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Safety

**NONNUCLEAR MUNITIONS SAFETY
BOARD**

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This publication implements Air Force Policy Directive (AFPD) 91-2, *Safety Programs* and Department of Defense Instruction (DODI) 6055.16, *Explosives Safety Management Program*, consistent with Air Force Instruction (AFI) 63-101, *Acquisition and Sustainment Life Cycle Management* and MIL-STD-882D, *Systems Safety*. It prescribes Air Force (AF) Nonnuclear Munitions Safety Board (NNMSB) operation and defines its membership and mission. This instruction also outlines procedures and responsibilities for conducting and reviewing safety studies on nonnuclear munitions, components, or related items that the AF has an operational, test, development, procurement or management responsibility for. It explains the safety verification and approval process for new or modified nonnuclear munitions and applies to all AF organizations assigned a mission or function involving nonnuclear munitions, including the AF Reserve and the Air National Guard (ANG). This publication may be supplemented at any level, but all direct Supplements must be routed to the OPR of this publication for coordination prior to certification and approval. Refer recommended changes and questions about this publication to the Office of Primary Responsibility (OPR) using the AF Form 847, *Recommendation for Change of Publication* and route AF Form 847s from the field through the appropriate functional's chain of command. Ensure all records created as a result of the processes prescribed in this publication are maintained in accordance with AF Manual (AFMAN) 33-363, *Management of Records*, and disposed of in accordance with AF Records Information Management System (AFRIMS) Records Disposition Schedule (RDS) located at <https://www.my.af.mil/afirms/afirms/afirms/rims/cfm>.

SUMMARY OF CHANGES

This document is substantially revised in format and organization and must be completely reviewed.

This revision reflects changes in guidance and procedures dealing with AF explosives safety standards. Major changes include incorporation of procedures to harmonize the NNMSB procedures with that of the Joint munitions safety review process. In addition, procedures with respect to non AF use ammunition in the Joint safety review process have been updated. Also, revisions have been made to the organization of the NNMSB to accommodate changes to MAJCOM organizations over the last thirteen years.

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Chapter 1

INTRODUCTION

1.1. Purpose. The purpose of this instruction is to establish the AF NNMSB, describe its purpose, operations, and scope of authority, and implement its safety policies and procedures.

1.2. NNMSB Members and Advisory Personnel.

1.2.1. NNMSB Members. The NNMSB is comprised of experienced individuals designated by their command or agency. Members must have expert knowledge of AF nonnuclear munitions, related systems, and associated operational safety policies and procedures, and must be able to act as AF technical authorities for the purposes of the NNMSB.

1.2.1.1. Members must also be knowledgeable of their command's unique policies, procedures and operational limitations and constraints. They will staff within their commands or agencies all read-ahead material, resolve differences, and bring command positions to the board meetings. In addition, members will thoroughly evaluate each study and review documents prior to an NNMSB meeting.

1.2.1.2. Members actively participate in all NNMSB meetings. Members present their command's position and strive to resolve all conflicts based on the best interest of the AF. Members will arrange for a proxy when attendance at a meeting is not possible. When notified of appointment to the NNMSB, a new member will arrange for an orientation with the Executive Secretary. This orientation may be done in conjunction with a normally scheduled convening of all board members. If this option is used, the new member will coordinate his/her orientation with the Executive Secretary at least two weeks prior to the meeting.

1.2.1.3. Members must possess the authority needed to ensure a comprehensive technical review within their command or agency of the safety studies and analyses on which NNMSB safety evaluations are based. The NNMSB membership is composed of one voting representative from each of the following commands and agencies:

1.2.1.3.1. Headquarters (HQ) Air Combat Command (ACC)

1.2.1.3.2. HQ Air Education & Training Command (AETC)

1.2.1.3.3. HQ Air Force Global Strike Command (AFGSC)

1.2.1.3.4. HQ Air Force Materiel Command (AFMC)

1.2.1.3.5. HQ Air Force Reserve Command (AFRC)

1.2.1.3.6. HQ Air Force Space Command (AFSPC)

1.2.1.3.7. HQ Air Force Special Operations Command (AFSOC)

1.2.1.3.8. HQ Air Mobility Command (AMC)

1.2.1.3.9. HQ Pacific Air Forces (PACAF)

1.2.1.3.10. HQ United States Air Forces in Europe (USAFE)

1.2.1.3.11. Air Force Operational Test and Evaluation Center (AFOTEC)

1.2.1.3.12. Air National Guard (ANG)

1.3. Chairperson and Member Duties.

1.3.1. The AF Chief of Safety, AF/SE, designates the Chairperson with the grade of Colonel (or civilian equivalent) or above. The Chairperson, or his/her designated representative, presides at NNMSB meetings. For a given matter before the Board, the Chairperson casts a vote only when a ballot of members present results in a tie.

1.3.1.1. Members from HQ ACC, HQ AFMC, HQ AMC, HQ PACAF, HQ USAFE, and AFOTEC constitute a quorum for conducting NNMSB business. Under unusual situations, such as a short notice or conflicting requirements, quorum members may delegate their votes to another quorum member (proxy), provided the proxy member and the NNMSB chairperson agree to the delegation. When the NNMSB reviews nonnuclear munitions where operational use is limited to other commands (e.g., HQ AFSOC), the members from those commands will be included in the quorum requirements.

1.3.1.2. Advisory Personnel. Advisory personnel (e.g., Explosive Ordnance Disposal (EOD), Air Logistics Center personnel) are invited to attend NNMSB meetings, as required. At times attendance by such advisors may be essential to the effective conduct of NNMSB business. Advisors do not exercise a vote during the formal proceedings. If the membership holds that inadequate advisory expertise is present to allow proper evaluation of munitions, then at the discretion of the Chairperson, review of the item may be postponed until a subsequent meeting.

1.3.1.2.1. The Chairperson approves the composition of special ad hoc groups to provide NNMSB-related review and advisory services to special access programs.

1.3.1.2.2. If not designated as the Chairperson, AFSC/SEW will provide the NNMSB with a representative to function as an advisor or consultant to the NNMSB at every meeting.

1.3.1.2.3. Individual NNMSB members may invite advisors and consultants, and will notify the Executive Secretary of those attendees well in advance of the meeting.

1.3.1.2.4. If the Chairperson, the Executive Secretary, or member anticipates that operational limitations may be imposed as a condition of certification of munitions for operational use, the Executive Secretary will advise the affected organization requesting NNMSB review. In addition, that organization will request participation by one or more advisory representatives of the affected AF Secretariat or Air Staff offices.

1.3.1.2.5. Representatives, advisors, and consultants from other HAF offices or government agencies, as required, will be invited to attend NNMSB meetings when their munitions (or munitions requiring their expertise) are under review.

1.3.1.2.6. Other advisors whose attendance may be appropriate are representatives of the AF procuring or modifying activity, the responsible test organization, and the user organization or unit.

1.3.1.2.7. Knowledgeable medical personnel shall be invited to attend when items under review contain chemical agents; depleted uranium; radiant energy from electronic, optical, or sonic sources; or other biomedical hazards.

1.3.2. The NNMSB may conduct joint reviews with the weapons safety certification bodies of other services for joint development programs. Joint reviews will normally be co-chaired, and can include participation of members from multiple Services. The NNMSB, however, reserves the prerogative to deliberate separately on a particular issue to achieve an AF position. Joint meeting minutes may also serve as official NNMSB minutes.

Chapter 2

NNMSB MISSION AND RESPONSIBILITIES

2.1. NNMSB Mission.

2.1.1. The NNMSB functions as an overall design review authority and System Safety Group (SSG) for nonnuclear munitions and conducts assessments, approvals, and certifications throughout munitions research, development, test and evaluation, production, deployment, and operational life cycle.

2.1.2. For nonnuclear munitions intended for operational use by the AF, the NNMSB:

2.1.2.1. Reviews and establishes design safety and qualification test criteria, standards, and requirements for nonnuclear munitions and related items.

2.1.2.2. Provides guidance to program management authorities throughout the life cycle of munitions programs and ensures criteria for safety certification reviews receive adequate consideration during the design, development, test evaluation, and operational deployment phases.

2.1.2.3. Maintains safety awareness over all new or modified nonnuclear munitions, including those developed by the AF, those obtained from other US military services, and those obtained from foreign sources.

2.1.2.4. Ensures safety certification or approval by another service or government does not replace the required NNMSB review and approval. However, certification and approval actions conducted jointly with another service's certification/approval authority may satisfy the NNMSB review and approval process.

2.1.2.5. Ensures a munitions or equipment item that is safety certified under the AF Nuclear Safety Certification Program (AFI 91-103, *Air Force Nuclear Safety Design Certification Program*) is certified for nonnuclear use, provided the nonnuclear portion of the system was evaluated. Such nuclear certified munitions and equipment items are not reviewed by the NNMSB unless specifically requested by a NNMSB member.

2.1.2.6. Verifies whether loss of nuclear certification (e.g., restricted from use or removal from the Master Nuclear Certification List (MNCL)) has resulted in the loss of nonnuclear certification.

2.1.2.7. Retains review and SSG authority and responsibility for nonnuclear munitions developed, procured, or otherwise obtained by the AF but not intended for AF operational use.

2.1.2.8. When requested, reviews nonnuclear munitions items intended solely for foreign military sales (FMS). These items are reviewed, but not certified, by the NNMSB even without an AF end user. This ensures these items receive the same level of design safety review as munitions that are certified by the NNMSB.

2.1.3. During the conduct of its safety study and review program, the NNMSB:

2.1.3.1. Ensures that munitions are evaluated against AF safety criteria, standards, and requirements and evaluations are based on analysis results and data obtained from engineering, development, and operational testing.

2.1.3.2. Verifies (through results of evaluations) that required level of design and performance safety is achieved during all of a munitions item's life cycle. An item's life cycle includes all phases of development, production, and AF operational use (including transportation, handling, maintenance, employment, and disposal) from program initiation through item removal from the AF inventory.

2.1.3.3. Reviews the safety aspects of explosives operations, when requested by a NNMSB member or HAF office, and recommends to the responsible organization actions to improve safety or occupational health provisions of the operation.

2.2. Systems, Munitions and Components to be Evaluated.

2.2.1. Aspects of munitions systems, such as add-on components, software, and off the shelf equipment, will be evaluated as integral parts of the systems to which they belong. The following nonnuclear munitions systems, subsystems, components, and related equipment items, except as noted, are within the purview of the NNMSB:

2.2.1.1. Nonnuclear Explosive Devices. All types of warheads, projectiles, bombs, mines, and grenades (plus their training configurations) capable of producing a hazardous reaction and implements of war or training, including nuclear weapon training shapes containing conventional explosives.

2.2.1.2. Nonnuclear Missiles (and Thrust-Augmented Munitions). This category includes nonnuclear missiles designed for air-to-air, air-to-ground, air-to-space, ground-to-ground, ground-to-air, and ground-to-space.

2.2.1.3. Release, Control, Suspension, and Dispersal Devices. All suspension systems (for example racks, launchers, rails), dispensers, or packaging devices used to contain or disperse nonnuclear explosive devices, or used as the direct launching platform for a complete nonnuclear munitions system.

2.2.1.4. Safing, Arming, and Target-Detecting Devices. All components used to safe, arm, and/or fire nonnuclear explosive devices or propulsion devices, including all fuzes and explosive or pyrotechnic transfer elements. Also, this category includes all components of munitions used to detect a target and issue signals for initiation of the kill mechanism (warhead, bomb, etc.).

2.2.1.5. Guidance and Control Mechanisms. All components integral to a nonnuclear munitions system used to direct a munitions item from the launching platform to the target. These include aerodynamic control surfaces, thrust vectoring devices, and retardation devices, and their associated control logic, seekers, and stored-energy sources.

2.2.1.6. Igniters and Initiators. All devices used in igniting or directing the initiation of nonnuclear explosive or pyrotechnic devices, fuzes, propulsion devices, stored-energy sources, or dispersal and suspension devices.

2.2.1.7. Guns and Ammunition. All guns and associated control, safing, and firing mechanisms, and all gun-fired ammunition (includes aircraft guns and small arms).

Ammunition propellant will be certified for stability if it is not in the Department of Defense (DoD) inventory.

2.2.1.8. Miscellaneous. Flares and markers, pyrotechnics, photoflash devices, explosive dispensers or decoy devices, explosives simulators, destructors, missiles, remotely piloted vehicles (RPV) that are intended to carry, launch, and fire or release nonnuclear munitions, demolition material, explosive ordnance disposal (EOD) equipment using explosives or controlling the initiation of explosives, chemical agents and dispensers, training and scoring items, targets that contain hazardous components, and other munitions-related explosive items.

2.2.1.9. Propulsion Devices. Rocket motors and engines that produce thrust by release of energy and used to propel any of the devices or mechanisms defined in paragraphs 2.2.1.1 through 2.2.1.8 above.

2.2.1.10. Support and Test Equipment. All handling, storage, test, maintenance, and transport equipment for use with or in support of nonnuclear munitions, including locally manufactured equipment, data scanners, and radio frequency identification device (RFID) systems and components. Test equipment includes commercially available equipment, used for testing safety critical functions (for example, arming or firing circuits) of nonnuclear munitions systems, subsystems, and components.

2.2.1.11. Directed Energy. Some devices and/or delivery systems considered to be weapons or weaponized items will be evaluated. This evaluation may be done in conjunction with the Directed Energy Weapons Certification Board as directed in AFI 91-401, *Directed Energy Weapons Safety*.

2.2.2. In accordance with AFI 51-402, *Legal Reviews of Weapons and Cyber Capabilities*, the Judge Advocate General will ensure all weapons being developed, bought, built, or otherwise acquired, and those modified by the AF are reviewed for legality under international law prior to their use in a conflict.

2.3. Exclusions.

2.3.1. The NNMSB does not evaluate the following areas:

2.3.1.1. Explosive components of aircraft egress and life support systems.

2.3.1.2. Non-Airborne launched RPVs (for example: target, decoy, and surveillance drones) except their explosive flight termination systems or unless the vehicle is designed to deliver nonnuclear munitions. However, a non-airborne launched RPV will be reviewed by the NNMSB at the request of the program office or an NNMSB member.

2.3.1.3. Nuclear, nuclear missile, or space systems requiring separate SSGs.

2.3.1.4. General purpose equipment such as ground transport and passenger vehicles and commercial forklifts.

2.3.1.5. Aircraft-munitions interface equipment whose functional characteristics (mechanical and electrical) are under configuration control of the aircraft design authority. By contrast, interface equipment whose characteristics are under configuration control of a munitions item design authority is addressed in paragraph 2.2.1.3 above.

Chapter 3

NNMSB GENERAL AND TECHNICAL SAFETY FUNCTIONS

3.1. General NNMSB Functions. The following applies to all nonnuclear munitions systems, subsystems, components, and associated support equipment the NNMSB reviews.

3.1.1. NNMSB approval is required prior to airborne testing of live-loaded uncertified munitions and initiating devices.

3.1.2. Prior to entry of new nonnuclear munitions into the AF inventory, regardless of source, a HAF certification for operational use is required. Certification will normally be based on NNMSB recommendation. Safety certification or approval by another US military service or foreign government does not replace NNMSB review and certification requirements.

3.1.3. No munitions or related equipment items will be released for operational use until adequate technical data (maintenance, storage, loading, EOD procedures, etc.) are available to the user. Final certification will not be recommended by the NNMSB until final technical order and final hazard classification actions have been completed.

3.2. Technical Safety Functions.

3.2.1. The NNMSB is charged with accomplishing the following technical safety functions:

3.2.1.1. Tailoring design safety criteria and standards and establishing safety performance requirements for nonnuclear munitions systems, subsystems, components, and related items the NNMSB reviews and evaluates.

3.2.1.2. Identifying and evaluating hazards in the design of munitions systems, subsystems, components or related items using the system safety engineering principles outlined in the current revision of Military Standard 882 (MIL-STD-882D). In addition, the NNMSB recommends methods to reduce the risk of hazards identified during NNMSB proceedings to obtain a level acceptable to the AF.

3.2.1.3. Establishing or approving procedures and warnings to help protect personnel, equipment, and property when risks cannot be adequately controlled through design provisions.

3.2.1.4. Developing safety recommendations, which minimize risk during the life cycle of nonnuclear munitions, taking into consideration the mission requirements, employment concepts, and operating environments.

3.2.1.5. Minimizing retrofit actions required to improve design safety. The NNMSB accomplishes this by identifying and including safety design criteria during the development phase of munitions systems, subsystem, component or related item.

3.2.1.6. Using historical safety data and lessons learned from similar munitions programs to help evaluate new designs.

3.3. Insensitive Munitions Technical Working Group (IMTWG).

3.3.1. The IMTWG is an established subgroup of the NNMSB and assists and acts on behalf of the NNMSB with respect to its role in the AF Insensitive Munitions (IM) program. The

IMTWG serves as a source of expertise to advise the NNMSB on all matters pertaining to IM program management and technical requirements. The IMTWG briefs current activities to the NNMSB during regularly scheduled meetings.

Chapter 4

CERTIFICATION, STUDIES, TEST, AND SAFETY STANDARD FUNCTIONS

4.1. Overview. NNMSB design safety certification action is required for nonnuclear munitions prior to entry into the AF operational inventory and is accomplished through review of various safety studies and test results. In addition, the NNMSB will not recommend final certification until adequate technical data is available to the user.

4.2. Certification.

4.2.1. A design safety certification is based on a Technical Munitions Safety Study (TMSS) or Munitions Safety Analysis (MSA) reviewed during a regular or special meeting.

4.2.1.1. The TMSS is a comprehensive safety study of nonnuclear munitions, used to document safety engineering evaluations and to submit safety findings for NNMSB review. The TMSS must contain sufficient information to fully support the certification recommendations formulated by the board.

4.2.1.2. The MSA is a less comprehensive safety study than the TMSS and is typically prepared for munitions support equipment and less complex systems (e.g. countermeasure flares, flight termination systems for drones) that have a minor impact on safety. Like the TMSS, the MSA must fully support NNMSB positions.

4.2.2. Although the MSA is not subject to HAF approval after NNMSB review (except as noted below in paragraph **4.2.6**), the MSA should not be used as the basis for Board action when a certification issue regarding higher level management attention is expected, regardless of the development status or intended use of the item under review. The Executive Secretary is available to provide guidance as to the appropriateness of the MSA versus the TMSS for any given item.

4.2.3. A non-complex review and approval or certification actions under NNMSB purview may not require a TMSS, TMSS supplement, MSA, or Test Hazards Assessment Review (THAR) (e.g. use of a modified bomb sling, flight testing of a practice bomb with a spotting charge, or certification of small arms, or small arms ammunition). For such actions, the NNMSB has delegated approval or certification authority to the Executive Secretary. Each item certified by the Executive Secretary will be approved through the use of an Executive Secretary Letter. These letters will be maintained on file by the Executive Secretary. At each regularly scheduled meeting of the NNMSB, the Executive Secretary will inform the Board of such approvals or certifications accomplished subsequent to the previous meeting.

4.2.4. The Chairperson and NNMSB members will be provided the draft edition of the TMSS or MSA in sufficient time prior to the scheduled meeting to allow proper review within the members' MAJCOMs. In no case will the review time be less than 25 days (for 2 or less straightforward weapons studies). For ambitious meeting agendas (for example, 4 or 5 studies for complex weapons), some of the draft TMSSs and MSAs will be distributed 45-50 days in advance, to level the members' review work load. Read-ahead information will also be provided for other (non-certification) meeting business requiring a NNMSB decision. Such read-ahead information will be provided at least 14 days prior to the meeting. If any

Board member states insufficient time was provided for a proper MAJCOM review, then the item in question will be removed from the meeting agenda.

4.2.5. If during their TMSS or MSA review, the Board members have questions or identify concerns, they will inform the TMSS or MSA preparing activity so that additional information may be made available at the NNMSB meeting.

4.2.6. Following formal review of the draft safety study, NNMSB design safety conclusions and certification recommendations are included in the TMSS or MSA. The TMSS is then prepared for release to HAF and SAF offices.

4.2.7. The Executive Secretary will maintain up-to-date reference material on the scope, content, level of detail, and format requirements for the TMSS and MSA and will provide appropriate guidance to agencies charged with preparing a TMSS or MSA.

4.3. Test Approval Functions.

4.3.1. The NNMSB issues design safety approvals for testing of uncertified munitions items listed in paragraph 2.2 and initiating devices (e.g. fuzes) involving the airborne launch of munitions from AF aircraft and aircraft not in the AF inventory flown by AF pilots. The captive carriage phase of such flight test programs may be entered prior to NNMSB approval for the live launch phase. NNMSB approval is not required for flight test of new munitions that are inert when loaded.

4.3.2. The basis for the flight test approval is the THAR conducted during a regular or special meeting.

4.3.2.1. Under extraordinary circumstances the Board members may be requested to issue flight test approvals individually in lieu of a formal meeting. In this situation, approval must be unanimous. This procedure may be used only with the agreement of the Chairperson and all quorum members.

4.3.2.2. The Board members and Chairperson will be provided read-ahead information at least 14 days prior to conducting a THAR. Such information may be a simple point paper for non-complex items, or it may be a comprehensive technical data package for test munitions that are potentially more hazardous.

4.3.3. If an NNMSB flight test approval is issued conditional upon completion of follow-on actions, the Executive Secretary will monitor these actions until their completion. If NNMSB flight test approval is not issued, the Executive Secretary will inform the requesting agency of the reasons for non-approval.

4.4. Safety Standards and Functions.

4.4.1. The NNMSB is the AF focal point for the development and/or adoption of design and performance safety standards for nonnuclear munitions.

4.4.2. Once approved by the NNMSB, safety standards and functions play a major role in determining a munitions design safety acceptability during the Board certification process. This applies equally to munitions developed or procured for performance or commercial specifications.

4.4.3. Attachment 3 lists standards currently approved by the NNMSB and considered applicable to the design, development, test, and evaluation of nonnuclear munitions intended for use by AF units.

4.4.4. The Executive Secretary will maintain awareness of applicable national and international standardization activities (including those in the private sector) and offer additional standards for possible NNMSB approval as appropriate. See Attachment 3.

4.4.5. In its capacity as the AF nonnuclear munitions SSG, the NNMSB provides munitions safety guidance to program management authorities responsible for acquisition of nonnuclear munitions. This guidance can be on design safety, analysis, and testing matters that could have a bearing on future certification. Guidance formulated by the NNMSB will be documented in the meeting proceedings. If a program management authority believes this approach might impact acquisition strategy, the NNMSB may direct the Executive Secretary to provide the guidance to the weapons program management authority. All official correspondence associated with NNMSB guidance or Executive Secretary letters will be maintained by the Executive Secretary.

4.5. Non AF Use Ammunition in the Joint Safety Review Process.

4.5.1. The Executive Secretary for the AF NNMSB is the AF representative to joint safety review processes. He/she provides AF coordination for joint weapon systems and munitions that are presented for use by Services/organizations other than the AF.

4.5.1.1. If joint weapon systems and munitions are to be used by AF personnel, the respective agencies must follow the instructions outlined in Section 5.2.1 for the desired systems/munitions in order to support a review by the full NNMSB voting panel in conjunctions with other Service safety review boards for approval/certification, as defined by this AFI.

4.5.1.2. When the NNMSB Executive Secretary receives a request for review by the Joint Safety Boards for joint service approvals of weapons systems and munitions that will not be used by AF personnel, the Executive Secretary will reply that no NNMSB review is required.

4.5.2. To expedite a joint safety review, the convening of a special session or an electronic review by specific members of the NNMSB will be decided by the Board Chairperson.

4.5.3. The Executive Secretary has authority to assign members to an AF review group if needed to review joint weapons systems and munitions for AF or non-AF use.

4.6. Risk Assessment. The NNMSB issues a risk assessment for instances when urgent timelines are not sufficient to support the normal Certification/Test Approval process. The intent of the risk assessment is to evaluate hazards based on information gathered to support an Emergency Operational Capability (EOC) for urgent military operations to ensure the appropriate level of risk mitigation or acceptance is achieved.

4.6.1. Determine acceptability of risks in accordance with MIL-STD-882D, *Systems Safety*.

4.6.2. Determine risk acceptance authority in accordance with DoDI 5000.02, *Operation of the Defense Acquisition System*, AFI 63-101, *Acquisition and Sustainment Life Cycle Management*, and MIL-STD-882D, *Systems Safety*.

Chapter 5

SAFETY STUDIES AND REVIEWS

5.1. Overview. The primary tool used by the NNMSB to evaluate the nonnuclear munitions and related equipment items is a positive safety study and review program set forth in MIL-STD-882D, *Systems Safety*. Application of MIL-STD-882D, *Systems Safety* techniques provides assurance that nonnuclear munitions and associated support and test equipment items, other munitions related items, and all operating procedures and technical data meet the highest safety standards. The safety evaluation process considers design, logistics, and operational requirements throughout a munitions item's life cycle. The program requires maximum use of existing safety documentation and lessons learned.

5.2. Nonnuclear Munitions Safety Study and Review Process

5.2.1. The agency (Program Executive Officers, Designated Acquisition Commanders, System Program Directors, Product Group Managers, Joint Program Offices, etc.) responsible for procuring or modifying nonnuclear munitions, including all nonnuclear missiles and related items specified in paragraph 2.2, is also responsible for ensuring the requirements of this directive are satisfied. These management and responsibilities include:

5.2.1.1. Ensuring a munitions item requiring NNMSB study and review is identified to the Executive Secretary or his/her designated Systems Safety Engineer early in the design or acquisition process. This allows review and certification actions to begin early enough to minimize any affect of the NNMSB review on schedule and procurement costs.

5.2.1.2. Ensuring compliance with all required design safety standards (in paragraph 6.1) and that adequate resources are allocated for explosives hazard classification and insensitive munitions action (including testing as specified in TO 11A-1-47, *DoD Ammunition and Explosives Hazard Classification Procedures* and current revision of MIL-STD-2105C, *Department of Defense Test Method Standard: Hazard Assessment Tests for Nonnuclear Munitions*).

5.2.1.3. Ensuring appropriate safety studies (TMSS, MSA, or THAR) are prepared at the earliest date possible in the development cycle as outlined below. In addition, early reviews by the NNMSB are highly desirable so impacts of safety related design changes, if any, are minimized.

5.2.2. Designated Systems Safety Engineers will work with the responsible agency to ensure:

5.2.2.1. A copy of the study or review documentation is submitted to the Executive Secretary at least 45 days prior to the NNMSB meeting. Final design drawings, electronics diagrams, copies of fault tree analyses, etc. will be provided by the responsible agency no later than 90 days prior to the NNMSB meeting.

5.2.2.2. Review documents and a study or review presentation are provided at the scheduled NNMSB meeting. The purpose of the presentation is to address design safety issues of the items under review and to respond to any concerns or questions the NNMSB members may have. In addition, guidance on presentation scope, level of detail, and format should be requested from the Executive Secretary.

5.2.3. Requests for release of information contained in a staff approved TMSS, MSA, or THAR must be submitted to the Executive Secretary.

5.3. Preparing a Technical Munitions Safety Study (TMSS) (see Attachment 2). The TMSS is a detailed safety study of nonnuclear munitions and is used to document safety engineering findings and to submit safety recommendations for NNMSB review. A TMSS is,

5.3.1. Prepared for nonnuclear munitions and related items of which the NNMSB maintains awareness as specified in this instruction.

5.3.2. Prepared by a HQ AFMC system safety engineering organization or by any other organization possessing sufficient safety engineering expertise.

5.3.3. A document used to present only the necessary design/performance details required for system evaluation and not as a source data for munitions. NOTE: Data in a TMSS may contain proprietary and/or privileged information.

5.3.4. Usually prepared following the start of development, test, and evaluation (DT&E), or following the start of the initial operational test and evaluation (IOT&E) portion of a combined DT&E/IOT&E.

5.3.5. Reviewed by the NNMSB and approved by the appropriate staff agencies prior to entry of production items into the AF inventory.

5.3.6. Forwarded to applicable staff agencies with the NNMSB's recommendations for coordination. Upon staff approval, a NNMSB recommendation becomes a directive on the specified action agencies.

5.4. Preparing a Munitions Safety Analysis (MSA). When the preparing activity decides that munitions support equipment and less complex systems (e.g. countermeasure flares, flight termination systems) has only minor impact on safety, the activity may prepare, with the concurrence of the Executive Secretary of the NNMSB, an MSA instead of a complete TMSS. However, the NNMSB may direct that a complete TMSS be prepared on the item in lieu of the MSA. An MSA is,

5.4.1. Needed to support a conclusion that a munitions item or modification of a munitions item has only a minor impact on safety.

5.4.2. Required for newly designed or modified unique or peculiar support equipment used with nonnuclear munitions. Staff agency review and approval of the MSA is not required.

5.4.3. Prepared by a HQ AFMC system safety engineering organization or by any other organization possessing sufficient safety engineering expertise.

5.4.4. Not used as source data for munitions and should present only the necessary design/performance details required for system evaluation. NOTE: Data in an MSA may contain proprietary and/or privileged information.

5.5. Preparing a Test Hazards Assessment Review (THAR). A THAR is the minimum analysis necessary before live airborne testing of uncertified munition items.

5.5.1. The intent of this assessment is to prevent danger to, or loss of, aircrew and aircraft during live test of uncertified munitions and initiating devices.

5.5.2. Munitions must be approved by the NNMSB for live airborne testing to include items loaded with live energetic material such as bombs, warheads, cluster bomb units, projectiles, rocket motors, flares, bursting charges, or similar devices.

5.5.3. Initiating devices must be approved for live airborne testing to include fuzes, rocket motor arm/fire devices, flare safety and ignition devices, guidance sections, and devices having an influence on initiation, such as retarders, launchers, and suspension racks.

5.5.4. The live flight test approval requirement does not prevent test of uncertified initiating systems when the items are inert filled.

5.5.5. A THAR must contain a physical and functional description of the item and sufficient analysis to ensure the item is safe for use within the controlled test environment. Review and approval of a TMSS or an MSA by the NNMSB satisfies the requirement for a THAR.

5.5.6. A THAR is prepared by a HQ AFMC system safety engineering organization or by any other organization possessing sufficient safety engineering expertise as determined by the NNMSB.

5.5.7. The THAR should not be used as source data for munitions and should be considered to carry the same limitations on disclosure as other safety documentation used expressly for mishap prevention.

5.6. Preparing a Risk Assessment (RA). An RA is for rare instances when urgent timelines are not sufficient to support the normal Certification/Test Approval process.

5.6.1. If Emergency Operational Capability (EOC) is requested by combatant commands to support an urgent military operation, the Program Manager (PM) will submit a RA request through the MAJCOM to AFSC/SEW for NNMSB coordination and approval.

5.6.2. The EOC request must include a Residual Risk Analysis (RRA). An RRA is an overall assessment of a system's suitability for emergency operations from a safety perspective. It should provide all information necessary to make informed risk management decisions. The RRA must include:

5.6.2.1. A risk analysis using the approach outlined in MIL-STD-882D, *Systems Safety*.

5.6.2.2. Recommendations and strategies to mitigate mishap risks exposed through operations or maintenance.

5.6.2.3. A risk mitigation strategy approval by the appropriate Risk Acceptance Authority. Determine the appropriate Risk Acceptance Authority using the highest mishap category of the initial risks (while recommended actions are being incorporated into the design) and residual risks (after all recommended actions have been incorporated). Refer to MIL-STD-882D and to DoDI 5000.02 to determine the required mishap Risk Acceptance Authority.

5.6.3. The PM will submit the operational necessity, the scope of intended use, and the period of time required to be excluded from the normal Certification/Test Approval process.

5.6.4. If approved, AFSC/SEW will provide documentation with the risk assessment to the PM. During the risk assessment period, data should be collected on safety related operational deficiencies and potential system improvements.

Chapter 6

INCORPORATION OF DESIGN SAFETY

6.1. Munitions Design Safety Standards and Criteria.

6.1.1. Mandatory design safety standards for all munitions will be submitted to the NNMSB for HAF approval.

6.1.2. Munitions design safety standards will incorporate a life cycle approach to ensure munitions can be safely handled, stored, and operated in all environments the items can reasonably be expected to experience throughout its life cycle. In addition, ensure munitions meet the requirements of Hazards of Electromagnetic Radiation to Ordnance (HERO) certification.

6.1.3. Munitions design safety standards must be given equal consideration along with logistics and operational requirements.

6.1.4. Design safety standards have been developed for certain types of munitions or components and must be followed. See Attachment 3 for examples of applicable standards.

6.2. Munitions Design Safety Deviations.

6.2.1. Deviations from munitions design safety standards are authorized only with the NNMSB's recommendation and concurrence of AFSC/SEW.

6.2.2. Deviations from munitions design safety standards will not be considered unless alternative design concepts or procedures are provided, with the concurrence of the NNMSB, and meet the intent of the applicable standard.

6.2.3. When munitions design safety deviation is either recommended or not recommended by the NNMSB and approved by AFSC/SEW, the applicable staff agency is the final approval or disapproval authority pending discussion with the NNMSB and review of the associated NNMSB documentation.

Chapter 7

ADMINISTRATIVE PROCEDURES

7.1. Administrative Procedures.

7.1.1. Meeting Frequency. Normally, meetings of the NNMSB are held semi-annually. Special meetings may be called to support time-critical acquisition program activities. Meetings of the NNMSB will be scheduled only by the chairperson or his/her representative; generally not to exceed once each quarter. The Chairperson will decide on a case-by-case basis if the amount of NNMSB business warrants scheduling additional meetings. In addition to these regular NNMSB meetings, special meetings may be held when required to support time-critical munitions development program milestones.

7.1.2. The NNMSB (members and advisory personnel) will meet in formal session when called by the chairperson, or designated acting chairperson.

7.1.3. The Executive Secretary provides meeting notification at least 30 days in advance of a regularly scheduled meeting date.

7.1.4. If a quorum member is not represented and proxy is unavailable, the Chairperson determines if the meeting will proceed with available members.

7.1.5. For special meetings the Executive Secretary informs the requesting agency that funding of the Board members' and Chairperson's travel expenses will be a condition for conducting the special meeting. The Executive Secretary polls members as to their availability before final special meeting dates are established.

7.2. Protocol.

7.2.1. Members will make a concerted effort to reach unanimous agreement for each matter requiring a Board position.

7.2.2. When unanimous agreement is not possible, the majority position is established by open ballot of the members.

7.2.3. The Chairperson casts a vote only when a ballot of the members present (including proxy votes) results in a tie.

7.2.4. Members representing the minority position may, at their discretion, prepare a minority report for inclusion in the official meeting minutes.

7.3. Presentations.

7.3.1. Normally all items appearing in an NNMSB meeting agenda will be supported by a structured presentation. The presentation is intended to answer questions arising during documentation review and to stimulate detailed discussions.

7.3.2. Agencies preparing NNMSB presentations should ensure essential supporting personnel (e.g., AF program management authorities, contractor representatives, etc.) are present to participate as needed during the presentation and discussions.

7.3.3. The Executive Secretary provides appropriate guidance to agencies charged with preparing and delivering NNMSB presentations.

7.4. NNMSB Requirements.

7.4.1. During a formal session, complete a comprehensive review of any TMSS, MSA, or THAR presented for developmental, prototype, and existing nonnuclear munitions and associated support equipment.

7.4.1.1. Reviews consider related issues such as the potential requirement for shields and barricades during electrical testing, the safety adequacy of packaging concepts, the availability of required technical data, and EOD procedures.

7.4.1.2. Identify areas of design safety deficiency relative to items under review. Specify conditions for certification when such deficiencies are noted.

7.4.2. Develop or review design safety standards, and recommend the adoption for AF use as appropriate.

7.4.3. Recommend policies, controls, and procedures to minimize hazards during nonnuclear munitions operations.

7.4.4. Charter special projects and ad hoc groups, as required.

7.5. Meeting Minutes, Studies, and Board Actions.

7.5.1. Minutes. For each meeting, document NNMSB proceedings with a comprehensive set of minutes. For each item under review, the minutes (and the TMSS or MSA as necessary) will include applicable findings, recommendations, and required additional actions. In addition, the Chairperson designates a primary action agency for items under review.

7.5.1.1. NNMSB minutes certify munitions studied are acceptable or not acceptable for further testing or use from a design safety viewpoint. When the minutes are signed by each member and approved by the Chairperson, they become the official NNMSB position. If unanimity cannot be achieved, minority reports may be prepared by the dissenting members and made a part of the official minutes.

7.5.1.2. NNMSB meeting minutes constitute interim fulfillment of approval/certification of munitions requirements and grant interim safety approval or certification for nonnuclear munitions or related items. If a staff agency disagrees with meeting minutes, AFSC/SEW will notify applicable commanders of disapproval and/or subsequent modification, if required, of interim approval or certification.

7.5.1.3. Commanders may proceed with munitions operations based on recommendations in NNMSB meeting minutes, pending HAF concurrence.

7.5.1.4. The Executive Secretary finalizes meeting minutes and updates TMSSs (amended to include NNMSB findings and recommendations). Also, the Executive Secretary submits the entire report to AFSC/SEW to initiate the AF/SE and AF staff agency approval process.

7.5.1.5. Signed NNMSB minutes and TMSS, with relevant findings and recommendations, are forwarded to AFSC/SEW, 9700 G Ave SE, Kirtland AFB NM 87117-5670. AFSC/SEW acts as the coordinating agency to obtain staff agency review and approval.

7.5.1.6. As appropriate, the Executive Secretary notifies program management authorities, test organizations, and unit commanders to proceed with planned activities and operations based on NNMSB's recommendations. If a staff agency disapproves a NNMSB recommendation, the Executive Secretary will notify concerned agencies of the change in certification status.

7.5.2. Studies. Once notified of AF/SE approval of a TMSS, the Executive Secretary publishes the report in its final version and distributes it to NNMSB members and associates, agencies responsible for implementing NNMSB recommendations, and other interested organizations.

7.5.2.1. Approval of a recommendation to develop or modify a system signifies staff agency awareness that such action would be desirable from a safety viewpoint. It does not mean that such an action will be officially proposed, initiated, or funded by a staff agency as a direct result of the recommendation. This is the primary responsibility of the action agency.

7.5.2.2. After a study is approved by HAF, the NNMSB's recommendations (as documented in the meeting minutes) are directive on the designated action agency. The action agency initiates and monitors action on the recommendations and makes periodic status reports to the Executive Secretary of the NNMSB until final action item closeout.

7.5.3. Action Items. Once NNMSB meeting minutes are approved by HAF, actions to implement Board recommendations are monitored until completion. Action items will be tracked until closure.

7.5.3.1. The Executive Secretary periodically requests action item completion status reports from designated action agencies.

7.5.3.2. The Executive Secretary arranges for action item status reports at each regularly scheduled NNMSB meeting.

7.5.3.3. The NNMSB determines when a recommended action item has been successfully completed.

7.5.3.4. The NNMSB may delegate to the Executive Secretary the authority to close purely administrative action items or to close a given action item upon the completion of a specific event (for example, the publication of a technical order).

7.5.3.5. When all action items related to munitions certification have been closed, final certification of a munitions item is granted. Final certification is documented in the minutes of the NNMSB meeting effecting closure.

7.6. Partnering Staff Agencies.

7.6.1. The following staff agencies will receive informational copies of NNMSB actions. These offices include the Office of the Assistant Secretary of the AF for Acquisition, Director of Global Power, SAF/AQPM; the Deputy Assistant Secretary of the AF for Environment, Safety, and Occupational Health, SAF/IEE; the AF Director of Logistics, Deputy Chief of Staff/Logistics, Installations and Mission Support (Integrated Life Cycle Management Policy Division), AF/A4LM; the AF Director of Logistics, Deputy Chief of Staff/Logistics, Installations and Mission Support (Nuclear Weapons Missile and Munitions

Division), AF/A4LW; and the AF Deputy Chief of Staff for Operations, Plans, and Requirements, Directorate for Force Application, AF/A5R-C.

7.6.2. These agencies must respond to AFSC/SEW within 30 calendar days indicating their concurrence or non-concurrence with NNMSB findings and recommendations. No response within the prescribed 30 day period constitutes approval.

7.7. AFSC/SEW.

7.7.1. Serves as technical lead for resolving any issues arising during staff agency coordination of the studies.

7.7.2. Upon receipt of concurrences or successful resolution of non-concurrences, submits TMSS to AF/SE for approval and forwards signed approvals to the Executive Secretary. In addition, minutes are provided to AF/SE for review.

7.7.3. Acts as approval authority for requests to deviate from mandatory design requirements.

7.7.4. Reports unfavorable mishap trends identified for munitions previously certified by the NNMSB that may require reevaluation by the NNMSB.

7.7.5. Appoints voting members of the IMTWG to include, as a minimum, a Chairperson, a AFSC/SEW member, and the Executive Secretary from the NNMSB.

7.8. HQ AFMC/SEW.

7.8.1. Designates an Executive Secretary of the NNMSB, a NNMSB member, and an engineering support function responsible for conducting NNMSB studies and analyses.

7.9. Other Commands. HQ ACC, HQ AETC, HQ AFGSC, HQ AFSOC, HQ AFSPC, HQ AFRC, HQ AMC, HQ PACAF, HQ USAFE, AFOTEC, and ANG.

7.9.1. Designate an NNMSB member and alternate.

7.9.2. Ensure members have the authority to provide a comprehensive command review of NNMSB safety studies and analyses.

7.9.3. Designate members to serve at least three years (whenever possible) and be a field grade officer or a DoD civilian grade equivalent. The primary objective for MAJCOMs is to select the best individuals (military or civilian) with requisite training, operational experience, and technical credibility to efficiently conduct NNMSB business. In addition, members will be prepared to do a minority report if the majority position is not consistent with their respective MAJCOM's position.

Chapter 8

EXECUTIVE SECRETARY DUTIES

8.1. General Duties.

- 8.1.1. Serves as the principal administrative assistant and key advisor to the Chairperson and Board members for conducting NNMSB affairs.
- 8.1.2. Consults with the AF procuring organizations, program offices, managers, or other agencies as necessary, to clarify requirements specified in this instruction.
- 8.1.3. Informs the Chairperson about NNMSB activities and issues that might affect NNMSB proceedings.
- 8.1.4. Maintains a list of appointed NNMSB members and alternates and provides the administrative services necessary to conduct NNMSB meetings. He/she also provides new member orientation.
- 8.1.5. Interacts with the Chairperson, members, AF procuring/modifying agencies, system program offices, or other agencies, as necessary, to ensure the effectiveness of the NNMSB safety/review process.
- 8.1.6. Maintains up-to-date preparation instructions for TMSSs and MSAs, technical read-ahead documentation, and NNMSB presentations.
- 8.1.7. Notifies the appropriate program management authorities of a change in certification status of nonnuclear munitions when the AF/SE or a staff agency disapproves an NNMSB recommendation on certification or non-certification.
- 8.1.8. Takes the following actions to schedule meetings authorized by the Chairperson.
 - 8.1.8.1. Issues meeting announcements at least 30 days in advance of regularly scheduled meetings.
 - 8.1.8.2. Polls Board members to determine their availability when the need for a special meeting is identified.
 - 8.1.8.3. Informs the agency requesting a special meeting that funding of the Board members' and Chairperson's travel expenses will be a condition for conducting the special meeting.
 - 8.1.8.4. Establishes meeting agendas.
 - 8.1.8.5. Establishes deadlines for submission of safety studies scheduled for review. Deadlines are normally 30-45 days prior to the meeting date.
 - 8.1.8.6. Invites appropriate advisors and special representatives to attend meetings as directed by the Chairperson.
 - 8.1.8.7. Provides all administrative services needed to support a meeting such as read-ahead packages and conference room(s).
- 8.1.9. Examines all documentation intended for NNMSB review to ensure appropriateness and technical quality, and also performs the following actions:

8.1.9.1. Circulates TMSSs and MSAs to NNMSB membership sufficiently in advance of a meeting to allow 25 days, at a minimum, for review and requests an AFSC/SEW waiver of the 25 day requirement when significant unavoidable delays in TMSS/MSA distribution arise.

8.1.9.2. Ensures read-ahead information to support THARs, SSG activities, and other matters requiring NNMSB action is received by the members at least 14 days before the meeting.

8.1.9.3. Notifies the preparing organization when documentation is deemed unacceptable for NNMSB review and provides guidance on changes needed to produce acceptable quality. As a result, the preparing organization will make necessary changes and resubmit documentation to the Executive Secretary for approval.

8.1.9.4. Ensures related studies, correspondence, and background material is available for the NNMSB meeting and establishes post-meeting liaison with agencies having a direct interest in the results of NNMSB proceedings.

8.2. Specific Duties.

8.2.1. When authorized by the NNMSB, monitors follow-on actions established as a condition of an NNMSB flight test approval and issues the final approval when actions are completed.

8.2.2. Notifies program management authorities, test organizations, and unit commanders when it is permissible to proceed with planned activities and operations based on NNMSB recommendations.

8.2.3. Notifies concerned agencies of the change in certification status if HAF disapproves an NNMSB recommendation.

8.2.4. Notifies agencies responsible for implementing NNMSB recommendations following HAF approval.

8.2.5. Provides NNMSB SSG guidance to program management authorities when inclusion of such guidance in the official NNMSB meeting minutes is deemed inappropriate.

8.2.6. Ensures NNMSB proceedings are fully documented and approved, and prior to review, are made available for review by the Board members as the last item of meeting business.

8.2.7. Forwards final meeting minutes and updated TMSSs to AFSC/SEW for approval.

8.2.8. Publishes and distributes final MSAs after NNMSB approval and final TMSSs after AF/SE approval.

8.2.9. Manages status reporting actions that implement approved NNMSB recommendations. Specifically, he/she:

8.2.9.1. Periodically requests action item status reports from designated action agencies.

8.2.9.2. Reports action item status at each regularly scheduled NNMSB meeting.

8.2.10. Maintains awareness of national and international standardization activities involving design and performance safety, analysis, and nonnuclear munitions testing, and offers such standards for possible NNMSB approval, as appropriate.

8.2.11. Maintains all NNMSB historical records, including meeting proceedings, indexes of TMSSs and MSAs, and logs of administrative closures issued by the Executive Secretary. He/she will assure the Board members are provided current copies of these indexes and logs and the NNMSB membership roster.

8.2.12. Maintains the NNMSB certification database, prepares the catalogue of NNMSB actions and distributes annual catalogue updates to Board members.

GREGORY A. FEEST
Maj Gen, USAF
Chief of Safety

Attachment 1**GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION*****References***

DODI 6055.16, *Explosives Safety Management Program*, 29 July 2008

DODI 5000.02, *Operation of the Defense Acquisition System*, 8 December 2008

AFPD 91-2, *Safety Programs*, 28 September 1993

AFI 16-201, *Air Force Foreign Disclosure and Technology Transfer Program*, 1 December 2004

AFI 51-402, *Weapons Review*, 27 July 2011

AFI 61-301, *The Domestic Technology Transfer Process and the Offices of Research and Technology Applications*, 30 May 2001

AF 91-103, *Nuclear Safety Certification Program*, 17 November 2010

AFI 91-401 *Directed Energy Weapons Safety*, 29 September 2008

AF Manual (AFMAN) 33-363, *Management of Records*, 1 March 2008

TO 11A-1-47, *DoD Ammunition and Explosives Hazard Classification Procedures*, 17 June 2005

Adopted Forms

AF Form 847, *Recommendation for Change of Publication*, 22 September 2009

Abbreviations and Acronyms

AAC—Air Armament Center

ACC—Air Combat Command

AETC—Air Education and Training Command

AF—Air Force

AF/A4LM—HQ AF Director of Logistics, Deputy Chief of Staff/Logistics, Installations and Mission Support (Integrated Life Cycle Management Policy Division)

AF/A4LW—HQ AF Director of Logistics, Deputy Chief of Staff/Logistics, Installations and Mission Support (Nuclear Weapons Missile and Munitions Division)

AF/A5R—C—HQ AF Deputy Chief of Staff for Operations, Plans, and Requirements, Directorate for Force Application

AFMC—Air Force Materiel Command

AFOTEC—Air Force Operational Test and Evaluation Center

AFRC—Air Force Reserve Command

AFSOC—Air Force Special Operations Command

AFSPC—Air Force Space Command

AFGSC—Air Force Global Strike Command

AFMAN—Air Force Manual

AMC—Air Mobility Command

ANG—Air National Guard

HERO—Hazards of Electromagnetic Radiation to Ordnance

IMTWG—Insensitive Munitions Technical Working Group

MSA—Munitions Safety Analysis

NNMSB—Nonnuclear Munitions Safety Board

RFID—Radio Frequency Identification Device

PACAF—Pacific Air Forces

RDS—Records Disposition Schedule

SAF/AQPM—Office of the Assistant Secretary of the AF for Acquisition, Director of Global Power

SAF/IEE—Deputy Assistant Secretary of the AF for Environment, Safety, and Occupational Health

SSG—System Safety Group

THAR—Test Hazards Assessment Review

TMSS—Technical Munitions Safety Study

USAFE—United States Air Forces in Europe

Attachment 2

TECHNICAL MUNITIONS SAFETY STUDY (TMSS) INSTRUCTIONS

A2.1. Information. A TMSS includes the following information, if applicable:

- A2.1.1. A description of the munitions item.
- A2.1.2. A sequential description of how a munitions item functions in its operational environment.
- A2.1.3. A hazard analysis of the munitions system according to MIL-STD-882D, *Systems Safety*. This analysis must deal with interfaces of the munitions item with other systems and subsystems, including test equipment and technical data.
- A2.1.4. A summary of mishaps and undesirable design features of similar inventory munitions (lessons learned, if applicable). The mishap history may be obtained from AFSC/SEW.
- A2.1.5. A safety-oriented evaluation of the technical data generated during development of the munitions item, including storage, maintenance, operation, surveillance, inspection, demilitarization and disposal procedures, if applicable.
- A2.1.6. Occupational health and environmental health assessment by bioenvironmental engineering, if required.
- A2.1.7. Final or interim hazard classification data (TO 11A-1-47).
- A2.1.8. Firefighting extinguishing agents, if available.
- A2.1.9. Appendices containing essential information from specifications and test reports to support findings.
- A2.1.10. Findings and conclusions of the preparing individual.
- A2.1.11. Findings and recommendations (after NNMSB review).
- A2.1.12. Action items (after NNMSB review).
- A2.1.13. Other information necessary to define the level of safety incorporated in the item (for example, a determination if a fuze meets pre-fuzing criteria).
- A2.1.14. A page for HAF approvals or comments.
- A2.1.15. An amendment or supplement if needed to reflect updated production or design changes.
- A2.1.16. The TMSS cover indicates its status and its authorized distribution.
- A2.1.17. Use a cover with the words "DRAFT" printed on it on the initial (draft) TMSS furnished to NNMSB members for review. This draft may contain (or have attached) copies of data and drawings. This data and drawings may be essential for the in-depth review required by the NNMSB, but are not necessary for further processing. In this event, remove the material after the NNMSB's review and insert a note to indicate the availability and location of the material.

A2.2. Distribution. Studies may be distributed by hard copy, disk (CD/DVD), or e-mail. If the information in the study is proprietary in nature, be sure to mark it as such and if sent electronically, encrypt it or password-protect the information/study.

A2.2.1. The draft discussed in paragraph A2.1. above is distributed only to the originating agency, the NNMSB Executive Secretary, AFSC/SEW, and the NNMSB members. NNMSB members also may distribute it within their commands.

A2.2.2. After the NNMSB has approved the study and made the necessary corrections, the Executive Secretary will add a section to the front of the study. This section shows the NNMSB's recommendations and includes a signature page for approval coordination.

A2.2.3. Replace the cover with one annotated by the words "AIR STAFF APPROVAL COPY". Forward seven copies to AFSC/SEW for staff agency review and HQ AF/SE approval if sent as hard copy or on disk.

A2.2.4. Coordination functions are discussed in Chapter 7.

A2.2.5. When approved by AF/SE, the Executive secretary will publish the final TMSS edition. Replace the cover with one annotated with the words "HQ USAF APPROVED SAFETY REPORT".

Attachment 3**STANDARDS AND SPECIFICATIONS APPROVED BY THE NNMSB**

A3.1. Overview. The following documents contain safety design and performance, test, and analysis criteria approved by the NNMSB for the design and evaluation of nonnuclear munitions:

A3.1.1. MIL-STD-331C, *Department of Defense Test Method Standard: Fuze and Fuze Components, Environmental and Performance Tests for*, 22 June 2009

A3.1.2. MIL-STD-461F, *Department of Defense Interface Standard: Requirements for the Control of Electromagnetic Interference Characteristics of Subsystems and Equipment*, 10 December 2007

A3.1.3. MIL-STD-464C, *Department of Defense Interface Standard: Electromagnetic Environmental Effects, Requirements for Systems*, 1 December 2010

A3.1.4. MIL-STD-810G, *Department of Defense Test Method Standard: Environmental Engineering Considerations and Laboratory Test*, 5 May 2003

A3.1.5. MIL-STD-882D, *Department of Defense Standard Practice: System Safety*, 10 February 2000

A3.1.6. MIL-STD-1316E, *Department of Defense Design Criteria Standard: Fuze Design, Safety Criteria*, 14 January 1999

A3.1.7. MIL-STD-1466, *Military Specification: Safety Criteria and Qualification Requirements for Pyrotechnic Initiated Explosive (PIE) Ammunition*, 25 March 1983

A3.1.8. MIL-STD-1751A, *Department of Defense Test Method Standard: Safety and Performance Tests for the Qualification of Explosives (High Explosives, Propellants, and Pyrotechnics)*, 25 May 2005

A3.1.9. MIL-STD-1760E, *Department of Defense Interface Standard: Aircraft Stores Electrical Interconnection System*, 24 October 2007

A3.1.10. MIL-STD-1901A, *Department of Defense Design Criteria Standard: Munitions Rocket and Missile Motor Ignition System Design, Safety Criteria for*, 6 June 2002

A3.1.11. MIL-STD-1911, *Military Standard: Hand-Emplaced Ordnance (HEO) Design, Safety Criteria for*, 10 July 1998

A3.1.12. MIL-STD-2088B, *Department of Defense Design Criteria Standard: Bomb Rack Unit (BRU). Aircraft*, 29 May 2007

A3.1.13. MIL-STD-2105C, *Department of Defense Test Method Standard: Hazard Assessment Tests for Nonnuclear Munitions*, 23 July 2003

A3.1.14. MIL-HDBK-454B, *Department of Defense Handbook: General Guidelines for Electronic Equipment*, 15 April 2007

A3.1.15. MIL-HDBK-1455, *Military Handbook: Dispenser and Submunition, Air Delivered, Safety Design and Safety Qualification Criteria for*, 14 February 1997

A3.1.16. MIL-HDBK-1512, *Department of Defense Handbook: Electro-Explosive Subsystems, Electrically Initiated, Design Requirements and Test Method*, 13 September 1997

A3.1.17. MIL-PRF-28800F, *Performance Specification: Test Equipment for Use with Electrical and Electronic Equipment, General Specification for*, 31 January 1994