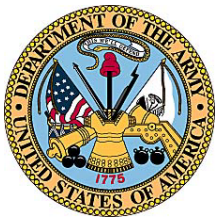
Department of Defense
Acquisition Manager's Handbook for
Insensitive Munitions



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Introduction

There are many examples of catastrophic losses from incidents involving conventional munitions. The collateral damage from these incidents may have been unpreventable in the past because of a lack of technology. Currently, there is national awareness and a drive to improve the incremental development of munitions, in addition to an international focus on munitions improvement.

Insensitive Munitions (IM) are designed to withstand unplanned stimuli such as heat from a bonfire, fuel fire, shock from bullet and/or fragment impact, and chain reactions from adjacent detonating munitions. The U.S. munitions stockpile is among the safest in the world, and our commitment to keeping it secure and technically advanced will aid in meeting IM requirements. Numerous groups monitor the IM community. These groups share a common goal to improve the reactions of munitions to unplanned stimuli. These groups include, but are not limited to the following:

- Munitions Safety Information and Analysis Center (MSIAC);
- Department of Defense Insensitive Munitions Integrated Process Team (DoD IM IPT);
- Joint Services Insensitive Munitions Technical Panel (JSIMTP);
- Department of the Navy Insensitive Munitions Council (IMC);
- U.S. Air Force Non-Nuclear Munitions Safety Board (NNMSB);
- Weapon System Explosives Safety Review Board (WSESRB); and
- U.S. Army Insensitive Munitions Board (IMB).

Investment in technology enhancements are needed to -improve the reaction of munitions to unplanned stimuli. The Department of Defense (DoD) is -increasingly stretching the technology envelope to develop munitions with the potential to meet or exceed performance requirements imposed through the Operational Requirement Document (ORD) for munitions. The weapons platforms that will deliver these munitions may also be used to provide security and self-defense. These platforms are limited quantity expensive high profile resources and are critical national assets. Therefore, they should never be subject to possible destruction resulting from catastrophic events, such as friendly fire, accidents or acts of war.

DoD has made significant progress in improving the performance, survivability, and interoperability of munitions. However, the primary challenge now facing every program and project manager is how to leverage these technologies to increase performance, affordability and processibility.

A number of potential benefits are associated with the development of IM technologies. Munitions incorporating IM technologies are less likely to react with other munitions, thus precluding the escalation and probability of collateral damage to personnel, platforms and/or the munitions stockpile. Munitions incorporating IM technologies not only have the potential to decrease the logistical footprint in munitions, but also the amount of support equipment and the number of security requirements for a forward-operating area ammunition supply point.

Disclaimer

The information contained in this Handbook will be updated periodically to include the most current data for Program Managers. Every attempt has been made to ensure that the information in this volume is current and accurate as of the date of publication.

Purpose

The purpose of this Handbook is to help program managers understand the IM requirement and the processes involved in developing an IM plan. This Handbook focuses on U.S. IM policies, the IM waiver process and offers suggestions on how to form an IM team, best practices in applying IM technology and requirements to ensure a successful IM program. It is designed to be a practical reference tool for use in developing and fielding IM compliant systems.

Background

Technological advances in the design of explosive ordnance are making it possible to develop a range of munitions termed IM that are less vulnerable to accidental and combat stimuli than previous weapons. Such munitions remain effective in their intended application, but are less sensitive than their predecessors to extreme but credible environments such as heat, shock or impact. While the introduction of IM into service is intended to enhance the survivability of logistic and tactical combat systems and minimize injury to personnel, IM also have the potential to provide more cost effective and efficient transport, storage and handling of munitions.

Application
The information illustrated throughout this Handbook is not intended to prescribe energetic and/or design selection processes. Rather it should serve as a tool to assist Acquisition/Administrative Executives, Program and Project Managers, and others in decision development by providing a baseline. This Handbook can be applied to the IM assessment of all non-nuclear munitions, either newly developed, product improved, replenishment purchased, or older designs still in service, during all phases of life, from manufacture to target or disposal.

This Handbook will not replace assessments carried out in accordance with other established documents and/or regulations to establish a particular munition's safety and suitability for service, nor will it replace legislative and regulatory requirements relating to the manufacture, transportation, storage and disposal of munitions.

Chapter 1: Understanding Insensitive Munitions

Insensitive Munitions (IM) are conventional weapons and ordnance that fulfill their performance objectives while minimizing collateral damage if exposed to stimuli including fires, impact and shock threats. The Department of Defense (DoD) established IM requirements to enhance the survivability of military and civilian personnel, platforms and infrastructure. **Appendix A** provides a glossary of commonly used IM terms.

THE INSENSITIVE MUNITIONS CONCEPT

The IM concept provides effective performance to the U.S. and allied warfighter while offering passive force protection and saving lives. This concept can offer the following distinct tactical advantages.

1. *IM can be a force multiplier*. Ships and other military platforms may be able to stay on station longer – engaging the enemy and fulfilling mission objectives – if they are not subject to extensive collateral damage from weapon or ordnance accidents.

2. *IM offer tactical logistical advantages*. Force protection is increasingly required in populated urban centers as the war on terrorism and asymmetric warfare expands. Conventional weapons stored in proximity to civilian populations make them an attractive target for terrorists and political extremists to inflict casualties on non-combatants. Weapons that comply with IM requirements minimize the threat to the surrounding community and infrastructure and offer the warfighter an opportunity to increase the forward-deployed weapon inventory.

3. *IM are potentially more cost effective and efficient to transport, store and handle*. Weapons meeting all IM requirements may be granted a reduced hazard classification (HC) ranking compared to non-IM variants of the same weapon. Reducing the HC ranking may make it possible to reduce the real estate involved in storing and handling these systems. **Chapter 5** provides an explanation of this subject.

The technologies developed to achieve IM are diverse and in the aggregate, offer a total systems solution to the weapons Program Manager. **Chapter 4** provides descriptions of several of these technologies

HISTORICAL INCIDENTS

The initiative to design, develop and deploy IM is based on serious weapon and ordnance accidents experienced by the U.S. military, allies and other nations. Table 1-1 provides

examples of some of the more significant accidents, in terms of lives lost and damage incurred, since the 1960's.

Table 1-1. Significant Weapon and Explosives Accidents Since 1960

Location and Date	Description	Number of Casualties	Losses (Then-year $)
USS Oriskany 26 Oct 66	An actuated flare was thrown into a locket of 2.75" rocket warheads. A warhead detonated, spreading the fire and causing other detonations.	44 killed 156 injured	$10 million
USS Forrestal 29 Jul 67	A ZUNI rocket was fired accidentally from an aircraft striking another aircraft and causing massive fire. Nine bombs detonated spreading the fire below decks.	134 killed 161 injured	$182 million
USS Enterprise 15 Jan 69	Exhaust from an aircraft engine starter unit directed onto a pod containing four ZUNI rockets caused a warhead to detonate. Fragments ruptured the aircraft's fuel tank and ignited a fire. Three more ZUNI warheads detonated. The shaped charges blew holes through the flight deck allowing burning fuel to invade the lower decks.	28 killed 343 injured	$122 million
USS Nimitz 26 May 81	An EA-6B aircraft crashed during a night landing, erupting into a fuel fire. Once the fire was believed to be out, the order was given to start the clean-up. A SPARROW missile warhead that was buried in the debris detonated. The explosion restarted the fire and three more warheads detonated before the fire could be extinguished.	14 killed 48 injured	$79 million
Camp Doha, Kuwait 11 Jul 91	A motor pool fire involved an M992 ammunition carrier loaded with 155-millimeter artillery shells that caught fire in the North Compound. An explosion spread the fire and caused a massive secondary explosion. The resulting series of explosions and fires devastated the vehicles and equipment in the compound and scattered unexploded ordnance and debris over much of the remainder of the camp. The Army lost more tanks in this incident than during the entire war against Iraq.	Three killed 49 injured	102 damaged and/or destroyed vehicles and in excess of $15 million dollars in damaged or destroyed ammunition.
Roseville, CA April 1973	A train loaded with bombs had just entered the yard in Roseville, CA, when a fire was observed in one of the boxcars. Before the fire department could react, a massive explosion demolished the boxcar and spread the fire. In the next few hours, 18 boxcars exploded in succession.	48 Injured	Property damage totaled $24 million
Benson, AZ 1973	The investigation of the Roseville train explosion was still in progress when 12 boxcars full of bombs exploded near Benson, AZ. Evidence found after the accident revealed that there had been a fire in one of the boxcars.	Undetermined	Undetermined

Location and Date	Description	Number of Casualties	Losses (Then-year $)
Jalalabad, Afghanistan[1] 10 Aug 02	Stored explosives were accidentally detonated at a warehouse for road-building projects. A heat wave –of more than 40 °C (100°F) over much of Afghanistan – may have triggered the explosion.	26 killed 90 injured	Undetermined
Spin Boldak, Afghanistan 28 June 02	According to the Afghan Minister of Interior (Taj Mohammed Wardak), a BM-21 rocket (122-mm caliber) fired by unknowns hit a weapons depot and started a chain of reactions.	32 killed 70 injured	Undetermined
Bien Hoa Air Force Base, Vietnam 16 May 65	One of the first ammunition dumps destroyed during the war.	Undetermined	Undetermined
Danang Ammunition Dump, Vietnam 21 Apr 69	Secondary explosions destroyed an ammunition storage area.	Undetermined	Undetermined

THE ROLE OF INSENSITIVE MUNITIONS IN ENHANCING SAFETY AND SURVIVABILITY

Military weapons and munitions, by their nature, represent a potential threat to the personnel, platforms and infrastructure that develop, produce, transport, deploy and store them. Weapon system safety policies and procedures promote the safe use, operation and storage of these systems. The role of IM is to complement system safety by reducing collateral damage in the event of an accident or unplanned stimuli, despite adherence to prescribed safety procedures. The combination of IM and system safety offers enhanced protection to the warfighter.

[1] North Atlantic Treaty Organization- IM Information Center Newsletter, 3rd Quarter 2002.

Chapter 2: U.S. Insensitive Munitions Policies

In 1987, the Component Acquisition Executives signed a Memorandum of Agreement establishing a joint requirement for insensitive munitions (IM). In 1988, the Joint Chiefs of Staff recognized that IM are driven by both requirements and acquisition policies. In the early 1990's, the Joint Ordnance Commanders Group (JOCG), noted a need for a policy statement regarding IM during the acquisition process. In December 1992, the JOCG recommended the inclusion of IM policy into Department of Defense Instruction (DoDI) 5000.2 in order to standardize the decision processes relating to munition sensitivity to unplanned stimuli.[2] A copy of the JOCG memorandum is provided in **Appendix B**.

In November 1994, the Under Secretary of Defense for Acquisition and Technology, Honorable Mr. Paul Kaminski, requested a position on IM policy from the Joint Requirements Oversight Council (JROC).[3] This memorandum, provided in **Appendix C**, noted perspectives of including IM in the acquisition and requirements processes and requested the JROC to recommend which realm – acquisition or requirements – best addressed the DoD goal of "meeting operational requirements with the least sensitive system design available." In November 1995, the JROC indicated that IM should be included in the acquisition process. A copy of this decision memorandum is provided in **Appendix D**.

INSENSITIVE MUNITIONS STATUTORY REQUIREMENT

The statutory requirement for IM is set forth in U.S. Code, Title 10, Subtitle A, Part IV, Chapter 141, Section 2389 which states, "The Secretary of Defense shall ensure, to the extent practicable, that insensitive munitions under development or procurement are safe throughout development and fielding when subject to unplanned stimuli."

Role of the Chairman of the Joint Chiefs of Staff

The Chairman of the Joint Chiefs of Staff (CJCS) shall provide advice and assessment on military capability needs in accordance with sections 153, 163 and 181 of Title 10-the IM Program. The CJCS shall present this advice and assessment through validated and approved capabilities documents. The CJCS may engage the Components and agencies to provide this advice and assessment. Consistent with this Directive, and in coordination with the USD (AT&L), the CJCS may establish procedures to carry out this responsibility.[4]

[2] Joint Ordnance Commanders Group memorandum dated 2 Dec 92, subject: Inclusion of Insensitive Munitions Policy in DoD Instruction 5000.2.
[3]The Under Secretary of Defense: Memorandum to the Joint Requirements Oversight Committee; 4 Nov 1994

The responsibilities and procedures of the CJCS, found in the following excerpts, can be found in the Chairman of the Joint Chiefs of Staff Instruction (CJCSI), 24 October 2002, and the Chairman of the Joint Chiefs of Staff Manual, 24 June 2003.

Chairman of the Joint Chiefs of Staff Instruction Policy

a. Title 10 of the U.S. Code establishes the Joint Requirements Oversight Council (JROC). The JROC charter provides overarching guidance for both the JROC proper and its direct support sub panels. This instruction delineates the responsibilities and procedures for organizations involved in bringing recommendations forward to the JROC and ultimately to the chairman for review and action.

b. The Defense Reorganization Act of 1986 (Goldwater-Nichols legislation) provides the statutory basis for CJCS review of major personnel, materiel, and logistics requirements of the Armed Services in relation to plans, programs, and budgets. The chairman uses the JROC as an advisory council to help fulfill his responsibility outlined in Title 10 of the U.S. Code to provide advice to the Secretary of Defense on requirements prioritization and the conformance of programs and budgets to priorities established both in strategic plans and those identified by the combatant commands.

c. The JROC primarily advises the chairman regarding requirements, programs and budgets via the programmatic processes (described in this instruction) and the requirements generation system for the purpose of planning and preparation of documents. Figure 2-1 depicts the respective paths and venues used when DoD components request JROC review of warfighting requirements and associated potential materiel and non-materiel resource solutions.[5]

[4]DoD Directive 5000.1, "The Defense Acquisition System," 12 May 2003.
[5]CJCSI 3180.01 Joint Requirements Oversight Council (JROC); Chairman of the Joint Chiefs of Staff Instruction, 31 Oct 2002.

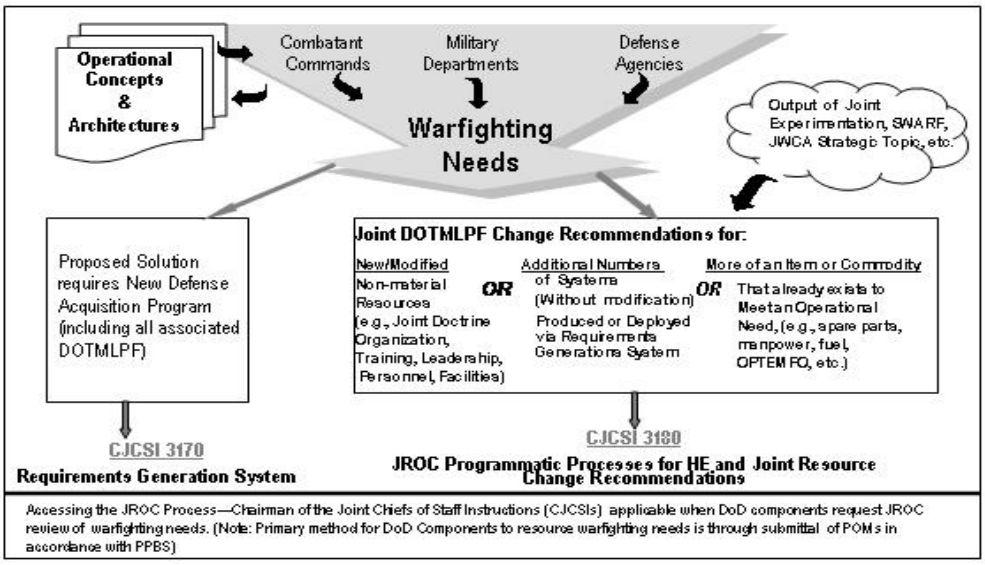

Figure 2-1. Accessing the Joint Requirements Oversight Council Processes

Joint Requirements Oversight Council, Insensitive Munitions Certifications and Waivers (J-4)

The Joint Staff J-4 will certify that all Capability Development Documents (CDDs) and Capability Production Documents (CPDs) for munitions, regardless of acquisition category level, contain the requirement to conform to insensitive munitions (unplanned stimuli) criteria. At a minimum, these CDDs and CPDs are to contain the statement, "Munitions used in this system will be designed to resist insensitive munitions threats (unplanned stimuli)."

IM waiver requests require approval by the JROC. IM waiver requests shall include a Component or agency approved IM plan of action and milestones to identify how future purchases of the same system, or future system variants, will achieve incremental and full compliance. Waiver requests will be submitted to J-4 for review, then forwarded to the JROC Secretariat in conjunction with the Joint Capabilities Integration and Development System's staffing for JROC consideration.[6]

[6]Chairman of Joint Chief of Staff M 3170.01-Enclosure C: JCIDS Staffing Process: CJCSM 24 June 2003.

ACQUISITION POLICY

The Defense Acquisition System exists to manage the nation's investments in technologies, programs, and product support necessary to achieve the National Security Strategy and support the United States Armed Forces. The investment strategy of the DoD shall be postured to support not only today's force, but also the next force, and future forces beyond.

The primary objective of Defense acquisition is to acquire quality products that satisfy user needs with measurable improvements to mission capability and operational support, in a timely manner, and at a fair and reasonable price. With that in mind, the following policies shall govern the Defense Acquisition System:

- Safety. Safety shall be addressed throughout the acquisition process. Safety considerations include human (includes human/system interfaces), toxic/hazardous materials and substances, production/manufacturing, testing, facilities, logistical support, weapons, and munitions/explosives. *All systems containing energetics shall comply with IM criteria.*
- Flexibility. Program Managers (PM) shall tailor program strategies and oversight, including documentation of program information, acquisition phases, the timing and scope of decision reviews, and decision levels, to fit the particular conditions of that program, consistent with applicable laws and regulations and the time-sensitivity of the capability need.
- Responsiveness. Advanced technology shall be integrated into producible systems and deployed in the shortest time practicable. Approved, time-phased capability needs matched with available technology and resources enable evolutionary acquisition strategies. Evolutionary acquisition strategies are the preferred approach to satisfying operational needs
- Innovation. Throughout the DoD, acquisition professionals shall continuously develop and implement initiatives to streamline and improve the Defense Acquisition System. PMs shall examine and, as appropriate, adopt innovative practices (including best commercial practices and electronic business solutions) that reduce cycle time and cost, and encourage teamwork.
- Discipline. PMs shall manage programs consistent with statute and the regulatory requirements specified in this directive and in reference. Every PM shall establish program goals for the minimum number of cost, schedule, and performance parameters that describe the program over its life cycle. Approved program baseline parameters shall serve as control objectives. PMs shall identify deviations from approved acquisition program baseline parameters and exit criteria.[7]

[7]DoD Directive 5000.01, "The Defense Acquisition System", 12 May 2003.

EXEMPTION FROM INSENSITIVE MUNITIONS REQUIREMENTS

Effective 26 January 1999, the Under Secretary of Defense for Acquisition and Technology (A&T) instituted a DoD policy exempting certain weapons from IM requirements. It should be noted that this exemption *does not apply* to contracts issued after 26 January 1999. This policy is excerpted below:

> "This exemption applies, in perpetuity, to all munitions in the current inventory, and to all munitions currently in production, including munitions currently in production contracts, in Low Rate Initial Production, and those munitions awaiting acceptance or delivery. The above notwithstanding, the Services should look for every feasible window of opportunity to insert IM technology into weapons continuing in production. Such improvements in existing munitions will aid in achieving the Department's long-term goal of having an IM compliant inventory. The aforementioned exemption is not transferable to new or modified munitions that use components, groups, sections, or subsystems from exempted munitions. "New munitions" include those that are under development contracts or are new, planned acquisition programs." [8]

The USD (A&T) memorandum is provided in **Appendix E**. It should be noted that the use of previously existing – and exempted – components such as warheads, rocket motors and fuzes does not constitute an exemption case for a specific weapon system. The PM is cautioned against assuming the applicability of the exemption memo to a given weapon without consulting available IM authorities.

The Role of the Department of Defense Integrated Product Team and Joint Services Insensitive Munitions Technical Panel

In May 1995, the Secretary of Defense directed the Department to apply the Integrated Product and Process Development (IPPD) concept of using Integrated Product Teams (IPTs) throughout the acquisition process. In 1997, the DoD IM IPT was established to address IM policies, requirements, programs and issues, both foreign and domestic.

Under the auspices of the former DoD 5000.2-R Part 4.2 and Part 5.4, the purpose of IPTs is to facilitate decision-making by making recommendations based on timely input from the entire team. The IPT approach simultaneously takes advantage of all members' expertise and produces an acceptable product, while focusing on program execution, acquisition reform, and the identification and implementation of strategic planning initiatives.[9]

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[8] Under Secretary of Defense for Acquisition and Technology (A&T) Memorandum; Sub: IM Exemptions; 26 Jan 1999.
[9] Rules of the Road: A Guide for Leading Successful Integrated Product Teams-Revision 1; October 1999.
[10] Jurgensen, Harold; *DoD Moving Toward Long-Term Goal of Compliant Inventory*; PM: November – December 2000.

The Joint Services Insensitive Munitions Technical Panel

The Joint Services Insensitive Munitions Technical Panel (JSIMTP) was established in May 1999, under the auspices of DoD 5000.2R. JSIMTP is an advisory panel that provides IM technical advice and assistance with the IM waiver process. JSIMTP also annually assesses the IM compliance of the DoD's munitions inventory, and furnishes the results to the Office of the Secretary of Defense Office of Munitions and the Joint Staff J-4.[10] **Appendix F** provides the standard operating procedures and charter for the IPT and JSIMTP

U.S. ARMY INSENSITIVE MUNITIONS POLICY

Army acquisition policy is promulgated in Army Regulation 70-1 (31 December 2003). An excerpt is provided below:

> Army Regulation 70-1 and DA Pamphlet (Pam) 70–3 implement the Army's acquisition policies for programs in acquisition categories (ACATs) I through III (para 3–2). This regulation assigns responsibilities to Army organizations in accordance with Department of Defense Directive (DoDD) 5000.1 and Department of Defense Instruction (DoDI) 5000.2. The Army will apply the direction contained in DoDD 5000.1 and DoDI 5000.2 to all acquisition programs, while streamlining and tailoring the procedures within statutory and program requirements.

Survivability

Munitions survivability is crucial to the success of combat systems. The reactive nature of munitions and combat systems makes them susceptible to degradation and destruction when exposed to stimuli such as fragments and fires. Design features should be developed and introduced via a total systems engineering approach that ensures that all combat system requirements are met while enhancing survivability to unplanned stimuli.

As required by DoDI 5000.2, materiel developers and combat developers must develop strategies and procedures for attaining soldier and system survivability goals and objectives, as they apply to Major Defense Acquisition Programs (MDAPs) and Major Automated Information System (MAIS) systems. Evaluation of system performance will be conducted as a continuous evaluation process during the system life cycle to maximize opportunities to collect system performance data in a cost-effective manner.

As stated previously, the Army's procedures for implementing IM policies can also be found in Department of the Army Pamphlet (DA PAM) 70-3, Appendix 25. The following excerpt from 70-3 is referenced in **Appendix G**.

The planning and execution of an IM program plan should be initiated at the start of a munition acquisition program and continue through production/fielding of the munition. Early and frequent coordination with the Army Insensitive Munitions Board (IM Board) is essential to insure that IM Program elements are adequately addressed and munitions acquisition is not adversely impacted.

U.S. NAVY INSENSITIVE MUNITIONS POLICY

U.S. Navy IM policy is established in Chief of Naval Operations (OPNAV) Instruction 8010.13C. Revisions to this instruction are currently in process. Significant policy statements from the current instruction are excerpted below. The complete policy is provided in **Appendix H**.

> All Navy munitions, in research and development or product improvement programs, shall be designed to meet the prevailing technical requirements for IM, as specified by Commander, Naval Sea Systems Command (COMNAVSEASYSCOM) governing instructions. Operational capability must be maintained, but every reasonable effort must be made to meet operational requirements with the least sensitive energetic materials available.
>
> Munitions in the current Navy inventory or production shall be modified to meet the requirements for IM, as specified by COMNAVSEASYSCOM directives, when the modification is technically, operationally and fiscally feasible.
>
> The Navy's IM policy extends to all munitions regardless of the source of design or manufacture, which are used, stored or transported aboard U. S. Navy ships, weapon platforms, weapon carriers, and munitions held at Navy ashore activities.

U.S. AIR FORCE INSENSITIVE MUNITIONS POLICY

The U.S. Air Force (USAF) has drafted an IM Management Plan to establish and describe Air Force procedures and organizational responsibilities for planning and carrying out an integrated Air Force IM program. The complete management plan (draft) is provided in **Appendix I.**

Although, initially the program will use incremental steps to achieve the goal of full IM certification of munitions, the ultimate objective of the IM program is to ensure USAF munitions attain full IM certification, which will ensure that USAF munitions will either not react or minimally react to unplanned stimuli while simultaneously not compromising the munitions' operational performance**.**

Applicability and Basis for the Plan

U.S. Air Force IM policy applies to conventional munitions without regard to the source of design or manufacture. Ballistic missiles and nuclear weapons are excluded. As a threshold each new weapon must meet insensitive munitions criteria unless granted a specific waiver in accordance with DoD and USAF directives, policies, and guidelines.

U. S. SPECIAL OPERATIONS COMMAND (USSOCOM) IM POLICY

On 15 December 2003, the U. S. Special Operations Command (USSOCOM) announced the establishment of a USSOCOM IM Board. The new IM Board will be reviewing all test plans and data for weapons, ammunition and explosives that require IM review and approval. The board will coordinate IM approvals or waivers with the Joint Staff for final Joint Requirements Oversight Council (JROC) approval.

The Program Manager (PM) of a new weapon or ammunition must submit a copy of the acquisition documentation (e.g., Initial Capabilities Document (ICD), Test and Evaluation Master Plan (TEMP), etc.,) to the IM Board. The documentation must include a complete weapon description, including the configuration of components containing energetic material, such as warheads, rocket motors, cartridges/propellant activated devices and fuzes. The acquisition documentation must include IM requirements and plans.

The PM is responsible for IM test planning and shall develop a test plan in accordance with Military Standard (MIL STD) 2105 C. The PM shall submit a copy of the test plan to the Weapons Systems Explosive Safety Review Board (WSESRB) and the USSOCOM IM office (IMO). The full waiver package will be staffed for approval by the Chairman of the USSOCOM IM Board. The Program Executive Officer, Special Programs (PEO-SP) is designated as the board chairman. USSOCOM will then forward the waiver request to the Joint Staff J-4 for staffing to obtain a final approval by JROC.[11] The USSOCOM memorandum can be found in **Appendix J**.

[11] United States Special Operations Command (USSOCOM) Memorandum; Sub: Establishment of IM Board, 15 Dec 2003.

Chapter 3: Insensitive Munitions and The North Atlantic Treaty Organization

The North Atlantic Treaty Organization (NATO) defines insensitive munitions (IM) as "Munitions which reliably fulfill their performance, readiness and operational requirements on demand, but which minimize the probability of inadvertent initiation and severity of subsequent collateral damage to weapon platforms, logistic systems and personnel when subjected to unplanned stimuli."[12] However, as NATO's involvement in IM evolved from an emphasis on explosive materials and their safety, the organization's Conference of National Armament Directors (CNAD) assumed responsibility for supporting the development and implementation of IM technologies. CNAD is comprised of Army, Navy, and Air Force Armament Groups and the Industrial Advisory Group.

The North Atlantic Treaty Organization Insensitive Munitions Information Center (NIMIC)

In 1978, under the auspices of CNAD, an action committee (AC) whose primary purpose was ammunition safety was created. This was called theAC/258, Group of Experts on the Safety Aspects of Transportation and Storage of Military Ammunition and Explosives. In 1979, CNAD created AC/310, Partnership Group on Safety and Suitability for Service Use of Munitions and Explosives. Under AC/310, four subgroups were developed:

Sub-Group 1. Explosive Materials
Sub-Group 2. Fuzing Systems
Sub-Group 3. Environment
Sub-Group 4. Munition Systems

In 1984, AC/310 became concerned with the vulnerability of weapons platforms and storage sites to the reactions of unplanned stimuli. This level of concern initiated the requirement for IM, which in turn led AC/310 to identify the need for a means by which to exchange technical information about IM within NATO. In response to this need, in 1988, the United States introduced a pilot NIMIC. Three years later, the pilot NIMIC was transitioned into a fully functioning entity, and transferred to NATO's Headquarters in Belgium.

[12]NATO Insensitive Munitions Information Center Web Site-www.nato.int/related/nimic

In October 2002, NATO approved several committee reduction and restructuring plans. AC/310 and AC/258 were merged into the CNAD Ammunition Safety Group or AC/326. This new group is comprised of the following six sub-groups:

- SG/1 on Energetic Materials
- SG/2 on Initiation Systems
- SG/3 on Ammunition Systems
- SG/4 on Transport Logistics
- SG/5 on Logistic Storage & Disposal
- SG/6 on Operational Ammunition Safety

Also, during this period, the NIMIC Steering Committee decided that NIMIC would transition into a new NATO Project Office, the Munitions Safety Information and Analysis Center (MSIAC). The scope of MSIAC will include Ammunition Safety throughout the life cycle of munitions, and support of AC/326's efforts in developing munition safety standards. NIMIC is slated to officially transition to MSIAC in 2004.[13]

NORTH ATLANTIC TREATY ORGANIZATION STANDARDIZATION AGREEMENTS (STANAGS) AND ALLIED PUBLICATIONS

There are multiple means of which to obtain standardization agreements in NATO. They are normally published as Standardization Agreements (STANAGs) or Allied Publications (APs). STANAGs and APs are processed in accordance with Allied Administrative Publication (AAP)-3, "Procedures for the Development, Preparation, Production and the Updating of NATO Standardization Agreements (STANAGs) and Allied Publications (APs)."

North Atlantic Treaty Organization Standardization Agreements (STANAGs)
A Standardization Agreement is the record of an agreement among several or all the member nations to adopt like or similar military equipment, ammunitions supplies and stores; and operational, logistic and administrative procedures. National acceptance of a NATO Allied Publication issued by the Military Agency for the Standardization may be recorded in a Standardization Agreement.

Currently, one ratified STANAG relates to IM, STANAG 4439. STANAG 4439's aims to establish a standardized policy for the development, assessment and testing of IM [14] This STANAG states that ratifying nations agree to:

[13]Touzé, Patrick, *NIMIC in a Transition Phase* North Atlantic Treaty Organization, March 2003.

[14] STANAG 4439 PPS (Edition 1)—Policy for Introduction, Assessment and Testing for Insensitive Munitions (MURAT), 18 Nov 98.

a. Whenever feasible, IM shall be developed and introduced into service.

b. The results of threat hazard assessments (assessments of threats to the munition), assessment of tests results, assessments and tests to evaluate IM performed in accordance with this document and the associated Allied Ordnance Publication (AOP)-39 developed to define the methodology for these and other matters will be provided by the developing nation.

STANAGs are normally used to publish NATO Agreements that required official recording of specific facts. The following STANAGs relating to IM have been issued to member nations for ratification:

- STANAG 4240, Liquid Fuel/External Fire, Munition Test, Procedures;
- STANAG 4241, Bullet Impact, Munition Test Procedures;
- STANAG 4375, Safety Drop, Munition Test Procedures;
- STANAG 4382, Slow Heating, Munition Test Procedure; and
- STANAG 4396, Sympathetic Reaction, Munitions Test Procedures.

The United States has ratified each of these five STANAGs. Final ratification by the full membership is pending.

The United States would like to make these STANAGs self-implementing and has revised the U.S. national S3 testing document concerning hazard assessment tests for non-nuclear munitions. MIL-STD-2105C, "Hazard Assessment Tests for Non-Nuclear Munitions," currently provides a single, one-stop shopping document for IM, environmental, basic safety and general S3 guidance.

Allied Publications (APs)
An Allied Publication (AP) is an official NATO standardizing document that some or all NATO nations agree to use as a common implementing document and which is distributed down to the Program Manager level.

APs are manuals that address tactics, intelligence, doctrine, training and exercise procedures, security rules, technical and administrative matters. They are normally applied in the CNAD areas when the information contained in an AP does not warrant or is not suitable for a STANAG.

There are three types of APs:

1. APs containing factual information only, that does not require a covering STANAG.
2. APs that direct- action to be taken in specific circumstances by implementing nations. These require nations' approval by the ratification of a covering STANAG.

3. A combination of the two, i.e., factual information (that does not require ratification) and requirements or instruction requiring nations' approval by ratification of a covering STANAG. In this case, the STANAG must indicate that the authority of AC/326 may modify the informative part of the AP without need for re-ratification. This informative part must be unambiguously identified in the (draft) STANAG from the beginning of its development.

The following APs pertain to IM:

AOP-15, "Guidance on the Assessment of the Safety and Suitability for Service of Munitions for NATO Armed Forces"

AOP-39, "*Guidance on the Development, Assessment and Testing of Insensitive Munitions (MURAT)"*

Chapter 4: Lessons Learned/Best Practices

Many success stories and beneficial anecdotes regarding insensitive munitions (IM) can benefit weapon Program Managers (PMs) in the application of IM solutions. Large and small weapon systems have been developed that meet all IM criteria establishing a solid knowledge base for future developments. The following table outlines examples.

Table 4.1 – Example Weapon Systems with Insensitive Munitions Technologies

Anti-Personnel Obstacle Breaching System (APOBS) IM Technology: PBXW-17 explosive. Benefit: Passes ALL IM tests with reduced logistics footprint.	
BLU 110/111 General Purpose Bombs IM Technology: PBXN-109 explosive. Benefit: Eliminates detonations from fire or fragments on flight deck.	
Stand-off Land Attack Missile Expanded Response (SLAM-ER) IM Technology: New container technology. Benefit: Passes sympathetic detonation (SD).	
Advanced Medium Range Air-to-Air Missile (AMRAAM) IM Technology: PBXW-11 fuze booster explosive. Benefit: Reaction violence reduced from detonation to burn for fragment impact threat.	
Tomahawk Missile IM Technology: PBXN-107 explosive replacing H-6 in unitary warhead. Benefit: Eliminates detonations or explosions in FCO, SCO, BI and FI.	
Evolved Sea Sparrow Missile (ESSM) IM Technologies: HTPE propellant & KS-33 explosive. Benefit: Reduced reaction violence in regarding previous variant.	

STANDARD Missile IM Technology: PBXN-110 explosive. Benefits: Increased performance & IM compared to previous variants.	
Joint Air-to-Surface Standoff Missile (JASSM) IM Technologies: AFX-757 Explosive, case venting and packaging. Benefit(s): Passes all IM tests.	
Modular Artillery Charge System (MACS) IM Technologies: Optimized propellant selection coupled with charge design/partitioning, vented container. Benefit: Least sensitive 155mm propulsion charge.	
M829A3 120mm APFSDS-T (Tank) IM Technology: Container venting new less sensitive propellant. Benefit: Passes most IM tests.	 
AGM-84 Harpoon-Warhead IM Technology: Uses warhead case, stress riser groove. Benefit: Passed IM tests.	

Many forms of technology have been developed to address IM and performance requirements. There are three major parameters that affect IM reactions; these are energetic materials, system design and packaging. The proper selection of energetic materials, which are the underlying factors in IM, is quite important. The selection of a less sensitive energetic material will relieve the burden on other remedies, such as barriers, which because of weight/volume limitations are not always practical. Often, it is necessary to take a system approach to optimize these three factors to achieve IM compliance. The technology areas associated with the three factors are shown in the following table.

Table 4-2. Parameters Affecting Insensitive Munitions Reactions

Less Sensitive Energetic Materials	Munitions System Design	Ordnance Protection
High Explosives Gun & Rocket Propellants Pyrotechnics Booster	Munition Cases Thermal/Shock Mitigation Venting Thermal Management	Container Design Shielding Packaging Barrier

The following pages identify examples of specific technologies such as less sensitive explosives, ordnance packaging, rocket propulsion and IM test specific mitigation technology that may assist PMs in addressing IM requirements.

Table 4-3. Insensitive Explosive Transitions

EXPLOSIVE USE	NOMENCLATURE	DEVELOPMENT STATUS	MUNITION APPLICATIONS
General-Purpose Explosives	PBXN-109	Final (Type) Qual.	BLU-110/111/116/117 Bombs*, BLU-109, Penguin* Hellfire Blast/Frag WH, GBU-24B/B Penetrator, MK-62 and MK-63 Quickstrike, JSOW (Unitary), Tomahawk Block IV
	PBXW-126	Qualified	JDAM, JSOW, Tomahawk/Harpoon, Penguin PIPs
	AFX-757	Final (Type) Qual.	JASSM
Internal Blast Explosives	PBXIH-135	Qualified	BLU-118*, SMAW NE Programs*
Metal Accelerating Explosives	PBXN-9	Final (Type) Qual.	Hellfire*, APOBS*, LAW/PIP, 5”/54 MK 64 (PIP)*, 5”/54, ERM*, AGS*, Excalibur*, JASSM, AMNS*, SABRE
	PBXN-10, Type I and II	Final (Type) Qual.	APOBS*, MONGOOSE*
	PBXW-11	Qualified	JSOW/SFW (BLU-108), AMRAAM*,.5” CARGO
	PBXN-106	Final (Type) Qual.	5”/54
	PBXN-107	Final (Type) Qual.	Tomahawk Block III
	PBXN-110	Final (Type) Qual.	Carl Gustaf*, AMRAAM*, STANDARD Missile, AIM-9X*, MK 146 WHD*, BROACH*
	KS-33	Qualified	ESSM*
	PBXN-112	Qualified	SLAM-ER*, Hellfire*, 76 mm PIP*
	PBXN-114	Qualified	AGS*, RASCL*
	PBXW-128	Qualified	Directional Ordnance Warhead
	PAX-2A	Qualified	DPICM*(GMLRS, M915*, M916, XM984*, M864, RECAP), M430A1* HEDP*, OICW/OSCW*
Underwater Explosives	PBXN-103	Final (Type) Qual.	MK-46 Torpedoes*, Captor*, MK-62 and MK-63 Quickstrike*, MK-57 Destructor, SABRE
	PBXN-105	Final (Type) Qual.	MK-48 Torpedo*
	PBXN-111	Final (Type) Qual.	MK-98 MND*, CALCM* (Tomahawk), CCAT*

EXPLOSIVE USE	NOMENCLATURE	DEVELOPMENT STATUS	MUNITION APPLICATIONS
	PBXN-203	Final (Type) Qual	SABRE, DET, ESMB, MICLIC*
Booster Explosives	PBXN-5	Final (Type) Qual.	Standard Missile*, APOBS*, Phoenix*, Sparrow*, 20 mm*, Hellfire, LAW*, XM-80*, 76 mm PIP*, 5"/54 MK-64 PIP*
	PBXN-7	Final (Type) Qual.	MK-50 Torpedo*, MK-98 MND*, RAW, Quickstrike*, Penguin*, BLU-110/111*, LAW, Hellfire, JAASM
	PBXN-8	Final (Type) Qual.	APOBS*, Detonating Cords
Primary Explosives	DXN-1	Final (Type) Qual.	APOBS*, MFF, MK 98 MND*, FMU-139
	PBXN-301	Final (Type) Qual.	Initiation Trains, Explosive Logic Trains

*In-service or in-engineering development for that particular weapon.

Advances in Containment and Storage

The development of vented containers for 155mm Propulsion charges Modular Artillery Charge System (MACS) and M829A3 120mm APFSDS-T greatly reduced their reactions in cook-off and bullet impact tests. The Stand-off Land Attack Missile – Expanded Response (SLAM-ER) passes all IM criteria when it is stored in an IM container. The Anti-Personnel Obstacle Breaching System (APOBS) is another example of a weapon system that passes all IM criteria. The APOBS uses both a shielding system and explosive formulation that work in tandem to mitigate all IM threats. Table 4-4 summarizes the advances in ordnance containers, warheads and stowage technologies.

Table 4-4. Ordnance Containers, Warhead and Stowage Technologies for Insensitive Munitions

TECHNOLOGIES	MUNITION SYSTEMS
Applied Technologies	
Composite Materials—Warhead Components	STANDARD Missile, Phoenix, AMRAAM, ESSM
Warhead Venting—Stress Risers, Plugs, and Enclosures	HARM, Harpoon/SLAM, Penguin, Tomahawk, JDAM, JSOW, 60mm mortar
Warhead Liners (Outgassing)	Harpoon/SLAM, JDAM, JSOW
Weapon Shielding Design (PHST)	Harpoon, JDAM, Maverick, Hellfire, APOBS, MK-57 NMD, NSSM Launcher 5”/54 Ammo, High-Performance Magazine, plus many others
Shipping Containers—New and Modifications	AMRAAM, Penguin, Sidewinder, SLAM, JSOW, MACS, M829A3 120mm APFSDS-T
Thermal Coatings	2.75-inch launcher, Quickstrike, SM container, 60mm mortar container
Available Technologies	
Composite Materials—Warhead Components Reactive Materials—Warhead Case Fragments or Solid FAE Mix	
Warhead Venting—Stress Risers, Plugs, and Enclosures, venting with low temperature melting material Warhead Liners (Outgassing and Shock-Mitigating)	
IHE Booster Designs	
Shielding Design, Analysis, and Material Selection Shipping Containers—New and Modifications Updated Test Methods for Weapon Support	

Insensitive Munitions Technical Accomplishments

To address the IM behavior of a solid rocket motor, a systems approach is mandatory. A propulsion unit’s response to the IM test environment is a function of numerous design details, many of which may be unique to a specific rocket motor. The thermally initiated venting system (TIVS) technology, for example, has been incorporated into the Advanced Medium Range Air-to-Air Missile (AMRAAM). TIVS technology offers mitigation for fast cook-off. The following paragraphs summarize some of the significant IM accomplishments in the propulsion and propellant technology arena.

- Due to the difficulty in defeating the pressure integrity of a steel rocket motor pressure vessel, composite and hybrid cases, whose pressure containment capability may be defeated before propellant ignition, may prove useful in meeting the IM requirements of a solid rocket motor. For example, in the fuel fire, the intent is to thermally degrade the case before the propellant reacts. In the

bullet and fragment impact testing, the intent is to destroy the integrity of the hoop windings of the composite/hybrid structure and allow the case to vent.

- Several formulation approaches that reduce a propellant's reaction violence have been developed. These approaches include the use of mixed solid oxidizers and the use of an energetic binder to lower the reaction temperature below the decomposition of AP. Energetic binders also allow the level of sensitive energetic solid ingredients to be reduced without losing performance.

  The most notable of the mixed oxidizers have been bismuth trioxide (Bi_2O_3) with AP in aluminized boost propellants and ammonium nitrate (AN) with AP in both aluminized and reduced smoke propellants. A significant reduction in reaction violence compared with that of state-of-the-art propellants has been demonstrated with propellants containing these mixed oxidizers loaded in analog or generic motors and subjected to the IM hazard tests. A boost propellant with bismuth trioxide (Bi_2O_3), AP, and aluminum has been demonstrated in composite-cased prototypes for potential use in the Tomahawk boost launch motor and in the 21-inch diameter risk reduction demonstration motor for the STANDARD Missile.

- A nitrate-ester-plasticized, reduced-smoke, hydroxyl-terminated polyether (HTPE) propellant containing the co-oxidizers AP and AN has been tested in composite case prototype motors with potential application to a number of missile systems. The HTPE polymer is custom synthesized specifically as a solid propellant binder. Prototypes that have been demonstrated include Sidewinder, Evolved Sea Sparrow Missile (ESSM), Rolling Airframe Missile (RAM), and the 21-inch diameter risk reduction demonstration motor. These new cases and propellant combinations show significant improvements over the equivalent state-of-the-art propellants in steel cases and come close to meeting the Navy's IM rocket motor goal of passing the IM hazard tests. Two HTPE propellant formulations have been selected for use in producing the ESSM.

- A second nitrate-ester-plasticized propellant binder system in the early stages of development has exhibited excellent ballistic performance and reduced reactions in subscale IM testing. This new binder system consists of hydroxy-terminated copolymers of polycaprolactones (HTCE). The HTCE binders can be used with and without the nitrate ester plasticizers. Results indicate that HTCE polymer is similar to HTPE polymer and may produce equal or better responses in full-scale IM tests. Although the HTPE polymer is custom synthesized specifically as a solid propellant binder, the HTCE polymer is a low-cost, commercially available material at less than $3.00 per pound. Prototypes are currently being fabricated for the 21-inch diameter risk reduction demonstration motor.

Additional information about IM technologies is available via the Munitions Safety Information and Analysis Center (MSIAC) database at *www.nato.int/related/nimic/*.

Chapter 5: The Approach To Acquiring Insensitive Munitions

A successful insensitive munitions (IM) program allowing certification requires available technologies, an appropriate level of funding dedicated for IM, required assets for testing and full integration in the engineering design, development and testing process. IM is a technically challenging technology area that requires the full commitment of program management.

ADDRESSING INSENSITIVE MUNITIONS IN SYSTEM DOCUMENTATION

Department of Defense (DoD) policy requires program managers (PMs) to address IM requirements during the development of Mission Needs Statements (MNS), Capstone Requirements Documents (CRDs) and Operational Requirements Documents (ORDs). The following excerpts are from 3170.01C and Chairman of the Joint Chiefs of Staff Manual (CJCSM) 3170.01 respectively, which specifies Joint Chief of Staff policy regarding IM as an integral component of the weapon requirements process:

> The Director, J-4, Joint Staff, will perform munitions insensitivity certifications and process insensitive munitions waiver requests as required.
>
> The Joint Staff J-4 will certify that all Capability Development Documents (CDDs) and Capability Production Documents (CPDs) for munitions, regardless of ACAT level, contain the requirement to conform to insensitive munitions (unplanned stimuli) criteria. At a minimum, these CDDs and CPDs are to contain the statement, "Munitions used in this system will be designed to resist insensitive munitions threats (unplanned stimuli)."

PREPARING A THREAT HAZARD ASSESSMENT TO ASSESS MUNITION VULNERABILITY

A Threat Hazard Assessment (THA) is a living document, which is updated/modified as a munitions system progresses through development. The document evaluates threats and munition reaction(s) throughout the life cycle, potential collateral damage from the munition reaction and potential solutions for non-IM responses. The basic components of a THA are:

a. **System Overview** – includes component descriptions and energetics.

b. **Life-Cycle Profile** – a cradle-to-grave sequence description of a munition, which should include details on logistic configuration(s), transportation method(s), storage configuration(s), fielded configuration(s) and any system specific considerations.

c. **Threats** – identified unplanned stimuli which may present a credible threat to the munition, and the part of the life cycle in which the threat is present.

d. **Munition Reaction** – known and/or expected reaction of the munition to the threats identified, including potential collateral damage to platforms, personnel and adjacent munitions from these reactions.[15]

e. **IM Tests** – recommendations about the types of tests to be conducted in order to establish the IM characteristics of the munition item, specify munition configuration and applicable test threat, component and/or full scale tests, as well as any engineering or screening type tests that would be beneficial.

f. **Solutions** – identification of technologies that have the potential to improve the IM characteristics of a munition item.

ESTABLISHING ACHIEVABLE INSENSITIVE MUNITIONS DESIGN GOALS IN TECHNOLOGY SELECTION

IM certification of a munition system is the ideal design achievement but may not be fully achievable if adequate funding and technologies do not exist. Government funded research at DoD and each Service level, develops IM technologies. Therefore, it is the responsibility of munition system PMs to tailor technology to their specific needs. Other factors that affect IM certification are: development phase, munition complexity, schedule, performance and overall commitment.

The goal of IM is to reduce collateral damage when weapons are exposed to unplanned stimuli. A total systems approach is often used to achieve maximum IM improvements. Complete compliance is not always possible. Incremental improvements are recognized as improvements to platform survivability and are acceptable when full compliance is not achievable due to a lack of IM technology to mitigate test failures.

Weapons that have integrated an incremental IM solution include general-purpose bombs, the Evolved Sea Sparrow Missile, LAW and HELLFIRE missiles. These systems employ one or more of the following technologies: advanced energetic materials (explosives and propellants), rocket motor materials and stowage configurations to improve their responses to IM stimuli.

SELECTION OF TECHNICALLY APPROPRIATE MITIGATION CONCEPTS

It is important to choose technically appropriate mitigation concepts to reduce fragment, blast, heat reactions, as well as munition design approaches, packaging technologies, and energetic material. A variety of IM technologies offer threat-specific solutions to the six threat stimuli defined in MIL-STD-2105C.

[15] Department of the Army Pamphlet 70-3: Appendix XXV, Revised 2003.

The PM should investigate technologies specific to the threats under consideration. Composite cases, for example, offer the potential to reduce reaction violence in cook-off scenarios but do not provide protection against bullet or fragment attack. Examples of technology solutions are provided in **Chapter 4**.

INSENSITIVE MUNITIONS TEST CRITERIA - MILITARY-STANDARD-2105

Military Standard (MIL STD) 2105C is the military standard approved for use by all components of DoD. A summary of IM testing guidelines is contained in MIL STD 2105C, Section 4. This document covers test procedures and tests for assessing IM performance characteristics and associated safety. It also provides the framework for a consolidated safety and IM test program.

The following IM tests and the passing criteria for IM as defined by MIL-STD-2105C, are listed below in Table 5-1.

Table 5-1. Insensitive Munitions Passing Criteria

TEST	PASSING CRITERIA
Fast Cook-off	No reaction more severe than Type V (Burning)
Slow Cook-off	No reaction more severe than Type V (Burning)
Bullet Impact	No reaction more severe than Type V (Burning)
Fragment Impact	No reaction more severe than Type V (Burning)
Sympathetic Detonation	No Type I (Detonation) reaction of any of the acceptor munitions
Shaped Charge Jet Impact	No Type I (Detonation) reaction

The Role of Small Scale Testing and Modeling in Predicting Insensitive Munitions Performance

Small-scale testing and modeling should be considered to support the assessment of IM responses. Small-scale testing is especially appropriate for systems that consist of very large quantities of explosives. All IM tests except sympathetic detonation (SD) may be effectively tested in small-scale with acceptable extrapolation to a full-scale system. The PM should consult the Service's IM Review Board prior to the conducting of small-scale testing, and obtain the approval by the Service's review authority or organization to ensure that there is concurrence regarding the applicability of small-scale testing for a given system.

Using Assessment versus Testing to Predict Insensitive Munitions Performance

Assessments, rather than testing of assets, may offer an economic advantage in the prediction of IM performance. A PM may, for example, conclude that a warhead or rocket motor is likely to fail an IM test based on test results for other systems that have similar confinement, energetic materials and threat scenarios. Many items with small amount of explosive or propellants (e.g., CADS, PADS, flares) can readily be compared to like items that have undergone IM testing. These assessments may be valid for documenting IM responses in a larger system. However, they may require full-scale testing to confirm passing IM performance.

Efficiencies of Combining Insensitive Munitions/Safety/Department of Transportation Tests

Three sets of tests are commonly used to assess munitions with respect to hazards: IM tests; hazard classification (HC) tests (used to classify munitions for transportation and storage purposes); and system specific tests used to assess the role of munition response on system vulnerability. In order to best utilize limited resources and avoid redundancy, IM test plans should be tailored to the maximum extent possible within the guidelines of the MIL-STD-2105 series, so that all three sets of tests can be harmonized into one coordinated test program with the minimum number of tests. Test plans should be coordinated with the appropriate Service hazard classifier and the Department of Defense Explosive Safety Board (DoDESB) when a DoD Hazard Classification is to be obtained per Technical Bulletin 700-2. The DoDESB can be contacted via their Web site at *http://www.ddesb.mil*.

CONDUCTING INSENSITIVE MUNITIONS TESTS

Baseline Testing

It is important to coordinate the planned baseline testing with the cognizant Service IM review board. These boards have extensive experience with IM testing and can offer insight and guidance regarding the applicability of the planned testing compared to the THA.

Each Service has its own organization for scoring IM test results. The U.S. Army IM Board (IMB) rules on test results and compliance for Army items. The IMB is chaired on a two-year rotational basis by IM subject matter experts from ARDEC, ARL, AMRDEC, and SMDC, and is permanently co-chaired by LOGR&D. The U.S. Navy IM Review Board provides official scoring for Navy systems. The U.S. Air Force Organization with test scoring ability is the Non-Nuclear Munitions Safety Board. .

CERTIFICATION OF INSENSITIVE MUNITIONS COMPLIANT DESIGN

A munition or weapon that passes all IM tests is deemed to be fully compliant with IM requirements. Test results should be presented to the individual Service review organizations. The Navy's IM Council issues Certification status to Navy and joint weapon programs with Navy involvement for weapons that are fully compliant with IM requirements. The Army IMB will issue Certifications of IM compliance for Army munition systems, and the Air Force IM certifications will be approved at the Air Force IM EA level.

Chapter 6: Insensitive Munitions Waivers

The purpose of an Insensitive Munitions (IM) waiver is to document Joint Staff approval to acquire and field a munition system despite failure of that system to successfully pass all of required IM tests. Since IM compliance is a system requirement for all munitions per Department of Defense (DoD) and respective Service policies, IM test failures indicate an inability to meet system requirements. Specifically, IM test failures reflect potential safety and survivability shortcomings of a munition, and increase the severity of the threat posed to combat and logistics systems. Consequently, these shortcomings must be approved through the requirements process, prior to acquisition of the system.

Approval of IM waivers rests with the Joint Requirements Oversight Council (JROC), and any system, that fails one or more IM test must obtain JROC approval for an IM waiver prior to fielding. Procedures have been established to ensure that documentation is developed for systems that fail one or more required IM tests, and that said documentation is reviewed for technical adequacy, and staffed with and/or by the appropriate organizations. A request for an IM waiver is processed only after all other elements of the IM program have been executed, all reasonable efforts to develop and acquire an IM-compliant system have failed and the responsible organization has determined that the need to field the noncompliant system outweighs the negative impacts of fielding such a system.

The request for an IM waiver is typically prepared by the Program Manager's (PM) staff or element providing engineering support, then coordinated at the working level with the a Service/agency IM Board for informal review. The IM Board conducts an informal review, and then coordinates with the Joint Services Insensitive Munitions Technical Panel (JSIMTP) for informal recommendations. The recommendations from these collaborations are provided to the PM or engineering support element to aid in the completion of the formal IM waiver request.

The formal IM waiver request is then developed and forwarded by the Program Executive Officer to the Service’s IM Executive Agent, and subsequent Joint Staff for review. The Executive Agent provides the waiver request to the IM Board for technical review and recommendations. IM Board recommendations are provided to the Service IM Executive Agents within 30 days after receipt of the request. After the IM Board’s technical recommendations are provided, the Service IM Executive Agent staffs the waiver request with the appropriate elements, obtains the Acquisition Executive Agent’s concurrence, and then forwards the request through the appropriate channels for Joint Staff technical review and final JROC approval. The purpose of the Joint Staff technical review is to advise the Joint Staff on adequacy of the request.

If there are no outstanding issues with the request, JROC approval is usually granted. If issues exist, such as failure to incorporate appropriate technology or lack of a Plan of

Action and Milestones (POA&M) for improvement, the waiver proponent may be required to revise the plans and waiver request

As each Service has specific information that is necessary for their respective IM waiver requests, the following are documentation examples and illustrations of Service-specific IM waiver approval processes.

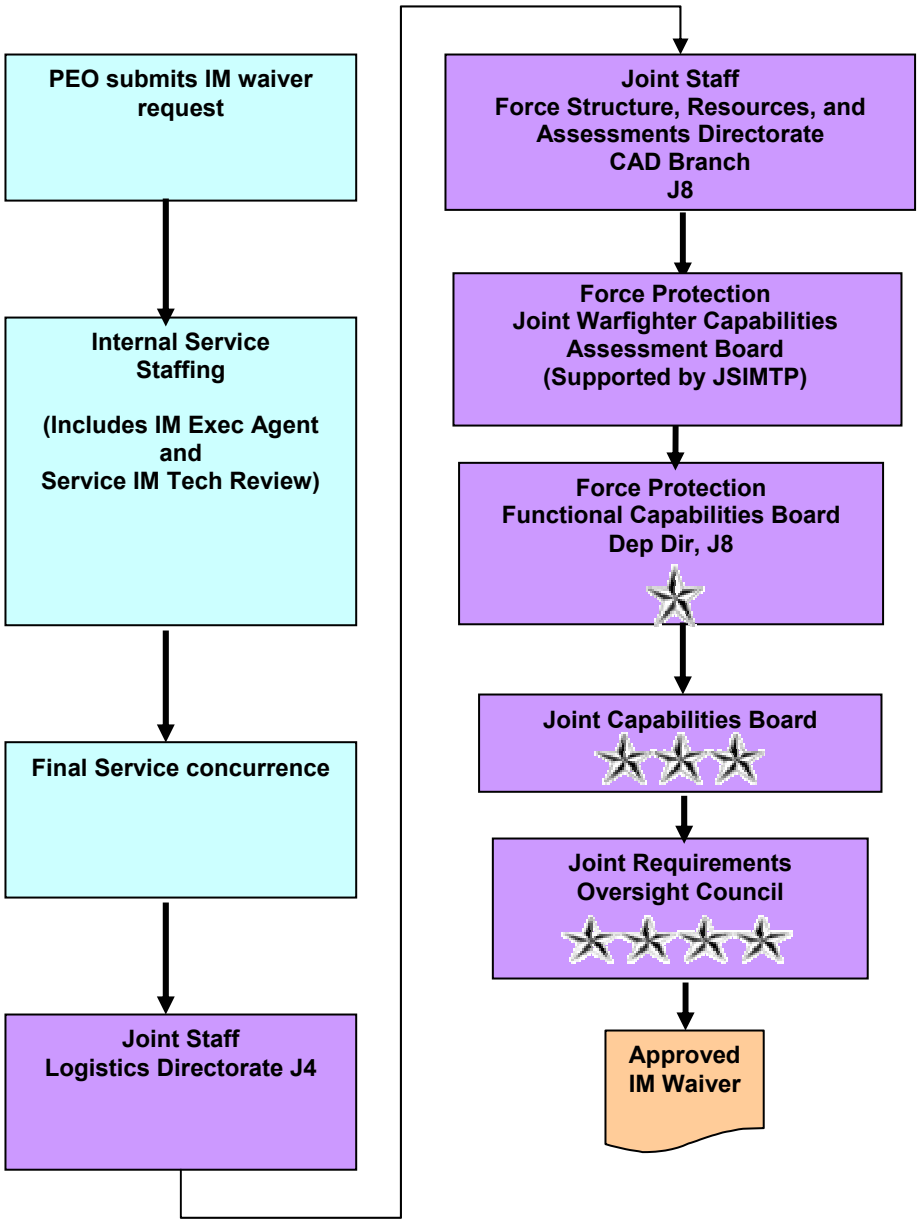

Figure 6.1 Insensitive Munitions Waiver Process

INFORMATION REQUIRED FOR U.S. NAVY INSENSITIVE MUNITIONS WAIVER REQUESTS

Munition:

Office of Primary Responsibility (OPR):

Weapon Description: Include complete nomenclature and other identification, i.e., Department of Defense Identification Code/Naval Ammunition Logistics Code (DoDIC/NALC) and description of explosive components. Include all test results as noted below, a prioritized list of actions required to make the munition item(s) IM-compliant, a sponsor-supported estimate of required funding and schedule by Fiscal Year (FY).

Summary of IM Test Results:

TEST	CONFIGURATION	REACTION/RESULTS
FCO		
SCO		
BI		
FI		
SD		
SCJI (if deemed credible by THA)		
SCJSI (if deemed credible by THA)		

Justification for Waiver Request: Describe clearly and concisely why it is not possible or feasible to make this item/system IM-compliant.

INFORMATION REQUIRED FOR U.S. AIR FORCE INSENSITIVE MUNITIONS WAIVER REQUESTS

Introduction:
If one or more of the IM tests is not passed the Program Manager (pm) or Item Manager/Developer must submit a formal waiver request to the Air Force Executive Agent for IM for Air Force review and approval to forward to the JROC for validation. NO PERMANENT WAIVER WILL BE GRANTED.

PM or item manager/developer Contact Information: Name, Address, Fax, e-mail, Phone

Munition: (Name and Nomenclature)

Description: Describe the system, labeling energetic components. Use of figures, schematics, and pictures is encouraged.

Summary of Test Results: Use the following tabular format. The munition must pass as a total system, i.e., not component by component.

Test	**Pass Criteria**	**Results**
Fast Cook-Off		
Slow Cook-Off		
Bullet Impact		
Fragment Impact		
Sympathetic Detonation		
Shaped Charge Jet Impact		
Shaped Charge Jet Spall Impact		

Test Results Reviewed By: (e.g. Non-Nuclear Munitions Safety Board)

Threat Hazard Assessment Summary:

Hazard Classification Test Results Summarized:

Actions Required to Make Munition Insensitive:

Other Pertinent Data: (Test Reports, Munition History, etc.)

Rationale for the Waiver Request:

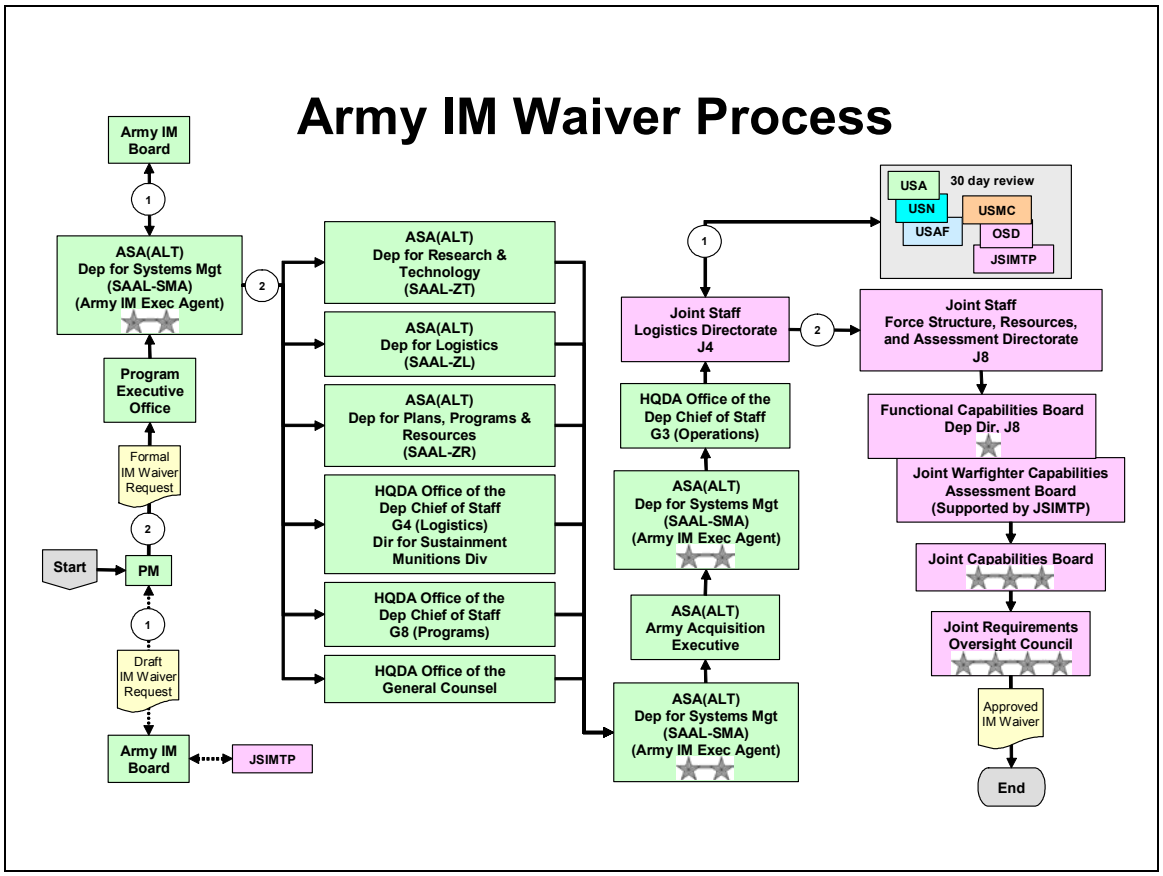

Figure 6-2. U.S. Army Insensitive Munitions Coordination Process

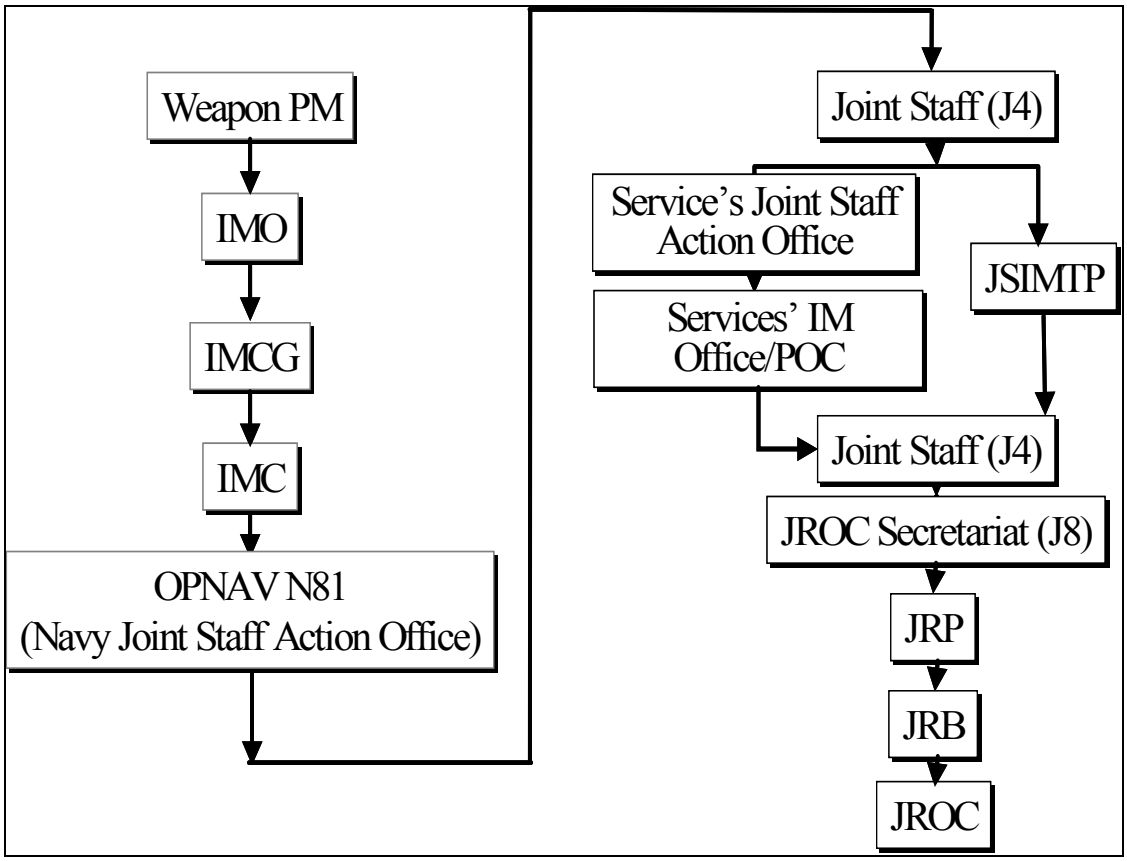

Figure 6-3. U.S. Navy Insensitive Munitions Coordination Process

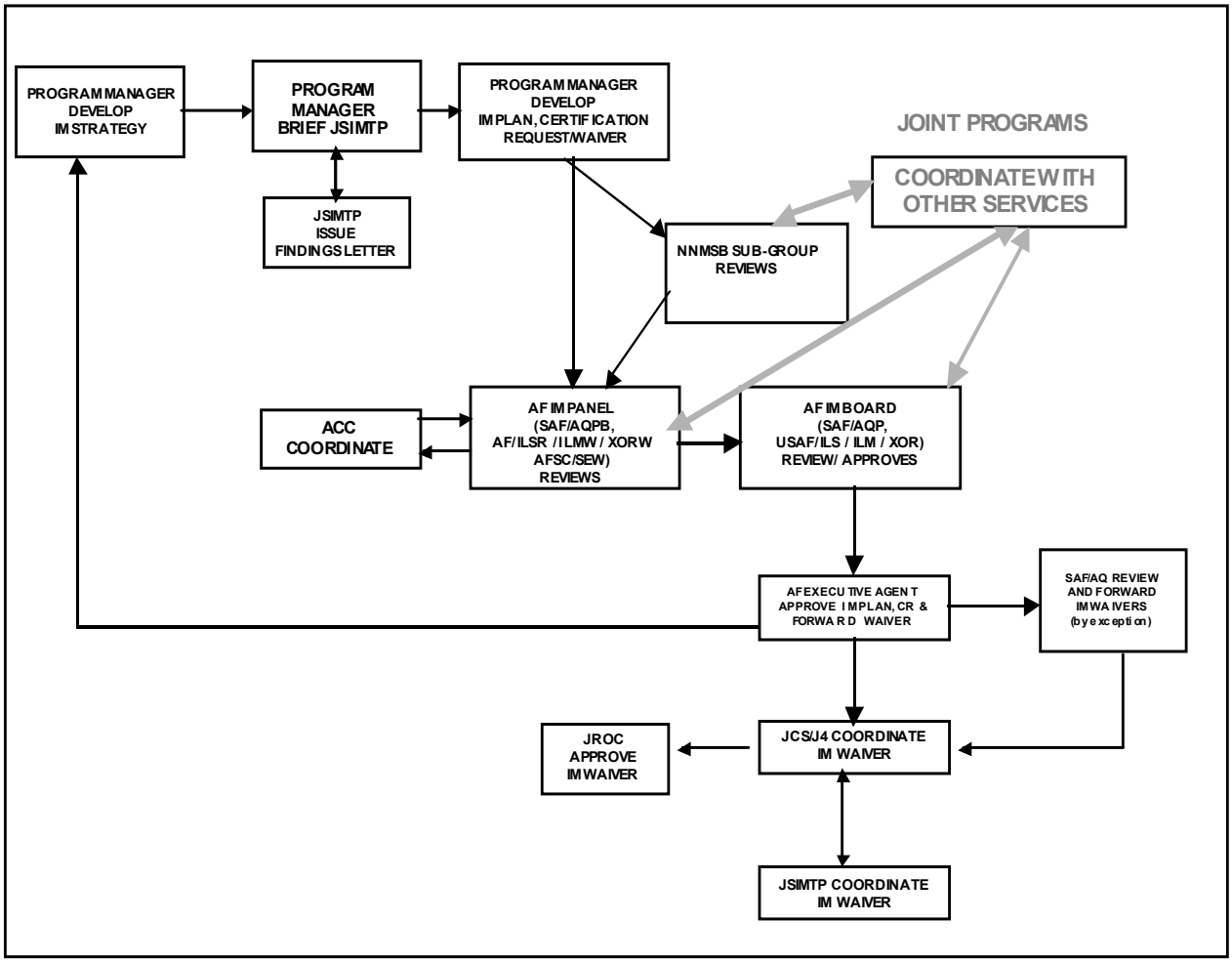

Figure 6-4. U.S. Air Force Insensitive Munitions Coordination Process

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Appendix A

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A&SE	Air and Surface Explosives	AEDA	Ammunition Explosives Dangerous Articles
AAAV	Advanced Amphibious Assault Vehicle	AFB	Air Force Base
AADC	Area Air Defense Commander	AFD	Arm-fire device
AAE	Army Acquisition Executive	AFSRB	Army Fuze Safety Review Board
AAP	Army Ammunition Plant	AGARD	Advisory Group for Aerospace and Development
AARGM	Advanced Anti-Radiation Guided Missile	AGS	Advanced Gun System
AAW	Anti-Air Warfare	AHM	asphaltic hot melt
ABF	Advanced Bomb Family (program terminated)	AIM	Air Intercept Missile
		AIM-9X	Advanced Sidewinder
ABL	Allegheny Ballistics Laboratory	AIWS	Advanced Interdiction Weapon System (program terminated)
ABS	Assault Breaching System		
AC	(NATO) Action Committee	A & I	(?) as in A & I formulations, Affordability and –
AC/310	NATO CARDRE Group, "Group on Safety and Suitability for Service of Munitions and Explosives"	Al	Aluminum
		ALAM	Advanced Land Attack Missile
ACAT	Acquisition Category	ALEX	Ultra Fine Aluminum (superfine aluminum)
ACDS	Advanced Combat Direction Systems	ALI	Aegis LEAP Interceptor
ACS	Attitude Control System	AMC	Army Materiel Command
ACTD	Advanced Concept Technology Demonstration (Program)	AMCOM	Army Missile Command
		AMMO	(azidomethyl) oxetane and 3-azidomethyl-3-methyloxetane
ADIM	Advanced Development Insensitive Munitions	AMNS	Airborne Mine Neutralization System
ADIMS	Ammunition Disposal Inventory Management System	AMRAAM	Advanced Medium Range Air-to-Air Missile
ADN	Ammonium dinitramide		
ADNBF	Aminodinitrobenzo-furoxan	AN	Ammonium nitrate

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AND	Ammonium Dinitramide
AOP	Allied Ordnance Publication (NATO)
AP	Ammonium perchlorate
APET	Advanced Penetrator (Penetration) Explosive Technology
APFSDS-T	Armor Piercing Fin Stabilized Discarding Sabot with Tracer
APOBS	Anti-Personnel Obstacle Breaching System
ARC	Atlantic Research Corporation
ARCCAPS	ARC Controlled Autoignition Propellant System
ARDEC	Army Research Development & Engineering Center
ARL	Army Research Laboratory, Aberdeen, MD
ARC	Atlantic Research Corporation
ARTEMIS	Chemical Agent Standoff Detection System
ASN	Assistant Secretary of the Navy
ASROC	Anti-submarine Rocket
ASSIST	Acquisition Streamlining & Standardization Information System
ASSW	Anti-Surface Ship Warfare
ASTRID	Ammunition Safety Test Report International
ASuW/SW	Anti-Surface Warfare/Strike Weapon
ASW	Air and Surface Weaponry (Program)
ASW	Anti-Ship Warfare
ASWT	Antimateriel Submunition Warhead Technology
AT&L	Acquisition, Technology & Logistics [as in OUSD (AT&L)]
ATACMS	Advanced (Army) Tactical Missile System
ATD	Advanced Technology Development (or Demonstration)
ATK	Alliant Techsystems Inc.
ATR	Advanced Technology and Research Corporation
ATT	Anti-Torpedo Torpedo
AUP	Advanced Unitary Penetrator
AUR	All-Up Round
BAA	Broad Agency Announcement
BAE	BAE Systems Inc.
BAMO	Copolymer of poly-3, 3-bis (?)
BAMO/	Copolymer of [Poly-3,3-bis (azidomethyl) oxetane and 3-azidomethyl-3-AMMO methyloxetane]
BAMO	bisazido-methyloxetane
BAT	Brilliant Anti-Tank, hardware
BD	Butadiene
BDNPF/A	Bis-dinitropropyl formal/acetyl (50/50 nitroplasticizer)
BI	Bullet Impact
BIC	Ballistic Impact Chamber

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Appendix A
Glossary

Bi_2O_3	Bismuth trioxide
BLU	Bomb, Live Unit
BMDO	Ballistic Missile Defense Organization
BNO	Hydroxyl-terminated polybutadine-acrylonitrile (prepolymer capped with ethylene oxide)
BOE	Bureau of Explosives (BoE)
BTTN	butanetriol trinitrate (an energetic plasticizer)
Bu-NENA	N-butyl-2-nitratoethyl nitramine (an energetic platicizer)
BVR	burn-to-violent reaction (a small-scale IM test)
C-4	Explosive, (RDX/motor oil/polyisobutylene/ dioctylsebacate)
CAD	Cartridge Actuated Device
CAE	Component Acquisition Executive
CAIMS	Conventional Ammunition Integrated Management System
CAME	Clean, Agile Manufacturing of Energetics
CCAT	Canistered Countermeasure Anti-Torpedo
CCC	Combustible Cartridge Cases
CCL	Concentric Canister Launcher
CD	Critical Diameter
CDN	Cyclodextrin nitrate
CDR	Critical Design Review
CEB	Chief of Naval Operations Executive Board
CIWS	Close-In Weapon Systems
CJCS	Chairman, Joint Chiefs of Staff
CJCSI	CJCS Instruction
CL-20	Hexanitro hexaza isowurtzitane, a high energy oxidizer
CLA	Carriers, Littoral and Amphibious (PEO-CLA) Carriers, Littoral Warfare, and Auxiliary Ships (PEO-CLA)
CMD	Cruise Missile Defense
CNA	Center for Naval Analysis
CNAD	Conference of National Armament Directors (NATO)
CNO	Chief of Naval Operations
COBEAN	Cost Benefit Analysis (a UK Tool based on CEB methodology to show Monetary benefits of introducing IM
COEA	Cost & Operational Effectiveness Analysis
COTS	Commercial off the shelf
CP	Counter Proliferation
CPIA	Chemical Propulsion Information Agency
CPOCP	Continuous processing of composite propellants
CPTA	Continuous Processing Technology Advancement

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CRA	Continuing Resolution Authority
CRADA	Cooperative Research and Development Agreement
CRD	Capstone Requirements Document
CSD	Chemical Systems Division (of Pratt & Whitney, formerly the United Technologies Corp.)
CSS	Coastal Systems Station (field activity of NSWS DD @ Panama City, FL)
CTH	Chart Three-Dimensional Hydrocode
CTIP	Commercial Technology Insertion Program
CYLEX	Cylinder expansion (test)
DAC	Defense Ammunition Center
DACS	Divert and Attitude Control System
DALA	Defense Ammunition Logistic Activity
DARPA	Defense Advanced Research Projects Agency
DATB	1,3-diamino-2,4,6-trinitrobenzene
DBTDL	Dibutyl tin dilaurate (tin-based cure catalyst)
DDESB	Department of Defense Explosives Safety Board
DDI	Dimeryl diisocyanate
DDNP	Diazodinitrophenol
DDT	Deflagration-to-Detonation Transition
DEA	Data Exchange Agreement
DEMVAL	Demonstration and Validation
DET	Distributed Explosive Technology
Det.	Detonating
DHE	Di-(2-hydroxyethyl) dimethylhydantion
DIPAM	Diaminohexanitrobiphenyl
DMA	Dynamic Mechanical Analysis
DMBT	Dimethlybitetrazole (an energetic fuel)
DNA	Defense Nuclear Agency
DNPF	Dinitropropyl fumarate
DNT	Dinitrotoluene
DOA	Dioctol adipate (or di(2-ethylhexyl) adipate)
DoD	Department of Defense
DoE	Department of Energy
DoNISOM	Department of the Navy International Standardization Organization Manual
DOS	Deformable Ordnance System Directional Ordnance System
DRX	Damage Resistant Explosives (Internal Blast Expolsives)
DSC	Differential Scanning Calorimeter (test)

DSMC	Defense Systems Management College	EOD	Explosive Ordnance Disposal
DTA	Differential Thermal Analysis (test)	EOM	End-of-Mix
		EOMV	End-of-mix viscosity
DTRA	Defense Threat Reduction Agency	EOS	Equation of State
DTRM	Dual Thrust Rocket Motor	EPDM	Ethylene propylene diene monomer
E&MD	Engineering & manufacturing development	ERGM	Extended Range Guided Munition Extended Range Gun-Launched Missile
EAD	Explosives Advanced Development (Program)		
		ESAD	Electronic safe and arm device
EB	Ensign Bickford	ESD	Electrostatic Discharge
EDCA	Executive Director for Conventional Ammunition (Army)	ESEM	Environmentally Safe Energtic Materials (program)
EFI	Exploding foil initiator	ESMB	Explosive Stand-off Mine Breaching
EFP	Explosively formed penetrator / projectile	ESMC	Explosive Stand-off Minefield Clearer
EIA	Extremely Insensitive Article; early initiating additives	ESSM	Evolved Sea Sparrow Missile
EIDS	Extremely Insensitive Detonating Substances	ETC	Electrothermal Chemical
		EVA	Ethylene vinyl acetate
ELC	Enhanced Lethality Cartridge	EVA	5-pound ballistic evaluation motor
ELSGT	Extra Large Scale Gap Test	EXV	Exoatmospheric Kill Vehicle
EM	Energetic Materials Electromagnetic	FAE	Fuel Air Explosive
		FAT	First Article Testing
EMCDB	Elastomeric Cast Double-base (propellant)	FCO	Fast Cook-off
EMD	Engineering Manufacturing Development	FCT	Foreign Comparative Testing (Test)
EMIC	Energetic Materials Information Center	FeAA	Ferric acetylacetonate

FEM	Fluid Energy Mill (Milling)	GPS / INS	Global Positioning System / Inertial Navigation System
FESWG	Fuzing Engineering Standardization Working Group	GSC	Generic Shaped Charges
FI	Fragment Impact	GTU	Generic Test Unit
FMCIS	Fielded Munitions Configuration Information System	HAN HARM	Hydroxyl ammonium nitrate High Speed Anti-Radiation Missile
FOTT	Follow-on-to TOW (warhead)	HAS	HMX - Al System, explosive with HTPB binder
FRAGMAP	Fragment Impact / Munitions Response Analysis for Guidance in Mitigation Assessment Program	HBX	RDX/TNT/Al/wax
		HC	Hazard Classification
FTIR	Fourier Transform Infrared	HE	High Energy, High Explosive
FTQ	Final (Type) Qualification	HEAA	High Explosives Anti-Armor
FTS	Factory-to-Target Sequence	HEAT	High Explosive Anti-Tank
FY	Fiscal Year (Government 1 Oct. to 30 Sept.)	HEDP	High Explosive Dual Purpose (Warhead)
FYDP	Future Years Defense Plan	HEI	High Explosive Incendiary
GAP	Glycidyl azide polymer (an energetic binder)	HEI-T Tracer	High Explosive Incendiary with
GAPA	An energetic platicizer with $-N_3$ thermal groups (GAP Azide)	HGS	HMX/graphite/HTPB explosive systems
GEM	Green Energetic Material (program)	HiSSS	High Speed Strike System
GES	Global Environmental Services	HMX	Cyclotetramethylene tetranitramine
GNU	Guidance Navigation Unit	HNS	Hexanitrostilbene
GOCO	Government-Owned, Contractor-Operated	HPDAP	High-performance dense additive propellant
GP	General Purpose (Bomb)	HPDP	Hybrid Propulsion Demonstration Program (consortium of Industry & DARP)
GPC	generic shaped charge		

HPLC	High Performance Liquid Chromatography	IMAD	Insensitive Munitions Advanced Development
HSMST	High Speed Maneuvering Surface Target	IMAD-HE	Insensitive Munitions Advanced Development-High Explosives
HTCE	Hydroxy-terminated caprolactone/tetramethylene; copolymer of polytetrahydrofuran and polycaprolactone	IMC	Insensitive Munitions Council, OPNAV
HTM	Hard Target Munitions	IMCC	Insensitive Munitions Coordination Council (dissolved)
HTP	Hard Target Penetrator	IMCG	Insensitive Munitions Coordination Group
HTPB	Hydroxyl-terminated polybutadiene (a propellant binder)	IMCWG	Insensitive Munitions Council Working Group
HTPE	Hydroxyl-terminated polyether; copolymer of polytetrahydrofuran and polyethylene oxide	IM EA	Insensitive Munitions Executive Agent
HTSF	Hard Target Smart (Structures) Fuze	IMET	Insensitive Munitions Engineering Technology
HWP	Heavy Wall Penetrator	IMGN	Insensitive Munitions Graphical Navigator
HWPTU	Heavy Wall Penetrator Test Unit	IMO	Insensitive Munitions Office (NOSSA N6)
HYTEMP	a polymeric binder	IMPS	Integrated Magazine Protection System
IB	Internal Blast	IMRB	Insensitive Munitions Review Board
IC	Integrated Circuit	IMTTP	Insensitive Munitions Technology Transition Program (NAVAIR)
ICO	Isothermal Cookoff	IOC	Initial Operational Capability
IDP	Isodecyl pelargonate	IOC	Industrial Operations Command
IHE	Insensitive High Explosive	IOT&E	Initial Operational Test & Evaluation
IHPRPT	Integrated High Payoff Rocket Propulsion Technology	IPDI	Isopherone diisocyanate
IM	Insensitive Munitions		

IPT	Integrated Product Team or Integrated Process Team	JSOW	Joint Stand-off Weapon
IR	Infrared	JTAMDO	Joint Theater Air Missile Defense Organization
IR&D	Independent Research and Development	JWCS	Joint Warfighting Counter Fire
IRDX	Insensitive RDX manufactured by SNPE	JWL	Jones-Wilkins-Lee
		KDN	Potassium dinitramide
ISA	International Standardization Agreements	KP	Potassium perchlorate
ISP	Specific impulse; the energy delivered (thrust) per unit of propellant mass	KP	Viscosity in kilopoise
		KPP	Key Performance Parameter
IWS	Integrated Warfare Systems (PEO-IWS)	KTA	Key Technical Area
		LAM	Loiter Attack Missile
JAMC	Joint Advanced Munitions Concept	LANL	Los Alamos National Laboratory
JANNAF	Joint Army / Navy / NASA / Air Force [Interagency Propulsion Committee]	LASM	Land Attack STANDARD Missile
		LASM-ER	Land Attack STANDARD Missile - Extended Range
JASSM	Joint Air-to-Surface Standoff Missile	LAW	Light Anti-Armor Weapon
JCS	Joint Chiefs of Staff	LCAC	Landing Craft Air Cushion
JDAM	Joint Direct Attack Munition	LCC	Life Cycle Cost
JOCG	Joint Ordnance Commanders Group	LCMS	Low Cost Missile System
		LEAP	Lightweight Exoatmospheric Advanced Projectile
JRB	Joint Requirements Board		
JROC	Joint Requirements Oversight Council	LIDD	Lightweight Disposable Disrupter
		LEEFI	Low energy exploding foil initiator
JRP	Joint Review Panel, Joint Requirements Panel	LIDD	Lightweight Disposable Disrupter
JSIMTP	Joint Services Insensitive Munitions Technical Panel	LLNL	Lawrence Livermore National Laboratory
JSIP	Joint System Improvement Plan		

LM	Limpet mine
LMA	Laurylmethacrylate
LMNR	Lead mnonitro resorcinate
LOVA	Low Vulnerability Ammunition
LPD	Landing Platform Dock
LRIP	Limited (Low) Rate Initial Production
LRLAP	Long Range Land Attack Projectile
LSC	Linear Shaped Charge
LSGT	Large Scale Gap Test
MAAWS	Multi-role Anti-armor Anti-personnel Weapon System
MACS	Modular Artillery Charge System Modular Assembly Cartridge System
MANTECH	Manufacturing Technology
MARS	Mass AP Reaction Suppression
MAS	Military Agency for Standardization (NATO)
MBI	Multiple Bullet Impact
MCM	Mine Countermeasures
MDA	Missile Defense Agency
MEK	Methyl ethyl ketone
MEMS	micro electromechanical memory system
MEOP	Maximum Expected Operating Pressure
MFI	Multiple Fragment Impact
MICOM	Army Missile Research & Development Command
MIL-STD	Military Standard
Mk-72	Lunch boost motor for STANDARD Missile
Mk-104	Dual Thrust Rocket Motor for STANDARD Missile
Mk-111	Tomahawk Missile launch boost motor
MLRS	Multi Launch Rocket System
MMDP	Magazine Mass Detonation Prevention (Program)
MMPT-ATD	Multimission Propulsion Technology – AdvancedTechnology Demonstration
MND	Mine Neutralization Device
MNS	Mission Need Statement
MOP	Memorandum of Policy
MOU	Memorandum of Understanding
MPLD	Multi-Purpose Low Drag
MPLD-T	Multi-Purpose Low Drag with Tracer
MRO	Mission Responsive Ordnance
MS	Mass Spectroscopy
MSDS	Material Safety Data Sheet
MSIAC	Munitions Safety Information Analysis Center (re: NIMIC)
MSIC	Munitions Status Information Center

MTA	Munitions Threat Assessment
MTN	Metriol tinitrate
MVAP	Munitions Vulnerability Assessment Panel (Army)
N100	Desmodur mltiisocyante crative (Mobay Chemical Co.)
NAPDD	Non-acquisition Program Definition Document
NASA	National Aeronautics and Space Administration
NATO	North Atlantic Treaty Organization
NAVAIR	Naval Air System Command
NAVSEA	Naval Sea Systems Command
NAVSEASYSCOM	Naval Sea Systems Command
NAWCWD	Naval Air Warfare Center Weapons Division
NAWCWPNS/CL	Naval Air Warfare Center Weapons Division, China Lake
NCA	NATO Codification System
NCCA	Naval Cost Center Analysis
NDEL	the "Naval Delegation" to NATO
NDI	Non-developmental Item
NDIA	National Defense Industrial Association
NDRE	Norwegian Defense Research Establishment
NF	No fire
NFTU	Naturally Fragmenting Test Unit
NGAAM	Next Generation Air-to-Air Missile
NIMIC	NATO IM Information Center
NIMIS	National IM Information System
NIPO	Navy International Program(s) Office
NITINOL	A nickel-titanium alloy (a memory metal)
NMD	Navy Munitions Data (Sheet)
nmi	Nautical mile
NOBEL	Near Ocean Bottom Explosive Launcher
NOL	Naval Ordnance Laboratory
NOSSA	Naval Ordnance Safety & Security Activity
NPV	Net Present Value
NQ	Nitroguanidine
NSFS	Naval Surface Fire Support
NSPO	NATO Sea Sparrow Program Office
NSWC/DD	Naval Surface Warfare Center, Dahlgren Division
NSWC/IHD	Naval Surface Warfare Center, Indian Head Division
NTACAMS	Navy Tactical Missile System
NTO	Nitrogen tetroxide; Nitrotriazolone

NWEC	National Warheads & Energtics Consortium (US Army), private sector Partner of the WETC	PAD	Propellant Actuated Device
		PAO	Polyalkylene oxide
ODI	Octadecyl diisocyanate	PAM	Precision Attack Missile
OESO	Ordnance Environmental Security Office (at NOSSA)	PAPI	Polymethylene polyphenylisocyanate
OGB	Optimized Gun Barrel	PAX	Picatinny Arsenal Explosive
OHEB Board	Ordnance Hazard Evaluation	PBXs	Plastic bonded explosives
OIS	Ordnance Integrated System	PBXC	Experimental PBX, development work at NAWC China Lake
ONR	Office of Naval Research	PBXIH	Experimental PBX, development work at NSWC Indian Head
OPEVAL	Operational Evaluation	PBXN	PBX that has been Final (Type) Qualified for a specific weapon or weapons
OPR	Office of Primary Responsibility	PBXW	Experimental PBX, development work at NSWC White Oak
OR	Operational Requirement	PCP	Polycaprolactone polyol
ORD	Operational Requirements Document	PDR	Preliminary Design Review
OSD	Office of the Secretary of Defense	PEG	Polyethylene glycol
OSI	Ordnance Systems, Inc.	PEI	Polyetherimide
[OUSD(AT&L)/DS,LW&M]	Office of the Under Secretary of Defense (Acquisition, Technology and Logistics)/ Defense Systems, Land Warfare and Munitions	PEO	Program Executive Office
		PEGAA	Hydrolyzable binder
P&V	Performance & Vulnerability	PEGN	Polyglycidyl nitrate
P&W	Pratt & Whitney	PEP	Propellant Evaluation Program
P^3I	Preplanned Product Improvement	PETN	Pentaerythritoltetranitrate
PAC-3	Patriot Advanced Capability-3 (system)	PfP	Partners For Peace (NATO)
		PGM	Precision Guided Munition

PIC	Precision Initiation Column
PIP	Planned Improvement Plan
plsp, rholsp	density impulse; measure of the delivered energy per unit of volume
PIT	preferential insulation technique
PHST	Propulsion Systems Hazards Subcommittee
PHST	Packaging, Handling, Storage and Transportation (Center)
PM	Program Manager
PNC	Pelletized nitrocellulose
POA&M	Plan of Action and Milestones
POC	Point-of-Contact
Poly-G	polyether polymer
Poly-NIMNO	A binder
PPG	Polypropylene Glycol
PSAN	Partially stabilized ammonium nitrate
PSHS	Propulsion Systems Hazards Subcommittee
psi	pounds per square inch
PTFE	Teflon, poly tertraflooroethyleine
PVA	Polyvinyl acetate or polyvinyl alcohol
PVP	Polyvinyl pyrolidone
QC	Quality Control (laboratory)
QDR	quantity-distance requirement (per DoD 6055.9 STD)
R^3	Recovery, Recycle, Reuse
R-45M	A hydroxy terminated polybutadiene polymer
R&D	Research and Development
RAM	Rolling Airframe Missile
RAS	RDX aluminum series
RATO	Rocket-Assisted Take-off (rocket motor)
RDA	Research and Development Activity
RDX	Trinitro trimethylene triamine; Cyclotrimethylenetrinitramine
RF	Radio Frequency
RFP	Request for proposal
RMEW	Reactive Material Enhanced Warhead
RONA	Royal Ordnance, North America
RTO	Research and Technology Organization (NATO)
S&A	Safe and Arm
S&T	Science & Technology (program)
S&TS	Strategic & Tactical Systems [as in OUSD (AT&L)/S&TS]
S&TS,M	Strategic & Tactical Systems, Munitions
SABRE	Shallow Water Assault Breaching
SADARM	Sense and Destroy Armor

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SBIR	Small Business Innovative Research
SCB	Small-scale Cook-off Bomb
SCO	Slow cook-off bomb
SCO	Slow Cook-off
SCV	Slow Cook-off visualization
SCVB	Slow Cook-off Visualization Bomb
SD	Sympathetic Detonation
SDACS	Solid Divert / Attitude Control System
SEAFOX	A German developed Airborne Mine Neutralization System
SEC	Senior Executive Council
SEM	Scanning Electron Microscopy
SERDP	Strategic Environmental Research & Development Program
SFAE	Solid Fuel Air Explosive
SFW	Sensor-Fuzed Weapon
SLAM	Stand-off Land Attack Missile
SLAM	Selectable Lightweight Attack Munition
SLAM-ER	Stand-off Land Attack Missile - Extended Range
SLJC	Stepped-lap-joint closure
SM	STANDARD Missile
SMAW	Shoulder-Launched Multipurpose Assault Weapon
SMCA	Single Manager for Conventional Ammunition
SMERF	Simple Multi-Material Eulerian Reactive Flow
SMTD	Submarine Torpedo Defense
S/N	Serial number
SNL	Sandia National Laboratory
SOCOM	Special Operations Command, Tampa, FL (U.S. Marine Corps)
SOF	Special Operation Forces
SOTA	State-of-the-Art
SPI	Single Point Initiation
SRM	Short Range Missile
SSCB	Small Scale Cook-off Bomb
SSGT	Small Scale Gap Test
SSP	System Safety Program
SSP	Strategic Systems Program
STANAG	Standardization Agreement, (NATO)
SWAG	Scientific Wild Ass Guess
SWPS	Stabilized Weapons Platform System
SX-2	A commercial detonating cord explosive
T&H	Temperature and humidity
TAAS	Technical Approach and Assessment Strategy
TADA	Tetracetyl-diaminoisowurtzitane

	(precursor)		Defense
TADF	Tetraacetyldiformylhexaazaiso-wurtzitane (precursor)	THADM	Threat hazard analysis Development Manual
TADS	Thermally active device(s)	THAMES	Threat Hazard Assessment Methodology Software (NIMIC developed)
TAGDN	Triaminoguanidine Dinitramide		
TAGN	Triaminoguanidium nitrate	Thermobaric	= high temperature + long duration pressure
TATB	Traminotrinitro benezene	TIVS	Thermally Initiated Venting System
TATF	Triacetyltriformyl-hexaaziaisowurtzitane	TMC	Thrust magnitude control
TBIP	Tomahawk Baseline Improvement Program	TMD	Theoretical maximum density
TBMD	Theater Ballistic Missile Defense	TMETN	Trimethylethane trinitrate (an energetic plasticizer)
TCG	Technical Coordinating Group	TMP	1,1,1-tris(hydroxymethyl)propane
TDA	Technical Design Agent; Technical Data Archives	TNAZ	1,3,3-trinitroazetadine or triamino-dinitro azetidine
TDI	2,4-toluene diisocyanate isomer	TNT	Trinitrotoluene
TDP	Technical Data Package	TOC	Total Ownership Cost
TEA	Technical Exchange Agreement	TOR	Terms of Reference
TECHEVAL	Technical Evaluation	TOW	Tube-launched Optically-tracked Wire-guided antitank Missile
TEGDN	Triethylene glycol nitrate	TP	Target Practice
TEGN	Triethylene glycol dinitrate	TP-T	Target Practice with Tracer
TEMP	Test and evaluation master plans	TPB	Triphenyl bismuth
TE-X	Thiokol explosive	TPE	Thermoplastic elastomer
T_g	Glass transition temperature	TPEG	A coupled polyol (terethane-polyethylene glycol copolymer)
THA	Threat Hazard Analysis	TQM	Total Quality Management
THAAD	Theater High Altitude Air		

TRR	Test readiness review (meeting)		sustainer motor)
TRW	Thompson-Ramo-Wooldridge Corporation	VGAS	Vertical Gun for Advanced Ships
TSO	Technical Specialist Officer	VLA	Vertical Launch Antisubmarine Rocket Vertical Launch AROC
TSRM	Third Stage Rocket Motor	VL-AROC	Vertical Launch ASROC
Tuff-Core	A lightweight laminate composite material (Atlantic Research Crop.)	VLS	Vertical Launch System
		VTS	Vacuum Thermal Stability (test)
TTCP	The Technical Cooperation Program	WAM	Wide Area Mine; Wide Area Munition
TTPV	Tactical Tomahawk Penetrator Variant	WATRB	Weapons Advanced Technology Review Board (NAVAIR)
TVA	Thrust vector actuation (hardware)	WCMD	Wind- corrected munition dispenser
TVC	Thrust vector control (hardware)	WDU	Warhead, Live Unit
UAV	Unmanned Aerial Vehicle	WETC	Warheads & Energtics Technology Center (located at Picatinny Arsenal, NJ.
UDLP	United Defense Limited Partnership		
USAF	United States Air Force	WHOI	Woods Hole Oceanographic Institute
USARDEC	U.S. Army Research, Development and Engineering Center (Picatinny Arsenal)	WS	Weapon System
USMC	United States Marine Corps	WSESRB	Weapon System Explosives Safety Review Board
UT/CSD	Chemical Systems Division of United Technologies Corp.	WTP-4	TTCP Subgroup W Technical Panel 4
UW	Underwater	WTU	Warhead, Training Unit
VA	Vinylacetate	YKT	Yorktown (NSWCIHD/Yorktown)
VCCT	Variable Confinement Cook-off Test		
VFDR	Variable Flow Ducted Ducted Rocket (a of Airbreathing		

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Appendix B

Joint Ordnance Commanders' Group (JOCG) Memorandum

DEPARTMENT OF THE ARMY
U.S. ARMY ARMAMENT, MUNITIONS AND CHEMICAL COMMAND
ROCK ISLAND, IL 61299-6000

DEPARTMENT OF THE AIR FORCE
OGDEN AIR LOGISTICS CENTER
HILL AIR FORCE BASE, UT 84056-5609

DEPARTMENT OF THE NAVY
NAVAL SEA SYSTEMS COMMAND
WASHINGTON, DC 20362-5101

DEPARTMENT OF THE AIR FORCE
ARMAMENT DIVISION
EGLIN AIR FORCE BASE, FL 32542-5000

DEPARTMENT OF THE NAVY
U.S. MARINE CORPS
HEADQUARTERS MATERIEL DIVISION
WASHINGTON, DC 20380-0001

MEMORANDUM TO THE JOINT LOGISTICS COMMANDERS

SUBJECT: Insensitive Munitions Joint Requirement

1 Reference:

a. Joint Requirement for Insensitive Munitions, undated.

b. JLC Memorandum to Joint Requirements Oversight Council, Sep 86.

2 The Joint Ordnance Commanders Group was tasked to develop procedures and criteria identified as "To Be Determined" in the Joint Service Technical Criteria and Definitions for Insensitive Munitions, tab of reference 1a. These criteria has been developed and the procedures incorporated into draft DOD-STD-2105, Hazard Assessment Tests for Navy Nonnuclear Ordnance. Additionally, the definitions has been revised to agree with STANAG 4240, Liquid Fuel Fire Test for Munitions.

3. A proposed JLC transmittal memorandum forwarding the revised tab to the Joint Requirements Oversight Council is enclosed.

Encl

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TAB
JOINT SERVICE
TECHNICAL CRITERIA AND DEFINITIONS
FOR INSENSITIVE MUNITIONS

1. GENERAL

a. Purpose. This document delineates technical criteria associated with insensitive munitions (IM). It provides definitions, identifies tests, and establishes criteria for those tests.

b. Applicability. This document is applicable to all nonnuclear ordnance and explosive systems.

2. DEFINITIONS

a. Detonation Reaction (Type I). The most violent type of explosive event. A supersonic decomposition reaction propagates through the energetic material to produce an intense shock in the surrounding medium (e.g., air or water) and very rapid plastic deformation of metallic cases, followed by extensive fragmentation. All energetic material will be consumed. The effects will include large craters for munitions on or close to the ground, holing/plastic flow damage/fragmentation of adjacent metal plates, and blast overpressure damage to nearby structures.

b. Partial Detonation Reaction (Type II). The second most violent type of explosive event. Some, but not all, of the energetic material reacts as in a detonation. An intense shock is formed; some of the case is broken into small fragments; a ground crater can be produced, adjacent metal plates can be damaged as in a detonation, and there will be blast overpressure damage to nearby structures. A partial detonation can also produce large case fragments as in a violent pressure rupture (brittle fracture). The amount of damage, relative to a full detonation, depends on the portion of material that detonates.

c. Explosion Reaction (Type III). The third most violent type of explosive event. Ignition and rapid burning of the confined energetic material builds up high local pressures leading to violent pressure rupturing of the confining structure. Metal cases are fragmented (brittle fracture) into large pieces that are often thrown long distances. Unreacted and/or burning energetic material is also thrown about. Fire and smoke hazards will exist. Air shocks are produced that can cause damage to nearby structures. The blast and high velocity fragments can cause minor ground craters and damage (breakup, tearing, gouging) to adjacent metal plates. Blast pressures are lower than for a detonation.

d. Deflagration Reaction (Type IV). The fourth most violent type of explosive event. Ignition and burning of the confined energetic materials leads to nonviolent pressure release as a result of a low strength case or venting through cases closures (leading port/fuze wells, etc.). The case might rupture but does not fragment; closure covers might be expelled, and unburned or burning energetic material might be thrown about and spread the fire.

Shaped Charge Jet*	No detonation
Spall*	No sustained burning

*These tests are required unless determined not to be credible threats via Threat Hazard Assessment.

c. The test procedures described in DOD-STD-2105A (DRAFT) of June 1988 apply, pending finalization of DOD-STD-2105A.

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Appendix C

Office of the Secretary of Defense for Acquisition, Technology and Logistics (AT&L) Memorandum

OUSD(A)/TS/OM TO 96026782 P002

THE UNDER SECRETARY OF DEFENSE
3010 DEFENSE PENTAGON
WASHINGTON, D.C. 20301-3010

ACQUISITION AND TECHNOLOGY

NOV 4 1994

B.11

MEMORANDUM FOR CHAIRMAN, JOINT REQUIREMENTS OVERSIGHT COUNCIL

SUBJECT: Insensitive Munitions Policy

The development and production of insensitive munitions (IM) has been a goal of the Department for almost ten years now. But there is disagreement within the acquisition management community on how best to achieve that goal.

In 1987, the Secretaries of the Military Departments signed a joint Memorandum of Agreement that stated, in part, "to the extent practical, all munitions should be made to meet IM criteria." Despite this agreement, there has been continuing concern about whether implementation has been as rigorous and comprehensive as it should be. To address this concern, the Joint Ordnance Commanders Group in 1992 developed an IM policy statement intended for publication in DoD Instruction 5000.2. That policy language read, in part: "Milestone decision authorities will ensure that all munitions planned for use on any DoD weapons platforms will be designed and acquired, to the extent that the solutions are affordable and consistent with operational requirements, so that they are not adversely sensitive to unplanned stimuli, such as heat, shock, and impact." A basic underpinning of this argument is that the increasing emphasis on joint military operations, as evidenced in Operation Desert Storm and in Haiti, puts a great premium on interoperability and safety, precisely the concerns that the design and production of IM-qualified munitions are supposed to address. Thus, a general statement requiring IM factors to be considered in the acquisition process is appropriate.

However, the Army and Air Force have taken issue with this approach. Their essential argument is that IM technical specifications are driven by requirements, not by acquisition policy. In other words, the degree of insensitivity designed into a particular munition is a function of the operational environment in which that munition will be employed, and thus is dealt with more appropriately as part of the requirements process.

I would like to obtain the official Joint Requirements Oversight Council (JROC) position on IM. Do you agree that the best way to address the Departmental goal of meeting operational requirements with the least sensitive system design available is through the requirements process? Or, do you think that the Department's objectives would be better served by an acquisition policy statement? Finally, if we were to address this issue through the requirements process, is there a mechanism to ensure that IM is routinely considered? I look forward to the JROC position. My staff point-of-contact is Joe Ferrara, extension 76079.

Paul Kaminski
Paul G. Kaminski

Department of Defense Acquisition Manager's Handbook for Insensitive Munitions

Appendix D

Joint Requirements Oversight Council (JROC) Decision Memorandum

THE JOINT STAFF
WASHINGTON, D.C. 20318-7000

JOINT REQUIREMENTS
OVERSIGHT COUNCIL

JROCM 148-95
6 December 1995

MEMORANDUM FOR THE UNDER SECRETARY OF DEFENSE FOR ACQUISITION AND TECHNOLOGY

Subject: Insensitive Munitions Policy

1. In answer to your memorandum*, the Joint Requirements Oversight Council (JROC) reviewed an on-going effort by the Services and the Joint Ordnance Commanders Group (JOCG) to establish an insensitive munitions policy for future munitions. The JROC agrees that meeting operational requirements with the least sensitive system design is through the requirements process and should be updated as necessary throughout the acquisition life-cycle for all acquisition programs. The waiver of any munitions/weapons, regardless of ACAT level, should require validation by the JROC. The JROC already reviews systems for interoperability and would expand this process to include insensitive munitions policies. Attached is the JROC proposed change to DoDI 5000.2.

2. As you know, the contentious insensitive munitions issue among the services focuses on all weapons and has stimulated much debate for many years. The JROC supports future munitions/weapons design to withstand unplanned stimuli and use less sensitive materials for safety and interoperability. It is a step in the right direction which will pay big dividends from our joint warfighting perspective.

W. A. OWENS
Vice Chairman
Joint Chiefs of Staff
JROC Chairman

Enclosure
Reference:
- USD(A&T) memorandum, 30 October 1995, "Insensitive Munitions Policy".
  USD(A&T) memorandum, 4 November 1994, "Insensitive Munitions Policy".

Department of Defense Acquisition Manager's Handbook for Insensitive Munitions

Appendix E

Office of the Secretary of Defense for Acquisition, Technology and Logistics (AT&L) Memorandum Regarding Exemption

THE UNDER SECRETARY OF DEFENSE
3010 DEFENSE PENTAGON
WASHINGTON, D.C. 20301-3010

ACQUISITION AND TECHNOLOGY

26 JAN 1998

MEMORANDUM FOR SECRETARIES OF THE MILITARY DEPARTMENTS
ATTN: ACQUISITION EXECUTIVES
SOCOM ACQUISITION EXECUTIVE
JOINT STAFF (J-4)
CHAIRMAN, DOD EXPLOSIVES SAFETY BOARD

SUBJECT: Exemption for Existing Inventory Items to Insensitive Munitions (IM) Requirements

The Services' existing munitions inventories represent a significant investment. It is not economically possible to backfit IM improvements into these weapons, even where mature technology exists to achieve major survivability gains. In recognition of this situation and to document our policy, munitions items currently in Service inventory are exempt from meeting Department of Defense IM requirements.

This exemption applies, in perpetuity, to all munitions in the current inventory, and to all munitions currently in production, including munitions currently under production contracts, in Low Rate Initial Production, and those munitions awaiting acceptance or delivery. The above notwithstanding, the Services should look for every feasible window of opportunity to insert IM technology into weapons continuing in production. Such improvements in existing munitions will aid in achieving the Department's long-term goal of having an IM-compliant inventory. The aforementioned exemption is not transferable to new or modified munitions that use components, groups, sections, or subsystems from exempted munitions. "New munitions" include those that are under development contracts or are new, planned acquisition programs.

In the event of a planned change in an exempted munition's life cycle (for example, a change in the munition's deployment environment or a munition's life extension program), a Service should review the planned change to determine whether the exemption still applies or if a need exists to incorporate insensitive munitions modifications, or to impose restrictions on the munition's use.

This policy is effective as of the date of this memorandum.

J. S. Gansler

Department of Defense Acquisition Manager's Handbook for Insensitive Munitions

Appendix F

DoD IPT and JSIMTP SOP and Charter

OFFICE OF THE UNDER SECRETARY OF DEFENSE

3000 DEFENSE PENTAGON
WASHINGTON, DC 20301-3000

ACQUISITION AND TECHNOLOGY

05 JUN 1997

MEMORANDUM FOR ASSISTANT SECRETARY OF THE ARMY (RD&A)
ASSISTANT SECRETARY OF THE NAVY (RD&A)
ASSISTANT SECRETARY OF THE AIR FORCE (ACQUISITION)
DIRECTOR OF THE JOINT STAFF (J4/3MPED)

SUBJECT: Integrated Process Team for Execution of Insensitive Munitions Policy

I am creating a working level Integrated Process Team (IPT) for Insensitive Munitions (IM) to ensure a fully refined, coordinated, and integrated IM policy and program among the Services. The Department of Defense (DoD) Regulation 5000.2-R on Unplanned Stimuli (4.4.8), International Considerations (3.3.5.2), and Joint Program Management (3.3.5.3) and MOP-77 (CJCSI 3170.01, paragraph 2e(3)) necessitates a uniform DoD-level refined policy and program on IM. I request you identify a member of your staff to participate as a team member, as required, until the work of the IPT is complete.

The IPT will accomplish the following: (1) refine the DoD IM policy and program addressing IM issues associated with the acquisition and life cycle operational support for all systems containing high energetic material; (2) develop a recommended DoD position on the IM policy established by the North Atlantic Treaty Organization Allied Ordnance Publication Number 39; (3) develop a process for reviewing all Services' systems for IM compliance during all phases of the standard and non-standard acquisition process (e.g., Advanced Concept Technology Demonstration programs); (4) establish a single DoD-level IM compliant data tracking system for all high energetic systems currently in the DoD inventory and those being developed and/or evaluated for the inventory; and (5) develop a plan of action and milestones for establishing and maintaining a consistent DoD policy and program on IM for weapons.

The first meeting of the IPT will be on June 26, 1997, from 1300 to 1700 hours at Naval Air Systems Command, 1421 Jefferson Davis Highway, Arlington, Virginia 22243 (Crystal City, Building: Jefferson Plaza Number Two (JP2), Room 1224). The chairperson of the IPT will be Mr. Tony Melita of the Office of Munitions; supporting him will be Mr. Tony Kress and Mr. Harold Jurgensen. All can be contacted at commercial (703) 695-1453/1468 or DSN 225-1453/1468. Please have your IPT selectee notify Mr. Kress or Mr. Jurgensen of his/her selection by June 16, 1997.

George R. Schneiter
Director
Strategic & Tactical Systems

cc: Attached

OFFICE OF THE UNDER SECRETARY OF DEFENSE

3000 DEFENSE PENTAGON
WASHINGTON, DC 20301-3000

ACQUISITION AND TECHNOLOGY

NOV 1 1999

MEMORANDUM FOR SECRETARIES OF THE MILITARY DEPARTMENTS
ATTN: ACQUISITION EXECUTIVES
SOCOM ACQUISITION EXECUTIVE
JOINT STAFF (J-4)
CHAIRMAN, DOD EXPLOSIVES SAFETY BOARD

SUBJECT: Amended Joint Services Insensitive Munitions Technical Panel Charter

Dr. Jacques S. Gansler, Under Secretary of Defense for Acquisition, Technology, and Logistics, established by memorandum dated May 4, 1999, the Joint Services Insensitive Munitions Technical Panel and approved its charter. The Panel charter authorized a member representative from each of the Military Services. The Special Operations Command now has its own procurement office and should have a member representative on the Joint Services Insensitive Munitions Technical Panel; accordingly, the charter has been amended to reflect that change by designating the Special Operations Command representative as a Joint Services Insensitive Munitions Technical Panel member.

This change was approved by all Joint Services Insensitive Munitions Technical Panel members and by the Department of Defense Insensitive Munitions Integrated Product Team. I hereby approve the amended Joint Services Insensitive Munitions Technical Panel Charter.

Anthony J. Melita
Deputy Director
Strategic & Tactical Systems, Munitions

Attachment:
Amended Charter for the Joint Services Insensitive Munitions Technical Panel

Original: May 4, 1999
Amendment 1: October 22, 1999

CHARTER
FOR THE
JOINT SERVICES INSENSITIVE MUNITIONS TECHNICAL PANEL

I. PURPOSE: This Charter establishes the Joint Services Insensitive Munitions Technical Panel to accomplish the coordination of IM technical matters within the Department of Defense (DoD). The Joint Services Insensitive Munitions Technical Panel is an advisory panel.

II. FUNCTIONS: The Joint Services Insensitive Munitions Technical Panel will carry out the following functions aimed at ensuring technical collaboration and agreement on the approach taken to meet the IM policies and procedures of DoD Regulation 5000.2R.

A. Provide technical advice and/or recommendations concerning Insensitive Munitions technology issues related to the requirements of Military Standard (MIL STD) -2105 to the following: Milestone Decision Authorities, the Joint Ordnance Commanders Group, Single Managers, Program Managers, Military Services' and SOCOM's IM Executive Agents, Overarching Integrated Product Teams, Working-level Integrated Product Teams, and other entities.

B. Conduct a review of all munitions' acquisition programs to support paragraph (A) above, and to assist in identifying Insensitive Munitions science and technology opportunities.

C. Maintain a real-time, top-level management database on munitions and their Insensitive Munitions technology status.

D. Serve as a technical advisory panel to the staff of the Office of the Secretary of Defense on international Insensitive Munitions issues.

E. Review Military Services' and SOCOM's munitions/weapons procurement planning information (as provided by the Insensitive Munitions Executive Agents) and make technical recommendations regarding available Insensitive Munitions technologies.

F. Assist the DoD effort to develop insensitive munitions with lower hazard classifications by providing technical advice and/or recommendations to developers regarding integrated Insensitive Munitions and Hazard Classification test planning to ensure compliance with TB 700-2 / NAVSEAINST 8020.8B / T.O. 11A-1-47 / DLAR 8220.1 "Department of Defense Ammunition and Explosives Hazard Classification Procedures".

1

SUBJ: JOINT SERVICES INSENSITIVE MUNITIONS TECHNICAL PANEL CHARTER

III. GUIDANCE: In addition to this charter, the Joint Services Insensitive Munitions Technical Panel will be guided by the latest approved version of DoD Regulation 5000.2-R, Chairman of the Joint Chiefs of Staff Instruction 3170.01, the technical parameters of MIL-STD-2105, North Atlantic Treaty Organization Standardization Agreement 4439, Allied Ordnance Publication -39, and other pertinent national and international technical agreements.

IV. REQUIREMENTS: The following reporting and membership requirements will apply to the panel:

A. Each Military Service and SOCOM will provide one panel member. Each Military Service and SOCOM will select its member based on the interpretation of the Panel's function. The Military Service and SOCOM representative should be a senior technical manager or scientist. Representatives of the Joint Staff, Office of the Secretary of Defense, Department of Energy, and Department of Defense Explosives Safety Board may serve as invited participants.

B. Joint Services Insensitive Munitions Technical Panel members will determine the initial chairperson. Subsequently, the chair will rotate biennially among the representatives from the Military Services and SOCOM. .

C. The Joint Services Insensitive Munitions Technical Panel will meet at least semi-annually. Additional meetings may be called at the request of any Military Service or SOCOM representative, or at the request of the Military Service or SOCOM Insensitive Munitions office, the Joint Staff (J-4), or the Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics, Strategic and Tactical Systems, Munitions [OUSD(AT&L)/S&TS,M].

V. ADMINISTRATION: The following administrative and reporting relationships will exist among the Joint Services Insensitive Munitions Technical Panel and the other offices involved in Insensitive Munitions technology and Hazard Classification matters:

A. Provide technical assessments and comments on Insensitive Munitions waivers to the Milestone Decision Authorities and the Joint Staff.

B. Provide a copy of all correspondence, reports, and meeting minutes to OUSD(AT&L)/S&TS,M and the Joint Staff (J-4).

C. Communicate directly with the Military Services' and SOCOM's Insensitive Munitions Offices.

D. Report annually to the Military Services' and SOCOM's Insensitive Munitions Executive Agents with copies to cognizant staff.

2

Department of Defense Acquisition Manager's Handbook for Insensitive Munitions

Appendix G

U.S. Army IM Policy (DA PAM 70-3)

Appendix XXV
Insensitive Munitions (IM)/Unplanned Stimuli

Points of contact:

Army Executive Agent for Insensitive Munitions (AEA-IM) / Deputy for Acquisition & Systems Management (ATTN: SAAL-SMA), Office of the Assistant Secretary of the Army (Acquisition, Logistics and Technology), 103 Army Pentagon, Washington, DC 20310-0103

U.S. Army Armament Research, Development and Engineering Center (ARDEC), Logistics Research and Engineering Directorate (ATTN: AMSTA-AR-ASL), Picatinny Arsenal, New Jersey 07806-5000

References: See Annex 1 for listing of applicable references.

Introduction: Munitions survivability is crucial to the survivability and success of combat systems. History has repeatedly shown that the reactive nature of munitions and combat systems makes them susceptible to degradation and destruction when exposed to stimuli such as fragments and fires. Consequently, the U.S. Army has established the requirement that munition developers incorporate design features via a total systems engineering approach to ensure that all combat system requirements are met while enhancing survivability to unplanned stimuli. The following procedures are intended to assist munitions developers in meeting the Army's Insensitive Munitions (IM) requirements. Further details concerning U.S. Army and Joint Service IM policies, requirements, and procedures may be found in the references at the end of this Appendix.

Object Lesson - Camp Doha, 11 July 1991: A motor pool fire in the North Compound at Camp Doha, Kuwait, involved an M992 ammunition carrier loaded with 155-millimeter artillery projectiles. An explosion spread the fire and caused massive secondary explosions. The resulting series of explosions and fires devastated vehicles and equipment and scattered unexploded ordnance and debris over much of the camp. The Army lost more tanks in that one incident than it had during the entire war against Iraq. Forty-nine personnel were injured. Three soldiers were killed while clearing the area of damaged ordnance. One hundred two vehicles were either damaged or destroyed; and, losses exceeded $15 million dollars in damaged or destroyed ammunition. If the munitions at Camp Doha had been insensitive, then the severity and extent of the damage might have been limited.

IM Concept and Objectives.

The IM concept is to provide effective performance to the warfighter while offering passive force protection via less sensitive munitions. Such a concept can offer distinct tactical advantages.

IM can become a force multiplier. Future combat systems, ships and other military platforms may be able to stay on station longer – engaging the enemy and fulfilling mission objectives – if they are not subject to extensive collateral damage from weapon or ordnance accidents.

IM offers tactical logistical advantages. Force projection is increasingly required in populated urban centers as the war on terrorism and asymmetric warfare expand. Conventional weapons stored in proximity to civilian populations make them an attractive target for terrorists and political extremists to inflict casualties on non-combatants. Weapons that comply with IM requirements minimize the threat to the surrounding community and infrastructure and offer the warfighter an opportunity to increase the forward deployed weapon inventory.

Less sensitive munitions are potentially more cost effective and efficient to transport, store and handle. Weapons that meet IM requirements may be granted a reduced DoD/DoT Hazard Classification (HC) ranking compared to non-IM variants of the same munition. Reducing the HC may make it possible to reduce the logistics footprint. Less real estate is required to store and handle these munitions, and logistics overhead costs are reduced.

U.S. Army Insensitive Munitions (IM) Board. The Army IM Board is chartered by the Army IM Executive Agent (AEA-IM) to provide developers with IM technical advice, review test plans, review test results, assess compliance with IM requirements, and propose IM technical positions. The IM Board also serves as the IM technical agent for the AEA-IM, providing the AEA-IM with recommendations concerning the adequacy of developers' efforts in incorporating IM technologies, and recommendations for additional IM efforts based upon consideration of technology maturity and program constraints.

IM PROGRAM PLAN ELEMENTS

The planning and execution of an IM program plan should be initiated at the start of a munition acquisition program and continue through production/fielding of the munition. Early and frequent coordination with the Army Insensitive Munitions Board (IM Board) is essential to insure that IM Program elements are adequately addressed and munitions acquisition is not adversely impacted. Figure XXV-1, below depicts the Defense Acquisition Management Model, and recommended coordination with the IM Board.

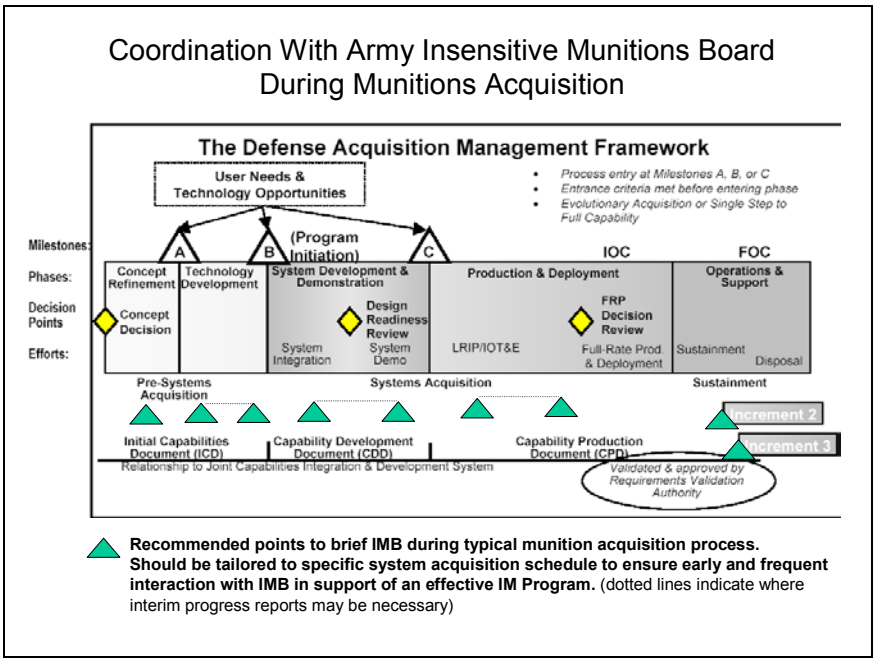

Figure XXV-1. Coordination With Army Insensitive Munitions Board During Munitions Acquisition

The briefing elements for the Army IM Board are at Annex 2. The IM program plan provides a map for achieving compliance with IM requirements or the basis for preparation for a waiver request if IM compliance cannot be achieved. Some tailoring of the IM program plan may be appropriate based on the specific acquisition program, but as a minimum, the IM program plan should include the following:

1. **IM Approach –** Early look at munition development to address; currently available, applicable IM technologies; planned/potential method(s) of evaluating technologies; trade studies; down select criteria; program schedule and funding.

> ***Developers are encouraged to coordinate the IM approach with the Army IM Board as early as possible in order to obtain recommendations on IM program structure and appropriate areas of technology investigation.***

2. **Threat Hazard Assessment (THA) –** Evaluation of threats and munition reaction throughout the lifecycle, potential collateral damage from the munition reaction and potential solutions for non-IM responses. The THA should be a living document, which is updated/modified as the system progresses through development. The basic components of a THA are:

   a. **System Overview** – to include component descriptions, and energetics,

b. **Life Cycle Profile** – description of cradle to grave sequence of munition including details on logistic configuration(s), transportation method(s), storage configuration(s), fielded configuration(s) and any system specific considerations,

c. **Threats** – identify unplanned stimuli which represent credible threat to munition and the part of the lifecycle in which the threat is present,

d. **Munition Reaction** – IM behavior, known and/or expected reaction to the threats identified, potential collateral damage to platforms, personnel and adjacent munitions from these reactions,

e. **IM Tests** – recommendation on tests to conduct to establish the IM characteristics of the munition item, specify munition configuration and applicable test threat, component and/or full scale tests, as well as any engineering or screening type tests which would be beneficial, and

f. **Solutions** – identify any technologies that have potential to improve IM characteristics of the munition item.

The THA should be coordinated early with the Army IM Board to insure that appropriate threats are identified prior to development of the IM Test Plan.

3. **IM Test Plan –** Proposed IM tests based on the THA, MIL-STD 2105C, as well as any specific system safety/HC requirements to include: the total number of assets needed; configuration and number of test articles for each specific test; detailed test setup description including test parameters (fuel source, heating rate, aim point), instrumentation (e.g., real time video, high speed video, pressure gages, witness plates); and information on required data collection/reporting.

Coordination of the IM Test Plan with the Army IM Board prior to conducting testing is essential.

Inadequate test setup, improper testing, and inability to collect required IM data will require testing to be repeated, at additional cost and potential program delays.

4. **IM Test Results –** Based on approved test plan, detailed documentation of results to include all instrumentation data (e.g., video, witness plate photos, pressure traces, thermocouple traces), pre-post test photos, and debris maps.

All IM test results must be presented to the Army IM Board for scoring.

The IM reaction scores provided by the Army IM Board are the only official scores, and will be part of the IM documentation for the munition's IM certification or waiver.

5. **Plan of Action and Milestones (POA&M) –** If a munition is not IM compliant due to failing one or more of the IM tests, a POA&M should be developed to address the failure(s). As a minimum, the POA&M should include the following: identify currently available and/or emerging technologies which offer potential improvement in IM characteristics; proposed plan to evaluate these technologies, associated trade studies and down select criteria; projected schedule for integrating validated technologies and resulting production quantities effected. The cost of pursuing the POA&M should also be included and noted where funds are available/allocated or where it is an unfunded requirement. The POA&M is now a required part of the IM Waiver process.

6. **IM Waiver Request -** If a munition fails or is assessed to fail one or more IM tests, an IM Waiver is required. Detailed procedures for developing and submitting an IM Waivers are discussed separately below.

IM Technical Approaches.

Historically, vulnerability reductions have been achieved primarily through subsystem optimization. Examples include adding extra armor to fighting vehicles, compartmentation on the M1 tank, and low vulnerability propellant for M60 tank munitions. Emerging requirements for future tactical and re-supply systems encompass increased performance, storage of larger quantities of more powerful munitions/missiles, and greater survivability against increased threats. The historical solution of subsystems/increased performance requirements can only be achieved through a system level optimization process involving the application of advanced system design concepts and essential IM technologies as shown in Figure XXV-2.

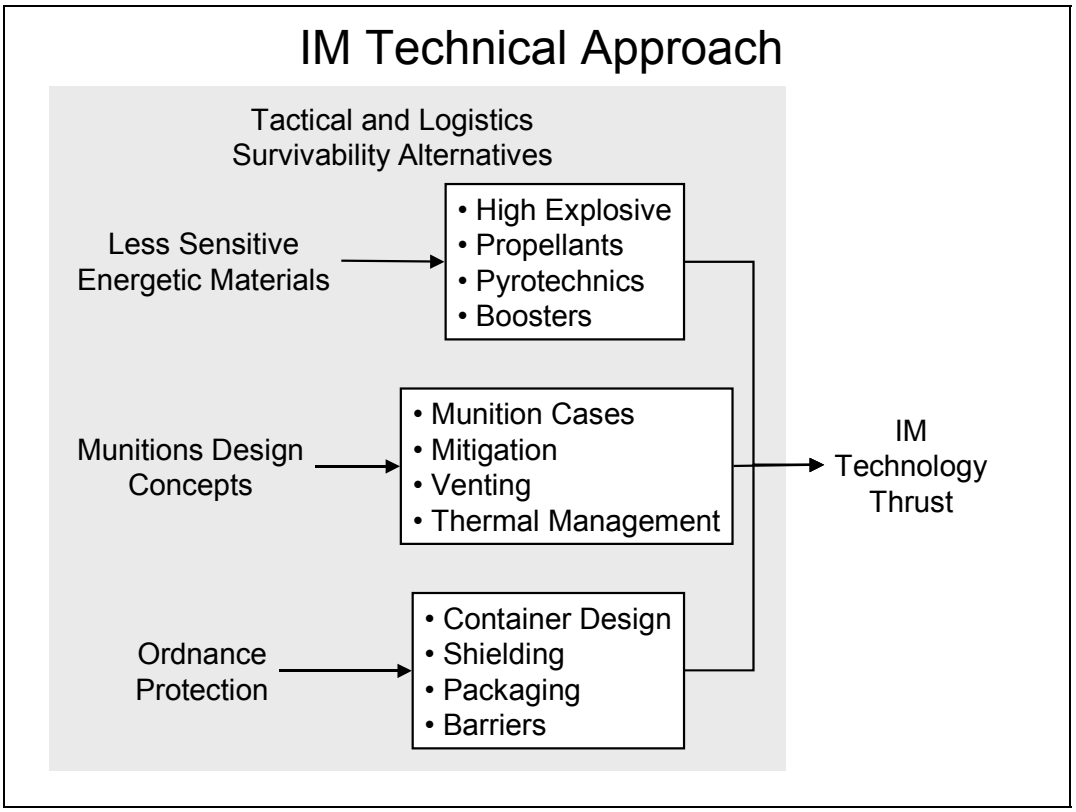

Figure XXV-2. IM Technical Approach

Test and Evaluation Strategy.

There are multiple sets of tests used to qualify and assess munitions with respect to threats and hazards. Two of these tests relate specifically to IM issues and are discussed below. System vulnerability tests is an example of other tests that do not have a direct relationship to IM, but the test results can be considered in the waiver request process.

1. IM Tests contained in MIL-STD-2105C are used to determine a munition's sensitivity to given stimuli. IM tests are required by the Joint Services Requirements for Insensitive Munitions.

2. Hazard Classification Test used to classify munitions for shipping and storage purposes. Hazard Classification tests are described in Army TB 700-2 and run in conformity with United Nations (UN) procedures and in conjunction with NATO Standardization Agreement (STANAG) 4439 and Guidance on the Development, Assessment and Testing of Insensitive Munitions (MURAT), AOP-39.

The Army IM T&E strategy encompasses tailoring test plans to the maximum extent possible to address all three sets of test requirements with the minimum number of tests. The tests strategy involves using MIL-STD-2105C and TB 700-2 and adding and/or modifying test based on the munition threat, vulnerability, and safety issues. The test and evaluation programs are fashioned to the extent possible to assure that all requirements are fully assessed in one coordinated test program.

IM Test and Evaluation Guidelines.

MIL-STD-2105C is the military standard approved for use by all components of the Department of Defense (DoD). A summary of IM testing guidelines is contained in MIL-STD-2105C, Section 4. This covers test procedures and tests for assessing IM performance characteristics and associated safety. It also provides the framework for a consolidated safety and IM test program.

IM Waivers.

The purpose of an IM waiver is to document Joint Staff approval to acquire and field a munition system despite failure of that system to successfully pass all of the required IM tests. Since IM compliance is a system requirement for all munitions, per DOD and Army policy, IM test failures indicate a failure to meet the system requirements. Specifically, IM test failures reflect potential safety and survivability shortcomings of a munition, and increase the severity of the threat posed to combat and logistics systems. Consequently, these shortcomings must be approved through the requirements process, prior to acquisition of the system. Approval of IM waivers rests solely with the Joint Requirements Oversight Council (JROC), and any system that fails one or more IM test must obtain JROC approval of the IM waiver prior to fielding. The Army has established procedures to insure documentation is developed for systems that fail one or more required IM tests and that this documentation is reviewed for technical adequacy and staffed with the appropriate organizations in order to establish an Army recommendation prior to approval by the JROC. A request for IM waiver is processed only after all other elements of the IM program have been executed, all reasonable efforts to develop and acquire an IM-compliant system have failed, and the responsible organization has determined that the need to field the noncompliant system outweigh the negative impacts of fielding such a system.

The request for IM waiver is typically prepared by the Program Manager's staff or element providing engineering support, and then coordinated at the working level with the Army IM Board for informal review. The Army IM Board conducts an informal review and coordinates with the Joint Services Insensitive Munitions Technical Panel (JSIMTP) for informal recommendations. The informal recommendations from the Army IM Board are provided to the Program Manager or engineering support element to aid in the completion of the formal IM waiver request.

The formal IM waiver request is developed and forwarded by the Program Executive Officer to the AEA-IM for Army and subsequent Joint staffing and review. The AEA-IM provides the waiver request to the Army IM Board for technical review and recommendations. Army IM Board recommendations are provided to the Army IM Executive Agent within 30 days after receipt of the request. After the Army IM Board technical recommendations are provided, the AEA-IM staffs the waiver request with appropriate Army elements, obtains concurrence of the Army Acquisition Executive, and then forwards the request through appropriate Army channels for Joint technical review

and final JROC approval. The purpose of the Joint technical review is to advise the Joint Staff on adequacy of the request.

If there are no outstanding issues with the request, JROC approval is likely. If there are issues, such as failure to incorporate appropriate technology, lack of a Plan of Action and Milestones (POA&M) for improvement, the waiver proponent may be required to revise the plans and waiver request. Figure XXV-3 depicts the process for staffing of Army IM waiver requests.

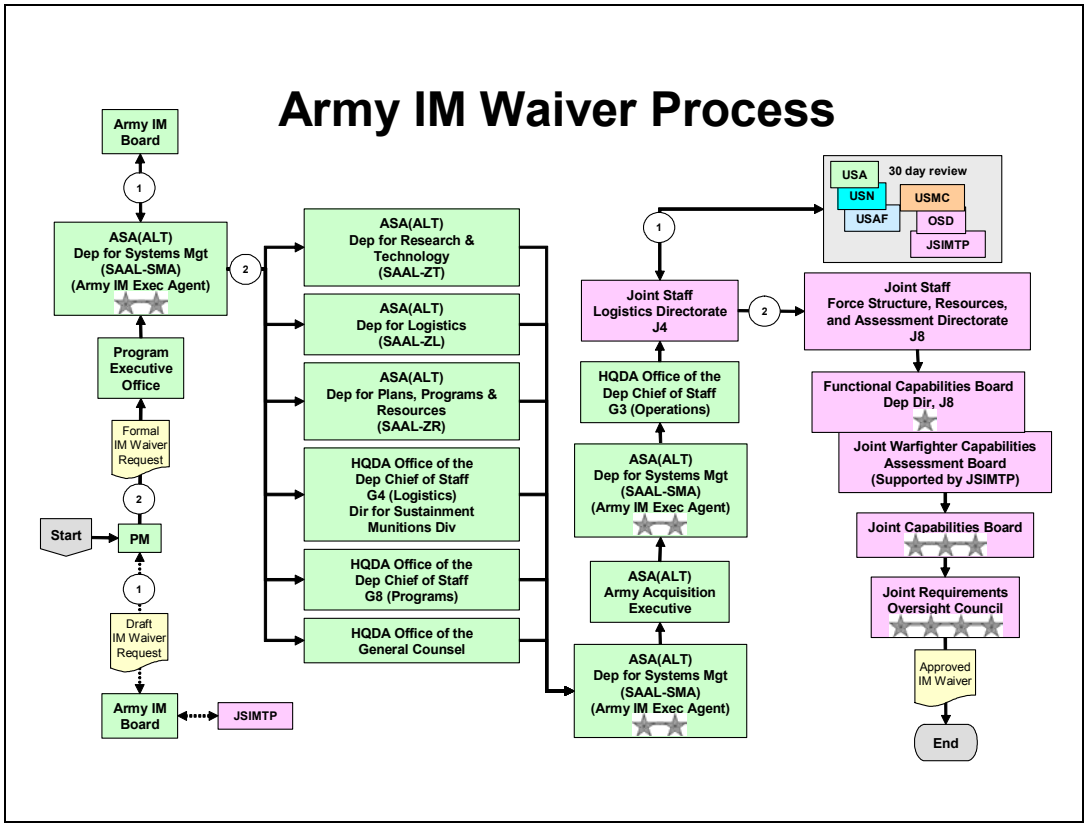

Figure. XXV-3. Army IM Waiver Staffing Process

Note: The ASA(ALT) Munitions Systems Directorate (SAAL-SMA) handles the processing/staffing of IM waiver requests for the Army Executive Agent for Insensitive Munitions (AEA-IM) and will request the ASA(ALT) Force Protection Directorate's (SAAL-SFP) assistance with staffing when air defense missiles are involved.

Annex 1
References

References:

Chapter 141 of Title 10 United States Code §2389.

Department of Defense (DoD) Directive 5000.1, 12 May 2003, Subject: The Defense Acquisition System.

Department of Defense (DoD) Instruction 5000.2, 12 May 2003, Subject: Operation of The Defense Acquisition System.

Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 3170.01C, 24 June 2003, Subject: Joint Capabilities Integration and Development System (JCIDS).

Chairman of the Joint Chiefs of Staff Manual (CJCSM) 3170.01, 24 June 2003, Subject: Operation of the Joint Capabilities Integration and Development System (JCIDS).

Memorandum, Under Secretary of Defense for Acquisition Technology & Logistics (AT&L), 26 January 1999, Subject: Exemption for Existing Inventory Items to Insensitive Munitions (IM) Requirements. (Commonly referred to as the Gansler Memo).

Memorandum, Army Acquisition Executive, 22 October 1996, Subject: Munitions Survivability Requirements for the Design and Procurement of New or Modified Ammunition/Weapons.

Memorandum, Assistant Secretary of the Army (Acquisition, Logistics and Technology), SAAL-SMA, 28 April 2003, Subject: Army Executive Agent for Insensitive Munitions.

MIL-STD-2105C, Department of Defense Test Method Standard “Hazard Assessment Test for Non-Nuclear Munitions”, 14 July 2003.

Guide for Development of Army Operational Requirements Documents (ORD), ORD Guide, 24 October 2002.

Army Regulation (AR) 70-1, 15 December 1997, Subject: Army Acquisition Policy.

Army Regulation (AR) 70-9, 30 April 1997, Subject: Material Requirements.

TB-700-2, DoD Ammunition & Explosives Hazard Classification Procedures.

DoD Acquisition Manager’s Handbook for Insensitive Munitions.*

* When published.

Annex 2
Briefing Elements
for
Army Insensitive Munitions Board

GENERAL

Briefer's name, organization, email, telephone number and mailing address

SYSTEM OVERVIEW

System/Program title

Purpose of briefing (e.g. To request Army IM Board recommendations…etc.)

Responsible Program/Project/Product Manager (PM)

Indicate what organization is providing system-engineering support for the system

Indicate what organization is providing IM technical support for the system

System description to include operation, energetics, Hazard Classification information, logistical configuration

Development and procurement schedule

Detailed explanation of any urgency relative to this acquisition

Provide details on production schedules and quantities to be produced to include the types of units and locations where munitions will be fielded

Address IM resources

REQUIREMENT DOCUMENT

Describe how IM is worded in the Capabilities Requirement Document.

THREAT AND HAZARD ASSESSMENT

Planned logistical and tactical life cycle profile of the system (This should include a description of Joint use or transport of the munition)

Specific character of threats to the system during its life cycle, from MIL-STD-2105C (e.g., bullet type, fragment speed, etc.).

Summary of Threat Hazard Assessment (THA)

Status of Army IM Board concurrence with Threat Hazard Assessment (Note: IMB concurrence required by DA Pam 70-3)

IM TECHNICAL APPROACH

IM technical approach and technologies being investigated

IM TESTING AND CONFIGURATION

Description of IM test plans and/or test item configuration.

Status of the Army IM Board's concurrence with test plans (Note: Army IM Board concurrence required by DA Pam 70-3).

Anticipated responses of the system to the IM stimuli in MIL-STD-2105C.

Status/results of IM testing (If test results will be briefed, the briefing must include a detailed description of the test setup, instrumentation, test results on final configuration, and data which can be used to quantify the reaction levels. Photographs, video, diagrams, and site maps should be used to show size and spatial relationships, locations of instrumentation, and debris patterns. (Note: IMB review of test results required by DA Pam 70-3).

CONSEQUENCES OF IM REACTIONS

Consequences of predicted or known IM responses: This should reference the system's life cycle (from cradle to grave), and describe the consequences of a munition's response, in terms of anticipated damage to logistics systems, combat platforms, operational readiness, mission performance, and human injury. This may require coordination with the combat developer or using organization.

STATUS OF IM REVIEW AT MILESTONES

Current milestone status of munition system

Name of Milestone Decision Authority for this system

Dates, results, and outstanding actions of the coordinated IM review required prior to each Milestone Decision. (Required by DA Pamphlet 70-3)

IM WAIVER

If munition fails or is assessed to fail any of the required IM tests, a waiver must be requested. The waiver request is sent to ASA(ALT) (ATTN: SAAL-SMA / AEA-IM), who subsequently forwards it to the Army IM Board for technical

review. DA Pam 70-3 describes the procedures. Describe status of actions planned/taken to seek a waiver.

PREVIOUS ARMY IM BOARD RECOMMENDATIONS

Chart that describes, by date, all previous IMB reviews and recommendations for this system, and current status of each.

Annex 3
IM Waiver Elements

Army IM waiver requests must include the following elements and the detailed requirements discussed in MIL-STD-2105C:

- Description of the munition. Major components, energetic materials; variants and quantities applicable to the waiver request; acquisition milestone status.

- Describe the capability requirement addressed by development and acquisition of this munition.

- Summary of the system life cycle from production to expenditure, to include a description of methods of transport via military and commercial means. Identify specifically the conveyances and methods other services will transport this item for the Army.

- Listing of the types of military units/locations that will receive this item and the quantities anticipated to be produced and distributed by year. If available list specific Army activities/elements and other services.

- Summary of the threats to this item as described in the Threat and Hazard Assessment (THA), tests which were identified as necessary based upon the THA, and rationale for not conducting specific tests.

- Detailed description of IM tests conducted for Fast Cook-Off, Slow Cook-Off, Bullet Impact, Fragment Impact, Shaped Charge Jet Impact, and Sympathetic Reaction. For each test, provide detailed descriptions of test setup from the test plan, and detailed results of the tests including specific reactions. Include specific data from other tests (i.e., Hazard Classification (H/C), System vulnerability, etc.) that may be used to assist in evaluating the IM characteristics of the munitions. Provide a summary chart of the Army IM Board scoring of the tests.

- Summary of all previous coordination with the Army IM Board, and the resulting recommendations.

- Description of technology that is currently available, which could improve the IM performance, and the rationale for not pursuing/applying the technology.

- Detailed Plan of Action and Milestones (POA&M) that describes the Army's approach to insure that future buys or variants of this item are IM-compliant.

- Date that the waiver is required, any rationale for urgency of this date, the length of time waiver is needed, and the specific number of items or years of production that the request is for.

- Description of this system/variant's predecessor munitions? Describe how this system/variant's IM characteristics are better or worse than its predecessors.

- Description of the operational and cost benefits to the Army if this waiver request is approved, and the negative impacts to the Army in terms of survivability, operations and cost if the waiver request is disapproved.

Department of Defense Acquisition Manager's Handbook for Insensitive Munitions

Appendix H

U.S. Navy IM Policy

Department of Defense Acquisition Manager's Handbook for Insensitive Munitions

Appendix I

U.S. Air Force IM Policy

US AIR FORCE

INSENSITIVE MUNITIONS

MANAGEMENT PLAN

November 2003

COORDINATION:

HQ USAF/IL	**DATE**
HQ USAF/ XO	**DATE**
HQ USAF/SE	**DATE**
HQ USAF/TE	**DATE**

APPROVED:

Air Force Executive Agent for Insensitive Munitions	**DATE**
Air Force Acquisition Executive	**DATE**

Table of Contents

1. Purpose for the Insensitive Munitions (IM) Management Plan

To establish and describe the Department of the Air Force procedures and organizational responsibilities for planning and carrying out an integrated Air Force Insensitive Munitions (IM) program. Initially the program will use incremental steps to achieve the goal of full IM certification of munitions. The ultimate objective of the IM program is to ensure USAF munitions attain full IM certification, which will ensure that USAF munitions will either not react or minimally react to unplanned stimuli while simultaneously not compromising the munitions' operational performance.

2. Insensitive Munitions (IM) and the Air Force: History, Why IM, and Goals

a. History

As a result of several serious incidents with significant property damage and numerous personnel casualties, DoD mounted an intensified effort in the late 1980s and early 1990s to make munitions less sensitive to unplanned stimuli. The Air Force has consistently supported IM in joint programs and is also aggressively pursuing IM in AF munitions programs, to include new buys of legacy weapons. The Air Force fully embraced insensitive munition fills in new weapons; nonetheless, the Air Force had a fully developed safety program for the non-IM weapons stockpile and did not feel the cost for moving to insensitive fills for stockpiled weapons was warranted. However, replenishment of the existing munitions used as a result of the recent extended combat operations caused a rapid decline in the stockpile of TNT (the main ingredient of the Tritonal-used fill). This coupled with the loss of any domestic TNT production capability, and the OSD decision to treat the purchase of the new fills as a "new" procurement necessitated exploring insensitive fills for these legacy weapons. A DoD-wide development program to meet this need was begun in 2001. Each Service has an overarching interest in IM development - the Navy for shipboard storage and handling, the Army for storage, transportation, and operational handling of huge amounts of munitions, and the Air Force for quantity-distance requirements for munitions storage and movement, and parking of loaded aircraft. In fact, all Services now have, or plan to have, programs to develop insensitive explosive fills for stockpiled weapons.

b. Why IM in the Air Force

The use of IM provides a quantum leap in the safety of handling, storage, and movement of munitions. IM minimizes the probability of an inadvertent munition initiation due to unplanned stimuli and reduces the severity of subsequent damage to weapons platforms, logistic systems, and/or personnel. The use of IM greatly reduces or completely eliminates the possibility of collateral damage to War Reserve Munitions (WRM) stocks and base facilities from a mass detonation of munitions. The use of IM also permits munitions to be stored closer to alert aircraft. This advantage alone would save munitions delivery time, enable closer aircraft parking, and allow more munitions to be stored per storage facility (5 to 6 times more explosive weight can be stored in a Tritonal clear zone using IM munitions). IM advantages are also evident where base real estate is severely constrained by encroachment and proximity of inhabited areas (clear zones can be reduced by as much as 50% with IM). IM can contribute to the Expeditionary Air Force site planning. For example, using an igloo site with 300,000 lbs net explosive weight in MK-84 type bombs with IM fill reduces the hazard classification (MIL-STD 2105C &

STANAG 4439) from 1.1 to 1.2.3 and shortens the required separation distance to the nearest inhabited building from 3,345 feet to 1,000 feet. The distance could be further reduced to 400 feet with an improved hazard classification of 1.6 (Extremely Insensitive Explosive Article). Similarly, the igloo weapons' capacity can be increased by 67% with an upgrade from a 1.2.3 to a 1.6 hazard classification.

In summary, improvements in hazard classification will offer the Air Force significant improvements in the following:

- Safety
- Reduced storage costs
- Potential to store more assembled weapons closer to aircraft
- Significant reduction in accident costs
- Significant reduction in potential loss of operational assets (aircraft, etc.)
- Reduction in infrastructure problems at bases with encroachment concerns.

c. Mid and Long-Range Goals

The advent of joint programs with the Navy, the unavailability of TNT for Tritonal production, the increasing importance of hazard reduction on Air Force bases, coupled with DoD and JCS directives, brought together an increased emphasis of IM in the Air Force. All weapons now in acquisition have incorporated various levels of IM capability into the program. The Joint Air to Surface Standoff Missile (JASSM) is the first major AF weapon to achieve full IM capability. The near term goal is to increase IM capability in weapons, even if only incrementally. The mid term goal is an improved IM capability for legacy weapons like the MK-80 series, with an envisioned follow on program aimed at full IM capability for explosive fills in the longer term. The far term goal is complete IM-compliance and related Hazard Classification (HC) reductions (per JCS direction).

3. Applicability and Basis for the Plan:

a. Applicability

Applies to all U.S. Air Force conventional munitions without regard to the source of design or manufacture. Ballistic missiles and nuclear weapons are excluded. As a threshold each new weapon must meet insensitive munition criteria unless granted a specific waiver in accordance with DoD and USAF directives, policies, and guidelines. Munitions are as defined below.

Per JCS Joint Publication 1-02, "DoD Dictionary of Military and Associated Terms," a munition is a complete device charged with explosives, pyrotechnics, and an initiating composition for use in military operations. This definition includes bombs and warheads; guided missiles; artillery, mortar, rocket, and small arms ammunition; mines, torpedoes, and depth charges; pyrotechnics; clusters and dispensers; cartridge and propellant actuated devices; electro-explosive devices; clandestine and improvised explosive devices; and all similar or related items or components explosive in nature.

b. Basis for the Plan

DoD policy and direction on making conventional weapons insensitive to unplanned stimuli such as fire, impact, and sympathetic detonation are contained in the documents cited below.

1. **Chairman, Joint Chiefs of Staff Instruction (CJCSI) 3170.01C, "*Joint Capabilities Integration and Development System (JCIDS),*" 24 June 2003, and Chairman, Joint Chiefs of Staff Manual (CJCS Manual) 3170.01, *"Operation of the Joint Capabilities Integration and Development System (JCIDS),"* 24 June 2003.** The documents specify that the Joint Staff will provide review, coordination and certification functions in support of the JCIDS process, to include munitions insensitivity certification. They also specify that the Joint Staff J-4 will certify that all Capability Development Documents (CDDs) and Capability Production Documents (CPDs) for munitions, regardless of acquisition category (ACAT) level, contain the requirement to conform to insensitive munitions (unplanned stimuli) criteria. As a minimum, these CDDs and CPDs will contain the statement "Munitions used in this system will be designed to resist insensitive munitions threats (unplanned stimuli)."

The documents further state insensitive munitions waiver requests require approval by the Joint Requirements Oversight Council (JROC). Insensitive munitions waiver requests shall include military service or agency approved insensitive munitions plan of action and milestones (POA&M) to identify how future buys of same or future system variants will achieve incremental and full compliance. Waiver requests will be submitted to J-4 for review and then forwarded to the JROC secretariat for JROC consideration.

2. **DoD Directive 5000.1, "*The Defense Acquisition System,*" 12 May 2003, Encl. 1, para. E1.23 Safety. "**Safety shall be addressed throughout the acquisition process. Safety considerations include human (includes human/system interfaces), toxic/hazardous materials and substances, production/manufacturing, testing, facilities, logistical support, weapons, and munitions/explosives. All systems containing energetics shall comply with insensitive munitions criteria."

3. **Defense Acquisition Executive (DAE) Memorandum, *"Exemption for Existing Inventory Items to Insensitive Munitions (IM) Requirements*", 26 January 1999**. Specifically states that all munitions, either initially entering the inventory, improved munitions, or being procured via production contracts awarded after 26 January 1999 shall be fully IM-complaint or have an approved IM waiver. For current inventory munitions, the Services should look for every feasible window of opportunity to insert IM technology into weapons continuing in production, which includes contract options, modification programs, and engineering change proposals. Munitions already produced and in place on installations are exempt, i.e., no retrofit of munitions. Every effort will be made to meet operational requirements with the least sensitive system design available. The long-range goal is a complete transition to insensitive munitions without compromising operational effectiveness.

4. **MIL-STD-2105C / STANAG 4439 *" Hazard Assessment Tests for Non-Nuclear Munitions.*** MIL-STD 2105C (STANAG 4439) covers test procedures and criteria for assessing IM performance and associated safety. Provides the framework for a consolidated safety and IM test program. Criteria must be met for full certification unless a Threat Hazard Assessment supports deviation from this baseline testing. Threat Hazard Assessments are conducted as an integral part of the IM certification process. The purpose of a THA is to evaluate over the munitions life cycle the threats and hazards to which the munitions may be exposed, including threats posed by friendly munitions, enemy munitions, accidents, handling, and storage. The THA results may support a deviation from the IM criteria in MIL-STD-2105C for certification of a munition. The entire operational environment of the munition must be examined to include the packaging, transportation, and storage of the munition at depot level, end user tactical storage facilities, and in operational use configuration storage, aircraft loading, and loaded aircraft parking. An approach to reduce or eliminate the hazards must also be determined and a technology or other means defined. The THA provides an assessment of the weapon's threat environment, is validated by the IM Technical Working Group (IMTWG) and, if required, is presented to the IMTWG's chartering organization, the Non-Nuclear Munitions Safety Board (NNMSB), for review and comment.

MIL-STD-2105C includes basic safety tests and IM tests. The basic safety tests include temperature and humidity, vibration, and 12-meter drops. The IM tests are fast cook-off, slow cook-off, bullet impact, fragment impact, sympathetic detonation, and shaped charge jet impact. An insensitive munition must still meet operational requirements while minimizing the probability of inadvertent detonation and resultant damage to materiel and people.

4. Resources

There should be no need for a separate or dedicated organization to administer the Air Force IM program. Funding for IM work for an individual munitions program will be funded by that program. IM development with an across the board application will be funded under appropriate existing Program Elements (PEs) reflecting the level of technology maturity.

5. Organizational Responsibilities in the Air Force

a. The following individuals and groups comprise the IM management team in the Air Force:

Air Force Acquisition Executive

- SAF/AQ (or its succeeding organization)
- Establish IM policy for the Air Force.
- Review and forward IM waiver requests to the JCS/J-4 (JROC) of a wide reaching impact (as determined by the IM Board).

Air Force Executive Agent for IM

- SAF/AQP (or its succeeding organization)

  Review and forward Air Force approved waiver requests to JCS/J-4 for JROC, final approval, except those requiring AF Acquisition Executive review and forwarding,

  Interface with Army and Navy IM Executive Agents,

  Oversee the Air Force IM program, including technology efforts,

  Interface with OSD and JCS on major IM matters,

  Chair the Air Force IM Board.

Air Force IM Board

- Consists of SAF/AQP (Chair & Air Force Executive Agent for IM), AF/ILM, AF/ILP, AF/XOR (or their succeeding organizations)
- Certify munitions that meet IM requirements,
- Recommend disapproval of waiver requests or recommend forwarding to the JROC for final approval,
- Approve munitions IM plans,
- Approve IM development projects with across-the-board applications,
- Make recommendations to SAF/AQ, through the Air Force IM Executive Agent, on IM policy and directives.

Air Force IM Panel

- Consists of SAF/AQPW (Chair & Air Force Secretariat for IM), AF/ILMW, AF/ILPR, AF/XORW, AF/SEW (or their succeeding organizations)
- SAF/AQPW, AF/ILMW, and AF/XORW are also members of the DoD IM IPT.
- Review and make recommendations to the IM Board on all program IM plans, waiver requests, certification requests, IM policy and IM organizational responsibility changes.
- Ensure relevant IM documents are coordinated through AAC and/or other appropriate AF Commands.
- AFSC/SEW's role on waiver requests is as a technical advisor.
- Coordinate on IM waiver requests of the Army and Navy as requested by the JCS/J-4 (forward to the Air Force IM Board only in instances of major impact to the Air Force).

- Assure Air Force membership on the DoD IM IPT and the Joint Services IM Technical Panel (JSIMTP).

SAF/AQR TBD

SAF/AQPW (or its succeeding organization)

- Serve as Air Force IM Secretariat
- Maintain records of all Air Force IM waivers, waiver requests, certifications, IM plans, and management/administrative matters,
- Advise program managers on procedures and processes for complying with DoD and Air Force policies and directives on IM,
- Monitor activities of the Joint Services IM Technical Panel on IM strategy plans of munitions programs, IM development/acquisition efforts, and waiver requests.

Non-Nuclear Munitions Safety Board (NNMSB)

- Develop recommendations on Air Force, DoD, and NATO IM standards, issues, and policy development
- Review the Threat Hazard Assessment (THA); the overall IM Plan, including the test plan; IM test results; IM certification requests; and IM waiver requests and forward recommendations to the Chairman of the Air Force IM Panel (SAF/AQPW)

Air Force Field Activities

- Organizations like the Air Armament Center (SPOs, AAC/WM, AAC/SES), AFRL Munitions Directorate (AFRL/MNME), AFRL Propulsion Directorate (AFRL/PR), Ogden ALC (OO-ALC/WM), Warner-Robins ALC (WR-ALC/LK) and the Air Force Safety Center (AFSC/SEW)
- Support the IM Panel, IM Board, and Executive Agent in technical evaluations and other aspects of the Air Force IM program.

Program Managers (Both Acquisition and Sustainment)

- Prepare and coordinate IM strategy and plans for all new non-nuclear weapons acquisition (to include the THA when required),
- Prepare and coordinate IM certification package for fully compliant munitions,
- Develop a program specific or (proposed Service level POA&M) for munitions that do not fully meet IM criteria as delineated in the THA,

- Prepare and coordinate IM waiver requests, including the POA&M, for munitions that do not fully meet IM criteria,
- Assure all legacy munition buys include insensitive munition requirements and prepare waivers if IM criteria cannot be currently met,
- Include IM in Acquisition Strategy Plans, Systems Acquisition Management Plans, and TEMPs,
- Update IM plan at all acquisition phase milestone reviews (or equivalent reviews for programs not requiring major milestone reviews),
- Review configuration changes for use of IM parts, components, and systems.

b. Linkage to exo-Air Force Forums

DoD IM Integrated Product Team (DoD IM IPT)

- Chaired by OSD (Deputy Director, Land Warfare and Munitions [OUSD(AT&L)/DS, LW&M]
- Establish DoD IM policy
- Oversee IM implementation across DoD
- Air Force membership

Joint Service IM Technical Panel (JSIMTP)

- Chaired by the Services on a two year rotation cycle
- Technical advisors to the DoD IMIPT, JCS/J-4, program and system managers on IM strategy and IM program development
- Air Force membership

6. Process and Procedures for IM Management

The implementation of the USAF IM policy and management plan is the responsibility of the following: The Director of Global Power Programs (SAF/AQP) as the Executive Agent; the members of the IM Board; the members of the IM Panel; program managers and others responsible for munitions requirements, acquisition, and logistics; the Non-Nuclear Munitions Safety Board; the IM Secretariat (SAF/AQPW), and field activities engaged in IM efforts.

a. Process: The review and approval process for IM plans, certification requests, and waiver requests is shown in Figure 1 below:

The process begins with the PM developing an IM strategy for the specific munition, incorporating that strategy into an IM Plan, and briefing the strategy and draft plan first to the NNMSB IMTWG and then to the JSIMTP. Utilizing the findings of the IMTWG and

the JSIMTP, the PM completes the IM Plan and submits it to the NNMSB IMTWG for final comment and coordination through the NNMSB to the AF IM Secretariat for staffing and approval. The PM shall incorporate a Threat Hazard Assessment (THA), which is incorporated into the IM plan and is used to determine which, if any, of the prescribed IM tests can be eliminated or tailored based on projected storage, handling, and overall experience of the munition over its life cycle. This assessment should enable the PM to determine whether the munition can be designed and produced so as to be fully IM compliant. If the initial assessment of the test results indicates full IM compliance, the PM will forward an IM Certification Request with the detailed test results to the NNMSB IMTWG for final determination of the type of reaction resulting from each test stimulus. The IM Certification Request will then be forwarded with comments and recommendations through the NNMSB to the AF IM Secretariat (SAF/AQPW) for staffing through the IM Panel and the IM Board. *IM Certification Request approvals or rejections will only be signed out by the Air Force IM Executive Agent.*

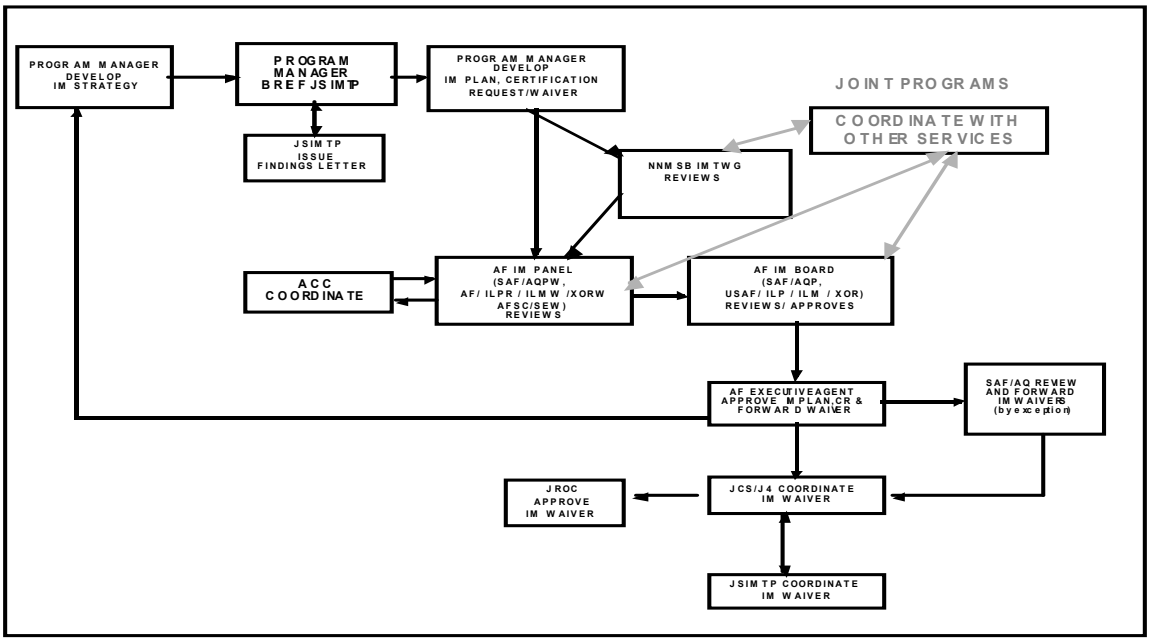

Figure 1 – USAF IM Management Plan Process

Should the PM decide early on that full IM compliance cannot be accomplished or the IM tests are not successful, the PM will forward a waiver request to the NNMSB IMTWG for technical and safety review. Upon final review and coordination with the NNMSB, the PM will submit the waiver request to the AF IM Secretariat for staffing through the IM Panel and the IM Board with the NNMSB comments/recommendations. The AF IM Executive Agent upon the recommendation of the AF Board will make the Air Force approval or disapproval decision on the waiver request. Following Air Force approval of the waiver request, the AF IM Executive Agent will forward the waiver request to JCS/J-4 for their approval. As shown in the process chart (figure 1), coordination of all key IM documents will be accomplished with Air Combat Command or other relevant users. IM Plans and Certification Requests are approved at the Air Force IM Executive Agent level. *IM waivers can only be approved at the JROC level.*

Review and coordination on IM Strategy and Plans, Certification Requests, Waiver Requests, and other IM matters by the Air Force IM Panel, IM Board, and Executive Agent will to the maximum extent possible be accomplished electronically. IM matters reviewed by the Air Force IMTWG of the NNMSB will also be accomplished electronically to the fullest extent possible. Formal meetings for the foregoing will only be scheduled in the event of extenuating circumstances or contentious matters.

The AF IM Executive Agent will provide written notification to the submitting Air Force organization of the final disposition of the certification request, IM Plan, and waiver request, including the submission of the waiver request to JCS/J-4, if approved by the Air Force.

The review of other Services waiver requests for JCS/J-4 will be accomplished by the Air Force IM Panel level and will not normally include a NNMSB IMTWG review. JCS/J-4 will forward the other Services waiver requests to SAF/AQPW through AF/XOXJ. The Air Force IM Board and Air Force IM Executive Agent would only become involved due to extenuating circumstances and by exception.

The principal means of working with the other Services is through the DoD Insensitive Munitions IPT, chaired by Office of the Under Secretary of Defense for Acquisition, Technology and Logistics, Defense Systems, Land Warfare and Munitions, and through the Joint Services IM Technical Panel. Other avenues for coordination include reviewing Army and Navy IM waiver requests for JCS/J-4, working with USD (AT&L) STS-Munitions, symposia on IM, and Service Executive Agents interaction for top-level IM matters.

b. Procedures

Procedures are guided by the documents and events described below.

1) Munition IM Plan: The PM for each munition in acquisition will develop an IM plan at the outset, and update it at each major Milestone Review (or equivalent). The plan will include:

System Description Summary - Emphasis on system level improvements, including but not limited to, explosive fill, thermal coatings, pressure relief, packaging, detonation wave barriers, or combinations of these improvements. Use of figures and tables is encouraged

Threat Hazard Assessment Summary - Describe both hostile and friendly threats to the munition over its life cycle and present a summary of the results and any impact on IM criteria. Also include evaluation of potential damage to the platform as a result of violent weapon reaction to unplanned stimuli. The THA will include the following:

- IM Compliance. Indicate when the munition will meet IM requirements or reason for its non-compliance. If non-compliant define approach to correct IM deficiencies, including efforts by others that are under consideration.
- Procurement Plan: Show the projected procurement quantities by FY and incremental plan to incorporate IM capability into the munitions
- Show schedule for IM tests and hazard assessment tests, and results as available
- Format is contained at Appendix A

The plan will be submitted simultaneously to the Non-Nuclear Munitions Safety Board (IMTWG) and SAF/AQPW as the IM Secretariat. SAF/AQPW will orchestrate the review, upon receiving NNMSB IMTWG and NNMSB (if required) comments, through the Air Force IM Panel, IM Board, and the Air Force Executive Agent for IM.

Note: In general, an IM strategy and plan should be no more than 10-15 pages.

2) IM Certification Request:

- IM Certificate Requests will include a system description highlighting energetic parts, IM test description and results, a threat hazard assessment summary, and a technical assessment.
- Requests for certification will be submitted to the Non-Nuclear Munitions Safety Board for review and following receipt of NNMSB comments to SAF/AQPW for coordination through the Air Force IM Panel, Air Force IM Board, and the Air Force Executive Agent for IM (See Figure 1).
- The Air Force IM Panel or IM Board may forward the IM Certification Request to the Joint Services IM Technical Panel for a technical assessment.
- The format for the IM Certification Request is at Appendix B

– *Note: In general, an IM Certification Request should be no more than 10-15 pages*.

IM Waiver Request: CJCSM 3170.01 requires all IM Waiver Requests be submitted to the JROC for final approval. Whenever a munition fails one or more of the IM tests required by MIL-STD-2105C (STANAG 4439) as delineated in the THA and a thorough

evaluation of the munition shows that meeting the IM requirements is not feasible within the current time constraints, the Program Manager must submit an IM Waiver Request. The IM Waiver Request should include:

- Name and description of the munition including type and quantity of energetic material and highlighting energetic parts
- Summary of IM test results
- Justification to include discussion of alternatives and a time line to reach IM certification.
- Impact if waiver is disapproved
- Points of contact
- A briefing may also be provided to support the request.
- Waiver Request and POA&M formats are at Appendix C & D, respectively
- If the program is awarding the final production contract, then the Program Office should prepare an Air Force Plan Of Action and Milestones (POA&M) to address emerging technologies that correct the noted weapon system IM deficiencies. Preparation, staffing, and submittal to the JSIMTP of this Service level IM POA&M should be initiated in parallel with the waiver process. The waiver request should provide a timeline for submittal of the Service level IM POA&M.
- If the program is awarding an initial or recurring production contract, then the waiver request should also contain either: (1) an executable POA&M for achieving full IM compliance (with one modification or by incremental improvements) or (2) specific rationale why neither a program POA&M or an Air Force POA&M needs to be provided.
- Before reaching the Air Force Executive Agent, the IM Waiver Request will first be reviewed by the NNMSB IMTWG and then by the Air Force IM Panel and Air Force IM Board. The rationale for the waiver request must be based on such factors as lack of available technology, prohibitive cost, lack of sufficient production, or an urgent operational requirement. A permanent waiver will not be granted. However, an IM Waiver Request may be submitted for multiple Fiscal Year (FY) buys when a POA&M has been established and funded. This multiple year request shall be limited to the minimum time required for incorporation of IM technology being developed in the POA&M.

APPENDIX A
FORMAT I: Munition Insensitive Munitions (IM) PLAN

Program Management: Include the name, phone, fax, and e-mail of the program manager or item manger and the program office responsible offices and individuals.

Munition: Name and Nomenclature

Weapon Description: Describe the system, labeling energetic components. Use of figures, schematics, and pictures is encouraged.

Background: The purpose of the plan and history of the munition and any other pertinent background information.

Overall Technical Approach: Describe the overall balanced technical approach to reach IM sensitivity via such avenues as:

- Less sensitive energetic materials (high explosives, propellants, pyrotechnics, boosters)
- Munition design concepts: (rocket motor cases, venting, coatings)
- Ordnance protection (container design, shielding, packaging, barriers)
- Combat system design concepts (compartmentation, hardening, shielding)

Test Plan and/or Summary of Test Results: Use the following format. Must pass as a total system, as delineated in the Threat Hazard Assessment (THA) and MIL-STD-2105C (STANAG 4439).

Test	Pass Criteria	Results
Fast Cook-Off		
Slow Cook-Off		
Bullet Impact		
Fragment Impact		
Sympathetic Detonation		
Shaped Charge Jet Impact		

Format for IM Test Plan:

Show a time-phased schedule for the IM testing by component and total system. Include a production/procurement schedule by time and quantity and indicate when the IM capability will be incorporated into the production.

IM Threat Hazard Assessment: Summarize the threat hazard assessment over the system's lifetime and the munition threat to the platform. Tables or other forms of depiction/illustration are encouraged

Plan of Action and Milestones (POA&M): Describe the technology under consideration to correct the identified IM deficiencies. Also how the IM tests will be analyzed with an eye toward implementing the proposed solutions. Provide a milestone chart depicting the funds programmed versus required, as well as significant events leading to incremental IM improvements and, ultimately, full IM compliance.

References and Other Supporting Comments: Include key references and any narrative supporting the IM plan.

Signature Page: *Munition IM Plan*

Program Manager : _____ _____
Signature **Date**

Air Force IM Panel Recommendation

Approval/Disapproval: _____ _____
Signature **Date**

Comment:

Air Force IM Board Recommendation

Approval/Disapproval: _____ _____
Signature **Date**

Comment:

Air Force Executive Agent for IM

Approval/Disapproval: _____ _____
Signature **Date**

APPENDIX B
FORMAT II: Insensitive Munitions (IM) Certification Request

Program Manager or Item Manager/Developer: Name, Address, Phone, Fax, E-mail

Munition: Name and Nomenclature

Weapon Description: Describe the system, labeling energetic components. Use of figures, schematics, and pictures is encouraged.

Summary of Test Results: Use the following format. Must pass as a total system, as delineated in the Threat Hazard Assessment (THA) and MIL-STD-2105C (STANAG 4439).

Test	Pass Criteria	Results
Fast Cook-Off		
Slow Cook-Off		
Bullet Impact		
Fragment Impact		
Sympathetic Detonation		
Shaped Charge Jet Impact		

Test Results Reviewed By: e.g., IM Technical Working Group of the Non-Nuclear Munitions Safety Board

References or Other Information to Support the Request: Test Reports, Weapon History, etc.

Signature Page: *IM Certification Request*

Program Manager : _____ _____

Signature **Date**

Air Force IM Panel Recommendation

Approval/Disapproval: _____ _____

Signature **Date**

Comment:

Air Force IM Board Recommendation

Approval/Disapproval: _____ _____

Signature **Date**

Comment:

Air Force Executive Agent for IM

Approval/Disapproval: _____ _____

Signature **Date**

APPENDIX C
FORMAT III: Insensitive Munitions (IM) Waiver Request

Program Manager or Item Manager/Developer: Name, Address, Phone, Fax, E-mail

Munition: Name and Nomenclature

Weapon Description: Describe the system, labeling energetic components. Use of figures, schematics, and pictures is encouraged.

Summary of Test Results: Use the following format. Must pass as a total system, as delineated in the Threat Hazard Assessment (THA) and MIL-STD-2105C (STANAG 4439).

Test	Pass Criteria	Results
Fast Cook-Off		
Slow Cook-Off		
Bullet Impact		
Fragment Impact		
Sympathetic Detonation		
Shaped Charge Jet Impact		

Test Results Reviewed By: e.g., Non-Nuclear Munitions Safety Board

Threat Hazard Assessment Summary:

Hazard Classification Test Results Summarized:

Actions Required to Make Munition Insensitive:

Other Pertinent Data: Test Reports, Munition History, etc

Rationale for the Waiver Request:

Signature Page: *IM Waiver Request*

Program Manager : _____ _____

Signature **Date**

Air Force IM Panel Recommendation

Approval/Disapproval: _____ _____

Signature **Date**

Comment:

Air Force IM Board Recommendation

Approval/Disapproval: _____ _____

Signature **Date**

Comment:

Air Force Executive Agent for IM

Approval/Disapproval: _____ _____

Signature **Date**

APPENDIX D

FORMAT IV: Plan Of Action and Milestones (POA&M)

APPENDIX E

FORMAT V: Threat Hazard Assessment (THA)

Department of Defense Acquisition Manager's Handbook for Insensitive Munitions

Appendix J

USSOCOM IM Memorandum

UNITED STATES SPECIAL OPERATIONS COMMAND
7701 TAMPA POINT BLVD.
MACDILL AIR FORCE BASE, FLORIDA 33621-5323

SOAL-SP

DEC 15 2003

MEMORANDUM FOR: SEE DISTRIBUTION

SUBJECT: Establishment of the United States Special Operations Command Insensitive Munitions Board

1. The function of the United States Special Operations Command (USSOCOM) Insensitive Munitions (IM) Board is to review all test plans and data for weapons, ammunition and explosives that require IM review and approval. The board will coordinate IM approvals or waivers with the Joint Staff for final Joint Requirements Oversight Council (JROC) approval.

2. The Program Manager (PM) of a new weapon or ammunition must submit a copy of the acquisition documentation, e.g., Initial Capabilities Document (ICD), Test and Evaluation Master Plan (TEMP), etc., to the IM Board. The documentation must include a complete weapon description, including the configuration of components containing energetic material, such as warheads, rocket motors, cartridges/propellant activated devices and fuzes. The acquisition documentation must include IM requirements and plans.

3. The PM is responsible for IM test planning and shall develop a test plan in accordance with MIL STD 2105 B. The PM shall submit a copy of the test plan to the Explosive Safety Review Board (WSESRB) and the USSOCOM IM office (IMO). After approval of the test plan, the PM is responsible for insuring that all IM tests meet the requirement of MIL STD 2105B. The USSOCOM IM Office must approve any deviation from the MIL STD.

4. Upon the conclusion of testing, the PM shall be responsible for generating and submitting a test report summary to the IMO, highlighting IM performance issues. If required, a request for waiver of IM requirements will be submitted as an enclosure to the test report. The waiver must be based upon a demonstrated lack of available technology, prohibitive cost and or urgent operational requirement. The waiver will be briefed to the Joint Service Insensitive Munition Panel (JSIMPT) for their support, guidance and recommendation.

5. The full waiver package will be staffed for approval by the Chairman of the USSOCOM IM Board. The Program Executive Officer, Special Programs (PEO-SP) is designated as the board chairman. USSOCOM will then forward the waiver request to the Joint Staff J-4 for staffing to obtain a final approval by JROC. A copy of the package will also be forwarded to the JSIMPT technical panel chairman. The waiver package will contain a Plan of Action and Milestones (POA&M) to address the PM's schedule and funding for correcting existing IM deficiencies.

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6. The IMO will conduct semi-annual reviews for assessment of on-going developmental work and will provide this information to the JSIMPT.

7. The USSOCOM IM Office is managed by the Vice Chairman who is the USSOCOM System Acquisition Manager for Ammunition. The board will also consist of a technical advisor, a service representative and a safety/testing representative. Other board positions may be added at the discretion of the Chairman. Current members of the USSOCOM IM Board are:

Chairman: COL Thomas F. Spellissy
Vice Chairman: LTC David W. Riggins
Technical Advisor: Dr. Carl Campagnuolo
Service Representative: Steve R. Turpin
Safety/Testing Representative: TBD

THOMAS F. SPELLISSY
Colonel, U.S. Army
Program Executive Officer
Special Programs

DISTRIBUTION:
OSD (AT&L)DS, LW&M (MR. ROBERT MALINE)
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PM. LAW-CS (MR. HARMAN)
PM, SOF WEAPONS & AMMO (CRANE, MR. SMITH)
JOINT STAFF J4 (LTCOL KIRKLAND)
JOINT STAFF J8 (COL MARTINEZ)

Department of Defense Acquisition Manager's Handbook for Insensitive Munitions

Appendix K

Service's Points of Contact for IM