Department of Energy
Washington, DC 20585

November 8, 1994

The Honorable John T. Conway
Chairman
Defense Nuclear Facilities Safety Board
Suite 700
625 Indiana Avenue, N.W.
Washington, D.C. 20004

Dear Mr. Chairman:

On September 27, 1994, the Defense Nuclear Facilities Safety Board issued Recommendation 94-4, which deals with deficiencies in criticality safety at the Oak Ridge Y-12 Plant.

On September 22, 1994, Board staff members were observing operations in Building 9204-2E at the Y-12 Plant. A discrepancy between a Criticality Safety Approval (CSA) document and the storage array it described, was observed and questioned by the Board staff members. The discrepancy involved the placement of containers in storage arrays not specifically allowed in the CSA. The Y-12 personnel responding to the Board staff's questioning failed to follow appropriate procedures to address criticality safety concerns. Violations of administrative controls specified in the CSAs and subsequent failure of operations personnel to take the actions required when a nuclear criticality safety incident occurs, were caused by: 1) lack of rigor and attention to detail in understanding and following nuclear criticality procedures and CSAs; 2) shortcomings in verbal and written communications regarding some CSAs; and 3) lack of clear understanding and implementation of roles and responsibilities.

Subrecommendation (1) of Recommendation 94-4, recommends that "DOE determine the immediate actions necessary to resolve the nuclear criticality safety deficiencies at the Y-12 Plant, including actions deemed necessary before restarting curtailed operations and any compensatory measures instituted. These actions should be documented, along with an explanation of how the deficiencies remained undetected by MMES and DOE (line and oversight)." Following is a summary of the actions we are taking to resolve criticality safety and conduct of operations deficiencies at the Y-12 Plant, and an explanation of how these deficiencies remained unresolved. Particular emphasis is placed on those actions necessary prior to resuming safe operations. Additional details and descriptions of longer-term activities will be addressed in the Recommendation 94-4 Implementation Plan.

As a result of this incident, Martin Marietta Energy Systems, Inc., (MMES) the Department's Y-12 Plant operating contractor, completed walkdowns of all CSAs and Operational Safety Requirements (OSR). The walkdowns identified 1,344 CSA nonconformances. The majority of these, 74 percent, were categorized as administrative nonconformances involving no loss of criticality safety controls, but clearly indicating a failure to effectively implement conduct of operations. The other 26 percent involved a loss of control, but not to an extent that the nuclear criticality safety double contingency principle had been violated. This incident along with three recent violations of OSR, prior to September 22, 1994, clearly point out that more aggressive and comprehensive management actions are required to bring the conduct of operations at the Y-12 Plant to an adequate level.

The MMES initially placed all nonessential Y-12 Plant operations in a standdown status on September 23, 1994. Essential activities necessary to protect the health and safety of workers and the public, and to maintain regulatory compliance, continue to operate. During the standdown, MMES is retraining all Y-12 Plant personnel on the requirements of a successful conduct of operations program. The training highlights several recent safety incidents and emphasizes the seriousness of failure to follow procedures. Later, it was determined the Y-12 Plant nuclear facilities are in an unplanned shutdown status because of the large number of criticality safety nonconformances and conduct of operations implementation problems.

A plan for continuing and resuming operations has been prepared by MMES and concurred in by the Department. The documentation is enclosed. Nonnuclear facilities which do not have CSAs, OSRs, or Class 1 Procedures resumed operations in accordance with the requirements delineated in the resumption plan.

Prior to resumption of Y-12 Plant nuclear facilities and activities, MMES will correct all CSAs, OSRs, and Class 1 Procedures governing those operations. Plans for programmatic improvements to the CSA process will be addressed in the Recommendation 94-4 Implementation Plan.

Consistent with Department of Energy Order 5480.31, "Operational Readiness Review," a four-step process will be employed for resolution of safety concerns prior to restart of nuclear operations. The contractor line management will assess and correct deficiencies, complete resumption requirements outlined in the "Plan for Continuing and Resuming Operations at the Y-12 Plant," then contractor oversight will independently verify readiness of the line. Contractor senior management will then inform the Oak Ridge Operations Office (OR) line organization of their readiness to resume operations. The Y-12 Site Office will review the contractor actions, and when satisfied, inform the OR independent oversight of their concurrence in the contractor readiness. The OR oversight will then perform an independent readiness assessment. Upon satisfactory completion of the Readiness Assessments, the Manager, OR will approve restart of the nuclear facilities. Resumption planning focuses on, in order of priority, plant efforts toward resuming the receipt and shipment

of special nuclear materials, quality evaluation of stockpile components, support of directive schedules, and full resumption of component dismantlement activities. Initial emphasis will be placed on those operations required to avoid any impact on dismantlement activities at the Pantex Plant.

Recognizing past weaknesses in dealing with operational readiness issues at the Y-12 Plant, MMES has arranged for extensive assistance, 14 mentors, for line management to facilitate the establishment of adequate and appropriate rigor and formality of operations. Performance objectives will be established, and must be met, by line personnel prior to removal of compensatory measures.

The Recommendation requested an explanation of how the nuclear criticality safety deficiencies remained undetected. This issue will be thoroughly outlined and examined in the Implementation Plan for the Recommendation. The following summarizes an initial assessment of the situation.

The initial assessment of MMES and OR revealed that both organizations were too accepting of Level IV criticality safety infractions. The emphasis in the Nuclear Criticality Safety program was on protecting against failures that could likely have led to a criticality. The program did not consider nonconformances falling outside of the Level I-IV categorization scheme to be of consequence and used level IV infractions primarily as trending information. No concerted actions were taken to reduce the number of deviations or to correct the root cause of recurring ones. From the Headquarters perspective, the initial assessment of both line and oversight organizations, revealed several issues that may have contributed to this problem. The first issue is lack of understanding of roles and responsibilities. This problem exists within and between the Headquarters line and oversight organizations, and from Headquarters down through the field. The second issue is a lack of sufficient quantity of properly trained individuals necessary to oversee the wide array of programs and projects related to an operating nuclear facility. This then led to the third issue. The third issue is a situation developed whereby each organization unrealistically relied on the other organization for both program development and implementation, and for problem identification and correction. In all cases, each of these organizations were aware that many of the specific and generic problems had been previously identified, but the possible link to large-scale systemic failures was only just being realized.

We have previously provided a draft copy of the resumption plan to your staff for review, and have received their comments. I have approved the resumption plan proposed, with the provision that the line management preparation for restart of nuclear facilities and activities, and the Martin Marietta Energy Systems, Inc. and OR Readiness Assessment implementation plans, and plans of action incorporate the staff comments. A copy of my guidance to the Manager, OR is enclosed.

The steps outlined in the resumption plan are an initial effort toward correcting the systemic problems. Additional actions and renewed efforts will be required to implement long-term improvements in conduct of operations at the Y-12 Plant. These actions will be outlined in the Recommendation 94-4 Implementation Plan.

Sincerely,

for

Victor H. Reis
Assistant Secretary
for Defense Programs

Enclosures