



Department of Energy

Washington, DC 20585

August 18, 1998

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

Dear Mr. Chairman:

In your letter of June 12, 1998, you identified fundamental problems with control of maintenance activities at the Y-12 Plant, as indicated by a number of reported occurrences. We agree with the Board's assessment, and note that additional similar incidents have been reported since your letter was written. Your letter was forwarded to Lockheed Martin Energy Systems, Inc., so that they could identify root causes for the identified deficiencies and develop a corrective action plan.

Lockheed Martin's response to the June 12, 1998, letter is enclosed. As demonstrated by the actions outlined, Lockheed Martin recognizes the need to improve management control of maintenance and construction activities. They have identified numerous additional occurrence reports related to inadequate work controls. Those reports have been analyzed to identify root causes and Lockheed Martin has developed a comprehensive corrective action plan. The key feature of the corrective action plan is site-wide implementation of the Integrated Safety Management System to assure effective work control processes throughout the contractor's workforce.

We expect to see near-term improvements in operations management's control of maintenance and construction activities as a result of the outlined corrective actions. If you have any questions, please contact me or have your staff contact Phil Aiken of my staff at (301) 903-4513.

Sincerely,

A handwritten signature in cursive script that reads "for Victor H. Reis".

for Victor H. Reis

Assistant Secretary
for Defense Programs

Enclosure

cc w/enclosure:
M. Whitaker, S-3.1



LOCKHEED MARTIN ENERGY SYSTEMS, INC.

**POST OFFICE BOX 2009
OAK RIDGE, TENNESSEE 37831**

August 13, 1998

Mr. R. J. Spence
Y-12 Site Manager
Department of Energy, Oak Ridge Operations
Post Office Box 2001
Oak Ridge, Tennessee 37831

Dear Mr. Spence:

**Contract DE-AC05-84OR21400, Response to
Defense Nuclear Facilities Safety Board Letter (990633)**

Lockheed Martin Energy Systems (LMES) concurs with the Defense Nuclear Facilities Safety Board (DNFSB) letter of June 12, 1998, identifying a fundamental problem with operations managers' control of maintenance activities in their facilities. Review of events related to this issue has also pointed to a programmatic problem with the root cause analysis and corrective action process. The corrective action plan is directed at improving operations management control of work, including the work planning and authorization processes, a re-emphasis on management and worker accountability for safety, and improving the critique process. Many of the ongoing improvements that are part of the Y-12 Plant integrated safety management (ISM) implementation are directed at these work control issues, and several of these are included in the attached corrective action plan.

Attachment 1 lists the occurrences and/or near misses identified during the past year related to work control. A root cause analysis was performed and a summary of results is included in Attachment 2. The analysis confirmed management problems as the basic root cause, including inadequate enforcement by Operations management of work control and authorization policies in their facilities, failure to address ownership and operation of key systems, and lack of a standard work planning and authorization process being used site-wide.

In addition, two recent, similar occurrences that were identified subsequent to the DNFSB letter were reviewed and are summarized in Attachment 3. The immediate actions that were taken as a result of these two recent occurrences are noteworthy and are also included in Attachment 3.

A corrective action plan has been developed which identifies credited improvements and required actions to address the causal factors and the root cause. Key features of the plan include:

- Implementation of ISM work control processes, holding management and workers accountable for their execution.

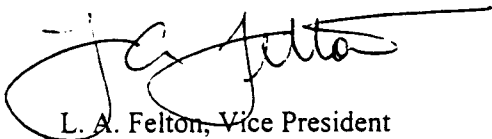
Mr. R. J. Spence, DOE-ORO
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- Proceduralization of informal agreements that govern sitewide systems affecting facility safety systems, clearly identifying Operations management ownership of system operations.
- Providing technical support to the operations management by the establishment of Operational Safety Boards (OSBs) consisting of line management, Environment, Safety, and Health technical experts and workers to assist in:
 - Work package/procedure review and approval as a minimum all safety class and safety significant system maintenance.
 - Verification that ongoing activities are being conducted in accordance with the approved work plan/procedure.
 - Ensuring all activities are conducted within the facility safety envelope.
- Improve the execution of the revised management review and critique process (Conduct of Operations Manual, Chapter 6) and reevaluate the root cause analysis process used to determine corrective actions.

The detailed corrective action plan is provided as Attachment 4.

Energy Systems recognizes that holding management accountable for safety and enforcing robust work control and authorization processes are fundamental to the resolution of these issues. Completion of the proposed corrective actions will be accomplished through continued improvements via the sitewide implementation of ISM. If you have any questions regarding this issue or the attached information, contact J. P. Crociata at 576-4901.

Sincerely,



L. A. Felton, Vice President
Defense Programs

LAF:tkc

Attachments: As Stated

c/atts: L. D. Bates
D. E. Beck
T. R. Butz
W. L. Clements
J. P. Crociata (RC)
L. A. Felton
R. E. Hawthorne
D. L. Mason
M. K. Morrow

**Attachment 1 to letter
Felton to Spence
Dated: August 13, 1998**

**Occurrences and Near Misses Related to the Issue of Operations and Management
Cognizance of the Status of Maintenance Activities and/or Safety Basis of Their Facility**

Work Authorizations/Conduct of Operations Deficiencies

<u>Occurrence Number</u>	<u>Title</u>
ORO--LMES-Y12NUCLEAR-1997-0024	Discovery of As Found Condition (USQD) - Coverage Zone Maps
ORO--LMES-Y12NUCLEAR-1997-0030	Employee Access to Evacuated Area Results in an Operational Safety Requirement (OSR) Violation
ORO--LMES-Y12NUCLEAR-1997-0037	Procedural Violations Result in Concerns Worthy of Reporting During Changeout of Portable Criticality Accident Alarm System
ORO--LMES-Y12NUCLEAR-1997-0049	Transportation of Radioactive Contaminated Containers Between Oak Ridge Sites Results in Noncompliances to DOT Regulations
ORO--LMES-Y12NUCLEAR-1997-0053	Potential Concerns and Issues Associated with the Building 9212 Fire Protection Program
ORO--LMES-Y12NUCLEAR-1998-0001	Potential Unreviewed Safety Question (USQ) - Building 9204-2E
ORO--LMES-Y12NUCLEAR-1998-0002	Transient Combustibles in Process Area Result in Potential Unreviewed Safety Question (Potential USQ)
ORO--LMES-Y12NUCLEAR-1998-0009	Inadequate Combustion Control Testing - Violation of the Basis for Interim Operation (BIO) - #Y/MA-7254
ORO--LMES-Y12NUCLEAR-1998-0010	OSR Violation
ORO--LMES-Y12NUCLEAR-1998-0011	Violation of Basis of Interim Operations (BIO) for Building 9212 - Transient Combustibles Present in Non-Sprinklered Area
ORO--LMES-Y12NUCLEAR-1998-0020	OSR Violation - Building 9204-4
ORO--LMES-Y12NUCLEAR-1998-0022	OSR Violation - Building 9215
ORO--LMES-Y12NUCLEAR-1998-0025	Operational Safety Requirement (OSR) Violation - Inadvertent Access to Posted Area of Building 9212
ORO--LMES-Y12NUCLEAR-1998-0026	Maintenance Performed Outside the Scope of Special Operations Package for Stack Number 48 HEPA Filter Changeout
ORO--LMES-Y12NUCLEAR-1998-0030	Limited Facility Operations due to Issues Associated with Criticality Safety Approvals
ORO--LMES-Y12NUCLEAR-1998-0035	Depleted Uranium Chips/Sludge Waste Preparation Event
ORO--LMES-Y12NUCLEAR-1998-0039	As-Found Condition Results in Potential Unreviewed Safety Question (USQ)
ORO--LMES-Y12NUCLEAR-1998-0040	Unauthorized Work on Emergency Notification System Speakers Results in a Violation of the Operational Safety Requirement (OSR)
ORO--LMES-Y12NUCLEAR-1998-0042	Potential Unreviewed Safety Question (USQ) Involving Magnahelic Gauges Associated with Exhaust System

<u>Occurrence Number</u>	<u>Title</u>
ORO--LMES-Y12NUCLEAR-1998-0043	Failure to Perform Required Fire Patrols Results in Violation of the Facility Basis for Interim Operations (BIO) - Y/MA-7254
ORO--LMES-Y12NUCLEAR-1998-0045	Failure to Enter Limiting Condition of Operation (LCO) Action Step Results in Violation of Operational Safety Requirement (OSR)
ORO--LMES-Y12NUCLEAR-1998-0046	Failure to Enter Limiting Condition of Operation (LCO) Action Step Results in Violation of the Operational Safety Requirement (OSR)
ORO--LMES-Y12NUCLEAR-1998-0047	Failure to Enter Limiting Condition of Operation (LCO) Results in Violation of Operational Safety Requirement (OSR)
ORO--LMES-Y12NUCLEAR-1998-0059	Potential Concerns and Issues Associated with Emergency Maintenance Activity
ORO--LMES-Y12SITE-1997-0045	Near Miss: Machine Tool Head Disengages During Maintenance Activities - No Personnel Injuries
ORO--LMES-Y12SITE-1997-0046	Notice of Violation (NOV) - West End Tank Farm (WETF)
ORO--LMES-Y12SITE-1998-0008	Health and Safety Concern During Floor Tile Installation
ORO--LMES-Y12SITE-1998-0010	Noncompliance with Department of Transportation (DOT) Hazardous Materials Regulations
ORO--LMES-Y12SITE-1998-0012	Basic Solution Contacts Two Maintenance Workers During Planned Removal of Piping - No Personnel Injuries
ORO--LMES-Y12SITE-1998-0018	Ceiling Tiles Fall in Site Cafeteria - No Injuries - Near Miss
ORO--LMES-Y12SITE-1998-0021	Falling Concrete from Ceiling (5 inches by 4 inches by 1 inches) Strikes Employee on Right Shoulder - No Injuries - Near Miss
ORO--LMES-Y12SITE-1998-0026	Degradation of the Emergency Notification System (ENS) Internal DC Power Supply
ORO--LMES-Y12SITE-1998-0038	Violation of Lockout/Tagout Procedure
ORO--LMES-Y12WASTE-1997-0006	Near Miss During Vehicle Backing Operation
ORO--LMES-Y12WASTE-1998-0003	Auditable Safety Analysis (ASA) Non-compliance for the Chip Oxidation Facility

Safety Basis

<u>Occurrence Number</u>	<u>Title</u>
ORO--LMES-Y12NUCLEAR-1997-0052	Potential Degradation of Authorization Bases – Building 9215, O-Wing
ORO--LMES-Y12NUCLEAR-1998-0016	Potential Unreviewed Safety Question

Poor Maintenance

<u>Occurrence Number</u>	<u>Title</u>
ORO--LMES-Y12NUCLEAR-1998-0012	Falling Light Fixture -- Near Miss -- no personnel injuries
ORO--LMES-Y12NUCLEAR-1998-0021	Operational Safety Requirement (OSR) Violation Associated With Preventative Maintenance on Criticality Accident Alarm System
ORO--LMES-Y12SITE-1998-0009	Window Falls in Processing Building - Near Miss

**Attachment 2 to letter
Felton to Spence
Dated: August 13, 1998**

Summary of Results of the Root Cause Analysis

The Direct Causes, which include, Personnel Error, Communication, and Immediate Supervision are the source of the events leading up to the identification and documentation of the reported deficiency.

The events identified as preceding the reported deficiency are:

Activities (Maintenance, Construction, etc.) are not always performed with the full knowledge of the operation management.

Understanding of what constitutes a safety system with configuration control and required work operations is less than adequate.

Procedures are not always adhered to as required.

Configuration Management of Safety Authorization Basis (e.g. SAR/BIO, TSR/OSR, etc.) and safety system status are not always adequately adhered to by managers and personnel.

Corrective Action Plans do not always address the underlying causes of an issue.

The Contributing Causes, which include, Procedures, Communication, and Immediate Supervision are the source of the Causal Factors leading to this deficiency. These Causal Factors are:

Failure to follow Procedure(s).

Operation outside authorized work plan that could affect system safety and safety basis of the facility.

Facility managers are not always aware of Facility Condition.

The Root Cause was determined to be Management Problems, which include:

Personnel are not being held accountable to plan and conduct work in accordance with approved procedures and/or work instructions (6E – Policy Inadequately Enforced/Defined)

Inadequate Knowledge and Oversight of Safety System Ownership, Maintenance, and Surveillance Activities (6E – Policy Inadequately Enforced/Defined)

Inadequate Work Control Process for Maintenance/Operations Activities (6B – Work Organization/Planning Deficiency)

Inadequate Control and Authorization of Work Activities (6A – Inadequate Administrative Control)

**Attachment 3 to Letter
Felton to Spence
Dated: August 13, 1998**

Recent Occurrences and Immediate Actions Taken

OCCURRENCES

- On July 23, 1998, the Enriched Uranium Operations (EUO) Organization Manager was informed that the maintenance activities being performed on a two hundred (200) horsepower electric motor had been improperly categorized as "Emergency Work." Due to the fact that this maintenance activity was mis-categorized a formal maintenance work package which would have included an Operational Safety Work Permit (OSWP) and a Job Hazard Analysis (JHA) was not initiated. Further review determined this work activity to be "critical" in nature rather than an "Emergency Maintenance Activity." Because the aforementioned formal safety controls were omitted during the planning process, these potential concerns and issues were deemed worthy of reporting.
- On July 14, 1998, Facilities Management Organization (FMO) maintenance personnel were assigned to disconnect and remove pump HNO₃-J-638 from the nitric acid receiving tank F-638. Lockout/Tagout (LO/TO) requirements were identified and the pump was isolated. During removal of the pump, maintenance personnel determined it was necessary to remove valve HV-12 because of its physical interference with the pump removal path. Valve HV-12 was one of the redundant isolation valves controlled by LO/TO permit. The maintenance personnel removed the pump discharge piping including valve HV-12 with the LO/TO locking device and tag in place. On July 16, 1998, during performance of a procedure walk down, operations personnel noticed that the valve was missing. Remembering that they had seen a LO/TO device on the valve previously, the operations personnel contacted the LO/TO Issuing Authority (IA). The IA re-checked the permit and then contacted the facility shift manager about the discrepancy.

IMMEDIATE ACTIONS

As a result of events described above, the Vice President for Defense Programs has taken a number of immediate actions. The actions taken:

1. A meeting was held with senior Y-12 organization managers to address the proper use of emergency maintenance in Y-12 facilities. During this meeting, the definition of emergency maintenance as described in Y10-35-008, *Maintenance Planners Guide*, was reinforced. To prevent recurrence of the misuse of this categorization, the Vice President for Defense Programs issued a letter to all operating facilities stating that he must approve all requests for emergency maintenance beyond that required to resolve imminent danger. A standing order has also been issued to the Plant Shift Superintendent's office to place these requirements in effect. A lessons learned has been issued, and all supervisory personnel were trained by July 31, 1998.
2. A review of maintenance activities during the past year is being conducted to evaluate the previous use of "emergency" maintenance. Additional lessons learned may be generated from this review and appropriate training provided to all site organizations.
3. In response to the removal incident where a valve was removed with LO/TO lock and tag attached, a number of corrective actions have been taken by the FMO.
 - a. The three individuals in FMO who violated the LO/TO were disciplined.
 - b. The work package was thoroughly reviewed before work continued to ensure that it contained no shortcoming that would have led to this incident. Safety briefs were conducted with all Defense Programs maintenance crews supporting EUO on July 17, 1998. The briefings covered the LO/TO requirements as being absolute and emphasized that locks or tags can only be removed by the issuing authority. Also covered was the principle that each of us has the responsibility for stopping work if there are any questions about safety.

**Attachment 4 to Letter
Felton to Spence
Dated: August 13, 1998**

Corrective Action Plan to Address Root Cause Analysis

This corrective action plan addresses the root causes from the analysis performed in response to the letter Spence to Felton, entitled "Defense Nuclear Facilities Safety Board Request (980366)," dated June 15, 1998. These corrective actions include the numerous changes that have been made to Y-12 programs in implementing Integrated Safety Management, identified in y15-635PD that resolve a significant portion of the root cause.

Root Cause Accountability	Action Taken	Completion Date
Personnel are not being held accountable to plan and conduct work in accordance with approved procedures and/or work instructions (6E – Policy Inadequately Enforced/Defined)	1. The Vice President for Defense Programs will issue a "policy statement" to re-emphasize that all individuals are responsible and will be held accountable to conduct activities in accordance with the approved work instructions and/or procedures.	8/15/98
	2. Conduct sitewide awareness training on the policy statement.	9/30/98

Root Cause Knowledge and Oversight	Action Taken	Completion Date
Inadequate Knowledge and Oversight of Safety System Ownership, Maintenance, and Surveillance Activities (6E – Policy Inadequately Enforced/Defined)	To clearly identify operation management ownership of system operations:	9/30/98
	1. Develop prioritized list and plan for proceduralizing Memorandums of Understanding (MOUs). Emphasis will be given to MOUs that address ownership of plant-wide systems (CAAS, Fire Protection, Power, etc.) and authorization of work on those systems where it can impact the safety basis of facilities.	12/31/98
	2. Develop and implement procedures that replaced MOUs. 3. Operations and maintenance walk-down of ongoing activities as defined in the guidance on plan-of-the-day.	Ongoing

Root Cause Knowledge and Work Control	Action Taken	Completion Date
Inadequate Work Control Process for Maintenance/Operations Activities (6B – Work Organization/Planning Deficiency)	1. Implement ISM in Nuclear Operations, Enriched Uranium, Special Material Operations, and Product Certification organizations and/or facilities <ul style="list-style-type: none"> • Establish Operational Safety Boards for applicable organizations/facilities • Implement work control procedures (see footnote) • Train personnel on site ISM training modules (see footnote) 	In accordance with plan (Complete)
	2. Complete implementation of ISM per approved action plans in Balance of Plant (BoP). <ul style="list-style-type: none"> • Complete ISM training for operations management, Operational Safety Board members, and maintenance in accordance with approved action plans. Training modules include Integrated Safety Management Overview, Identification of Hazards, Job Hazard Analysis, and New Activity Startup Requirements • Establish OSBs • Implement work control procedures 	9/30/98
	3. Complete organizational self-assessments of BoP ISM programs	12/31/98
	4. Conduct independent BoP ISM management review including a review of work planning and authorization.	3/31/99

ISM work control procedures: Y10-012, Hazard identification for maintenance and new work activities; Y70-043, Job Hazard Analysis; Y10-35-008, Maintenance Planner's Guide; Y10-190, New Activity Startup Requirements, Y70-809, Unreviewed Safety Question Determination

Site ISM training modules: Integrated Safety Management Overview, Identification of Hazards, Job Hazard Analysis, and New Activity Startup Requirements

Root Cause Work Control and Authorization	Action Taken	Completion Date
Inadequate Control and Authorization of Work Activities (6A – Inadequate Administrative Control)	<ol style="list-style-type: none"> 1. Promulgate comprehensive guidance on Plan-of-the-Day and implement guidance, focused on: <ul style="list-style-type: none"> • Format and content of PODs packages • Required statusing of authorized activities • Change control of the POD • Operations management cognizance of activity status via walk-downs and review of work packages • Attendance requirements 2. Conduct independent assessment of POD execution in all nuclear facilities. 3. Conduct independent BoP ISM management review including a review of work planning and authorization. 	<p>Complete for Nuc Ops</p> <p>8/31/98 for remaining organizations who use PODs</p> <p>9/30/98</p> <p>3/31/99</p>

Root Cause Process Ineffective	Action Taken	Completion Date
Root Cause Analysis process has resulted in less than adequate corrective actions being identified	<ol style="list-style-type: none"> 1. Improve the execution of the revised management review and critique process (Conducts of Operations Manual, Chapter 6) . 2. Reevaluate the root cause analysis process used to determine corrective actions. 	<p>11/1/98</p> <p>12/15/98</p>