Lessons Learned

Installation of an Air Emission Source without the Regulatory Required Air Preconstruction Permit
Report issued: October 2004

Event:

The Feynman Computing Center (FCC) Utility Improvements project that was initially defined in 1998, but not implemented until November of 2002, resulted in the installation of an air emission source (1500 kW diesel generator) without the regulatory required construction permit[1] or incorporation of the source into the sitewide operating air permit. The discrepancy was recently discovered during self-assessment activities associated with implementing an integrated environmental management system (EMS). Ceorrective action has been taken.

Lessons Learned:

Background

As a result of noted opportunities for improvement made during the October 1999 Integrated Safety Management (ISM) validation process, Fermilab conducted a tri-partite assessment of the construction document review process and issued a report in December of 2000. The tripartite assessment revealed that the current environmental regulatory framework posed risks that the then construction document review process did not adequately address. Process improvements, which included the transfer of environmental personnel from the ES&H Section to FESS (in February 2001), were implemented as a result of the tripartite assessment. Concurrently, the FCC Utility Improvements project was already in the Title 2 project phase[2] and this timing prevented its benefiting from the construction review process improvements. Several additional process improvements have been implemented by FESS since that time, such as the utilization of an Environmental Review Form (ERF) for each project, and issuance of a responsibility matrix along with project documents. However, the FESS ERF[3] is completed early on, such as during the project definition or conceptual design review phase, with the primary intent of fulfilling the National Environmental Policy Act (NEPA)[4] requirement. The ERF is a useful tool for identifying opportunities for minimizing potential environmental impacts through design. It also serves to identify aspects (attributes that can interact with the environment), and their regulatory implications (like permitting, erosion control, etc.), applicable to the conceptual design. However, the current system does not appear to

[1] The Illinois Environmental Protection Act requires construction permits prior to beginning construction of an air emission source or air pollution control equipment, or modification to an existing air emission source unless specifically exempt by 35 IAC 201.146 (exemptions contained in FESHM 8080 – Air Emissions Control Program).
[2] In this phase, the design team will produce the drawings, Exhibit A and Exhibit B (specifications) that set forth the detail requirements for the construction project.
[3] The Environmental Review Form designates whether project activities are covered by the Fermilab NEPA Generic Routine Maintenance Categorical Exclusion or whether a more formal NEPA review including submittal of a Project Information Form to the ES&H Section is necessary.
[4] The purpose of the NEPA is to recognize environmental impacts and ensure that environmental factors are given consideration along with others, such as cost, in decision-making by federal agencies

guarantee that environmental aspects of the final design will be reevaluated and, most importantly, addressed.

Conclusion

Therefore, in order to minimize the risk of an environmental compliance issue that could result in an enforcement action, fine, or damage to the Laboratory's image from initiating the Title 3 (construction) phase of a project without required environmental permits, it is critical that all project environmental aspects and their regulatory implications be reevaluated and addressed by FESS ES&H personnel once the project design has been finalized (typically during the Title 1 project phase[5]). This reevaluation of the environmental aspects of the final design should be documented for each project and included in the final design Comment and Compliance Review package. The ES&H Section will provide consultation upon request and will compile permit applications upon notification. FESS Construction managers should include in their project timeline an allowance for permit application preparation and a possible 90-day environmental agency permit application review period.

Contributing Actions/Conditions and Recommended Action

- The lack of a FESHM chapter formally documenting the Air Emissions Control Program created a resource void. The need to fill this gap was identified through EMS implementation activities. FESHM chapter 8080 was issued in May of 2004.

- The FESS 'Construction Document Review & Distribution Procedures' were not followed for the 'FCC Utility Improvements project.' The ES&H Section was excluded from the distribution of the May 2000 Lab-wide Review, the July 2000 QA Review, and the December 2000 Value Engineering Report QA Review. This appears to be an anomaly, but there is no explanation in the project file as to why the ES&H Section was excluded from these construction reviews.

  The ES&H Section filed comments during the 1998 and 1999 QA Reviews stating that the potential air emissions from the proposed diesel generator would need to be quantified and necessary changes to the facility air permit made dependent upon the final size of the generator. They also recommended that the generator manufacturer be consulted for emissions information in order to make impact calculations. Exclusion of the ES&H Section from construction reviews after 1999 prevented the opportunity to follow up on how these comments were being addressed.

  FESS 'Construction Document Review & Distribution Procedures' dated April 2000 and 'Document Review Procedure' dated May 2001 should be reviewed and updated to ensure that recommendations made in the December 2000 tripartite assessment of the construction review process were addressed. In addition, the procedures should

[5] In this phase, the design team prepares more detailed drawings and finalizes the design plans, showing correct sizes and shapes for spaces. The design plans indicate significant equipment and experimental apparatus, staging areas, and related ancillary spaces…

include the roles and responsibilities of FESS ES&H personnel and the recommended final design evaluation of environmental aspects.

- The overall flux of this project illustrates the need to systematically ensure continuity regarding project ES&H concerns and issues. The project fluctuated from the initial identification of the need to upgrade the FCC utilities in 1998 to implementation in 2002 with regard to scope (due to expanding capacity needs of FCC), management (transfer from GPP to UIP) and personnel involved (from both Fermilab and the engineering consultants). A project file review revealed the following numerous design modifications occurred. The generator was initially proposed as 1000 kW in 1998, then 1500 kVA in 1999 with a change in units from kW to kVA on the design documents, then 1500 kW in 2000, then two 750 kW generators as recommended in a Value Engineering Report (VER) in December 2000. The file review did not uncover documentation to indicate when or why a 1500 kW unit was ultimately chosen and installed, but the last design document sent for review (ES&H was excluded from reviews after 1999 as stated previously) was the above-mentioned VER. Understandably, scope changes were necessary to ultimately meet the customer need. As stated earlier in the report, it is critical that all project environmental aspects and their regulatory implications be reevaluated and addressed by FESS ES&H personnel once the project design has been finalized. This reevaluation of the environmental aspects of the final design should be documented.

- Fermilab cannot rely on Subcontractors to be knowledgeable regarding ES&H requirements, to communicate regulatory concerns or issues, or to follow up on regulatory issues that are raised. There was a surprising lack of awareness for environmental regulations by the three primary subcontractors involved in this project, summarized as follows.

    - Crawford, Murphy and Tilly (CMT), Inc. was subcontracted to provide a number of services for the FCC Utility Improvements project including a review of applicable codes and regulations. CMT did not identify the regulatory need for an air permit. Although CMT routinely provides services that include the installation of power supply equipment, they were unaware of the regulatory need for permits until Fermilab interviewed them for this report in September of 2004.

    - Excelon Solutions (subsidiary of ComEd) also provided consulting engineering services and actually purchased the generator on Fermilab's behalf from the manufacturer (Cummins Power Generation), but did not alert the FESS Construction Manager to the air permit consideration. In November of 2000 the FESS Construction Manager transmitted an electronic mail message to Excelon requesting that two environmental issues, emissions from the diesel generator and fuel tank size for spill containment planning, be addressed after the value-engineering phase was completed. The file does not indicate that Excelon responded. In January of 2001, Excelon was subcontracted to address the December 2000 QA review comments and these

environmental issues were again transmitted, but the file does not indicate that Excelon responded. When interviewed for this report in September of 2004, Excelon personnel were aware of the regulations, but could not account for failing to provide consultation regarding the need for a permit for the 1500 kW generator that they installed for the Lab.

- Patrick Engineering delivered a value engineering report in December 2000 that evaluated the then proposed design. In the report they recommended installation of two 750 kW generators instead of one 1500 kW unit. This report did not mention environmental permitting as a factor (a permit would not have been required for the two 750 kW generators).

- To avoid taking ownership/occupancy of a project that is out of compliance, landlord division/section Project Managers should make every effort to ensure inclusion of their ES&H personnel throughout project design evolution. The Work Permit Notification Form (WPNF), which documents authorization to commence work by the landlord division/section, lists applicable permits (for example, environmental permits), site-specific training requirements, and organizations that will need to be notified prior to commencement of work. Since the Division/Section Senior Safety Officer (SSO) is required to approve the project WPNF before a Notice to Proceed ~~with~~ when construction is issued, it is important that the SSO confirm the WPNF accuracy before signing it.

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