. A monthly interface meeting is also held with representatives from the Hanford Prime Contractors, the Hanford Fire Department and the DOE-RL fire protection engineer to discuss and address fire protection program items. These meetings also serve as a means for exchanging information on items requiring interface with the fire department or other Site contractors.

Hanford has a sitewide tracking system for tracking corrective action items. The system, known as the Deficiency Tracking System (DTS) is used to track findings and recommendations resulting from assessments, appraisals, and audits. Recommendations resulting from the fire protection facility assessments, FHA's, and audits are placed on this tracking system. This is required by HNF-PRO-345, "Fire Protection Corrective Actions". The Hanford Fire Department also has an internal tracking system for inspection, testing, and maintenance related items. They provide monthly reports to facility managers where corrective action is required.

Items are tracked on these systems until completed or resolved. Facility management has responsibility for resolving recommendations affecting their buildings/operations. The Fire Department validates closure of items on their tracking system while the validation process for DTS is a graded approach depending on the severity of the item. Procedure, HNF-PRO-052, "Corrective Action Management" implements and outlines the latter process.

Based on the above review, we believe the elements of Item 4 are being satisfied, however there were isolated cases where improvement in use of the issues tracking system is necessary. See "Areas for Improvement" (Item 5).

**Areas for Improvement:**

The following areas were identified as a result of a Fire Protection Program Integration Review that was in process at the time this request was received from DOE-RL. The Review report is scheduled to be issued by 8-31-98. These items are being forwarded to the appropriate subcontractors for their information and/or corrective action as warranted. The weaknesses were not identified throughout the Program, but were noted in isolated cases under specific Project areas under the Project Hanford Management Contract.

1. The Project Hanford Management System (PHMS) Fire Protection Procedures are not clearly identified in some of the lower tier subcontractor documents.

**Action Plan:** Subcontractors must ensure a link is in place between the PHMS Fire Protection Procedures and their Operations. This will be identified for the appropriate facilities in the Fire Protection Program Integration Review.

2. The facility fire protection engineer is not always included in the review of project design and changes that may affect fire protection. Fire Protection comments are not always managed to ensure satisfactory resolution.

**Action Plan:** Subcontractors must ensure procedures are in place and implemented to govern the document review process, i.e. ensure document review by a qualified fire protection engineer of items affecting fire protection (and satisfactory resolution of comments). This will be identified for the facilities where the weakness was noted in the Fire Protection Program Integration Review. One subcontractor has already initiated a root cause analysis to identify correct weaknesses in this part of their fire safety program.

3. Recommendations resulting from assessments are not always placed on the Site tracking system until resolved or completed.

**Action Plan:** Subcontractors must place all findings/recommendations from assessments on tracking system until resolved or completed. This will be identified for the appropriate facilities where the deficiency was noted in the Fire Protection Program Integration Review.

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## Pacific Northwest National Laboratory

Operated by Battelle for the  
U.S. Department of Energy

August 10, 1998

Mr. Roger F. Christensen, Director  
Science and Technology Operations Division  
U.S. Department of Energy  
Richland Operations Office  
P.O. Box 550, MSIN K8-50  
Richland, WA 99352

Dear Mr. Christensen:

CONTRACT NO. DE-AC06-76RL01830 - FIRE SAFETY PROGRAMS

Ref: Letter, RF Christensen, RL, to the Director, Pacific Northwest National Laboratory,  
dated July 16, 1998, same subject.

Per your request in the referenced letter, an evaluation of the Pacific Northwest National Laboratory (Pacific Northwest) fire protection program has been performed to address the adequacy of fire safety as specified in the four bullets in the memorandum from Secretary Moler. The evaluation was based on recent internal and external assessments of the fire protection program. A copy of the evaluation is attached.

The conclusion of the evaluation was that the Pacific Northwest fire protection program is a comprehensive fire safety program as defined in DOE Fire Safety Criteria. Deficiencies identified in the 1997 DOE-RL appraisal of the fire protection program are associated with documentation of the program elements and mitigative action was not required. The deficiencies noted do not increase the risk to Pacific Northwest operations, facilities, or staff. The fire protection program is consistent with the requirements and elements contained in DOE 5480.7, and DOE RLID 5480.7.

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2 Battelle Boulevard • P.O. Box 500 • Richland, WA 99352

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Telephone (509) 376-1187 ■ Email dick.watkins@pnl.gov ■ Fax (509) 376-1660

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Mr. Roger F. Christensen  
August 10, 1998  
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If you have any questions on the evaluation, please contact Mr. Andrew Minister on  
(509) 376-4938.

Very truly yours.

  
Richard S. Watkins, Director  
Environment, Safety & Health

RSW:AGM:lap

Attachment

cc: CP Christenson, RL  
TL Davis, RL  
SJ Veitenheimer, RL



## RESPONSE TO THE SECRETARIAL MEMORANDUM ON FIRE SAFETY

Pacific Northwest National Laboratory

Prepared by: AG Minister  
August 7, 1998

### Introduction:

The May 14, 1998, Secretarial Memorandum on Fire Safety Programs requested a response to a number of individual program elements. The program elements that were delineated in the memorandum are listed below, along with the response to each element and the status of the fire protection program at Pacific Northwest National Laboratory (Pacific Northwest). The evaluation is based on a review of the fire protection program portion of the "DOE-RL 1997 PNNL Environment, Safety and Health (ES&H) Management System Appraisal" and on a review of the "Battelle Fire Protection Program Appraisal" dated November 8, 1996.

### Evaluation:

The fire protection program portion of the "DOE-RL 1997 PNNL Environment, Safety and Health (ES&H) Management System Appraisal" resulted in 2 findings and 8 observations. The findings documented that Pacific Northwest facility fire protection assessments were not being performed in accordance with the frequencies established in DOE Orders and that a fire hazards analysis (FHA) of the 325 Building had not been performed. The observations noted deficiencies in the documentation of the Pacific Northwest fire protection program. Corrective actions for one finding and 5 observations have been completed. The open finding on the FHA for the 325 Building will be completed when the U.S. Department of Energy, Richland Operations Office (RL) approves the FHA, which is scheduled for submittal and for approval in September 1998. Corrective actions to close the 3 remaining observations will be completed when conversion of PNL-MA-43 manual chapters to SBMS subject areas is finished and when a Memorandum of Understanding with the Hanford Fire Department on testing and inspection of fire protection systems is completed. The results of the appraisal as stated were "Overall, PNNL has a good FP program."

The "Battelle Fire Protection Program Appraisal" resulted in one finding. The finding noted that Pacific Northwest facility fire protection assessments were not being performed in accordance with the frequencies established in DOE Orders. The corrective action for the finding was completed in February 1998.

### Program Elements:

1. *Defines critical fire safety management authorities, systems, and capabilities (including the involvement of cognizant fire safety and emergency response professionals); implements accurate fire safety performance measures; and defines minimum response capabilities to site fire emergencies ("Baseline Needs").*

Pacific Northwest's Standards Based Management System (SBMS) provides the policies, standards, management systems, requirements, and guidelines necessary to support safe and efficient operations. Pacific Northwest's business management systems are designed 1) to integrate ES&H requirements into the processes of planning and conducting work to protect the worker, the public, and the environment, and 2) to achieve "defense in depth" by carefully applying work controls tailored to the work being performed. The management systems and their functionality within integrated safety management are defined in Pacific Northwest's *Integrated ES&H Management System* and the *Integrated ES&H Program Description*. The Pacific Northwest fire protection program objectives are listed in the Facility Safety Management System in the SBMS hierarchy. Various elements of the SBMS define fire safety roles, responsibilities, authorities, and accountabilities for Pacific Northwest staff.

Pacific Northwest has four fire protection engineers. The fire protection engineers are assigned to the Facility Safety section in the Safety and Health Department of the Environment, Safety and Health Directorate. Fire protection engineers directly support facility management, facilities engineering, operations management, and laboratory staff on fire protection issues. Fire protection engineering is adequately staffed to meet the needs of Pacific Northwest.

Fire safety program data and statistics that are delineated in DOE Order 5484.1 are and will continue to be collected and reported in conjunction with the DOE Annual Fire Protection Program Summary, as well as the Computerized Accident/Incident Reporting System (CAIRS) and Occurrence Reporting and Processing System (ORPS). The data and statistics collected are evaluated to identify trends.

Pacific Northwest relies on the on-site Hanford Fire Department (HFD) for emergency response to fires, medical emergencies, rescues, and hazardous material incidents. The HFD is operated under the Plant Hanford Management Contract. In 1997, the HFD performed a "Baseline Needs Assessment." The HFD capability has been deemed adequate to respond to anticipated emergencies on the site. Pacific Northwest fire protection and facility operations staff work closely with the HFD to develop pre-fire plans and to manage fire system outages and changes to facilities.

*2. Assures performance of comprehensive fire safety assessments on a regular basis and the maintenance of up-to-date fire hazards analyses (FHA's) for all significant facilities.*

Pacific Northwest fire protection staff perform comprehensive fire safety assessments of facilities operated by Pacific Northwest. The frequency of assessments was brought into compliance with the frequencies identified in DOE Order 5480.7A and DOE RLID 5480.7 in February 1998. Deficiencies noted during the assessments are entered into the Corrective Action Tracking System (CATS) and tracked to closure.

Pacific Northwest is in the process of performing a FHA on the 325 Building. It is anticipated that the FHA will be submitted to RL for review in September 1998. A preliminary FHA has been completed for the 3020 Building (Environmental Molecular Sciences Laboratory). Funding has been requested in the FY 99 budget to complete the final FHA for the 3020 Building.

*3. Adopts a comprehensive set of fire safety policies, program requirements, standards, and procedures, coupled with other measures such as active and passive fire protection systems, appropriate to the activities and hazards present, as part of a defense-in-depth approach to fire protection.*

Pacific Northwest has a comprehensive set of fire safety policies, program requirements, standards, and procedures that implement the requirements of DOE Order 5480.7A and DOE RLID 5480.7. The fire safety policies, program requirements, standards, and procedures are defined in SBMS. Specific documents include the Facility Safety Management System; PNL-MA-43, Industrial Hygiene, Occupational Safety and Fire Protection Programs manual; *Facility Fire Protection* subject area; and *Fire Prevention when Working with Open Flame, Welding, Cutting, or Grinding* subject area. Other SBMS subject areas address fire safety issues in conjunction with occupational safety and industrial safety issues. Several of the PNL-MA-43 manual chapters are in the process of being converted to SBMS subject areas. The subject areas that are being developed are *Fire Extinguishers; Flammable and Combustible Liquids; and Explosives and Munitions.*

The Pacific Northwest fire protection program utilizes applicable portions of the Occupational Safety and Health Administration regulations and national codes and standards in addition to DOE Orders. Fire protection features for facilities, staff, and programs are based upon the requirements in 29 CFR 1910 and the National Fire Protection Association codes and standards. Pacific Northwest fire protection is in the process of performing a review of DOE Order 5480.7A; DOE RLID 5480.7; and 29 CFR 1910, Subpart E – Means of Egress; Subpart L – Fire Protection; Subpart Q – Welding, Cutting and Brazing; and 106 to 108. Flammable and Combustible Liquids, Spray Finishing Using Flammable and Combustible Materials, and Dip Tanks Containing Flammable and Combustible Materials to identify gaps between the applicable portions of the requirements and fire protection program elements. The reviews are being documented on a Records of Decision (ROD) form. The reviews will be completed by the end of September 1998 and any deficiencies noted during the reviews will be tracked to closure.

Pacific Northwest has incorporated the "defense-in-depth" approach to fire protection for facilities where the maximum possible fire loss is in excess of \$1,000,000 or where fire losses would cause a significant impact on programs. The "defense-in-depth" approach complies with DOE fire protection requirements. Fire alarm, fire suppression, and fire barriers are installed to provide active and passive fire protection capabilities. Existing fire protection features are inspected, tested, and maintained in accordance with nationally recognized standards and DOE-approved frequencies. The HFD performs testing and inspection of active fire protection systems for Pacific Northwest. In order to assure that the testing and inspection is performed according to Pacific Northwest operational requirements, a Memorandum of Understanding with the HFD on testing and inspection of fire protection systems has been drafted and resolution of comments is in process.

*- Assures performance feedback through routine DOE oversight and contractor self-assessments, including the collection and analysis of complete and accurate fire protection program data and statistics, and an effective issues management system that demonstrates*

*validation and closure of corrective measures.*

As noted previously in this evaluation, oversight of the fire protection program has been performed by RL in the "DOE-RL 1997 PNNL Environment, Safety and Health (ES&H) Management System Appraisal" and by the "Battelle Fire Protection Program Appraisal." Fire protection staff perform a fire protection program appraisal every two years in accordance with DOE-RLID 5480.7. The appraisal evaluates implementation of RL fire protection requirements in the Pacific Northwest fire protection program.

As noted previously, fire protection program data and statistics that are delineated in DOE O 5484.1 are and will continue to be collected and reported in conjunction with the DOE Annual Fire Protection Program Summary, as well as the CAIRS and ORPS systems. The data and statistics collected are evaluated to identify trends.

Pacific Northwest has CATS in place to track deficiencies that result from internal and external assessments and appraisals. The CATS tracks deficiencies, planned corrective actions, and corrective action status. Deficiencies are not closed until the corrective actions have been completed.

**Summary:**

The Pacific Northwest fire protection program is a comprehensive fire safety program as defined in DOE Fire Safety Criteria. Deficiencies identified in the 1997 DOE-RL appraisal of the fire protection program are associated with documentation of the program elements and mitigation action was not required. The deficiencies noted do not increase the risk to Pacific Northwest operations, facilities, or staff. The fire protection program is consistent with the requirements and elements contained in DOE 5480.7A and DOE RLID 5480.7.

054021



Job No. 22192  
 Written Response Approved: :  
 Due Date: N/A  
 Assigned: N/A  
 Client CCN: 060565  
 OU: N/A  
 TSD: N/A  
 DRA: N/A  
 Subject Code: 5000

AUG 12 1998

U.S. Department of Energy  
 Richland Operations Office  
 S. J. Veitenheimer, Director  
 Quality, Safety, and Health Programs Division  
 P.O. Box 550, MSIN AS-55  
 Richland, Washington 99352

Subject: Contract No. DE-AC06-93RL12367  
**FIRE SAFETY PROGRAMS**

Reference: Letter, R. E. Gerton, RL, to S. D. Liedle, BHI, same subject, CCN 060565, dated July 15, 1998

Dear Mr. Veitenheimer:

In accordance with the referenced letter, the attachment addresses the adequacy of the Environmental Restoration Contractor's (ERC's) fire safety program consistent with the requirements and elements contained within the U.S. Department of Energy (DOE) Order 5480.7A, "Fire Protection," and R 5480.7, "Fire Protection." Per DOE direction, this evaluation of the ERC's fire safety program will consist of a new assessment. This response to the secretarial concerns was developed by reviewing the following items.

- Fire protection policies and program requirements.
- The existing ERC corrective action tracking system.
- Existing program and facility assessments.
- The utilization of the Hanford Fire Department for emergency response.
- Completed fire hazards analyses/fire protection assessments.
- The knowledge of the ERC fire protection engineer.


Bechtel Hanford, Inc. (BHI) currently implements a comprehensive fire protection program as detailed in BHI-SH-01, *ERC Environmental, Safety, and Health Program* and implementing procedures. The fire protection program has been developed and is implemented in accordance with DOE fire safety policies, contractual requirements, and other appropriate fire safety criteria and guidelines.

S. J. Veitenheimer  
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If you have any questions, please contact Bob Lichfield, Manager of Safety and Hygiene, at 377.

Sincerely,



M. C. Hughes  
Vice President, Operations

RDL:jea

Attachment: Response to the Secretarial Memorandum on Fire Safety

cc: J. E. Cavanaugh (RL) H0-12, w/a  
C. P. Christenson (RL) A5-55, w/a  
R. E. Gerton (RL) H0-12, w/a  
R. A. Holten (RL) H0-12, w/a

## RESPONSE TO THE SECRETARIAL MEMORANDUM ON FIRE SAFETY

### Introduction:

The May 14, 1998, Secretarial Memorandum on Fire Safety Programs requested a response to a number of individual program elements. These elements have been delineated below, along with their status at Bechtel Hanford, Inc. (BHI).

#### "A firm management commitment to fire safety"

The BHI overall safety policy is stated in BHI-MA-01, *ERC Policies, Organization, and Responsibilities*. The BHI management commitment to implement a comprehensive Environmental, Safety, and Health (ES&H) Program is described in BHI-SH-01, *ERC Environmental, Safety, and Health Program, Section 4.0, "Management of Environmental, Safety, and Health Program."* The specific fire protection program requirements are specified in BHI-SH-01, *ERC Environmental, Safety, and Health Program, Section 10.6, "Fire Protection."*

#### An "adequate staff of qualified fire protection professionals"

Currently, ES&H has one full-time fire protection engineer (FPE) responsible for definition and coordination/implementation of the BHI overall fire protection program. This staff position is augmented with design engineering staff with commercial nuclear fire protection experience or other third party fire protection professionals as necessary to prepare fire hazard analyses, evaluations, or assessments. This combination of capabilities is considered sufficient for activities and operations of the Environmental Restoration Contractor (ERC).

#### "Adherence to existing the U.S. Department of Energy (DOE) fire safety policies and other appropriate fire safety criteria and guidelines."

The BHI fire protection program complies with the appropriate requirements of applicable Code of Federal Regulations (CFRs) and National Fire Protection Association (NFPA) criteria. In addition to these requirements and criteria, the ES&H fire protection program complies with the additional requirements of DOE Headquarters (HQ) and the U.S. Department of Energy, Richland Operations Office (RL) directives included in the ERC contract. The BHI fire protection program was developed to the guidance of the DOE Fire Protection Resource Manual.

#### "Define(s) critical fire safety management authorities, systems, and capabilities (including the involvement of cognizant fire safety and emergency response professionals)"

BHI relies on the services of the Hanford Fire Department to provide fire suppression, fire system inspection testing, hazardous material (HAZMAT) response, and emergency medical response for the ERC managed facilities on the Hanford Site. These critical fire safety management authorities and responsibilities are delineated in BHI-SH-01, *ERC Environmental, Safety, and Health Program, Section 10.6, "Fire Protection."*

"Implements accurate fire safety performance measures"

Currently, BHI reports fire safety performance measures delineated in DOE Order 5484.1 as of the DOE Annual Fire Protection Summary. Additional fire safety performance measures pertinent to the Hanford Fire Department are separately reported to DOE.

"Defines minimum response capabilities to site emergencies ('Baseline Needs')"

As noted above, BHI relies on the Hanford Fire Department to provide emergency response. Based on a recent DOE assessment, the capabilities of the Hanford Fire Department were deemed adequate to respond to anticipated site emergencies.

"Assures performance of comprehensive fire safety assessments on a regular basis."

Fire protection program appraisals and fire protection facility assessments are performed in accordance with the frequencies and category areas identified in DOE Order 5480.7A and RI 5480.7.

"Maintenance of up-to-date fire hazards analyses for all significant facilities"

Fire Hazard Analyses (FHAs) have been completed for all ERC nuclear facilities. The FHAs appended to nuclear facility safety analysis reports and subject to the Unreviewed Safety Question (USQ) process to maintain configuration control. As part of the nuclear SARs, the FHAs are also subject to annual updating as required for SARs.

"Adopts a comprehensive set of fire safety policies, program requirements, standards and procedures."

As noted above, the upper tier BHI fire protection policies, authorities, program requirements and standards are defined in BHI-SH-01, *ERC Environmental, Safety, and Health Program*, Section 10.6, "Fire Protection." In addition to these requirements, a number of specific implementing procedures for fire protection are contained in BHI-SH-02, *Safety and Health Procedures*, Section 6.0, "Fire Protection Implementing Procedures." The fire protection implementing procedures are grouped into the following major areas: management and administration; fire protection design; fire protection systems; fire prevention procedures; fire protection procedures; and special hazards protection procedures.

Each of these major areas contains individual implementing procedures that address the full range of hazards and controls in accordance with the appropriate guidance of the DOE Fire Protection Resource Manual.

"Active and passive fire protection systems, appropriate to the activities and hazards present, part of a defense-in-depth approach to fire protection."



The current status of both active and passive fire protection systems for existing ERC managed facilities has been evaluated and documented in numerous Fire Hazard Analyses (FHAs) and fire protection assessments. Since the majority of ERC facilities are unoccupied surplus facilities that are no longer being operated, deactivation of fire protection no longer required for safety or facility protection is desirable to reduce ongoing system surveillance and maintenance costs.

To support fire protection system deactivation decisions, RL reviewed the status of existing fire protection systems, and the associated facility fire hazard analyses and fire protection assessments. This DOE/RL review was documented in *Automatic Fire Protection Suppression and Detection System Deactivations for Bechtel Hanford, Inc. Assigned Facilities at the Hanford Site, Richland, Washington*, dated August 4, 1997. The RL report also identifies the prerequisites for deactivating fire protection systems. BHI continues to deactivate fire protection systems no longer required for safety or facility protection when the deactivation pre-requisites identified by DOE are met.

"Assures routine performance feedback through routine DOE and contractor self assessments"

As a matter of good business practice, BHI ES&H routinely perform self-assessments in the area of fire protection. The self-assessments may result in the identification of areas for improvement that are subsequently addressed. Existing facility fire protection assessments are periodically reviewed and updated (if necessary) to reflect current facility conditions.

In addition, RL periodically assesses BHI performance in the fire safety area. The RL assessments may be periodically scheduled formal audits or surveillances, or consist of unannounced spot checks of the BHI fire protection program.

"Collection and analysis of complete and accurate fire protection program data and statistics"

Fire safety program data and statistics delineated in DOE Order 5484.1 are collected and reported in conjunction with the DOE Annual Fire Protection Program Summary, as well as the Computerized Accident/Incident Reporting System (CAIRS) and Occurrence Reporting and Processing System (ORPS) systems.

The ERC will make better utilization of its existing "Corrective Action Tracking System" as required by current policy and procedures in order to provide collection and analysis of fire protection program data and statistics.

"An effective issues management system that demonstrates validation and closure of corrective measures"

BHI-SH-01, *ERC Environmental, Safety, and Health Program*, Section 10.6, "Fire Protection," fire protection program responsibilities requires management to develop corrective action plans, provide timely resolution, and provide the necessary support for resolving fire protection deficiencies identified during appraisals, assessments, and surveys. Fire protection system

emergency impairments and system restrictions. BHI-SH-02, *Safety and Health Procedures*, Section 6.1.2, "Fire Protection Corrective Actions," requires the processing of conditions requiring corrective action to be entered into the "Corrective Action Tracking System," which is described in BHI-MA-02.

**Summary:**

BHI currently implements a comprehensive fire protection program as defined in BHI-SH-01 *ERC Environmental, Safety, and Health Program* and implementing procedures. As noted previously, this program has been developed and is implemented in accordance with existing DOE fire safety policies, contractual requirements, and other appropriate fire safety criteria and guidelines.