



## Department of Energy

Fermi Site Office  
Post Office Box 2000  
Batavia, Illinois 60510

AUG 26 2011

Dr. Bruce L. Chrisman  
Chief Operating Officer  
Fermilab  
P.O. Box 500  
Batavia, IL 60510

Dear Dr. Chrisman:

**SUBJECT:** DOE 2011 Fermilab Materials and Radiological Clearance Operations  
Technical Assist Visit

**Reference:** Letter M. Jones to M. Weis, dated July 15, 2011, Subject: Technical Assist Visit  
to Support Materials and Radiological Clearance Operations at Fermilab.

The DOE Office of Science conducted a review from April 4-8, 2011 of the Fermilab processes for property and material clearance (attached). The review was designed to determine the progress made by the laboratory in achieving the prerequisites for resumption of materials and radiological clearance operation consistent with Secretary of Energy memoranda dated July 13, 2000 and January 9, 2001.

The review team found that Fermilab adequately addresses radiological materials and protection issues in compliance with 10 CFR Part 835 as it relates to radiological material and property management. The review team also found that Fermilab is in compliance with DOE Order 458.1 and current DOE policy relating to the Secretarial mandates dealing with the suspension and moratorium on metal recycling.

Enclosed is the final report for this review. Two proficiencies and six observations were identified in the report. The two proficiencies do not warrant any action on the part of Fermilab and the laboratory is recognized for its leadership in these areas. The six observations have seven recommendations associated with them.

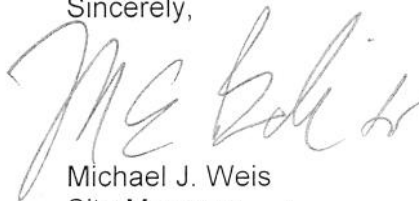
The review recommended that a more focused effort is needed to prepare the Fermilab radiological and property management programs to resume materials and radiological clearance operations for the purpose of material recycling or reuse. The recommendations address improvements to site practices and procedures to support these clearance operations. These improvements are required as a prerequisite for consideration of any application to DOE to resume materials and radiological clearance operations for the purpose of reuse or recycling.

Observation 1 in the report states that [DOE] "moratorium and suspension policies would benefit from clarification by DOE Headquarters." A panel discussion on this topic will be held at the 2011 Accelerator Safety Workshop at Argonne National Lab on September 20, 2011. John Blaikie, Team Lead for the Fermilab Review, will lead this discussion.

AUG 26 2011

FSO will work with Fermilab to resolve the identified recommendations and achieve the closure needed to support future clearance operations. At a minimum we will track through frESHTRK all the required actions in response to the recommendation. Please contact Dennie Parzyck of my staff to begin discussions on the closure process. In the interest of addressing future operations on the Fermilab site, it is desirable to initiate the closure process by September 30, 2011.

Sincerely,

A handwritten signature in cursive script, appearing to read "Michael J. Weis".

Michael J. Weis  
Site Manager

Enclosure:  
As Stated

cc: P. Oddone, w/encl.  
Y. -K. Kim, w/encl.  
N. Grossman, w/encl.  
R. Ortgiesen, w/encl.  
D. Carlson, w/encl.

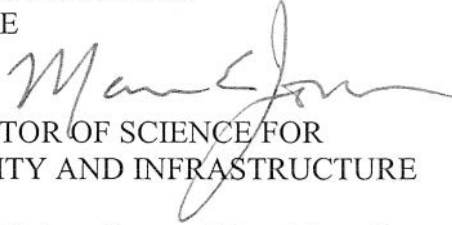


## Department of Energy

Washington, DC 20585

July 15, 2011

MEMORANDUM FOR MICHAEL J. WEIS  
MANAGER, FERMI SITE OFFICE  
OFFICE OF SCIENCE

FROM: MARCUS E. JONES   
ASSOCIATE DIRECTOR OF SCIENCE FOR  
SAFETY, SECURITY AND INFRASTRUCTURE

SUBJECT: Technical Assistance Visit to Support Materials and  
Radiological Clearance Operations at Fermi National  
Accelerator Laboratory (Fermilab)

The Office of Science (SC) conducted a review of the property and material clearance processes used at Fermilab on April 4 to April 8, 2011. The objective was to assess and evaluate progress made to develop and implement enhancements to these processes directed by the Secretary of Energy in memoranda dated July 13, 2000, and January 19, 2001. These improvements are required as a prerequisite for consideration of any application to resume materials and radiological clearance operations for the purpose of reuse or recycling.

The review team was led by the Office of Safety, Security and Infrastructure (SSI) and included representatives from the Office of Health, Safety and Security (HSS) and the National Nuclear Security Administration. The review report is provided in the attachment.

The team found that Fermilab can adequately address radiological materials and protection issues and is in compliance with the requirements of 10 CFR Part 835, *Occupational Radiation Protection*, as they relate to radiological material and property management. Fermilab is also in compliance with DOE Order 458.1, *Radiation Protection of the Public and Environment*, and the current DOE policy regarding the Secretarial mandates concerning the suspension and moratorium on metal recycling. Two proficiencies and six observations were identified during the review and are detailed in the attached report.

Regarding current policy imperatives mandating improvements in the Department's radiological clearance and surplus and scrap management programs, Fermilab should seek assistance from SSI's Environment, Safety and Health Division to interpret current policy requirements and to develop and apply an appropriate compliance strategy. Coordination with SSI will ensure that a consistent approach to compliance, that is vetted through relevant headquarters organizations (e.g., General Counsel and HSS), is implemented across all SC sites.



M-2612

I would like to thank the Fermi Site Office and the laboratory for working with the review team in conducting this review. If you have any questions or require further assistance you may contact John Blaikie of my staff at 301-903-8470.

Attachment

cc w/ attachment:

J. McBrearty, SC-3

M. Bollinger, SC-FSO

J. Scott, SC-FSO

M. Procario, SC-25.2

## Attachment

### Fermi National Accelerator Laboratory Technical Assistance Visit Report to Support Materials and Radiological Clearance Operations

#### OVERVIEW OF ASSESSMENT

Fermi National Accelerator Laboratory (Fermilab) radiation control and materials release program was determined to be compliant with the requirements contained in Department of Energy (DOE) Order 458.1, *Radiation Protection of the Public and Environment*. Fermilab has a well defined material organization program at the Railhead<sup>1</sup> site where the material is stored and the site has been effective in maintaining proper accountability of all metal entering the facility.

The materials identification and release process is clearly defined and documented. The process specifies a single organizational structure and approach methodology used at the Railhead site. This process, used for collection, monitoring and release, has been effective in maintaining proper accountability of materials and metals entering the Railhead. There is a well-established communication link between Fermilab and the DOE Fermi Site Office (FSO) which ensures effective oversight and helps enhance the quality of operational and support programs at Fermilab.

Fermilab has a strong radiological and material control program and an effective radiological clearance process that is well supported by both management and staff resources. Over the last several years the site has made several improvements to their processes and program objectives. Continued improvement will require additional attention and management commitment, specifically to address the accumulation and disposition of excess materials. Public involvement and access to site material disposition information was noted in the Annual Environment Report to the Director. Data within the report was consistent with the impacts of the Secretarial policy based on the reduced amounts of materials released as reported for pollution prevention and waste minimization.

Fermilab's management and storage of excess materials is well-documented and readily verifiable in the field. The site approach to implementing the Secretarial policy on suspension and moratorium was found to be applied in a very conservative manner, leading to the unnecessary accumulation of materials that should not be encumbered by these policies. This observation is consistent with the situations seen at other Office of Science (SC) sites and is a result of common misunderstanding of the intent and reach of the aforementioned Secretarial policies. Fermilab process knowledge, material conditions and site practices, while conservative, are well established to clearly segregate and document the policy status of excess materials.

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<sup>1</sup> Railhead is a term used at Fermi to refer to a material storage area at the north end of the laboratory site.

Site impacts associated with conservative application of the suspension and moratorium policies are evident in the amount of material currently being held, stored, and managed at the Railhead. Additional storage capacity was developed to accommodate material deemed encumbered by these policies and has resulted in increased operational costs. Estimates provided to the review team regarding the cost for material disposition, recovery and lost revenue were estimated to be \$13M over the next five to eight years.

The instrument calibration facility (for those instruments used in conjunction with radiological material surveys) is well-organized. Calibration facility operations are sound and provide the quality assurance processes necessary to ensure instrumentation is operating properly and within specification. Review of the process for user notification and return of instruments for calibration found that several instruments were out of calibration and had not been returned to the calibration facility. User notifications and requests to return “out of calibration instruments” are made and an additional notification to user supervision is sent when instruments are not returned for calibration in a timely manner. Management support is needed to provide a more robust notification and return policy of radiological instruments to ensure that out of calibration instruments are not available for use in the field for radiological and materials clearance purposes.

The team reviewed the Fermi Site Office (FSO) oversight of the Fermilab Radiological Controls Program. FSO oversight activities are thorough, well defined, distributed to all ES&H staff members, and meet the intent of independent verification as delineated in the Secretarial memorandum. FSO and laboratory personnel collectively participate in an integrated oversight process across the various site programs and elements.

In-briefings were provided for the review team to help the members better understand current site conditions and practices. One condition of the site that was noted was the potential reduction in site operating funds and the potential long term generation of excess materials based on expected decontamination and decommissioning (D&D) activities. It was noted by senior site management that D&D planning activities were only beginning and the potential impacts to the site would be significant if material clearance operations could not be restarted or resumed. The team agreed that a more focused effort was needed at the site to support an increase in the potential materials management and release opportunities. These opportunities would require strengthening the current radiological and property management program and processes to support the anticipated increase in D&D related activities such as planning, project management, dismantlement, material characterization, staging, storage and release.

The Fermi Radiological Materials Initiative Review was well coordinated and attended by Fermilab senior management and DOE site personnel. The laboratory’s radiological and materials processes are robust and ensure regulated materials are not released into general commerce. Several program improvements were noted during the review. Site practices and procedures used to support material clearance operations will require some review and modification to facilitate continued improvements, support efforts to reduce radiological areas and provide better enforcement of instrument returns for calibration.

Development of program documentation to support planned D&D activities should also be addressed. Specific observations and recommendations for improvement are detailed below.

## PROFICIENCIES

**Proficiency-1: Excess and encumbered material located at the Railhead is well organized and documented which facilitates an efficient process for the receipt, segregation and control of material.**

Fermilab has made significant improvement in material handling and storage processes by consolidating its operations in one primary location. Documentation provided to the team demonstrated that site procedures and Railhead material storage locations are well known and documented. Processes that control materials into and out-of the Railhead allow for a single organization to control material movement.

**Proficiency-2: Site Office independent verification activities are thorough and well defined. FSO and laboratory personnel collectively participate in an integrated process across the various site programs and elements.**

The team reviewed FSO oversight of the Fermilab Radiological Controls and Property Management Organization's programs. FSO oversight activities are thorough, well defined across staff functional areas and meet the intent of independent verification as delineated in the Secretarial memorandum. FSO oversight is carried out through surveillances performed on the organization's sites as well as direct participation in organizational and topical meetings dealing with radiation protection, waste management, and property management. Oversight also includes regular day-to-day contact with the involved organizations at every level from the working level to senior management. Observations and action items identified during these interactions are tracked to satisfactory completion by both the contractor and FSO.

## OBSERVATIONS

**Observation 1: Moratorium and Suspension policies, as implemented, would benefit from clarification by DOE Headquarters.**

Presently, two DOE policies govern the disposition of metallic personal property and scrap into general commerce. They are:

- a) The February 2000 moratorium on the release of metals contaminated in volume with radioactive material: The moratorium applies to volumetric contamination only; and
- b) The July 13, 2000, suspension on the release of scrap metal for recycling from radiological areas as defined by the requirements of 10 CFR Part 835,

*Occupational Radiation Protection:* The Suspension Policy only affects metals designated as scrap while in a radiological area.

The Review Team found that both DOE policies have been applied in a very conservative manner.

Accumulation of large amounts of material at the Railhead was observed during a walkthrough of the storage area. On-site interviews with Fermilab property management personnel indicated that specific amounts of metals were from former radiological areas but were not contaminated or activated. This determination was based on process knowledge and documentation such as the Material Movement Request (MMR) form. However, the site has not performed a documented formal review of all site radiological areas to address the impact of the Secretarial policy and the performance mandate within the policy.

The MMR process used to document the condition of materials and establish the process knowledge for decision making on its disposition is identified as an improvement in Fermilab site practices. However, based on the current policy implementation, some material was determined to be encumbered and located to the Railhead for storage pending a future decision regarding appropriate disposition.

Recommendation-1: Fermilab should review and revise applicable plans and procedures to implement policy clarifications, such as reduction of the number and size of radiological areas and resume material clearance operations consistent with the observations and recommendations found in this report. This will help reduce the overall impact of the policy and address the performance mandate.

**Observation-2: Site implementation of Suspension guidance is applied in a very conservative manner. Procedures used to implement the suspension and moratorium policies include Radiological Materials Area (RMA) although RMA is not a 10CFR835 defined radiological area.**

Fermilab has erred in implementing the Secretarial policy suspending the release of scrap metals for recycling. Fermilab erroneously includes Radioactive Material Area (RMA) as a 10CFR835 defined Radiological Area. Specifically, Operating Procedure BSS/PIC/101, *Fermilab Property Inventory, Control Railhead Storage Area, Radiation Surveys and Certifications*, (Railhead Procedure) dated 03/11/11, paragraph 3, states that “Group 1 material does not originate from a radiological area. ***Under the current suspension, Radioactive Material Areas are classified as Radiological Areas.***” [emphasis added]. RMAs are ***NOT*** radiological areas per the definitions contained in 10 CFR 835 and scrap stored there is ***NOT*** subject to the policy restrictions associated with the Secretarial suspension on the release of scrap metal for recycling. All material cleared for release into general commerce MUST be formally determined to be compliant with the requirements of DOE Order 458.1, *Radiation Protection of the Public and Environment*, regardless of policy considerations.



The Railhead Procedure provides the definition of Group 1 (described above) and Group 2 (items not from a radiological area) materials, and was established to segregate and control material disposition. Observations at the Railhead found that Group 1 and 2 materials are stored in the same area and could potentially result in comingling of segregated material.

Recommendation-2a: The Railhead Procedure should be corrected to eliminate an RMA from being designated as a 10CFR835 defined Radiological Area.

Recommendation-2b: The site should enforce segregation of Group 1 and Group 2 materials to reduce the risk of co-mingling of suspect radiologically contaminated material with uncontaminated items obtained from non-process areas of the laboratory.

**Observation-3: Documentation of truck monitor use for radiological and materials release processes could be improved.**

Fermilab uses a truck monitor to evaluate the radiological status of loads of materials prior to release from the site, either as waste or recyclable materials. Use of the truck monitor helps ensure that aggregation of materials from Fermilab do not collectively result in an alarm at a facility receiving the materials for disposal or recycle. Further, application of bulk monitoring technology is directly comparable with the type and rigor of radiological monitoring applied to disposition of scrap in the commercial sector. When combined with rigorous hand survey and other appropriate radiological monitoring techniques, use of the truck monitor provides additional assurance that materials released into general commerce from Fermilab meet the criteria established by DOE O 458.1. However, MMR forms do not clearly identify data obtained from use of this monitor as critical information to consider for disposition of material from the site.

Recommendation-3: Fermilab should consider applying additional rigor and formality to use of the truck monitor to evaluate loads of materials leaving the site. Specifically, the requirement for monitor use and the radiological status of materials evaluated through use of the monitor should be more prominent on the MMR to ensure this information is considered as part of the disposition actions.

**Observation-4: Fermi Radiological Control Manual (FRCM) requirements, as reviewed, for the release of material are not being consistently implemented across Divisions.**

The Team reviewed internal implementing procedures for this manual at the Accelerator Division and Particle Physics Division and found inconsistencies as well as potential non-compliances with the requirements of the FRCM. The Team noted that there is not a site-wide procedure governing the clearance of materials from radiological control.

Recommendation-4: Review and revise site and divisional procedures for materials release to ensure consistency and to meet performance mandates as required within the Secretarial policy.

**Observation-5: Material Movement Request form and relevant information could be improved.**

The MMR form is institutionalized via the Railhead procedure and provides both property management and radiological support personnel with relevant information to make disposition determinations. The team reviewed several MMRs (e.g., E11939SP, M147158, M148356 and M151290) and found two versions of the MMR in use. One MMR (E11939SP) was found to have additional information in the form of “Special Instructions for Requestor/Originator” that provided a more detailed radiological description and instrumentation used to survey material for clearance purposes.

Recommendation-5: Develop a single Material Movement Request form that includes all relevant information to strengthen and formalize the radiological and materials release process to include all material movement documentation.

**Observation-6: Return of radiation survey instruments due for calibration needs to be improved to ensure that instruments that are out-of-calibration are not available for use in the field.**

Instrument calibration log sheets were reviewed and found to contain over 300 instruments accounted for in the calibration tracking system at Fermilab. Instrument logs provided to the team indicated that, approximately 100 of these instruments were identified as in-service in the field and available for routine use. Subsequent discussions regarding the process for notification of pending calibration due dates and return of instruments for calibration found that approximately 10 to 20 were out of calibration and had not been returned to the calibration facility on, or prior to, the calibration due date.

Recommendation-6: Fermilab management should support a more robust notification and return policy of radiological instruments to ensure that out-of-calibration instruments are not available for use in the field for radiological and materials clearance purposes.

## Appendix A

### Scope of Review

This review focused on four areas of interest:

1. Policy of Secretarial Memoranda: Programmatic encumbrance and impact on costs and schedule;
2. Radiological Areas: Criteria for establishing and de-posting areas and supporting surveys and procedures;
3. Material Control and Clearance: Processes for control and clearance of material and equipment from radiological areas including compliance with the requirements of 10 CFR Part 835, *Occupational Radiation Protection*;
4. Implementation of the Secretarial suspension on the release of metals for recycle from radiological areas: Status of evaluation and enhancements to management of property control systems, processes and record keeping mandated by the Secretary of Energy's Memoranda of July 13, 2000, and January 19, 2001.

## **Appendix B**

### **FNAL Technical Assistance Visit Participants**

#### ***Review Team Members***

John Blaikie, SC-31, Team Lead  
Scott Davis, SC-31, Deputy Team Lead  
Richard Meehan, NA-58, Senior Technical Advisor (remote)  
Carlos Corredor, HS-22, Team Member  
Dennis Ryan, BNL, BSA Field Support Manager, Observer  
Donna King, BNL, BSA Property Manager, Observer

#### ***Fermi Site Office Personnel***

Mark Bollinger, Deputy Site Office Manager  
John Scott, Operations Management Division  
Dennis Parcyck, Facility Representative, Site Visit Coordinator

#### ***Fermilab Personnel***

Don Cossairt, Radiation Protection Group Leader  
Susan McGimpsey, ESH Section Health Physicist  
Billy Arnold, ESH Section Hazard Control Technology Group Leader  
Butch Hartman, ESH Section Instrumentation Group Leader  
John Kelly, Property Manager

#### ***Argonne Personnel***

Angela Harvey, Argonne Site Office  
Steve Butala, Argonne National Laboratory, Radiological Controls