

SUBJECT: Office of Independent Oversight's Office of Environment, Safety and Health Evaluations Activity Report for the Tour of the Nevada Critical Experiment Facility and Attendance at the Department's Nuclear Criticality Safety Program Planning Meeting – August 24-25, 2010

The U.S. Department of Energy (DOE), Office of Independent Oversight, within the Office of Health, Safety and Security (HSS), participated in the DOE Criticality Safety Support Group's (CSSG) activities in/near Las Vegas, Nevada, including a tour of the Critical Experiment Facility (CEF) located within the Device Assembly Facility (DAF) at the Nevada National Security Site (NNSS). These activities support DOE's Nuclear Criticality Safety Program (NCSP).

The NCSP held a planning meeting on August 24, 2010, at the Nevada Operations Office (DOE-NV), which included the CSSG. On August 25, the participants visited DAF to tour the CEF. The HSS participation provided HSS with an opportunity to maintain operational awareness, while supporting DOE line management efforts to safely and securely accomplish their missions.

NCSP Meeting Observations: NCSP planned tasks appear to be adequate and appropriate. The meeting was productive and insights were gained.

CSSG Meeting Observations: The CSSG held meetings before and after other activities described in this activity report, primarily to develop a technical position on revising DOE-STD-1027-92, *Hazard Categorization and Accident Analysis Techniques for Compliance With DOE Order 5480.23, Nuclear Safety Analysis Reports* with regard to the role of criticality safety in hazard characterization. Additionally, a number of other changes to DOE-STD-1027 seem warranted, as well as a few changes to other documents such as DOE O 420.1B. The CSSG Chairman is drafting a memo to address these issues.

Site Visit Observations: On August 25, the CSSG toured the CEF located at the DAF at the NNSS. (Note: there are plans to rename the CEF to avoid confusion about having a facility within a facility. However, in this report it will be referred as the CEF.) The Contractor has upgraded, refurbished, and installed four critical experiment machines including new digital instrumentation and controls at CEF, which is located in the western side of DAF. These machines are Planet, Comet, Flattop, and Godiva, each of which has had its safety mechanisms improved since being relocated from the Los Alamos National Laboratory (LANL) to NNSS. These machines are not yet operational, but operations have been simulated with surrogate material. Graphical user interfaces and digitized controls have been shown to function properly, and there are mechanical means to shut down (scram) on loss of power or high radiation signal. Currently, limited operations involving fissile material are authorized to perform subcritical measurements and associated activities pending startup authorization for performing critical experiments.

The Contractor is working through the corrective actions associated with the list of pre-start findings from the recent Operational Readiness Review and expects to begin full operations by the end of FY 2011, with limited subcritical measurements and some other associated activities

being performed in the interim per the current authorization. There is also a list of post-start findings that will limit the scope of full operations until resolved. In the interim, management is sending Reactor Operators (RO) to Valduc, France, to maintain their qualifications; i.e., performing subcritical experiments alone is insufficient to maintain full qualifications, and all personnel who operate critical assembly machines must be certified ROs. Also, CEF management and NCSP program management are collaborating, with technical input from the CSSG, on prioritizing other fissionable material, etc., to be packaged and transported to the CEF for future experiments. DOE's goal is to consolidate at CEF a representative sample of suitable fissionable materials and special neutron reflectors, fixtures, and accessories that will suffice for the foreseeable future.

Actions to recruit a criticality safety engineer for the CEF prior to startup are ongoing. CEF currently has sufficient certified ROs. CEF also currently has sufficient certified Fissionable Material Handlers to handle fissionable material to perform all planned subcritical experiments and associated fissionable material moves.

The relocation of the CEF function from LANL to DAF has been completed, and future operations will likely be safer due to additional safety features. Planned additions to the CEF inventory and further material consolidation should meet DOE's foreseeable critical and subcritical experiment needs.