

## DNFSB Staff Observations on the Implementation of Conduct of Operations at Pantex

### 1. Summary:

- a. The DNFSB staff performed a systematic review of the implementation of DOE Order 5480.19, Conduct of Operations at Pantex from August 9, 1993 through September 3, 1993. This review was prompted by the number of recurring deficiencies identified by the Staff during previous reviews and tours at Pantex. The Staff review found that implementation of conduct of operations is seriously delinquent, and has been inconsistent at Pantex. Although increased emphasis has recently been placed on upgrading conduct of operations, significant deficiencies exist that will require focused attention at all levels of the Amarillo Area Office (AAO) and Mason and Hanger (M&H) organizations.
- b. The Staff has identified several concerns. In summary, the problems are:
  - (1) Conduct of operations has not been implemented at Pantex as purported in the August 1991 M&H Conduct of Operations Implementation Plan for the Pantex Plant. M&H recently completed a division level element-by-element self-assessment that showed significant levels of non-compliance, three years after the order was approved. In lieu of updating the implementation plan, M&H has recently developed a short range summary of actions being taken to improve/implement conduct of operations. M&H has only recently developed and forwarded to AAO a Compliance Schedule Agreement (CSA).
  - (2) All personnel at Pantex have not been effectively trained in the concepts of conduct of operations as required by DOE Order 5700.6C, Quality Assurance, and DOE Order 5480.19.
  - (3) The Pantex Plant has not implemented an effective method for identifying, investigating, and correcting conduct of operations deficiencies as required by DOE Order 5700.6C. Numerous conduct of operation deficiencies continue to plague Pantex. The Staff continues to observe conduct of operations deficiencies that are frequently overlooked by first and second line supervisors. Pantex has recently completed conduct of operations training for all supervisory personnel. However, it appears that this training has not been effective in educating supervisors in identifying and correcting conduct of operation deficiencies.
- c. Weapon dismantlement will continue at Pantex for many years and proper conduct of operations is vital to safe operations. Also, personnel providing technical support to dismantlement operations are a vital element in the safety envelope and must receive a commensurate level of management attention for implementing conduct of operations. The potential impact of deficient conduct of operations on

health and safety at Pantex was recently illustrated by a violation of the high explosives limit for a bay (ALO-AOMHSM-PANTEX-1993-44). The occurrence was directly related to conduct of operations violations. Constant review and informed interest by senior management is required to achieve an adequate conduct of operations program.

2. Discussion:

- a. Introduction: The Staff and Outside experts have been reviewing conduct of operations as adjuncts to other topical reviews since the first trip to Pantex in 1992. These reviews have identified recurring deficiencies that caused the Staff to question whether Pantex had effectively implemented DOE Order 5480.19. As a result, a systematic review of conduct of operations was performed over a four week period. Reviews were conducted by M. Moury, S. Krahn, T. Quale and D. Boyd. Each of the reviewers conducted their review over about a one week period, with the exception of T. Quale who conducted his review over three weeks. The reviews consisted of document reviews, tours of operations, and interviews with personnel from M&H, AAO and DOE-Albuquerque (AL).
- b. Implementation of DOE Order 5480.19:
  - (1) Implementation Plan -
    - (a) The M&H implementation plan for DOE Order 5480.19 was initially approved in October 1991; it has not been updated since. The 1991 Implementation Plan indicated conduct of operations implementation was to be completed by the end of 1992. However, a December 1992 M&H self-assessment found M&H did not meet the intent of seventeen of the eighteen chapters in DOE Order 5480.19. From Staff review of the plan and discussions with the new M&H Deputy Director for Operations it was apparent that the plan was outdated, of poor quality, and was not being used. Significant delays from the implementation plan were not reported to DOE-HQ as required by the DP-I approving letter.
    - (b) It was only recently that M&H completed a division level element-by-element self-assessment that reflects the status of compliance. This assessment was used as the basis for developing a Compliance Schedule Agreement (CSA) which was submitted to AAO on October 8, 1993. However, the compliance assessment was not done with direct reference to the Order requirements, and as a result, it does not meet the requirements of DP-AP-202.
    - (c) In lieu of an adequate implementation plan M&H has recently developed a short range summary of actions being taken to

improve/implement conduct of operations. The plan is intended to quickly correct significant deficiencies, but does not provide a long-term, coordinated plan to come into compliance with the Order across the site.

- (d) Implementation of conduct of operations has been inconsistent across the site. A major contributor was the lack of guidance concerning which portions of the Order were applicable. As such, applicability was determined on an ad hoc basis at the division level. In recognition of this weakness, M&H developed a conduct of operations plant standard. This standard establishes, on a division basis, the applicability of the Order at Pantex.
- (e) AL stated that they will be issuing guidance by November 1, 1993 on updating the implementation plans that will address many of the questions raised concerning application of the order to weapons assembly/disassembly activities. In addition, AL plans to require submission of updated implementation plans by April 1994.

(2) Administrative Implementation - As a result of the inadequate implementation plan, lack of guidance on specific applicability, and perfunctory implementation, implementing procedures vary significantly in their quality and degree of compliance with the requirements of DOE Order 5480.19.

- (a) Weapons Dismantlement Procedures - Pantex has developed an organized method for developing, reviewing and issuing the procedures used for weapon assembly, disassembly, and surveillance (i.e., Nuclear Explosive Operating Procedures, or NEOPs). This method entails a high-level procedure writer's guide, specific guidance for the development of NEOPs, and requirements for adherence to procedures. All weapon assembly, disassembly, and surveillance procedures are being re-written using the NEOP process. A detailed review was performed of two recently completed NEOPs to determine the extent to which the procedural controls and requirements had been implemented; specifically, these were the PAL Operating Procedures (N57-301094, 7/ 14/93) and the Retirement, Disassembly, and Inspection Procedure (N57-174509, 7/29/93 for the B57 weapon. In general, the development, review, and issuance of NEOPs used at Pantex appears to meet the guidance provided in authoritative DOE documents and industry standards.
- (b) Plant Operating Procedures - The Staff and outside experts reviewed operating procedures implementing conduct of operations

requirements. The review found that the quality and thoroughness of the documents varies from division to division, although few represented full compliance. The following specific deficiencies apply:

- (i) Shift Turnover-M&H Internal Operating Procedure (IOP)-B0006, Manufacturing Division Guidelines for Formal Conduct of Daily Operations, dated July 30, 1991, has not been updated to reflect the current Manufacturing Division organization or to include use of the Supervisor Shift Turnover Checklist. The Manufacturing Division Supervisor Shift Turnover Checklist notes the review of selected records by the supervisor during the shift but not prior to accepting responsibility for the shift. This is inconsistent with DOE Order 5480.19 which states that certain status documents should be reviewed prior to assuming responsibility for the shift.
  - (ii) Operator Aids-IOP-B007, Manufacturing Division Guidelines for Operator Aids, did not include a process to ensure that operator aids derived from procedures are reviewed for possible changes when the parent procedure is changed. This deficiency was corrected in September 1993.
  - (iii) There are three plant standards dealing with lockout/tagout. The multiplicity of directives complicates the subject, leads to inconsistencies and overlap among procedures and can confuse those responsible for accomplishing lockout/tagouts. In addition, STD 80052, Single Electrical Source, Single Disconnect Equipment, does not include all prerequisite conditions set forth in DOE Order 5480.19, Chapter IX, paragraph 5.b.
- c. Training and Qualification: All personnel at Pantex have not been trained in the concepts of conduct of operations as required by DOE Order 5700.6C, Quality Assurance, and DOE Order 5480.19. The status of training is as follows:
- (1) M&H has not completed training for production technicians.
  - (2) M&H has not completed training for other non-supervisory personnel. A four-hour conduct of operations training course developed for all employees was first taught in July 1993. The Staff observed a portion of the training and found it well organized and thorough.
  - (3) AAO facility representatives are scheduled to attend the EM-25 two week

conduct of operations training course in January 1994.

- (4) The following training has been provided:
  - (a) Initial training for all supervisors on-site (first line supervisors and up) was completed in June 1993. However, M&H has not implemented a program to reinforce the concepts of conduct of operations in the workplace on a continuing basis.
  - (b) Most AAO staff attended either the M&H supervisor course or a 24 hour conduct of operations training course in Albuquerque.
  - (c) AL staff attended the 24 hour conduct of operations training course in Albuquerque.
- (5) It appears that the training provided has not been effective in educating personnel on conduct of operations, and the concepts are not being reinforced in the workplace. The Staff continues to see conduct of operations deficiencies during operations.

d. Identification, Investigation, and Correction of Deficiencies: DOE Order 5480.19 is applicable to all DOE elements and contractors performing work for DOE. As stated in the Order, the implementation of the requirements and guidelines of DOE Order 5480.19 "should result in improved quality and uniformity of operation." DOE Order 5700.6C, Quality Assurance, requires that an organization establish and implement process to detect and prevent quality problems and to ensure quality improvement. The Staff continues to observe conduct of operations deficiencies that are frequently overlooked by first and second line supervisors. Without correctly identifying conduct of operation deficiencies, identifying and correcting the root cause, and then transferring those lessons learned to other scenarios, implementation of DOE Order 5480.19 will be problematic.

- (1) Identification:
  - (a) Management Assessments - M&H has committed senior management to increase the number of management walk-through's and to teach portions of the M&H Formality of Operations training. However, based on the Staff's interviews and discussions with AAO and M&H personnel, it is not clear that management is adequately trained to identify and correct conduct of operations deficiencies in the workplace. M&H management does not appear to be the catalyst for improving the implementation of conduct of operations at Pantex. Mid-level managers have not internalized the benefit of conduct of operations, and consequently there is no daily reinforcement of proper conduct of operations in the work place.

- (b) Independent Assessment - DOE Order 5700.6C and DOE Order 5480.19 require AL and AAO to assess the effectiveness of the M&H implementation of DOE Order 5480.19.
  - (i) For conduct of operations, this responsibility on site lies solely with the Facility Representatives. However, due to the shortage of qualified Facility Representatives, they are unable to observe all facility operations. An attempt was made to involve other AAO organizations in assessing conduct of operations, primarily through the AAO structured walk-around program. However, according to some AAO personnel, this has been marginally effective apparently due to reluctance by AAO personnel to accept additional review responsibilities.
  - (ii) AL provides independent reviews of various functional areas through their Performance Assessment Group. AL is sending their conduct of operations reviewers to the EM-25 conduct of operations training course to teach them how to effectively evaluate conduct of operations. AL has also established a conduct of operations Task Force composed of representatives from all AL site contractors. The Task Force meets to discuss lessons learned, answer conduct of operations questions, and develop consensus on how DOE Order 5480.19 will be implemented at AL sites.

(2) Investigation:

- (a) Abnormal event investigation - Pantex has not implemented a formal process to critique occurrences or other abnormal events as specified in DOE Order 5480.19. However, Pantex personnel are preparing a formal procedure to provide this direction. Due to the small number of reportable occurrences at Pantex, only 59 thus far this year, it is intended that a limited number of personnel be trained to conduct critiques.
- (b) DOE Order 5000.3B. Occurrence Reporting - The Staff conducted a review that consisted of a comparison of the order requirements to the Mason & Hanger (M&H) implementing procedure and then a review of the actual occurrence reporting process used by M&H. This review found that the M&H implementing procedure, Plant Standard 3140, is an acceptable representation of the requirements of the old order (5000.3A). However, a procedure reflecting the revised order has not been issued; the Order requires that the site specific procedure be issued by August 22, 1993. The revised

Implementation Plan has been approved DOE-AAO and forwarded to DOE-AL for approval. A review of the Implementation Plan found that none of the five listed attachments had been prepared. For example, when DOE order 5000.3A was revised, the requirements concerning categorization of occurrences were changed and the revised order stated these new requirements were to be implemented within one month of the effective date of the order (2122193). These site specific requirements are one of the listed attachments to the Implementation Plan and have not been issued by M&H. Site personnel are now using a combination of the old site criteria and the actual revised order to categorize occurrences without the aid of any formal guidance.

- (3) Corrective Action: Issues are raised by various organizations and methods. The ability of the organization to determine the root cause of the issue, develop a corrective action plan, and track the issue to closure is vital to proper conduct of operations. The Staff reviewed the AAO and M&H issues management systems and found that they are in their infancy.
  - (a) AAO Issues Management System - The AAO Issues Management System presently only captures issues raised by the facility representatives. It does not capture any other issues raised by the AAO staff, or issues that the AAO is required to respond to.
  - (b) M&H Issues Management System
    - (i) The M&H Issues Management system has been developed and base-line data is being entered from the most recent issues. The system will capture issues from: External Organizations; Corporate Oversight; DNFSB; Laws, rules, regulations; Performance Based Assessments; ORE/ORRs. The tracking system uses a rudimentary risk based prioritization system. The only method to capture issues in the past was through ad hoc systems developed by various divisions. No attempt is presently being made to capture old (greater than 2 or 3 months) outstanding issues.
    - (ii) M&H's Performance Assessment Department conducted a DOE Order 5480.19 performance based self-assessment baseline in December 1992. The assessment was very critical and found that M&H was in compliance with only one of the eighteen chapters of the order. It further stated: "The implementation of Conduct of Operations is compliance oriented rather than performance oriented. Best management practices have not been gleaned from the

order. It appears that management is not trying to implement the intent of the requirements, rather minimizing the implementation to the letter of the order. Examples of this mentality include logkeeping, operator aid posting, required reading, and control room activities." Many of the concerns raised in the report were confirmed during the DNFSB staff review. For example, no standardization was found in reporting and processing corrective actions, no formal system for performing investigations exists, similar lockout/tagout deficiencies exist, and logbook entries continue to be cursory. The issues in the December 1992 report from the Performance Assurance Division are not tracked in the M&H Issues Management System, supporting the Staff's concern that without an effective issues management and root cause analysis program, any benefit or lesson learned that could have been gained may be lost.

#### Attachment 1 - Conduct of Operations in the Work Place

Numerous conduct of operations deficiencies continue to plague Pantex. The following observations resulted from the Staff's review, as well as reviewing operations over the past several months.

3. W79 Capping and Sticker - There were numerous (about six) informal changes in the LLNL procedures for capping and laser welding. These changes which had not been submitted for formal approval were being used during the dry run. Some changes were minor in nature while others were of some technical substance. None could be immediately identified as having a safety implication. The LLNL Team Leader stated that the procedures had been "frozen" since early June and that these changes would be incorporated in the next major revision prior to the W79 PFD production run. Examples of the informal changes are:
  - a. RM257417 (Capping), pg 26 - Added a Step 23 to "measure welded cap and machine cap down." A specific tolerance was verbally discussed but not written down.
  - b. RM257417, pg 12 - The requirement to turn a knurl knob an additional 1/4 turn after tightening was lined out due to the replacement of the knob with a different seating surface.
  - c. The nitrogen purge station operated by Mason & Hanger to maintain a nitrogen blanket in the glovebox was operated without a procedure. The W79 Team leader stated that the M&H personnel were trained to operate the station. A DOE Facility Representative stated that a procedure to operate the station did not exist. The



nitrogen purge station valves were not labeled. This system varied with a different nitrogen station operated by LLNL that was labeled and operated by LLNL personnel by procedure.

4. Shift Turnover - The Manufacturing Division Supervisor shift turnover did not include a walkdown of operational areas. In some cases this may require access to security locked bays/cells.
5. Operator Aids - In the current Manufacturing Division organization there are seven facility managers responsible for different buildings, bays and cells. Some operator aids are applicable to several operational areas which are the responsibility of different facility managers. The present operator aid process does not include a review of existing or proposed aids by different facility managers to ensure consistency for aids that are applicable to more than one facility.
6. Lockout/Tagouts - Several comments were developed from the review of lockout/tagout practices during maintenance activities:
  - a. The original of the Lockout/Tagout permit was retained by the electricians in the field. Copies of the permit were not provided to the electrical shop office or the facility manager who authorized the lockout/tagout.
  - b. The breakers were locked out with individually keyed locks and the keys were hung on a board in the electrical shop office. On further consideration of these conditions, the electrical shop supervisor sent one of the electricians for the keys and a lockbox. The four keys were placed in the lockbox and each electrician put his own lock on the lockbox and retained the key. The lockbox was kept in the field with the work package instead of returning it to the electrical shop office.
  - c. The Lockout/Tagout permit had entries in pencil and ink; check marks instead of initials in one column; a work procedure number was missing. The form does not provide a space for a brief description of the work requiring the lockout/tagout.
  - d. Electricians assigned to a job were questioned about their understanding of the lockout/tagout process and the importance of correctly following the procedure. They commented to the effect that while the process enhances their personal safety and the procedure steps must be complied with, the requirements are excessive and slow down work unnecessarily.
  - e. Facility managers do not maintain a file or notebook with active lockout/tagouts permits and a listing which can be audited.
  - f. A number of "Danger Do Not Operate" tags observed in various locations are holdovers from the past and in some cases their present status is undetermined.

- g. The Staff observed the repair/replacement of a hot water pump in Building 1294. The controller for the pump was tagged and locked for removal of the motor pigtail. The inlet and outlet valves to the pump were located approximately 12 feet high near the ceiling. These valves were shut, but not locked and tagged. The craft personnel loosened the flanges, drained the water from the pipe, and removed the pump. The flanges continued to leak water. The following work practices were observed:
  - (a) The hot water was heated using a steam fed heat exchanger. Steam to the heat exchanger was not isolated. As a result, the water that continued to drip was hot though ~ 212
  - (b) No temperature gages were installed in the system near the heat exchanger. The Facility Manager (FM) did not know the temperature of the hot water, even as an approximation.
  - (c) Electrical equipment, including a large battery pack were in the same room as the pump. The controller for the pump motor was beneath the flanges, slightly offset from vertical. Leakage from the flanges overhead had the potential to drip or spray on electrical equipment, thereby causing shorts or arcing.
  - (d) The FM was informed of this lockout/tagout procedure. The FM did not show immediate concern, and it is not clear that the FM understood the magnitude of the potential safety issues. Pantex personnel indicated that the difficulty in reaching the valves provided adequate protection for the workers and equipment and that the valves need not be locked/tagged shut.
  - (e) The FM was not familiar with the work package procedure used by the craftsmen. The FM stated that the job should be completed by the end of the day. Nearly 24 hours later, the craftsmen had not initiated troubleshooting on the pump because of other priorities.
- 7. Equipment Labeling - Discussions with several facility managers indicated that a Manufacturing Division labeling program is not active at this time while awaiting results of a pilot effort in new construction Building 12-121, HE Machining Facility, and development of a program with an upgraded standard. The pilot labelling program does not meet the requirements of DOE Order 5480.19 (Conduct of Operations Requirements for DOE Facilities) because the components are not uniquely identified. Two valves labelled "Main Drain" were adjacent to one another. One valve was the main drain for the fire sprinkler system, and the other valve was the main drain for the deluge system. Both were painted red, both were at the same height, they were connected by a (nominal) 4" pipe, and neither was uniquely identified.

## Attachment 2

### Lack of a Systematic Process Impacts Conduct of Operations

1. Purpose: This report documents the observations of the Pantex Site Representative who reviewed the technical processes and the information flow between multiple departments on general use handling equipment from September 13 to October 25, 1993. This equipment is used for weapons dismantlement and has impacted several aspects of conduct of operations.
2. Summary: A rigorous and systematic technical approach to control the safe operation of facility systems, equipment, and tooling has not been conducted, therefore, the operator (i.e. production technician, maintenance technician, Building Manager, etc.) is not provided the assurance that indications are accurate and reliable. The technical information on the facility systems, equipment, and tooling is limited and has not been rigorously developed to nuclear industry standards. The flow of information is not communicated effectively to affected organizations. Responsibilities for the development and coordination of the necessary technical information are not well understood or defined by personnel and management.
3. Background:
  - a. On September 13, 1993, a group of DNFSB Staff members were observing the high explosive (HE) disassembly of a W70 unit in Cell 12-85. During the disassembly, a piece of HE was transported from the disassembly stand to a table using a vacuum lifting fixture. The vacuum lifting device was attached in a manner described in the O&I Standard 7-5000, General Safety Requirements, which is the referenced standard in the Nuclear Explosive Operating Procedure (NEOP). Two production technicians were observed attaching the vacuum lifting fixture to the HE. The production technicians attached a hose to the fixture and the Plant vacuum supply system, drew a vacuum on the fixture, and conducted a comparison check between the fixture gage and the Plant vacuum supply gage. The hose was removed and a one minute vacuum drop test was conducted. Upon satisfactory completion of the vacuum drop test, the hose was reconnected and the HE was moved from the stand to the table. The Plant vacuum supply gage had a permanently installed label stating "CALIBRATION NOT REQUIRED."

In the nuclear industry, personnel are trained to trust their indications. This trust is based on a system that provides accurate and reliable gages and instruments that are routinely maintained and periodically checked against a known standard. This principle is noted in DOE Order 5480.19, "Conduct of Operations Requirements for DOE Facilities N~ Chapter 11, which states: "Operators should believe instrument readings and treat them as accurate unless proven otherwise. Ignoring an unusual reading because an operator believes an instrument is faulty can cause abnormal conditions to be undetected." The principle is further emphasized in

DOE Order 4330.4A, "Maintenance Management Program", Attachment 11, Section 12.2 which states: "Operators depend on installed facility instrumentation for accurate indications, process control actions, and trip functions to operate the facility safely and reliably. The accuracy of installed instrumentation is established and maintained through the MT&E control and calibration program." Finally, ASME Standard NQA-1 states: "Tools, gages, instruments, and other measuring and test equipment used for activities affecting quality shall be controlled and at specified periods be calibrated and adjusted to maintain accuracy within necessary limits."

4. Discussion: The following information and observations demonstrate the lack of systematic approach and rigorous technical method to ensure reliable and accurate indications.
  - a. O&I Standard 7-5000 states that the fixture gage and the Plant vacuum supply gage shall be "approximately" the same during the comparison check. The word "approximately" is not defined in the procedure nor is a tolerance band given. The procedure states that the operating range for the vacuum is normally between 18 and 22 inches Hg. A minimum vacuum level of 16 inches is also stated in the procedure. There is not a tolerance band provided in the procedure.
  - b. The W70 HE Disassembly NEOP lists the step requiring the attaching of the vacuum lifting fixture and movement of the HE as a "CRITICAL "
  - c. The B57 HE Disassembly NEOP does not reference O&I Standard 7-5000 but instead inserts most of the steps in Section 10.2 of the standard into the NEOP. The minimum vacuum of 16 inches Hg on the fixture gage is not in the NEOP. These steps are not listed as "CRITICAL" steps.
  - d. The Risk Management Department managers in ES&H stated that the probability of failure and consequences of dropping material from this fixture were analyzed to be low. This analysis led to the classification of the vacuum system in Building 12-85 as an "Important" system and, therefore, does not require calibration. The crane and hoist system is designated a "critical" system. The vacuum lifting and holding fixtures are not categorized as either a "Critical" or "Important" system.
  - e. The 12-85 Building Manager stated that Metrology determined what gages required calibration. Metrology stated that the Building Managers determined what gages required calibration. The 12- 104 Building Manager, who has significant Naval Reactors experience, stated he did not know who was responsible for determining which gages required calibration.
  - f. Tooling Design engineers stated that no calibration was required on the fixture gages. These gages were initially checked when the fixture is first assembled. The fixture gages then undergo only a visual inspection prior to use, that is, the needle

is checked to see if it is not bent and that the gage reads zero with no vacuum.

- g. The Tooling Design Manager was not aware of the vacuum numerical requirements in O&I Standard 7-5000 for the Section 10.2 Vacuum Lifting and Holding Fixtures nor was he aware of the recent July 30, 1993 changes to this section of the procedure. He stated none of his engineers were involved in the changes to this section.
- h. The Tooling Design Manager did not know the engineering bases for the minimum vacuum requirements in the O&I Standard 7-5000. On the following day the Tooling Design Manager stated that the mid-range of 20 inches Hg provided a 2.5: 1 margin of safety and that the minimum vacuum of 16 inches Hg provided a 2: 1 ratio. He did not know the calculated weights, surface areas, or associated fixtures for which these ratios were based.
- i. The Maintenance Department of Facility Operations provided the preventive maintenance check completed in July 1993 that conducted a very simplified accuracy check of the Plant vacuum gages. According to maintenance personnel, the check consists of comparing all seven of the cell vacuum gages to ensure they are all reading basically the same. Acceptance criteria for this accuracy check was left up to the maintenance personnel since no guidance was provided on the procedure. This is also a single point check and not a full range check.
- j. On August 23, 1993, the Training Department initiated a six hour course for production technicians on general equipment prior to the start a weapon disassembly training. This training include a short section on vacuum lifting and holding fixtures. Additionally, this section does not contain all the requirements in Section 10.2 of O&I Standard 7-5000 and does not explain the basic principles of vacuum lifting and holding.
- k. Section 10.2 of O&I Standard 7-5000 for attaching the vacuum lifting or holding fixture requires that the vacuum be drawn on the material, the vacuum hose disconnected, and a one minute vacuum drop test conducted. The O&I Standard 7-5000 requires a "DO NOT USE" tag be installed if the test fails unless special instructions are approved for use. With certain material, however, the material configuration can be such that a vacuum cannot be maintained and thus a vacuum drop test cannot be conducted. The W70 NEOP references this section of O&I Standard to be followed but since it is a general standard it does not have to be open during disassembly. According to a M&H manager, this is one of the few disassembly procedures that specifically references this section of the O&I Std.
- l. A M&H weapons process engineer had assumed that the gages were calibrated. The engineer stated that several decisions were made on another weapons program based on this assumption during a recent Qualification Evaluation for Dismantlement.

- m. The M&H weapons process engineer, who had at one time been a production technician, stated that there are many different types of vacuum lifting and holding fixtures. The engineer also stated that the vacuum plays different roles for different fixtures such as being the primary lifting or holding force, being an aligning force, or being a secondary lifting or backup force.
- n. The training instructor who wrote the lesson plan for (13) above is also a production technician certified on five weapons. He stated that there are twelve different types of vacuum lifting and holding fixtures associated with those five weapons. He stated that vacuum was the primary lifting or holding force for the twelve fixtures. He was not aware that vacuum could also have a different function as mentioned in (2) above.
- o. When asked what did "approximate" mean when conducting a gage comparison as stated in O&I Standard 7-5000, the training instructor stated that if both gages were in the normal band of 18 to 22 inches Hg then that was approximately the same. When asked if "approximate" also meant that one gage could read 22 and the other gage could read 18 and therefore have a 4 inch difference, the training instructor stated it was acceptable.
- p. The training instructor did not know the engineering bases for the minimum vacuum of 16 inches Hg.
- q. Two production technicians and one production supervisor certified on the W70 HE disassembly process were questioned on the requirements of O&I Standard 7-5000. All three could not state the normal range of vacuum quoted in the procedure. All three stated that the Plant supply gage was the controlling gage for the minimum vacuum requirement of 16 inches Hg. The procedure in O&I Standard 7-5000 states it is the fixture gage.
- r. Another production supervisor stated adamantly that if the comparison check of the two gages were not within 0.5 inches Hg then he would not allow the operation to proceed.
- s. The union has recently come to an agreement with M&H that requires M&H to put a copy of O&I Standard 7-5000 in every bay and cell.
- t. The Tri-Lab personnel were surprised that the gages in the vacuum lifting fixtures were not calibrated. They stated that DOE ALO personnel had told them not to question conduct of operations related issues such as gage calibration.