DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 23, 1994

MEMORANDUM FOR: G. W. Cunningham, Technical Director

COPIES: Board Members

FROM: H. W. Massie

SUBJECT: Trip Report on Suspect Parts - Pantex Site

1. **Purpose:** This report documents a review of the suspect parts program at Pantex (non-weapons areas) by the Defense Nuclear Facilities Safety Board Technical Staff (H. W. Massie) and an outside expert (J. D. Porter). This review was conducted on July 27-29, 1994.

2. **Summary:** The issuance of several occurrence reports regarding the existence of suspect fasteners and nuts at the Pantex plant (non-weapons area) led the Staff to conduct a more comprehensive review of the suspect bolts and suspect parts program at Pantex. The Staff found that although Mason & Hanger (M&H) had prepared a suspect parts (e.g., bolts and circuit breakers) implementation plan, it was not being implemented because of lack of funding. The staff was particularly concerned about the potential existence of suspect bolts in the hoists and cranes utilized to lift nuclear weapons in the bays and cells. Also of concern are the forklifts. The Department of Energy Albuquerque office (DOE-AL) and Department of Energy Headquarters (DP-625) provided guidance to M&H for eliminating suspect parts in a supplemental directive (AL-57XB), and in a directive of November 24, 1993. This guidance, if complied with, would alleviate the staff's concerns. The most important elements that are not being performed by M&H are a sampling and testing program for suspect parts (e.g., bolts), engineering involvement in the procurement of all critical parts, and inspection of existing critical equipment, such as cranes and hoists in the bays and cells.

   Subsequent to this trip, the M&H quality division manager informed the staff that M&H has now committed to implement a suspect parts program including verification testing.

3. **Background:** Existence of suspect (and possibly counterfeit) parts, including bolts on equipment that lift nuclear weapons, is an important safety issue. Department of Energy's (DOE's) general requirements for procurement, which relate to elimination of suspect parts, are contained in Criterion 7 of DOE Order 5700.6C, *Quality Assurance*. Specifically, item i of Criterion 7 states that "the quality of purchased items and services should be verified at intervals to a degree consistent with the item's or service's complexity, risk, quantity and frequency of procurement." Also, DOE Order 4330.4, *Maintenance Management Program*, specifies general requirements for procurement of plant equipment. DOE-AL supplemental guidance, AL-57XB, and the DOE Headquarters directive of November 24, 1993, both provide detailed requirements.

4. Discussion/Observations:

a. Suspect Parts Program Implementation:

In response to a DOE Headquarters directive of November 24, 1993, M&H conducted a line by line assessment of its suspect parts program. Non-compliances were identified in about 70 percent of the requirements; a majority of the non-compliances were attributed to lack of funding. The staff found that the non-compliances were in critical areas, such as verification testing, engineering involvement in the procurement of parts which could be suspect or counterfeit, and the effort to review or assess existing critical safety components for suspect parts. M&H presented a revised suspects parts implementation plan dated March 1, 1994, which was stated to cost in excess of $2M.

In a April 8, 1994, letter, the Amarillo Area office (AAO) formally responded to the revised implementation plan by expressing concern over M&H's lack of action to either remove or identify suspect items, or to mitigate their potential threat to worker safety. This letter also requested that M&H redirect its work so that work on suspect parts could be accomplished in FY94. M&H's response entailed a proposal to cut other important maintenance activities at Pantex, but generally reiterated a position that the suspect parts program was not of more importance than other currently supported activities. The DNFSB Staff strongly disagreed with M&H's response.

b. Procurement Issues:

1. Qualified Suppliers: Qualified suppliers listings (QSLs) were implemented in early 1994 by M&H. Quality level 1 procurement (i.e., for critical safety systems) are qualified by audit. Quality level 2 procurement (i.e., for important safety systems) can be qualified by examination of past vendor history. The Staff found that, although certified material test reports are required, verification sampling and testing were not performed as part of receipt inspection; this was a key requirement in the DOE Headquarters directive of November 24, 1993.

   M&H recently included quality clauses regarding the preclusion of suspect parts in its purchase orders.

2. Engineering Involvement in the Procurement Process: The staff found that there is essentially no engineering involvement in the procurement process for replacement parts; this violates the requirements of the DOE Headquarter's directive of November 24, 1993. The procurement initiator typically specifies like-for-like replacement parts without an engineering review. This program applies not only to bolts, but also to other products, such as circuit breakers and piping joints.

3. Product Acceptance Program: The M&H personnel reported that laboratory testing for a verification program could be accomplished on site for about a $30K initial capital investment and recurring annual cost of about $80K. The Staff believes that this area is critical for detection of "counterfeit" bolts. Suspect bolts are now detected by looking for pre-identified head markings found in the DOE-AL supplemental guidance; however, this is not sufficient for identification of all counterfeit bolts.

4. The Staff also found that equipment supplied from national labs was a possible source of suspect fasteners in that they do not receive proper receipt inspection. This, in fact, occurred on a forklift supplied by Sandia National Laboratory.

c. Training & Procedures: The only training on this subject, conducted to date, was a one time visit by trainers from the DOE Quality Training and Resource Center (from Hanford). During the visit, 145 personnel received training related to identification of suspect bolts (by head markings), including both hourly workers and exempt employees. This increase awareness on part of the hourly workers resulted in safety concerns expressed to the Staff by the workers. Suspect parts awareness training will be added to the general employee training starting in October 1994.

M&H has recently issued two procedures for conducting visual inspections of crane/hoists and forklifts, and for locating suspect fasteners in the load path. This inspection will be conducted as part of the normal plant preventive maintenance. No timeframe for completion of the visual inspection was established.

d. Facility Tour: The Staff observed one forklift and toured two bays, one cell, and Building 12-116, which is a yet to be commissioned Special Nuclear Material staging building. Suspect fasteners were noted in installed systems. However, many of the bolts in the cranes and hoists could not be easily observed because they are in the higher regions (greater than 20 feet) of the cells and bays.

In Building 12-116, suspect fasteners were observed in an x-ray machine foundation and throughout the fire suppression system. Two ungraded fasteners were used in the foundation for a pit storage rack. The M&H building manager was aware of the noted concerns and stated that the suspect bolts were to be addressed prior to facility startup (in two years).

e. DOE Audits/Assessments: Neither AAO nor AL has effective suspect parts assessment programs. The Staff found that M&H conducted two audits in the suspect parts area since 1992, but that some findings from the audits have not been resolved. Also, DOE Headquarters (DP-625) conducted a suspect parts review on March 11, 1994, and stated:

1. ". . . concerned about lack of progress at Pantex on this issue since our last visit on September 9, 1992."

2. "Aside from the previous purging of general stores and the procedure developed to preclude the procurement of suspect fasteners, we saw no concerted effort or plant-wide actions to identify, evaluate, and remove installed suspect parts from critical system and components."

The Staff agrees with both observations.

5. **Future Staff Actions:** The DNFSB Staff will follow the implementation of the suspect parts implementation program as part of future quality assurance/maintenance reviews. The Staff believes that the commitments made by M&H to the MTC are adequate for addressing the safety concerns related to the existence of suspect bolts.