

## CHAPTER 5

### SAFETY STUDIES AND REVIEWS

#### A. GENERAL

The Military Department evaluates system safety throughout the life cycle of a nuclear weapon system, including Allied systems that will use U.S. nuclear weapons, for which the Military Department has cognizance. One method used is periodic safety studies and reviews performed by a Military Department NWSSG. A NWSSG evaluates current information about the nuclear safety of the weapon system, observes weapon system operations, and makes assessments of the nuclear weapon system on DoD nuclear weapon system safety policy and standards. A NWSSG may recommend draft safety rules, technical and operational procedures, and other positive measures to maximize safety consistent with operational requirements. This Chapter describes NWSSGs and their activities, and identifies the different types of safety studies and reviews. It provides the guidelines for the conduct of safety studies and reviews and outlines the process for the preparation, coordination, and approval of associated safety documentation.

#### B. NUCLEAR WEAPON SYSTEM SAFETY GROUPS

1. General. Detailed nuclear weapon system safety studies and reviews are conducted periodically throughout the DoD life-cycle of a nuclear weapon system by NWSSGS. A NWSSG is convened for a particular study or review by the Military Department and is operated for its duration by the Military Department. A NWSSG Chair is selected by the convening Military Department. NWSSGS provide one means of assessment of nuclear weapon system safety but have no oversight responsibility. NWSSG member organizations remain informed through their applicable chains of command. Based on its evaluations, the NWSSG may also recommend draft safety rules for operation of the nuclear weapon system to ensure that it continues to meet the four DoD Nuclear Weapon System Safety Standards. Alternately, the NWSSG may draft safety rules that permit continued operations with an identified vulnerability while maximizing safety consistent with operational requirements. The NWSSG is disbanded when the Military Department accepts its report, which serves as the basis for the Military Department's Nuclear Weapon System Safety Report (NWSSR).

2. Composition. The NWSSG is composed of military and civilian professionals from the Military Departments, the U.S. Strategic Command (USSTRATCOM), the DSWA, and the DoE. Other Combatant Commands or any additional commands and Agencies with responsibility for nuclear weapon system safety may be included as considered applicable by the Military Department. Members will be assigned for the duration of the study or review.

3. Responsibilities. NWSSG members shall do the following:

- a. Be knowledgeable of safety policy and procedures.
- b. Identify, analyze, and provide assessments of pertinent nuclear weapon system safety-related information and operations.
- c. Be able to convey to the NWSSG the unique operational requirements of their organization, parent command, and the Department of Defense.

d. Independently formulate their judgments when assessing whether the system meets the DoD nuclear weapon system safety policy and standards.

e. The Chair of the NWSSG is responsible for all aspects of a given safety study or review, including preparation, conduct, and reporting. The Chair shall conduct the study in the schedule and scope specified by the convening authority and ensure complete coverage of safety-related issues. The Chair is also responsible for ensuring that all minority opinions are recorded in the NWSSG report.

#### **4. Member Qualifications**

a. The NWSSG Chair should be a military grade O-6 or civilian equivalent (or at a minimum be a military grade O-5, or senior, or civilian equivalent), and have nuclear weapon experience necessary to meet their responsibilities.

b. NWSSG members shall have the following:

(1) Minimum military grade O-4 or civilian equivalent. Exceptions will be approved by the Chair.

(2) Extensive operational or technical experience with nuclear weapon systems and experience or training in evaluation techniques applicable to the DoD nuclear weapon system safety standards.

(3) No direct responsibility for the design, development, or production of the specific nuclear weapon system under evaluation.

c. NWSSG members are encouraged to complete the applicable curriculum of the safety training program outlined in Chapter 9.

#### **5. Membership Roles**

a. The Military Department member(s), USSTRATCOM member, or other invited Combatant Command members, as applicable, provide a combination of operational experience and technical expertise to support thorough evaluation of nuclear weapon system safety.

b. The USSTRATCOM member, or other invited Combatant Command members, as applicable, provide current knowledge in nuclear weapon mission requirements.

c. The DSWA member will represent the interests of the Chairman of the Joint Chiefs of Staff and the OSD.

d. The DoE member represents the nuclear weapon design and development aspects of nuclear weapon system safety and provides technical knowledge of the warhead.

#### **6. NWSSG Advisors**

a. Advisors may be invited by NWSSG members, as approved by the Chair.

b. Advisors must have relevant technical knowledge of nuclear weapon systems, or specific technical knowledge or operational experience with the design, development, production, or operation of the nuclear weapon system under evaluation.

c. Advisors are encouraged, but are not required, to have completed the safety training program outlined in Chapter 9.

d. Advisors do not have a formal voice in NWSSG proceedings and may not submit findings, observations, or minority opinions. They are encouraged to make contributions to NWSSG briefings, discussions, and deliberations, through the member whom they represent, to clarify points of discussion on issues raised by their sponsor or another NWSSG member. Advisors may participate in such discussions, but their input will be limited by their advisor status.

### C. TYPES OF STUDIES AND REVIEWS

1. The different types of safety studies and reviews include: Initial Safety Study (1SS), Preliminary Safety Study (PSS), Interim Safety Study (I NSS), Pre-Operational Safety Study (POSS), Operational Safety Review (OSR), Special Safety Study (SSS), and Transportation Safety Study (TSS). Those studies and reviews, when conducted, are normally performed in relation to specific phases of the joint DoD/DoE life-cycle process (figure 5-1).

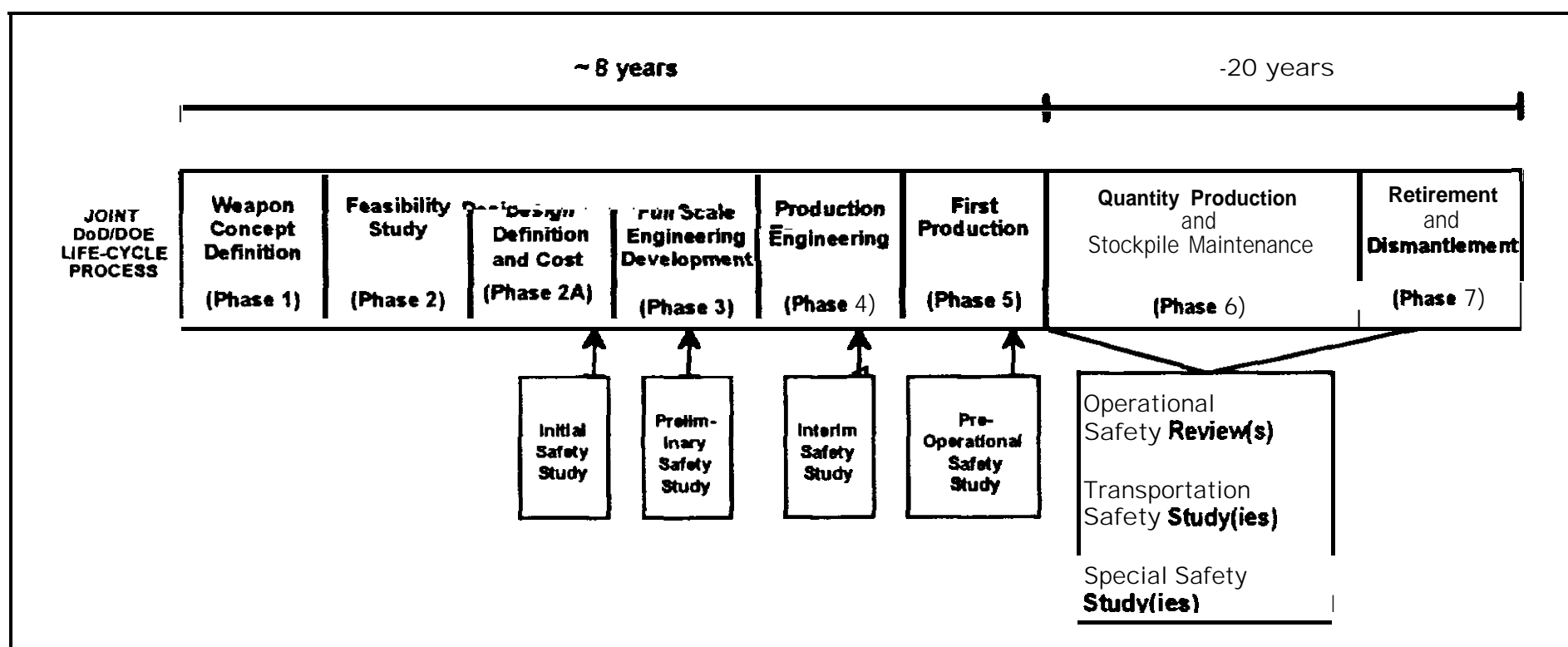


Figure 5-1. Integration of Safety Studies and Reviews with the Joint DoD/DOE Life-Cycle Process

2. Appendix B describes the purpose, timing, and scope of each study and review. It also identifies the linkages between the safety program and joint DoD/DoE life-cycle activities. Additional information on the joint DoD/DoE life-cycle process and its relationship to the DoD Nuclear Weapon System Safety Program is in Chapter 10.

### D. STUDY AND REVIEW PROCEDURES

#### 1. Prestudy and Review Requirements

a. The Military Department shall request and consider recommendations from the NWSSG member organizations regarding the scope and agenda of the study or review and shall distribute a convening letter and an agenda to member organizations.

b. A Military Department data package shall be provided to NWSSG member organizations at least 30 days before the start of a study or review. That package includes at a minimum:

(1) Technical description and concept of operations for the nuclear weapon system. That information subsequently becomes “Part A of the Military Department safety rules package.

(2) Description of the safety features incorporated into the nuclear weapon system. That information subsequently becomes “Part B of the Military Department safety rules package.

(3) Current or draft safety rules or draft changes to current safety rules as proposed by the Military Department. That information is “Part C” of the Military Department safety rules package.

c. The Military Department shall request, through the ATSD(NCB), that the DoE provide the following information at the study site:

(1) Warhead descriptions including history of alterations and modifications, status of the Major Assembly Release (MAR), and operating modes.

(2) A summary of the warhead design safety features, including use control, that support the weapon safety theme.

(3) An assessment of how the design safety features support the MCS and the DoD nuclear weapon system safety standards, including a summary of environments in which inherent weapon design characteristics alone are inadequate to meet the MCS.

d. The Military Department shall review the following material and make it available to the NWSSG at the study site, as applicable:

(1) JNWPS TPs and Service technical manuals.

(2) Pertinent material from previous Military Department NWSSRs on the specific nuclear weapon system, including approved findings and recommendations.

(3) The most recent POG and DRAAG reports.

(4) A summary of relevant accidents and incidents, nuclear weapons technical inspection results, and unsatisfactory reports.

(5) Technical nuclear safety analyses, as available, that address system features, interfaces, operations such as transportation, and applicable risk assessments.

(6) Applicable operations orders, operations plans, directives, and related materials.

## **2. Conduct of the Study or Review**

a. **Activities.** The NWSSG shall conduct a safety study or review, in accordance with this Manual and Military Department implementing instructions. The NWSSG shall do the following:

(1) Review the Military Department data package.

(2) Review the status of relevant findings, recommendations, and open corrective actions from previous Military Department NWSSRS.

- (3) Receive technical and operational briefings on the weapon system under study.
- (4) Determine if the nuclear weapon system maybe operated safely in the concept of operations. Observe operations with applicable support equipment in a representative sample of operational environments (and in substantially unique operational environments).
- (5) Review technical and operational procedures in TPs and in safety rules, in view of observed operations.
- (6) Examine the STS document, with particular emphasis on storage, maintenance, transportation, and employment operations, to determine that all relevant activities that have safety aspects are reviewed.
- (7) Review potential hazards in normal and abnormal environments identified in the STS document for impact on safety.
- (8) Review the process for the authentication of nuclear control orders at the delivery unit level.
- (9) Review results and recommendations of available inadvertent and unauthorized launch analyses and related software and physical security analyses.
- (10) Examine safety-related use control matters in the context of the second safety standard.
- (11) Examine safety-related security matters in the context of the fourth safety standard.

b. **Determinations.** The NWSSG shall determine if the nuclear weapon system is being operated in a manner that meets the DoD nuclear weapon system safety policy and standards.

(1) If the system meets the standards, the NWSSG shall draft, if applicable, new safety rules or changes to current safety rules or recommend other positive measures to further ensure maximum safety consistent with operational requirements.

(2) If the system may not be verified to meet DoD nuclear weapon system safety standards, the NWSSG shall:

(a) Draft safety rules or other positive measures stating their benefits that will permit continued operations.

(b) Determine operational impacts if the safety rule or other positive measure is not adopted.

(3) If the system does not meet the standards, the NWSSG shall do the following:

(a) Determine nuclear weapon system limitations and constraints that do not allow safe operation of the system; and either,

(b) Determine draft safety rules or other positive measures that will allow the system to meet the standards; or,

(c) Draft safety rules that permit continued operations with an identified vulnerability while maximizing nuclear weapon system safety consistent with operational requirements.

(4) In cases where a weapon system does not meet or cannot be verified to meet the standards, the NWSSG also will identify the following:

(a) Affected part(s) of the STS.

(b) Applicable accident scenario(s), abnormal environment(s), or other factors causing nonconformance with the standards and including the following:

1 Plausible sequences of events that may lead to those undesirable situations.

2 System response(s), if known, to the abnormal environment or other factors causing nonconformance with the standards (e.g., nuclear yield, HE detonation, prearming, launching, or releasing). Credible combinations of abnormal environments should be identified where possible.

(c) Procedures and hardware, if any, that are identified as “deficient.”

(d) Specific limitations imposed on system operations will be identified and justified in the safety rules package.

(5) If the NWSSG majority determines that hazardous conditions exist, the NWSSG Chair may recommend immediate constraints on nuclear weapon system operations or cessation of operations for the nuclear weapon system. If such action is recommended, the Military Department shall be notified through the fastest means of communication. Notification shall include minority opinions. The NWSSG must also recommend the conditions that must be satisfied before operations may resume.

c. Reporting Requirements. The NWSSG shall prepare a NWSSG report, in accordance with the format specified in Appendix C.

(1) The “record paper copy” Report must be signed by all members participating in the safety study or operational review. The NWSSG report shall not be changed following the signature of the NWSSG members other than to correct administrative errors.

(2) The report shall be forwarded to the Military Department in 2 weeks following completion of the study. Copies of the NWSSG report shall be distributed to NWSSG member organizations.

### 3. Post Study or Review Requirements

a. On receipt of the NWSSG report, the Military Department shall do the following:

(1) Notify the ATSD(NCB) of the completion of the study.

(2) Approve or disapprove, with applicable rationale, the findings and recommendations in the NWSSG Report. The Military Department may require the NWSSG to provide additional information. A corrective action shall be identified for each approved recommendation, as appropriate.

(3) Use the NWSSG report, including minority reports, as the basis for preparation of a Military Department NWSSR and a safety rules package, in accordance with the formats specified in Appendix C, as applicable.

b. The Military Department shall distribute the Military Department NWSSR in 4 months of receipt of the NWSSG report, or in time to support the coordination of the safety rules package, whichever comes first, to: the ATSD(NCB); the NWSSG member organizations; the Chairman of the Joint Chiefs of Staff and the Military Department nuclear weapon system lead project officer (or managers, as applicable) for information.

### E. MILITARY DEPARTMENT SAFETY RULES PACKAGE

When the NWSSG report includes draft safety rules or changes to existing safety rules, the Military Department shall, simultaneously with the preparation of the NWSSR, prepare a Military Department safety rules package for separate coordination and approval. (See figure 5-2) The format for the safety rules package is in Appendix C.

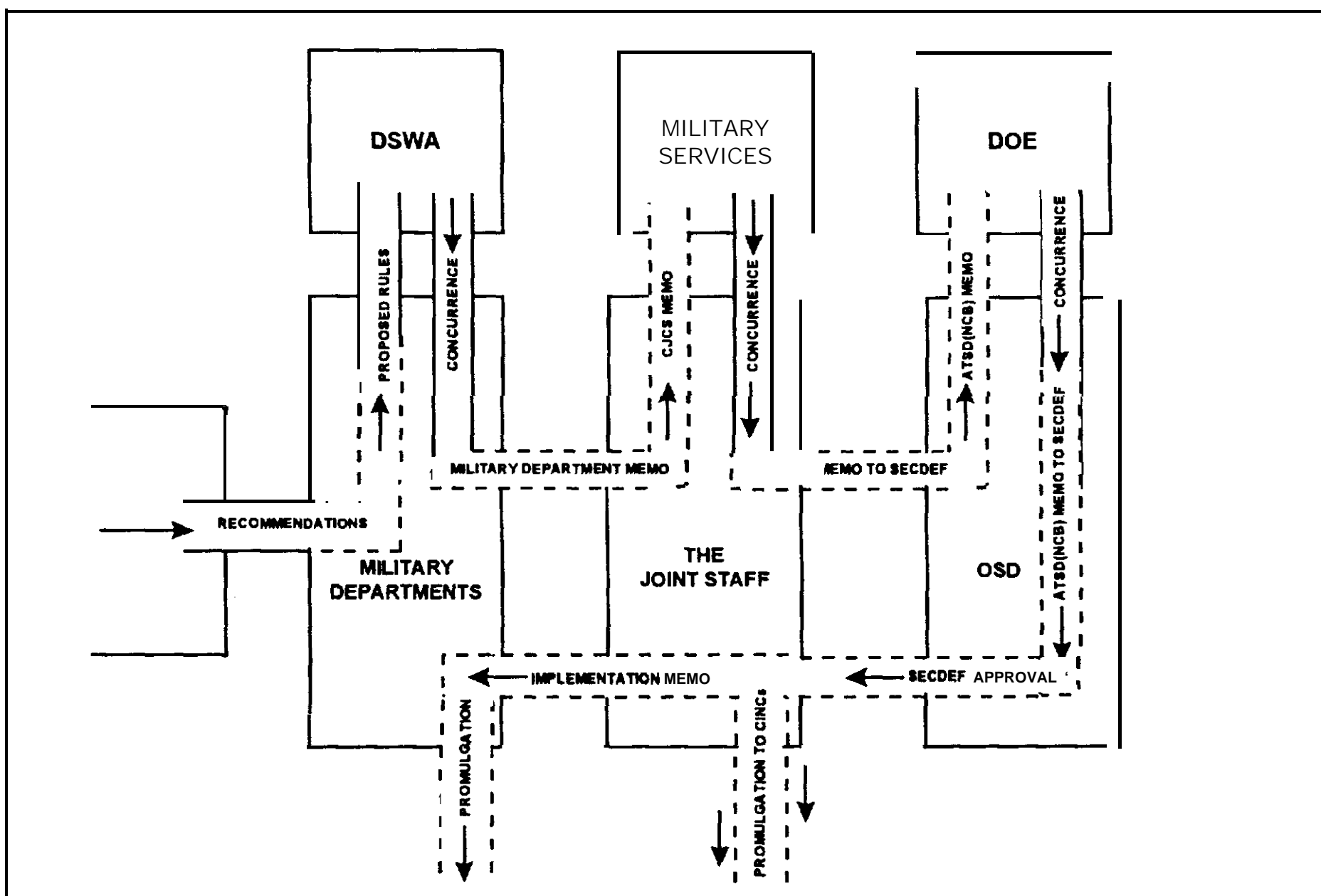


Figure 5-2. Safety Rule Coordination Process

1. The safety rules package coordination and approval process must be conducted as expeditiously as possible and includes the following:

a. An internal review by the Military Department of the draft safety rules recommended by the NWSSG and preparation of a safety rules package presenting Military Department-proposed safety rules.

b. Military Department coordination with the Defense Special Weapons Agency participating in the study.

c. The Chairman of the Joint Chiefs of Staff coordination with all Services, concurrence by the Chairman of the Joint Chiefs of Staff, and a recommendation for approval by the Chairman of the Joint Chiefs of Staff to the Secretary of Defense.

d. ATSD(NCB) coordination with the DoE. The DoE recommendations will be coordinated with the Chairman of the Joint Chiefs of Staff, the Military Department, and the DSWA.

e. Recommendation for approval by the ATSD(NCB) to the Secretary of Defense.

f. Approval of proposed safety rules by the Secretary of Defense.

g. Distribution of the safety rules by the Chairman of the Joints Chiefs of Staff to the DoD Components, as applicable.

h. Implementation of safety rules by the DoD Components, as applicable.

2. The following guidelines apply to all safety rules package processing:

a. Proposed alterations to the safety rules package during processing must be coordinated with the applicable Military Department before transmittal to the DoE for coordination. Issues arising from DoD coordination of safety rules packages shall be resolved by the ATSD (NCB).

b. The Secretary of Defense approval of all safety rules is contingent on Parts A and B of the safety rules package remaining substantively unchanged from the Military Department Data Package considered during the safety study or review.

c. The Chairman of the Joint Chiefs of Staff may request that the Secretary of Defense grant interim approval of the proposed safety rules when circumstances dictate approval in a time period that does not permit completion of the formal coordination process. The ATSD(NCB) will provide the interim safety rules package to the DoE with a 7-day suspense. Interim approval of safety rules will be effective for a maximum of 6 months and does not negate the requirement for final processing of a safety rules package. Interim approval of safety rules permits acceptance of custody, routine peacetime storage, maintenance, training, inspection, transportation and deployment activities. It does not permit nuclear weapons to be used in exercises, nor does it permit operations with nuclear weapons except in response to a valid nuclear release order. If final processing of safety rules is not completed in the 6-month period, the Military Department must request an extension.

d. Approved safety rules shall be disseminated by the Chairman of the Joint Chiefs of Staff to the applicable DoD Components. Unless otherwise specified, safety rules and revisions to approved safety rules shall be implemented within 30 days of Secretary of Defense approval. System specific safety rules must be in effect before the DoD Components can accept custody of, or conduct any operations with, nuclear weapon systems.

e. Safety rules remain in effect until rescinded by the Chairman of the Joint Chiefs of Staff. The Secretary of Defense shall be informed of any rescision.

3. Administrative Changes



a. An administrative change is a nonsubstantive change to the safety rules, such as changes in nomenclature, deletion of weapons or delivery vehicles from the inventory, or word changes that do not affect substance.

b. Administrative changes to safety rules are proposed by the Military Department, shall be coordinated with the DSWA and the Chairman of the Joint Chiefs of Staff, and are approved by the ATSD(NCB). Proposed administrative changes must be accompanied by appropriate rationale.

c. Administrative changes must meet the following specifications:

(1) There is no change in established safety policy or judgments on the nuclear weapon system.

(2) There is no substantive change to the concept of operations on which safety rules are based.

(3) There is no change to the nuclear safety features in either the weapon(s) or the delivery vehicle.

(4) There is no change to specific restrictions as in the approved safety rules.

d. Administrative changes, when approved, will be provided to the DoE.

#### **F. INFORMATION REQUIREMENTS**

1. The Military Department shall provide an Annual Safety Status Report to the ATSD(NCB) on July 1. The Report shall describe the status of open corrective actions for each of the approved NWSSG findings and recommendations from completed studies and reviews. Information copies of the report will be provided to the Chairman of the Joint Chiefs of Staff and the DoE.

2. The information requirement identified above has been assigned DoD Internal Report Control Symbol DD-A&T(A)1994, *Annual Safety Status Report*, in accordance with DoD 8910.1 - M (reference (j)). Additional reports of finding, plans, policies, procedures, publications and courses of action described in this manual are exempt under Section E.4 of (reference (j)).