



Department of Energy  
National Nuclear Security Administration  
Washington, DC 20585



June 2, 2006

The Honorable A. J. Eggenberger  
Chairman  
Defense Nuclear Facilities Safety Board  
625 Indiana Avenue, N.W., Suite 700  
Washington, DC 20004-2901

Dear Mr. Chairman:

I am writing this letter on behalf of Ambassador Brooks in response to your letter dated March 27, 2006. In your letter you forwarded results of your staff review of the Criticality Experiments Facility (CEF) Project design. Your staff review was focused on the adequacy of the authorization basis for CEF, the criticality safety program, the fire protection program, the confinement features, and the management and oversight roles of the National Nuclear Security Administration.

Major issues raised by the Board staff include inattention to the interface requirements between the existing Device Assembly Facility and proposed CEF operations, and lack of acceptable resolution of safety issues such as the need for fire protection, ventilation, and criticality alarms in the bays and cells.

I am pleased to inform you that all of the major issues brought to our attention by the Board staff have been fully deliberated and are resolved. Resolution of issues will be documented in the revision to the Preliminary Documented Safety Analysis and other relevant project documents. Issues that result in design changes will be implemented in the final project design.

The enclosure to this letter reflects planned disposition of major issues raised in the Board letter.

If you have any questions, please contact me or have your staff call Ms. Deborah D. Monette of the Nevada Site Office at (702) 295-2588.

Sincerely,

Thomas P. D'Agostino  
Deputy Administrator  
for Defense Programs

Enclosure



cc:

L. Brooks, NA-1, w/enclosure

J. Norman, NSO, w/enclosure

E. Wilmot, LASO, w/enclosure

M. Whitaker, DR-1, w/enclosure

SEPARATION

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Enclosure to the Letter from Thomas P. D'Agostino  
Response to the Defense Nuclear Facilities Safety Board  
Regarding

Letter dated March 27, 2006 from Chairman A.J. Eggenberger  
to the Honorable Linton Brooks, Administrator NNSA



Design Issues of the Criticality Experiments Facility (CEF)  
Project

May 10, 2006

The Criticality Experiments Facility (CEF) project is a Congressionally approved line-item project # 04-D-128 with the purpose to relocate four existing critical assembly machines (Comet, Planet, Flattop, and Godiva) from TA-18 at Los Alamos National Laboratory to the Device Assembly Facility (DAF) at the Nevada Test Site. The DAF will be modified to allow critical assembly operations in two DAF round rooms, provide remote control room capability, provide secure storage of the CEF Special Nuclear Material inventory, and provide a General Purpose Bay capability in support of designated CEF missions involving Radiation Test Objects.

On March 27, 2006, the Board sent a letter to the Administrator, National Nuclear Security Administration, transmitting two Staff Issue Reports, one dealing with fire protection at CEF and the other with the Safety Basis for CEF. The following table consolidates the major issues identified in the two Staff Issue Reports and presents the steps that are underway or planned to be taken to resolve the Defense Nuclear Facilities Safety Board and National Nuclear Security Administration Safety Basis Review Team issues identified.

<b>Board Major Issue</b>	<b>Actions</b>
<p>Fire Protection: . . . <i>Software Quality Assurance</i>-The CEF fire analysis does not meet current software quality assurance (SQA) requirements of Title 10 of the Code Federal Regulations, Part 830, <i>Nuclear Safety Management</i>.</p>	<ul style="list-style-type: none"> <li>• A new Consolidated Fire and Smoke Transport analysis will be performed under Software Quality Assurance requirements per DOE-EH guidance.</li> <li>• The Preliminary Fire Hazards Analysis (PFHA) will be revised to reflect appropriate fire damage and modeling.</li> <li>• The Preliminary Documented Safety Analysis (PDSA) Revision 2 will reflect technical basis for fire protection system changes, as required.</li> <li>• Evaluation of alternative systems is underway, including dry-pipe and chemical with appropriate detection and alarm capabilities.</li> <li>• PFHA results will be reflected in the PDSA and submitted with Critical Decision – 3D (DAF Modifications). Milestone date is June 30, 2006.</li> </ul>
<p>Ventilation System: The operation sequence of the fire dampers/suppression system and the HVAC system needs to have clear design criteria, along with system description(s) describing how those criteria have been met. Additionally, further guidance in DOE Technical Standard 1066, Fire Protection Design Criteria, regarding fire protection for filtration units has not been addressed.</p>	<ul style="list-style-type: none"> <li>• CEF will modify the ventilation systems in the storage vaults to add High Efficiency Particulate Air filtration.</li> <li>• The assembly cell and the general-purpose bay ventilation systems do not need to be modified because the existing systems meet the facility design criteria.</li> <li>• Agreement has been reached among the project team, the NNSA Safety Basis Authorization Team, and the DAF facility operator that the CEF ventilation systems will be retained as safety-significant system, structures, and components for consistency with the DAF. The final design and procurement packages, scheduled to be completed by June 30, 2006, will reflect this agreement.</li> </ul>

<p>DAF Emergency Response (Fire): The contractor's evaluation lacks sufficient detail to permit the conclusion that a fire in these areas with no suppression system would not result in untenable life safety conditions for workers and firefighters, extensive damage to adjacent criticality experiment equipment and materials, or the release of hazardous materials.</p>	<p>DAF has well-established emergency response plans and procedures. Fire scenarios are developed and exercised on a regular basis in drills as part of the Emergency Response Program.</p> <p>The general fire response strategy at DAF is to not fight fires involving nuclear materials, but rather to focus on protection of personnel. The ongoing revision of PFHA for the CEF will provide a technical basis for determining if the current DAF firefighting strategy is appropriate for CEF.</p>
<p>Combustible Loading Separation Distance: Combustible loading assessments performed by the fire protection system engineer indicate the need for a 6-foot standoff of combustibles from the criticality experiment equipment. The contractor could not describe the basis for that distance. No technical basis for the combustible loading limits or standoff distance has been provided.</p>	<p>The current six foot stand-off distance at DAF is required for explosive handling operations.</p> <p>CEF operations will not involve explosives. Therefore, this requirement is not applicable or relevant to CEF. Where credited to prevent ignition, the technical basis for the stand-off distance for combustibles will be provided in the PDSA.</p>
<p>Loss of Criticality Experiment Capabilities: The Board has expressed concern in the past regarding the potential loss of criticality experiment capability at DOE while these machines are being moved from LANL to DAF.</p>	<ul style="list-style-type: none"> <li>• The Nuclear Criticality Safety Program (NCSP) Manager has provided funding to Lawrence Livermore National Laboratory for hands-on criticality safety training in FY06.</li> <li>• The NCSP Five Year Plan (FY07 Revision) will further address specific plans and tasks for maintenance of capability.</li> <li>• The NCSP Manager briefed the Board on current plans on April 11, 2006; the Criticality Safety Support Group (CSSG) has been involved in NCSP planning.</li> </ul>

<p>DOE Oversight/Identification of Safety Systems and Controls: The Board's staff is concerned that numerous technical issues affecting the identification of safety systems and controls remain unresolved. The staff does not understand how DOE could approve CD-2 without addressing the issues associated with removal of the fire suppression systems.</p>	<p>Consistent with the Department of Energy (DOE) Manual 413.3-1, "Project Management for the Acquisition of Capital Assets," the DOE Office of Engineering and Construction Management (OECM) validated the CEF baseline, including review of the PDSA Revision 1, in November of 2005, which formed the basis of the CD-2 approval.</p>
<p>Preliminary Documented Safety Analysis (PDSA):.... For example, the PDSA was prepared using an outdated revision (Change Notice 1) of DOE Standard 3009-94, Preparation Guide for U.S. DOE Nonreactor Nuclear Facility Documented Safety Analysis, that was in effect when the DAF DSA was prepared, instead of the latest revision (Change Notice 2). Although this was deemed by the project to be inconsequential, the design ramifications may be considerable.</p>	<ul style="list-style-type: none"> <li>• Revision 2 is being prepared in accordance with DOE-STD-3009, Change Notice 2.</li> <li>• The Preliminary Safety Evaluation Report (PSER) identified the same concerns noted by the Board staff, including the potential effects of a seismic event or explosive detonation.</li> <li>• PDSA Revision 2 will address all PSER issues and will be issued for formal SBRT review to support CD-3D request for approval scheduled for June 30, 2006.</li> </ul>
<p>Water in-leakage into DAF, have been poorly assessed for the potential impact on the project design.</p>	<ul style="list-style-type: none"> <li>• The overall DAF leak-repair plan was sent to the Board in a letter dated March 13, 2006.</li> </ul>
<p>Criticality Accident Alarm System (CAAS): ... significant worker safety issue associated with CEF operations is radiation exposure due to inadvertent criticality, yet LANL and LLNL have not resolved their disagreement on what portions of CEF will require a criticality alarm system.</p>	<ul style="list-style-type: none"> <li>• CEF operations will utilize portable CAAS in the General Purpose Bays.</li> <li>• Neutron counters in the assembly cells will include annunciation for criticality accidents.</li> <li>• These design changes incorporate recommendations made by the CSSG evaluation performed in February 2006.</li> </ul>
<p>DAF/CEF Criticality Safety Requirements: Authorization of operations may also prove difficult with respect to criticality safety requirements, as expectations for criticality safety documentation differ between the procedures used by LANL to conduct the critical experiments and those used by LLNL to govern DAF activities.</p>	<p>CEF will develop a mutually acceptable criticality safety program to support operations.</p> <p>The FY08 DAF DSA annual update will incorporate CEF developed safety management programs and Technical Safety Requirements. These will be validated during the CEF Operational Readiness Review process.</p>