May 16, 1996

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:

On February 13, 1996, the Department of Energy (DOE) issued its Revision 1 of the Implementation Plan (IP) for Defense Nuclear Facilities Safety Board (DNFSB) Recommendation 93-6. The IP focuses on ensuring that the Department maintains the capability to conduct safe dismantlement, modification, assembly, and testing operations. The following deliverables are transmitted:

Deliverable A.1.B, "A completed W69 Weapon Safety Specification (WSS) and W56 WSS" is due on May 30, 1996. The W69 WSS is located at Enclosure 1 as a formal deliverable under the Recommendation 93-6 IP. (Note: The W69 WSS is classified SECRET-RESTRICTED DATA and should not be placed in the public reading room.) Because of the continued effort to ensure that all stockpile evaluation program and archiving information is included into the W56 WSS, this document is not ready for formal transmittal to the DNFSB to satisfy the deadline. The W56 WSS will be ready for transmittal approximately August 30, 1996.

Deliverable A.2, "Copy of revised EP401110" is due on May 31, 1996. Due to further refinements and continuing upgrades to Seamless Safety 21 (SS-21) the Engineering Procedure (EP) 401110 will be approved and ready for distribution by August 30, 1996. Deliverable A.2 committed to changing the WSS portion of the EP401110 to address incorporation of safety information obtained from archiving and stockpile evaluation system programs. These changes were completed and a tasking memorandum (Enclosure 2) from Albuquerque Operations Offices to the national laboratories and Pantex to implement these changes has been transmitted. The tasking letter also specifies acceptable methods for documenting the archiving methodology and safety-related data in the WSS. This tasking memorandum was generated to provide interim guidance for those WSSs currently being developed while the EP401 1 10 undergoes further revisions. The delay in completing the revision to EP401110 has resulted from a comprehensive effort to incorporate lessons learned from implementing SS-21 on the B61-0, 2 & 5 and W69 dismantlement processes, and to add "Nuclear Explosive & Weapon Security & Control" from

Draft DOE Order 5610.15. Additionally, Enclosure 2 contains pages from EP401 1 10 which reflect the changes that satisfy the requirements of Deliverable A.2 of Recommendation 93-6 Implementation Plan. No further changes are anticipated to EP401110, which would affect the areas dealing with Recommendation 93-6.

Should you have any questions, please contact me or have your staff contact Mr. Richard C. Crowe, Associate Deputy Assistant Secretary for Military Application and Stockpile Management, on (301) 903-4221.

Sincerely,

Victor Stello, Jr.
Principal Deputy Assistant Secretary
for Quality Management

Defense Programs

Enclosures:
Deliverable A. 1.B (SRD)
Tasking memo fm AL and pages fm EP401110

Weapons Operations - Albuquerque Operations Office

1. Responsibility

   The Albuquerque Operations Office (AL) is responsible for the implementation of this task, subject to the final approval and acceptance from the Deputy Assistant Secretary for Military Application and Stockpile Management Relevant operations office elements, management and operating contractor(s). and the nuclear weapons laboratories will be an integral part of the implementation of this task.

2. Commitment A. 1

   Development of a WSS for each weapon. The final WSS describes the weapon disassembly and inspection process for enduring weapons and the dismantlement operation for retired weapons. It also identifies all hazards that the SS-21 Project Teams will consider when conducting safety hazard analyses. when developing the weapons operation process, and when determining appropriate safety criteria from the point of weapon shipping and handling through final disposition of materials. The WSS will capture safety aspects from all relevant weapon-specific documentation, including safety-related information from: (1) design individuals from the laboratories who are or were active in the original design of the specific weapons, (2) weapon operation experts from Pantex who participated in the assembly or disassembly of the weapons, (3) any other unique skills and knowledge drawn from technically competent laboratory and Pantex personnel, and (4) relevant safety information gained through the weapon surveillance program Incorporating the archiving program information as an input to the WSS will also ensure that relevant historical safety information from all personnel, including retired and those about to retire, will be included. As a result, the WSS will be the single source document for all safety-related information, including that archived from Pantex and the nuclear weapons laboratories personnel (items 1, 2, and 3 above).

3. Deliverable B

   A completed W69 WSS and W56 WSS.

4. Comments:

   This enclosure contains only the W69 WSS. The W56 WSS will be ready for transmittal approximately August 30, 1996.

Enclosure 1

THIS IS A PAGE HOLDER
ACTUAL DOCUMENT IS CLASSIFIED AND
WAS PROVIDED TO THE DNFSB ON MAY 7, 1996

Cage Code 14213 SS398160

Lisotto SNL, 2111
Haertling LANL, ESA-WE
(SS3981 60. DOC)

WEAPON SAFETY SPECIFICATION, W69 (U)

CHANGE HISTORY

CONTROL NUMBER	***ISSUE***	***RELEASE/CHANGE NO.***	***DATE***
SS398160	A	CER 940635SA	11/94
	B	FCO950217SA	3/7/95
	C	FCO960245SA	3/7/96
	C	FCO960485SA	4/29/96

THIS IS A PAGE HOLDER
ACTUAL DOCUMENT IS CLASSIFIED AND
WAS PROVIDED TO THE DNFSB ON MAY 7, 1996

Weapons Operations - Albuquerque Operations Office

1. Responsibility

   The Albuquerque Operations Office (AL) is responsible for the implementation of this task, subject to the final approval and acceptance from the Deputy Assistant Secretary for Military Application and Stockpile Management. Relevant operations office elements, management and operating contractor(s), and the nuclear weapons laboratories will be an integral part of the implementation of this task.

2. Commitment A. 2

   AL supplemental directives that integrate Recommendation 93-1 analysis, SS-21, and the improved safety evaluation and Nuclear Explosive Safety Study verification procedures will provide detailed guidance for development of safe weapons operations. As such, they will address WSS requirements, safety criteria, and technical disciplines for developing weapons operations, safety evaluations, and Nuclear Explosive Safety Study guidance for verifying that the processes are safe and predictable. Following implementation of the revised supplemental directives, the SS-2 1 EP40 1 1 10 will be modified to reflect upgraded WSS requirements.

3. Deliverable

   Copy of revised EP401110

4. Comments

   This enclosure contains Albuquerque Operations Office Tasking memorandum to the national laboratories and the applicable pages from EP401110 which were changed as a result of Recommendation 93-6. The change control markings on pages 12, 34, 35, and 43 indicate the areas which deal with Recommendation 93-6.

Enclosure 2

[DOE ALB MEMORANDUM]

Date: March 18, 1996

Reply To Attn Of: WPD:ETR

SUBJECT: Documentation of Archiving Methodology and Safety Related Data

To: Jerry Dow, L-125, LLNL
Lou Salazar, F630, LANL
Corey Knapp, MS-9033, SNL-CA
Herb Berman, M&H/PX

The attached letter from Department of Energy/Albuquerque Operation Office (DOE/AL) to Department of Energy/Headquarters (DOE/HQ) represents a commitment to document the methodology and resulting safety related data generated from archiving efforts in support of the Weapon Safety Specifications (WSS).

This commitment must be met for all future WSSs, including the W69 and W56.

The general approach is to provide references in the WSS to those documents which describe the archiving methodology and data obtained. Each organization involved (the nuclear laboratory, nonnuclear laboratory and production plant) must document and provide WSS references for their respective archiving activities on the subject weapon.

Regarding archiving methodology, it is appropriate to reference a generic plant or laboratory standard or procedure if that procedure was followed for the subject weapon program. If such a procedure does not exist or if a unique approach to archiving is taken for a weapon system, then a brief summary of the archiving activities should be written, placed in the weapon files (e.g. the dismantlement program library), and referenced in the WSS.

Regarding data, it is suggested that each organization document a short summary of safety-related data that was generated from the archiving effort and reflected in the WSS. One value in such a summary will be to support future discussions and decisions regarding the value obtained from archiving efforts. This summary should also be referenced in the WSS. AL assumes that more detailed records of data (e.g. completed interview forms, comment forms, videotapes...) are routinely documented by each organization.

The approach described above is considered the minimum requirement to meet DOEs commitment to document the methodology and safety related data for the archiving process.

Please ensure that the revised EP401110, Revision B, is consistent with the general approach to archiving documentation described in the attached letter and the more specific documentation guidance provided in this letter. Also, please ensure that the WS6 and W69 WSS include the required archiving methodology and data documentation references and said references are available for review if requested.

Please address any questions on this matter to Debbie Monette (505-845-5292) or Gene Rodriguez (505-845-5380) of my staff.

Harry T. Season, Jr.
Director
Weapon Programs Division

cc:
Bruce Lownsbery, L-300, LLNL
Coleman Johnson, L-385, LLNL

Mike Haertling, C936, LANL
Charlie Miller, J514, LANL
Darrell Schmidt, C936, LANL
Jim Harrison, MS 0447, SNL-NM
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Lawrence Pace, WPD, AL
Missy Klem, WPD, AL
Steve Northrop, WPD, AL
Kathleen Chabai, WPD, AL

2.4 Process Deliverables

The project team uses task teams to develop the process deliverables, to fulfill the purposes identified in Section 1.2, and to address the safety criteria described in Section 6. The principal process deliverables are the Weapon Safety Specification, Personnel Plan, Operating Procedure, Operating Facility Readiness, Equipment & Facility Layout, Tooling, and Hazard Assessment. References to formal documentation associated with each of these deliverables is contained in information modules. (See Paragraph 2.4.3 for information about the modules.) The information corresponding to the modules are process and/or weapon-specific, and are retrievable as source material for the operating procedure. The deliverables are described in the following paragraphs.

2.4.1 Weapon Safety Specification

The Weapon Safety Specification(s) is a formal and controlled document(s) prepared by the cognizant design agencies. It incorporates information from design drawings, Baseline Process Flow, Weapon Status Report, Criticality Report, and INRAD Report. The Weapon Safety Specification provides as-built information pertaining to the characteristic design features, safety attributes, and hazards for a nuclear weapon configuration or a family of similar nuclear weapon configurations; and safety-critical information to enable development of the Personnel Plan, Operating Procedure, Operating Facility Readiness, Equipment and Facility Layout, and Tooling. It provides source information to the Hazard Assessment task team. A copy of the Weapon Safety Specification is included as part of Module 3 (see Figure 2) of the operating procedure. See Paragraphs 5.4, 6. l, and Appendix l for related information. See Reference l for an example of a Weapon Safety Specification.

For retired weapon systems and enduring stockpile weapon systems, the Design Agency weapon system engineers shall review past surveillance program data and include pertinent safety related information resulting from that review in the derivation of the WSS. In addition, for enduring stockpile weapon systems, the results of continuing surveillance activities will be reviewed on an annual basis by the Design Agency system engineers and the WSS will then be updated annually (if required) to include pertinent safety information. The results of the annual review will be

provided to DOE for review.

Archiving can be an important facet in the development of each Weapon Safety Specification. In context to the WSS, archiving shall be defined as a formal program to capture unique safety-related information which may contribute to the development of safe weapon assembly/disassembly and surveillance procedures at the Pantex plant. Each WSS will provide references to nuclear laboratory, non-nuclear laboratory, and production agency documents which describe the methodology employed to obtain the safety information for that program and describe the safety related information generated by the archiving process, that is reflected in the WSS.

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6. SAFETY CRITERIA - EP401110

The following paragraphs describe the safety criteria that are to be addressed when employing the Integrated Safety Process. They have been developed to fulfill the purposes identified in Section 1.2 The Safety Criteria are arranged by task team deliverable. See Appendix 1 for related Safety Checklist Information.

6.1 Weapon Safety Specification

The general requirement is to assure that the safety characteristics and the hazards of the weapon are understood with respect to the operating environment, the effects alterations and modifications have to the nuclear weapon, and the changing states of the nuclear weapon as it undergoes an assembly or disassembly. With respect to the weapon assembly/disassembly, its constituent components, and special materials, the task team shall identify, describe, or define the:

1. Applicable weapon configurations and Alterations (ALTS) and their impact on the weapon assembly/disassembly process.
2. Safety-critical assembly or disassembly operations (e. g., reservoir and valve removal process).
3. Credible deviations (i.e., an identified acceptable alternate) from normal operations and applicable immediate action procedures.
4. Personnel hazards including hazardous materials and high pressure hazards.
5. Energetic-and electro-sensitive devices, their sensitivities and/or associated hazards.
6. Safety-critical handling requirements.
7. Radiological hazards including radiation field intensities and the potential for contamination.
8. Criticality and one-point safety concerns, as applicable.
9. Changes in safeguards and hazards characteristics as a result of aging effects.
10. Acceptable tritium concentrations for continuance of operations.
11. Assembly and component weights.
12. Positive verification checks (e.g., electrical tests, tritium detection, etc.) which identify the current state or status of critical components.
13. Required special tooling and hardware.
14. Applicable nuclear explosive safety rules.
15. Annual surveillance cycle report data which has identified any safety related issues or any Significant Finding Investigations.
16. Potential changes in the sensitivity of hazardous components due to aging or environmental exposure and precautions required to mitigate those hazards.
17. Critical paths of entry for energy sources and the precautions taken to mitigate

unauthorized energy sources.

18. Safety related data generated from the archiving programs by the nuclear laboratory, non-nuclear laboratory, and production agency.

6.2 Personnel

The general requirement is to assure the proper selection, training, qualification, and certification of operating personnel and their reliability, in the operational safes, process. This includes production technicians and others involved in the hands-on operations or who have direct supervisory responsibilities for the weapon-specific operations.

Specific safety criteria are:

1. Personnel performing work on a nuclear explosive shall be certified in the DOE Personnel Assurance Program (PAP).
2. Personnel performing work on a nuclear explosive shall be trained and qualified for the specific nuclear weapon program before performing the work.
3. The training program shall include performance-based evaluations (including criteria for passage of a written examination).
4. The personnel management process shall provide an identification/qualification methodology of critical personnel for weapon-specific operations.

6.3 Operating Procedure

The general requirement is to assure the technical safety of the operating process through the positively controlled interactions of the weapon, personnel, operating facility, tooling, and equipment. The operating procedure shall establish a repeatable, efficient, and tractable operating process that, when adhered to in sequence and substance, will yield quality results, will implement nuclear explosive safety requirements, is safe for personnel use, and will not adversely affect the facility or environment.

Specific safety criteria are:

1. The operating procedure shall identify safety critical steps.
    - *Safety critical steps are operations in the procedures consisting of a single step or series of steps when incorrectly performed or omitted will lead to a Significant Safety Incident. The intent of designating safety critical steps is to call attention to them and prevent incidents that may cause serious injury or abnormal radiation exposure to personnel, initiation of any explosive or pyrotechnic, rupture of a high pressure vessel, or abnormal release radiological or toxic.*

APPENDIX 1 - SAFETY CHECKLIST EP401110

The following paragraphs provide guidance information intended to assist the project and task teams as they employ the Integrated Safety Process. They are not requirements, but are useful in stimulating thought about how to address the safety criteria, which are requirements.

Weapon Safety Specification

1. Does the Weapon Safety Specification limit or eliminate electrical tests which were for reliability if the weapon is being disassembled and components are not being reused? All electrical tests related to safety should be stipulated and required in the specification.

2. Does the Weapon Safety Specification identify changes in internal components if hazards have increased since FPU? Potential topics are oxidation, air-borne contamination during disassembly operations, etc.

3. Does the Weapon Safety Specification stipulate requirements for using electrical shorting plugs during an assembly or disassembly operation and covers as required for other, non-critical, applications?

4. Does the Weapon Safety Specification identify when radiography is required for acceptance/safety considerations and eliminate unnecessary radiography requirements during disassembly?

5. Does the Weapon Safety Specification stipulate humidity requirements for the weapon if increased (or decreased) humidity within the operating facility increases the sensitivity of any hazardous component?

6. Does the Weapon Safety Specification state that access to detonators or detonator cables be kept to a minimum and immediately protected from any/all energy sources when exposed?

7. Does the Weapon Safety Specification identify components that should be immediately packaged and/or removed from the disassembly area due to safety or ALARA concerns?

8. Does the Weapon Safety Specification identify circuits or access points that could be utilized during an assembly or disassembly to increase the safety attributes of the weapon?

9. Does the Weapon Safety Specification identify the lowest threshold Electro-Explosive Device (EED) and limit the energy levels of those external energy sources used in the disassembly or assembly operation based on the lowest EED threshold?

10. Does the Weapon Safety Specification identify all hazardous materials and potential personnel hazards associated with an assembly or disassembly process?

11. Does the Weapon Safety Specification include a full description of the weapon, including all applicable field retrofits and alterations (ALTS)?

12. Does the Weapon Safety Specification identify stop and/or no-stop points which should be observed during the processing of the weapon if those points identified affect the safety of the disassembly/assembly process?

13. Does the Weapon Safety Specification identify areas of concern during operations where radioactive gases or materials have the potential of being released (cutting, machining, firing of valves, chemical solvents in solution, etc.)?

14. Does the Weapon Safety Specification identify acceptable radioactive gas monitor levels for weapon-specific critical operations (breaking of seals, etc.)?

15. Does the Weapon Safety Specification identify radioactive material within the weapon system by component, radioactive material, location, and weight?

16. Does the Weapon Safety Specification provide a description of all explosives within the weapon

including component name, location, explosive amounts, and whether self-contained or not?

17. Does the Weapon Safety Specification protide electrical bonding requirements including "safe or desired" electrical bonding points on the weapon or fixture?

18. Does the Weapon Safety Specification identify adhesively bonded HE assemblies within the weapon system and state precautions against dependence on any/all aged adhesive bonds?

19. Does the Weapon Safety Specification define the sensitivity and makeup of the HE material within an assembly and state if the material is more or less sensitive than "standard" DOE explosives?

20. Does the Weapon Safety, Specification describe potential scenarios in the event of an inadvertent firing of any EED?

21. Does the Weapon Safety Specification identify any potential safety concern with the EED and concerns with any material transfer?

22. Does the Weapon Safety Specification identify all electrostatic sensitive devices (ESDs), their location/designation, and the no fire/all fire characteristics?

23. Does the Weapon Safety Specification identify all toxic/poisonous material within a weapon assembly, its location/designation and applicable precautions?

24. Does the Weapon Safety Specification identify all high pressure hazards within a weapon assembly, their location/designation, precautions, initial fill pressures, and expected end of life pressures?

25. Does the Weapon Safety Specification define any/all aging effects on the weapon or weapon components?

26. Does the Weapon Safety Specification define the nuclear characteristics of the weapon assembly including one point safety, criticality, INRAD levels and dose rate calculations for the various configurations?

27. Does the Weapon Safety Specification integrate and implement ES&H requirements?

28. Does the Weapon Safety Specification identify all potential non-verifiable weapon configurations that have safety significance?

29. Does the Weapon Safety Specification include applicable safety data generated during archiving activities?

30. Does the Weapon Safety Specification identify all safety-related internal components of the weapon and how they are integrated into the weapon system?

31. Does the Weapon Safety Specification identify all possible by-pass measures that affect the safety of the weapon system?

32. Does the Weapon Safety Specification identify the "interruptible" electrical systems which can be used as a safety control during the disassembly or assembly of the weapon?

33. Does the Weapon Safety Specification state that PAL status of the weapon system should be verified

prior to any activity on the system?

34. Does the Weapon Safety Specification identify all potential hazards that could be generated as the result of an unlikely functioning of a component during assembly or disassembly operations?

35. Does the Weapon Safety Specification identify all critical interface areas, such as cable interconnects, and the precautions, such as electrical bonding, required to protect the personnel and the nuclear weapon?

36. Does the Weapon Safety Specification identify all safety-critical circuits exposed during an assembly or disassembly operation?

37. Does the Weapon Safety Specification identify circuits or access points that could be utilized during an assembly or disassembly operation to enhance safety attributes of the nuclear weapon?

38. Does the Weapon Safety Specification identify all assembly or disassembly levels where radiation sources should be monitored prior to proceeding with the operation?

39. Does the Weapon Safety Specification identify all hazard-related components in an assembly or subassembly and recommended their removal prior to further disassembly?

40. Does the Weapon Safety Specification define all aging effects on the nuclear weapon or nuclear weapon components that may potentially effect the safety of an assembly or disassembly operation?

41. Does the Weapon Safety Specification identify all safety related information from the annual surveillance cycle reports' Significant Finding Investigation Reports, or URs?

Personnel

1. Does personnel training include knowledge of potential and kinetic energy sources, the potential consequences, and the required mitigation techniques for potentially hazardous, nuclear weapon assembly or disassembly operations?

2. Does personnel training include knowledge and maintenance requirements, including frequency of maintenance, for the weapon-specific tooling and equipment?

3. Does personnel training include knowledge of the roles and responsibilities of the line management, radiation technology staff, or any other personnel involved in the weapon-specific operations?

4. Does personnel training include knowledge of radiation principles and hazards involved in the weapon-specific operations?

5. Does personnel training allow for sufficient numbers of personnel to be trained/qualified as health physics staff to support ongoing operations at the facility during abnormal situations?

6. Does personnel training familiarize personnel with the use of specific monitoring equipment, including but not limited to handling, placement, determining equipment operational status, switch positions?

7. Does personnel training familiarize personnel in the safe handling of "swipes" or any other specific monitoring techniques where contamination might possibly be spread by contaminated gloves or other methods?

8. Does personnel training address ALARA concerns and precautions for radioactive and all other hazardous components of the assembly? Note: The warnings or cautions should be understood in relation to the defined hazard.

9. Does personnel training include definition of the radiation field around the nuclear weapon assembly or its constituent components so as to address personnel protection?

10. Does personnel training identify, document, and incorporate lessons learned into the general or weapon-specific training classes to assure that repeated anomalies are eliminated?

11. Does personnel training establish and identify the time period requirements (e.g., every 90 days) for weapon-specific or non-specific training validation?

12. Does personnel training provide knowledge about controlling lifetime radiation exposure levels in order for those personnel exposed to radiation to be cognizant of the maximum allowable level?

13. Does personnel training stipulate that all involved personnel understand the critical safety system operations in normal, as well as, abnormal modes?

14. Does personnel training include weapon-specific training for personnel involved in the process to identify all ALARA concerns for radioactive and hazardous components?

15. Does personnel training include requirements for personnel to seek aid when moving objects that may be unstable during movement, thereby requiring the personnel to perform a two-person operation?

16. Does personnel training include instruction on immediate action procedures?

17. Does personnel training include instruction on two person concept?

Operating Procedure

1. Does the operating procedure specify that verification of program, serial number, and ALT identification should take place prior to any disassembly on the specific weapon?

2. Does the operating procedure identify operations, such as cutting, machining, firing of valves, cleaning with solvents, etc., where radioactive gases or materials may be released?

3. Does the operating procedure address the explosives within the nuclear weapon by identifying all explosives-containing components, their locations, the amounts of explosive, whether self-contained or not, the electrical bonding requirements, and the recommended electrical bonding points?

4. Does the operating procedure identify the tooling and tooling sequence used in an assembly or disassembly operation?

5. Does the operating procedure have steps to verify that tooling is as designed?

6. Does the operating procedure stipulate precautions and responses for all credible deviations that could become abnormal or emergency situations?

7. Does the operating procedure stipulate emergency recovery procedures for all potential credible deviations where nuclear explosive, personnel, or facility safety is a concern?

8. Does the operating procedure identify personnel protection required such as gloves, respirator, etc., for all personnel such as production technicians, radiation technicians, supervisors, etc, involved in the assembly or disassembly operation?

9. Does the operating procedure state the ALARA concerns and precautions for radioactive as well as all other hazardous components of the assembly?

10. Does the operating procedure specify warnings or cautions in that portion of the procedure which is applicable to the defined hazard?

11. Does the operating procedure identify the radiation field around the assembled weapon or individual component radiation field as required for personnel protection?

12. Does the operating procedure specify that equipment and tooling not be placed in such a position that movement of that material could adversely impact the safety attributes of the nuclear weapon?

13. Does the operating procedure contain all specific nuclear safety rules for the weapon system and stipulate that all personnel understand those rules prior to beginning operations?

14. Does the operating procedure identify critical component packing/unpacking instructions and requirements as applicable?

15. Does the operating procedure identify, as required, weapon-specific in-process contamination checks?

16. Does the operating procedure specify that drop heights be kept to a minimum in those procedures applicable to assisted lifts?

Operating Facility

1. Has the operating facility been configured to allow control and positive verification of the relative humidity in the processing area?

2. Has the operating facility been configured to enable positive verification that the facility and supporting equipment needed to perform radiation checks are present and operational?

3. Has the operating facility been configured to allow, for a given operation, only authorized power sources, to preclude power sources that are not authorized, and to provide positive verification of both cases?

4. Has the operating facility been configured to control and positively verify any maximum or minimum ambient temperature allowed for critical component processing and storage?

5. Has the operating facility been defined to include complete documentation of the safety envelope, and is the documentation on file and available for review?

6. Does the operating facility have an established maintenance schedule that is controlled and maintained by the facility manager?

7. Does the operating facility have controls in place that allow use only after verified compliance with the maintenance schedule and requirements?

8. Does the operating facility have controls in place to ensure that permanent equipment operations within a facility employ good industrial safety practices and comply with DOE and OSHA requirements?

9. Has the operating facility been configured so that facility systems, such as RAMS, exhaust, UV alarms, can be positively verified prior to certification of the facility?

10. Has the operating facility been configured so that the quantities of all hazardous materials that enter the facility and trigger an ALARA concern (e.g., HE, SNM) are known and maintained current, and so that at any time in the operation, the quantities of these hazardous materials can be positively verified?

11. Does the operating facility contain sufficient work space and seating area for the personnel (e.g., tables, carts, chairs) to avoid having personnel use waste cans and other equipment for those purposes?

12. Has the operating facility been configured to avoid uneven surfaces that could detrimentally affect movement or transportation of nuclear weapons and components?

13. Has the operating facility been configured so that ingress and egress areas are obstacle-free and will allow safe movement or transportation of nuclear weapons and components.

14. Has the operating facility been configured so that the limiting conditions of operation (LCO) are positively verified to be operational or non-operational?

15. Has the operating facility been defined so that the LCOs are identified as a part of the building standard and have a normal maintenance schedule as controlled by the facility manager?

16. Has the operating facility been configured so that all critical systems have permanent identification labels?

17. Has the operating facility been established with a facility maintenance plan and does the plan include the proper sign-off requirements?

18. Has the operating facility been configured so that NEPA documentation is in place as a prerequisite to using the facility for specific nuclear-weapon operations?

19. Has the operating facility been configured to enable positive verification that all functional monitors (RAMS, UV alarms, tritium monitors, etc.) are set at a level of detection that protects the personnel?

20. Has the operating facility been configured to support placement of all required operator aids and to support confirmation that all required operator aids are in place?

21. Has the operating established using a configuration control process that enables the user to positively verify that it is operation-ready?

22. Has the operating facility been established using a change control process that ensures only authorized changes are incorporated into the operating facility?

23. Has the operating facility been configured to employ consistent physical labeling and supporting

documentation for systems critical to the safety of the facility?

24. Has the operating facility been configured to support emergency drill simulations for abnormal conditions?

25. Has the operating facility been configured to control, in a verifiable manner, all calibrated equipment entering and exiting the facility?

26. Has the operating facility been configured to enable periodic verification (e.g., daily, weekly, etc.) of the critical safety systems readiness as a prerequisite for operating facility use?

Equipment And Layout

1. Does the layout identify all power sources (e.g., electrical, pneumatic, hydraulic, etc.) that are authorized for use in the operating area?

2. Does the layout specify marking requirements for all power sources that are authorized for use in the operating area?

3. Does the layout control equipment and tooling to ensure only authorized equipment and tooling enters the operating facility?

4. Does the layout define the locations of personnel safety protection equipment and materials, and enable positive verification that the identified items are present?

5. Does the layout define the locations of authorized processing areas for parts after removal (disassembly) or parts prior to first-time use (assembly)?

6. Does the layout address all hazards, process controls, and personnel protection?

7. Does the layout define equipment locations in the process area when the location affects the overall safety of the operation (e.g., hoist, HE cart locations, tooling locations)?

8. Does the layout define equipment locations and enable verification that all required equipment and tooling are present in the facility, and that no hazards are introduced by the placement of the equipment and tooling in the process area?

9. Has the layout been designed to assure that all equipment and tooling, including portable tooling utilized in one-time operations and tooling that is temporarily placed, does not introduce a tripping or other hazard?

10. Has the layout been defined to preclude any movement of equipment or tooling that could affect the safety attributes of the nuclear weapon system?

11. Has the layout been defined to control the location of process materials (i.e., 35 account material) to avoid intermixing substances?

12. Has the layout been defined to identify areas where hazardous operations involving the local exhaust system should take place?

13. Has the layout been defined to identify all specialized equipment (monitors, etc.), specify the effective

range for the equipment, and stipulate calibration requirements, as necessary?

14. Has the layout been defined to provide an area for all equipment and tooling, and specified the area that the equipment should be used in?

15. Does the layout define areas for ALARA-related items and verify that a clear ingress/egress path is available for movement of those items?

16. Does the layout define storage areas for HE and HE handling equipment separate from other storage areas and from the weapon process?

17. Does the layout support minimum movement of HE immediately after disassembly or immediately prior to assembly?

Tooling

1. Has the tooling been designed to employ a configuration control process that enables the user to positively verify that only the authorized tooling is being employed in the specified weapon assembly or disassembly operation?

2. Has the tooling been designed to employ a change control process that ensures only authorized changes are incorporated into tooling and that only authorized tooling is delivered to the user?

3. Has the tooling been designed to include positive features that will preclude use of tooling in an unintended mode? For example, instead of relying just on visual indicators, such as marking "FORWARD" on the tooling, also design the tooling so that it can only be assembled in one direction.

4. Have tooling carts and weapon assembly carts been designed such that the rolling mechanisms can be positively locked in position, and easily and positively verified that they are locked?

5. Have the transportation carts and holding stands been designed so that the worst-case composite center of gravity (CG) of the cart or stand plus nuclear weapon assembly lies inside the effective area of the supporting base?

6. Has the tooling been designed such that all sharp or abrasive tooling surfaces (e.g., knurled handles, edges, corners, screw threads, etc.) that could contact the high explosive (HE) are insulated or otherwise configured to preclude contact?

7. Has the tooling been designed to mitigate potential consequences associated with an object impacting the HE?

Hazard Assessment

1. Does the hazard assessment address all credible weapon states, locations, and configurations?

2. Does the hazard assessment address all credible facility states and configurations?

3. Does the hazard assessment address external events?

4. Does the hazard assessment address facility impacts on the process?

5. Does the hazard assessment address all relevant processes, both normal and contingency?

6. Does the hazard assessment address worker health and safety, public health and safety, facility damage, and environmental impact?

7. Does the hazard assessment address multiple events?

8. Does the hazard assessment systematically address dependencies between events?

9. Does the hazard assessment document the source for all estimates of frequency and consequence?

10. Does the hazard assessment include an analysis of human reliability?

11. Are the accident sequences, and the estimates for event frequency and consequence based on and reviewed by subject matter experts?

12. Is there a documentation trail from final risk estimates back to source documents or expert judgments?

13. Have all hazard assessment issues been addressed and documented?

14. Was the hazard assessment performed consistent with standard industry practices?

15. Were facility and process walk-downs performed as part of the hazard assessment?

16. Has the hazard assessment identified safety-critical tooling and procedural steps?

17. Does the hazard assessment analyze the consequences of the dominant credible accidents?

18. Does the hazard assessment provide sufficient quantitative analysis to demonstrate why potential accident sequences leading to HE detonation or nuclear detonation are deemed incredible?

19. Does the hazard assessment address all hazards from process specific industrial hazards up to and including nuclear detonation?

20. Does the hazard assessment identify safety class/safety significant structure, systems, and components?

21. Does the hazard assessment identify weapon specific operational safety controls (OSC's)?

22. Does the hazard assessment identify safe guards, both preventive and mitigative, designed to minimize dominant risks?

23. Does the hazard assessment address weapon critical safety features that cannot have their configuration verified by non-intrusive means prior to disassembly?

24. Does the hazard assessment identify procedural steps with a potential for significant adverse consequences given a human error or equipment failure?

25. Does the hazard assessment employ human factors data and analysis techniques to determine the likelihood of accident sequences resulting from human error?