JOINT SYSTEMS SAFETY REVIEW GUIDE FOR USSOCOM PROGRAMS

Version 1.1

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Department of Defense

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Preface

The United States Special Operations Command (USSOCOM) is, by its very nature, a Joint warfighting command, comprising forces from all the Services. Therefore, acquisition programs within USSOCOM are considered to be Joint programs. USSOCOM functions both as a Supported and Supporting Combatant Command (COCOM). Under the provisions of Title 10 of the United States Code Section 167 (Title 10 USC Sec 167), USSOCOM has acquisition authority on a par with the Military Departments (e. g., Budgeting and Programming, Acquisition Authority, Head Contracting Activity, etc.) and also Service-like responsibilities (e. g., Organize, Train, Equip; establishing Operational Requirements, Operational Testing).

Unless otherwise noted in appropriate Acquisition Decision Memoranda (ADM), USSOCOM acquisition policies and procedures apply to Programs for which USSOCOM is the Milestone Decision Authority (MDA) and is providing Program Management. Exceptions to USSOCOM responsibilities, policies, and procedures for those acquisition programs in which USSOCOM is the MDA but a Military Department provides the Program Management are defined in program-specific Memoranda of Agreement (MOA) with the respective Military Departments. In the case of USSOCOM acquisition programs for which a Military Department has been assigned as MDA, USSOCOM policies and procedures normally do not apply.

Historically, weapon safety review board certifications in support of USSOCOM acquisition programs were obtained through multiple reviews by the respective system safety boards and organizations in each of the Military Departments. The process to certify weapons and laser systems as safe for use by members of more than one Service has been to conduct individual Service system safety reviews by each of the Services whose members would be expected to employ those system(s). While each individual Service has long-standing weapon safety review processes designed to meet their Service-unique requirements, multiple individual system safety reviews conducted in series by each Military Department and/or Service for a particular Joint weapon or weapon system are expensive, time consuming and redundant. Additionally, a multiple review board approach has the potential for conflicting safety requirements and recommendations resulting in inconsistent safety designs and/or operating procedures. Currently, the USSOCOM considers all weapons used by their components to be Joint weapons, that is, available for use by any of their components. Therefore, it is both prudent and logical to require a single, integrated and consolidated weapon safety review and certification be conducted for each USSOCOM system in a coherent, collaborative manner by the respective weapon safety review authotities

The Defense Safety Oversight Council (DSOC) Acquisition and Technology Programs Task Force (ATP TF), on 21 July 2005, approved a proposal to streamline the weapon safety review process for USSOCOM programs and chartered a Joint Weapon Safety Working Group to develop and refine a collaborative, Department-wide process for USSOCOM support. Weapon safety representatives from USSOCOM, the Army, Navy, Marine Corps, Air Force, the Department of Defense Explosives Safety Board (DDESB), and the Office of the Under Secretary of Defense (OUSD) for Acquisition Technology & Logistics (AT&L) coordinated the development of a Joint process that addresses Joint safety release and certification. This process eliminates the inefficiencies inherent in the existing individual Military Department and Service system safety review processes when examining, for safety purposes, any USSOCOM weapon system with Joint

application. This Joint collaborative review process accelerates the fielding of weapon systems to the USSOCOM warfighter without compromising safety.

This guide outlines this Joint Safety review process for use by the weapon systems, munitions, and laser safety organizations of the Department of Defense (DoD), the Military Departments, and the individual Services to accomplish efficient and effective safety reviews in support of USSOCOM Joint acquisition program needs. It is anticipated that once this process is validated for SOCOM systems, it will be expanded for use with all weapon and laser systems having potential for multi-Service employment. Work on generating the generic joint process is already underway; and leverages this ongoing SOCOM initiative.

The process outlined in this guide should be applied to all elements of a weapon, weapon system, or ordnance item acquisition program (system, subsystem, hardware, and software) in all anticipated environments (handling, transportation, storage and employment) regardless of Acquisition Category (ACAT). This guide should be used in conjunction with related directives, instructions, policy memoranda, or regulations issued to implement mandatory requirements.

The Office of Primary Responsibility (OPR) for this guide resides in the Under Secretary of Defense (Acquisition, Technology and Logistics (USD (AT&L)) Systems and Software Engineering and Developmental Test and Evaluation organization (USD (AT&L) /SSE/DT&E). Updates to this guide will be made as required.

To provide feedback to the OPR, please email Dr. Elizabeth Rodriguez-Johnson at Elizabeth.Rodriguez-Johnson@osd.mil.

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1. Key Terms, Descriptions, and Principles

Joint weapons, weapon systems, and ordnance items may cross all DoD Component boundaries, including numerous safety organizations. In order to assist the joint system safety effort it is critical to establish consistent terminology for today's complex systems.

By necessity, unique, and in some cases new, terms are applied. The following terms and descriptions are key to the proper application of this guide.

1.1. USSOCOM Munitions/Weapons/Ordnance System Safety Review

A combination of processes and activities designed to deliver safe weapon systems to the USSOCOM warfighter through the coordinated and collaborative efforts of the individual Military Departments and their respective Services in compliance with all statutory and regulatory requirements.

1.2. USSOCOM Laser Safety Review

A combination of processes and activities designed to deliver safe laser systems to the USSOCOM warfighter through the coordinated and collaborative efforts of the individual Military Departments and their respective Services, which shall be coordinated by the Lead Service for the Joint acquisition, in compliance with all statutory and regulatory requirements.

1.3. System Safety Lead (SSL)

The System Safety Lead (SSL) is the acquisition Program Manager's system safety representative, leads the Safety Integrated Product Team (IPT), and has overall responsibility for the execution of the System Safety Program (SSP) and the System Safety Program Plan (SSPP). The Navy and Marine Corps define this role as the Principal for Safety (PFS). In this guide the term SSL subsumes both the SSL and PFS functions. The SSL is appointed by the PM.

1.4. Service Safety Review Coordinator (SSRC)

The Service Safety Review Coordinator (SSRC) is an individual identified by a Military Department or Service. The function of the SSRC is to serve as the primary point of contact to assist or work with the SSL to facilitate coordinated joint safety reviews of USSOCOM weapon systems, munitions, and laser systems within the Military Departments and /or Services. The duties and involvement of the respective SSRCs will differ depending upon the requirements of individual Military Department or Service and their normal system of assuring weapon safety. Areas where the division of duties between the SSRC and the SSL differ are indicated in this document by noting those duties that are performed by the SSRC or by the SSL, as appropriate. The Military Department assigned the lead for the acquisition effort will provide the Lead Service Safety Review Coordinator (LSSRC).

1.5. Service Laser Safety Review Coordinator (SLSRC)

The Service Laser Safety Review Coordinator (SLSRC) is the POC identified by a Military Department or Service who is the initial lead for coordinating the review of a laser system. The SLSRC can be from Air Force Laser System Safety Review Board (LSSRB) or the Navy Laser Safety Review Board (LSRB) or the U.S. Army Center for Health Promotion and Preventative Medicine (USACHPPM) Laser/Optical Radiation Program (L/ORP). The Military Department assigned the lead for the acquisition effort will provide the lead SLSRC, referred to as the LSLSRC (Lead Service Laser Safety Review Coordinator).

1.6. Service Laser Safety Review Authority (SLSRA).

The SLSRA for each of the Services are:

1.6.1 Army: Manager, Laser/Optical Radiation Program (L/ORP), USACHPPM

1.6.2 Navy and Marine Corps: Chair, Laser Safety Review Board (LSRB)

1.6.3 Air Force: Chair, Laser System Safety Review Board (LSSRB)

1.7. Lead Service Laser Safety Review Authority (LSLSRA).

The Service that is serving as the lead for the acquisition in support of USSOCOM, will also serve as the Lead Service Laser Safety Review Authority (LSLSRA) for conducting the Joint laser safety reviews.

2 Identifying Joint Weapons Programs

Policy established by the Joint Requirements Oversight Council (JROC) directed the establishment of a Joint Weapon Safety Technical Advisory Panel (JWSTAP). The JWSTAP is chartered to advise the Deputy Director for Force Protection (DDFP) on weapon safety issues pursuant to its primary duty of advising the JROC during their review and analysis of all weapon capability documents submitted under the framework of the Joint Capabilities Integration and Development System (JCIDS) process. The JWSTAP reviews and provides recommended revisions to capability documents by identifying and providing constructive recommendations to reduce or eliminate safety concerns while retaining the desired operational effectiveness of the weapon when handled, transported, stored or used in Joint operating environments.

2.1 Determining Requirement for Review/Certification

The USSOCOM Acquisition Executive (AE) has determined that all weapons, munitions, ordnance or laser system or related devices developed or procured for USSOCOM use are to be considered “Joint use systems” since they will be available for use by all components of USSOCOM. Therefore, all such systems will require a Joint safety review and safety assessment. These joint safety assessments will be based on and supported by the appropriate JCIDS capability and design documentation, or JCIDS equivalent documents. The Joint review

process starts when the PM's designated SSL initiates dialogue with the LSSRC and/or with the LSLSRC, when lasers are a part of the weapon system. See Appendix C for the respective initial laser safety POCs. The LSLSRC once receiving the request for laser system safety review will consider all SOCOM lasers as joint service laser systems and will coordinate with the other services as a joint effort.

2.2 Coordinating the Approach

The traditional approach to the systems engineering system safety process, as delineated in MIL-STD 882, must be followed. MIL-STD-882 provides guidance for developing a system safety process, as necessary, to accommodate a variety of program characteristics. Appendix D of this document provides guidance and review criteria expectations for technical data package submissions in support of a Joint system safety review and Milestone Decision.

A MIL-STD-882 approach to system safety facilitates safety involvement early in the Program acquisition process, reducing future costs and risks. In the case of non-developmental (NDI) and commercial off the shelf (COTS) items, or USSOCOM modified variants of such items, this approach will reduce the costs and potential mishap risks that would normally be inadvertently transferred into any subsequent Program of Record (PoR).

Using the guidance contained herein, the SSL will develop a proposed approach that adequately meets or addresses all Military Department and/or Service safety, and laser safety, requirements. The SSL will coordinate with the LSSRC and/or the LSLSRC to develop information regarding the boards, panels and organizations that need to be contacted. In the process of developing safety and test requirements for the product, the SSL will develop a safety program schedule that facilitates completion of safety tasks including testing and reviews, and will also identify and provide the resources required to conduct and complete the safety program tasks. The SSL, working with his/her SSRC, and/or LSLSRC, will contact all the potentially interested Military Department or Service safety review boards from the list in Figure 1 to identify all their respective areas of interest and responsibilities. The organization and phone number for each primary and alternate SSRCs and SLSRCs are provided in Appendix C. The LSSRC and the LSLSRC, or their technical POCs, will also provide advice on safety analyses and testing requirements, the scheduling of reviews, and the resources required by the various safety organizations and testing communities. The SSRCs and SLSRCs will maintain cognizance of the interested Military Department and/or Service safety organizations and will advise the PM and SSL of any changes. Safety review organization technical POCs will, after initial review of the planned acquisition, advise the SSL, and the LSSRC and/or LSLSRC regarding the need for formal safety board proceedings, or if the reviews and certification may be accomplished via alternative safety board procedures, such as letter data package reviews and/or Board Secretariat recommendations or approvals.

Figure 1. List of Safety Review Boards and Organizations by Military Departments

2.3 Integrating Services' Weapon Safety Requirements

The SSL, in coordination with the SSRCs and SLSRCs, will be responsible for integrating safety requirements from the Military Department and/or Service review boards and organizations, and for determining if disparities exist among the Military Departments or Services. Any identified disparities regarding laser safety requirements will be addressed and coordinated by the LSLSRC. Any additional design data and testing requirements that are identified as a result of an initial safety board or safety organization review of the PM's planned acquisition will be communicated by the safety board or safety organization POCs to the SSL, SSRCs and LSLSRC representatives, as appropriate. The LSSRC, LSLSRC, or SSL, as appropriate, will coordinate the safety requirements as shown in Figure 2. The coordinated set of program requirements will reside with the SSL. The safety board POCs may convey Military Department or Service-unique safety requirements. When a single material solution is being designed to meet all the consolidated requirements, it is likely that one safety board or organization will request data or identify safety requirements that another safety board may not request. While requests for data do not necessarily constitute a significant disparity or conflict, disparate or conflicting requirements that drive excessive or duplicative testing, or necessitate acquisition of multiple system designs will require resolution or adjudication at the appropriate level.

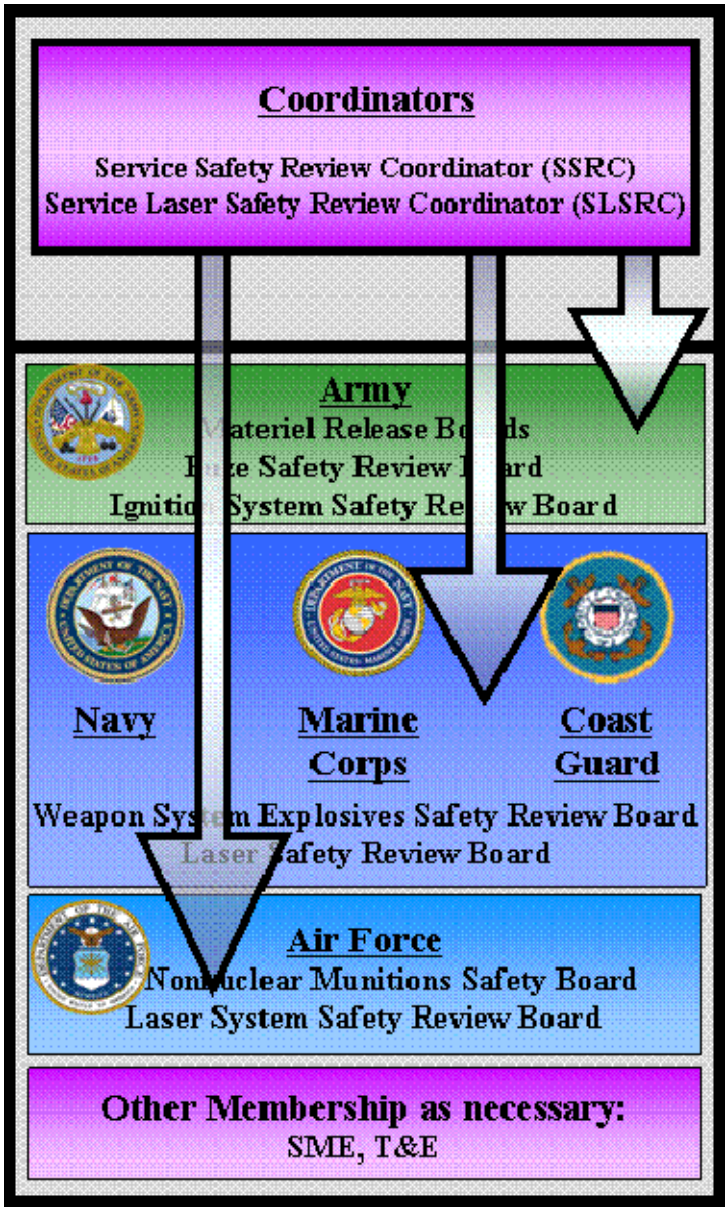

Figure 2. Joint Service Coordination

2.4 Resolving Disparate or Conflicting Weapon Safety Requirements

If the SSL, LSSRC, or LSLSRC confirms there are disparate or conflicting safety requirements such that conformance with all the consolidated safety requirements is not practicable, then the SSL, LSSRC or LSLSRC, in coordination with the SSL, as appropriate, will request collaboration among the dissenting review board authorities as described in Section 3. In cases where the non-laser safety disparities cannot be resolved at that level, the PM may request a meeting of the Chairpersons of the Military Department Service Safety Boards and the appropriate Chief of System Safety from the Army Armament Research, Development, and Engineering Center (ARDEC) or the Army Aviation and Missile Command (AMCOM), hereafter referred to as the Executive Council, to resolve the matter. For clarification/resolution

of specific laser safety findings, the PM may request the LSLSRC to coordinate a meeting with the LSRAs to resolve any conflicting issues. If such meetings are needed to resolve the conflicts, the SSL, the LSSRC, or LSLSRC, as appropriate, will coordinate schedules, meeting location and facilities for a meeting of the Executive Council or SLSRAs.. Every effort will be made to achieve agreement among the cognizant safety organizations with regard to safety requirements for, and testing and analyses to be conducted of, the weapon, munition, ordnance item, or laser system. In the event resolution cannot be achieved by the Executive Council or SLSRAs,, the SSL or LSSRC/LSLSRC, as appropriate, will request each Executive Council member and/or SLSRAs to articulate the risk and operational limitations, if any, associated with not meeting its organization's unique safety requirements. The SSL or SSRC/LSLSRC will then present the issue to the appropriate higher management level for a decision. When safety requirement disparities result in a disagreement on the level of risk associated with a particular safety requirement, the issue will be presented to the risk acceptance authority appropriate for the highest level of risk articulated by any member of the Executive Council, or by SLSRAs. The statement of risk should list any operational limitations associated with not meeting the unique safety requirements, and explain the Military Department, Service, Executive Council, and/or SLSRAs' concerns. If potential risks or operational limitations are then accepted by this authority, the SSL will document this acceptance, in writing, noting any restrictions or limitations on the use, handling, transporting, or storing of the weapon aboard platforms (e.g., aircraft, vehicles, ships, submarines) or at shore facilities, bases, or commands within each respective Military Department or Service.

3 Joint Board Meetings

When any formal board meeting is required as part of this proposed safety review process, or is requested to resolve significant disparate or conflicting requirements among the safety boards, the SSL or the LSSRC, or LSLSRC in coordination with the SSL, as appropriate, will arrange the schedule and location. This will normally be a joint meeting of the existing Military Department and Services safety boards or safety organizations involved, hereafter referred to as the "Joint Boards". The SSL, SSRCs, or LSLSRC, as appropriate, will coordinate with the safety boards and organizations to determine the content of the safety data package that is required to be delivered for review 30 days prior to any meeting of the Joint Boards. The SSL or SSRC will coordinate with the LSLSRC for the conduct of a Joint Service laser system safety review.

3.1 Joint Boards Procedures

It is expected that the Joint Boards will resolve any open disparities or conflicts with the safety design, analyses, or testing results. Figures 3 and 4 illustrate the weapon safety and laser safety review processes. Joint Board deliberations will be documented in formal minutes, to include actions and/or recommendations, and will be signed by the designated Military Department's or Service's designated safety board Chair or safety organization representative. The integrity of each safety board, however, will be maintained, and respective safety board positions will be recorded in the Joint minutes. The intent is to provide the PM with a set of findings that are coordinated and consistent among the Military departments and Services, and that contain any necessary supporting rationale for the safety requirements, finding, and/or actions. It is important to note that it is possible that one Military department's or Service's weapon safety

requirements may be satisfied while there may remain one or more open actions needing resolution in order to satisfy the unique requirements of other Military Departments or Services. This is not necessarily a conflict, and it is expected that each safety board will honor valid requirements of the others.

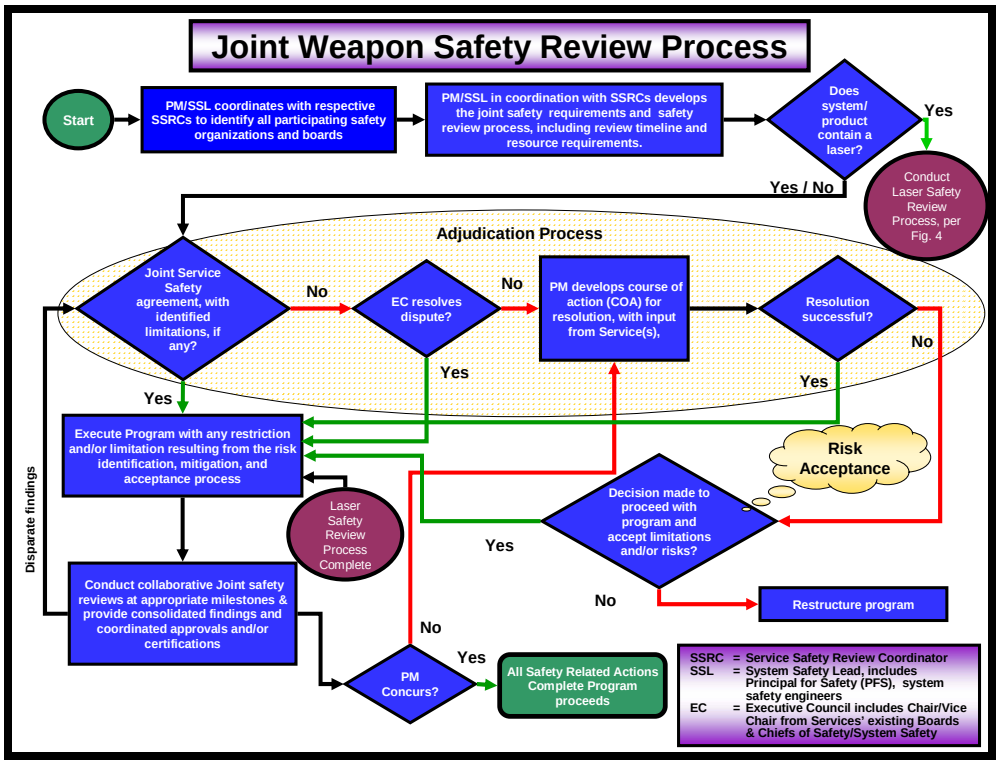

Figure 3. Joint Weapon Safety Review Process

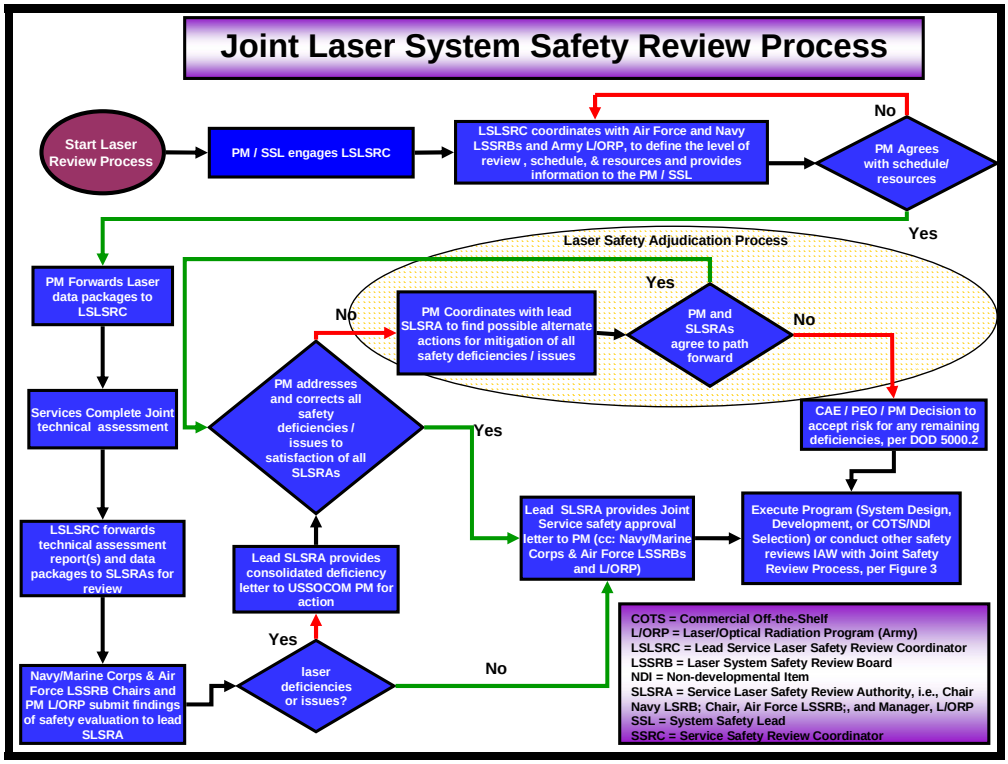

Figure 4. Joint Laser Safety Review Process

If the subject product in question has been slated for a formal review by the Joint Boards, the respective safety organizations and safety board technical POCs will, upon receipt of data and documentation, initiate the requisite safety assessments pursuant to developing board decisions. The safety board or safety organization of the Military Department selected to lead the acquisition program will coordinate the assembling of the Boards' representatives to perform the reviews. However, if a Military Department has not yet been selected to lead the acquisition program, the USSOCOM AE may designate an appropriate Military Department to convene a Joint Board. The Joint Board will be co-chaired by the Chairpersons and/or Vice-Chairpersons from those Military Department and Service Boards in attendance. The Joint Boards' members will review and deliberate the data and documentation presented. Based on this review and deliberation process, the Joint Boards will prepare a Joint document, signed by the appropriate senior safety representatives who have participated in the safety review, indicating the findings of the Joint Boards.

3.2 Development of Joint Boards Findings

Minutes of the Joint Boards meetings will be prepared and distributed by the lead safety board or safety organization of the Military Department selected to lead the acquisition program, or designated to convene the Joint Boards. The minutes will include any Board assigned action items cited as Findings. The minutes will be endorsed by the lead participant from each board or safety organization who attended the Joint meeting. The minutes will be distributed to the acquisition PM, the lead of the system development IPT, and the lead participants of the cognizant safety boards and organizations, as a minimum. Each participating Military

Department or Service will maintain an independent set of records. The LSSRC and the SSL will coordinate with the members of the Joint Boards to determine closure of any non-laser related Joint Boards findings and/or actions. For laser safety related findings/actions, the SSL will coordinate with the LSLSRA for resolution.

3.3 Resolution of Joint Boards Findings

Similar to the process for resolving disparities among safety requirements (Section 2.4 above), the PM may also request a meeting of the Executive Council to resolve Joint Boards non-laser related findings/actions. For clarification/resolution of specific laser safety findings, the PM may contact the LSLSRC to request a meeting with the appropriate SLSRAs to resolve any conflicting issues. If such meetings are needed to resolve the conflicts, the SSL, the LSSRC, or LSLSRC as appropriate, will coordinate schedules, meeting location and facilities for a meeting of either the Executive Council, or the SLSRAs, as may be necessary. In the event resolution can not be found by the Executive Council or the SLSRAs, the SSL or LSSRC/SLSRC, as appropriate, will request each Executive Council and or SLSRA member to articulate the risk and operational limitations, if any, associated with the proposed finding/action in question. The SSL will then present the issue for a decision at the appropriate higher management level. When disparities occur among Joint Board members, or among the Service laser safety boards, regarding findings/actions that result in a disagreement on the level of risk associated with a particular safety finding/action, the issue will be presented to the risk acceptance authority appropriate to the highest level of risk articulated by any member of the Executive Council or SLSRAs. The statement of risk should list any operational limitations associated with not fully addressing the proposed finding/action in question, and explain the Military Department, Service, Executive Council, and/or SLSRAs concerns. If potential risks or operational limitations are then accepted by this authority, the SSL will document this acceptance, in writing, noting any restrictions or limitations on the use, handling, transporting, or storing of the weapon aboard platforms (e.g., aircraft, vehicles, ships, submarines) or at shore facilities, bases, or commands within each respective Military Department, or Service. Copies of this risk acceptance documentation, including any limitations, will be provided to the Joint Boards and to the SLSRAs." For laser systems, if any Service has identified a laser safety deficiency, this system cannot be approved for Joint Service use until all deficiencies are satisfactorily resolved by the PM and SLSRAs.

3.4 Funding Responsibilities

It shall be the responsibility of the acquisition program manager to agree to and fund the labor, travel and other related costs for:

- Joint or out-of-cycle reviews, as appropriate
- Safety engineering support
- Administrative support (facilities, equipment, etc.)
- Technical support from outside DoD
- Joint Laser Safety Review Process

Appendix A. Applicable References

The following list of documents is provided as a guide, but is not all inclusive. The Program SSL in conjunction with the Service SSRC should conduct a thorough research of all pertinent DoD, Federal, and Local Government safety-related directives that may be germane to the safe manufacturing, handling, storing, or transporting of the weapon or combat system.

General:

AT&L Knowledge Sharing System (AKSS)
(http://deskbook.dau.mil/jsp/default.jsp)

CJCSI 3170.01 series, Joint Capabilities Integration and Development System
(www.dtic.mil/cjcs_directives/cdata/unlimit/317001.pdf)

CJCSM 3170.01 series, Operation of the Joint Capabilities Integration and Development System
(www.dtic.mil/cjcs_directives/cdata/unlimit/m317001.pdf)

Support of the Headquarters of Combatant and Subordinate Joint Commands
(www.dtic.mil/whs/directives/corres/pdf2/d51003p.pdf)

Defense Acquisition Guidebook
(http://akss.dau.mil/dag/)

Defense Acquisition University Continuous Learning Modules
(https://learn.dau.mil/html/clc/Clc.jsp)

Standards:

IEEE/EIA 12207	Information Technology – Software Lifecycle Processes
MIL-STD- l00	Engineering Drawing Practices
MIL-STD-331	Fuze and Fuze Components: Environmental and Performance Tests
MIL-STD-464	Department of Defense Interface Standard; Electromagnetic Environmental Effects; Requirements for Systems, Equipment, and Facilities
MIL-STD-461	The Control of Electromagnetic Interference Emissions and Susceptibility, Requirements For

MIL-STD-498	Software Development and Documentation
MIL-STD-709	Ammunition Color Coding
MIL-STD-721	Definitions of Effectiveness Terms for Reliability, Maintainability, Human Factors, and Safety Materiel (1990)
MIL-STD-810	Environmental Test Methods and Engineering Guidelines
MIL-STD-882	Standard Practice for System Safety
MIL-STD-1316	Fuze Design, Safety Criteria
MIL-STD-1385	Preclusion of Ordnance Hazards in Electromagnetic Fields; General Requirements for
MIL-STD-1399	Interface Standard for Shipboard Systems, Section 300, Electric Power, Alternating Current
MIL-STD-1399	Interface Standard for Shipboard Systems, Section 070, DC Magnetic Field Environment Design Requirements and Test Methods
MIL-STD-1425	Safety Design Requirements for Military Lasers and Associated Support Equipment
MIL-STD-1472	Human Engineering Design Criteria for Military MIL-STD-1629 Procedures for Performing a Failure Mode, Effects and Criticality Analysis
MIL-STD-1751	Safety and Performance Tests for Qualification of Explosives
MIL-STD-1911	Hand Emplaced Ordnance Design Safety Criteria
MIL-STD 1901	Munition Rocket and Missile Motor Ignition System Design, Safety Criteria For
MIL-STD-2036	General Requirements for Electronic Equipment Specifications
MIL-STD-2105	Hazard Assessment Tests for Non-Nuclear Munitions
DOD-STD-2167	Defense System Software Development
DOD-STD-2168	Defense System Software Quality Program
DOD STD-6055.9	Ammunition and Explosives (A&E) Safety Standards
NFPA Std 115	Recommended Practice on Laser Fire Protection
FDA Laser Notice No. 52	Guidance on the DOD Exemption from the FDA Performance Standard for Laser Products of 12 Jul 02

	(clarifies and updated FDA exemption No. 76EL-01DOD)
FAA Order 7400.2E	Procedures for Handling Aerospace Matters
FAA Advisory Circular 70-1	Outdoor Laser Operations
FAA Advisory Circular 70-2	Reporting of Laser Illumination of Aircraft
ANSI Std Z136.1	American National Standard for Safe Use of Lasers
ANSI Std Z136.4	American National Standard Recommended Practice for Laser Safety Measurements for Hazard Evaluation
ANSI Std Z136.6	American National Standard for Safe Use of Lasers Outdoors

Handbooks:

MIL-HDBK-310	Global Climatic Data for Developing Military Products
MIL-HDBK-347	Mission-Critical Computer Resources Software Support
MIL-HDBK-454	General Guidelines for Electronic Equipment
MIL-HDBK-504	Guidance on Safety Criteria for Initiation Systems
MIL-HDBK-764	System Safety Engineering Design Guide For Army MIL-HDBK-881 Work Breakdown Structure, 1998
MIL-HDBK-828	Laser Range Safety
MIL-HDBK-1512	Electro-explosive Subsystems, Electrically Initiated, MIL-I-23659 Appendix A General Design Specification for Electrical Initiators
MIL-HDBK-2036	Electronic Equipment Specifications

Specifications:

MIL-E-6051	Electromagnetic Compatibility Requirements System
MIL-I-23659	General Design Specification for Electrical Initiators
MIL-H-46855	Human Engineering Requirements for Military Systems, Equipment, and Facilities
MIL-M-15071	Manuals, Technical: Equipment and Systems, Content Requirements
MIL-M-38784	Manuals, Technical; General Style and Format Requirements
MIL-S-901	Shock Tests, H.I. (High-Impact) Shipboard Machinery, Equipment, and Systems, Requirements For

DID DI-SAFT-80102A	Safety Assessment Report.

Directives and Instructions:

DoD

DODI 5000.1	Operation of the Defense Acquisition System
DODI 5000.2	Mandatory Procedures for Major Defense Acquisition Programs (MDAPs) and Major Automated Information System (MAIS) Acquisition Programs
DODI 6055.1	DoD Safety and Occupational Health (SOH) Program
DODI 6055.5	DoD Industrial Hygiene and Occupational Health, January 10, 1989
DODI 6055.15	DoD Laser Protection Program
DODD 6055.9E	Explosives Safety Management and the DoD Explosives Safety Board
DODD 4145.26-M	Contractors Safety Manual for Ammunition and Explosives

DoD Guides:

DOD	OSD Risk Management Guide
DOD	Environmental, Safety, and Occupational Health (ESOH) Guide

Joint

JSSS HDBK	Joint Software System Safety Committee, Software System Safety Handbook, December 1999
OUSD (AT&L)	Unmanned Systems (UMS) Safety Guide for DoD Acquisition

TB 700-2/NAVSEAINST 8020.8/ TO 11A-1-47/DLAR 8220.1	Department of Defense Ammunition and Explosives Hazard Classification Procedures

Army

TR92-2	Software System Safety Guide (May 1992)
AR 11-9	The Army Radiation Safety Program
AR 40-5	Preventive Medicine
AR 40-10	In Support of the Army Materiel Acquisition Decision Process (2007)
AR 385-10	The Army Safety Program (2007)
AR 385-16	System Safety Engineering and Management (1985)
DA PAM 385-16	System Safety Management Guide (1987)
DA PAM 385-24	The Army Radiation Safety Program
AR 385-63/MCO 3570.1	Range Safety
DA PAM 385-63	Range Safety
TB MED 524	Control of Hazards to Health from Laser Radiation

Navy

SECNAVINST 5100.14	Military Exempt Lasers
SWO20-AH-SAF-010	Weapons System Safety Guidelines Handbook
NAVSEA OP 4	Ammunition Afloat
NAVSEA OP 5	Ammunition and Explosives (A&E) Ashore
NAVSEA OP 3347	US Navy Ordnance Safety Precautions
NAVSEA OP 3565	Electromagnetic Radiation Hazards; Hazards to Personnel, Fuel, and Other Flammable Material and Ordnance
OD 30393	Design Principles and Practices for Controlling Hazards of Electromagnetic Radiation to Ordnance
NAVSEAINST 5100.12	Requirements for Naval Sea Systems Command System Safety Program for Ships, Shipborne Systems, and Equipment

NAVSEAINST 8020.5	Qualification and Final (Type) Qualification Procedures for Navy Explosives (High Explosives, Propellants, Pyrotechnics and Blasting Agents)
NAVSEAINST 8020.6	Navy Weapon System Safety Program
NAVSEAINST 8020.7	Hazards of Electromagnetic Radiation to Ordnance Safety
NAVENVIRHLTHCENINST 6270.8	Health Hazard Assessments
OPNAVINST 5100.9	Navy Safety Precautions for Forces Afloat
OPNAV 5100.23	Navy Occupational Safety and Health Programs Manual
OPNAV 5100.24	Navy System Safety Program
OPNAVINST 5100.27/MCO 5104.1	Navy Laser Hazard Control Program
OPNAVINST 5101.1	Resolution of Electromagnetic Radiation (EMR) Hazard Reports
OPNAV 5102.1	Accident Investigation and Reporting
OPNAV 4110.2	Hazardous Material Control and Management
OPNAV 5100.24	Navy Systems Safety Program
OPNAV 5100.27	Navy Laser Hazards Control Program
OPNAVINST 8010.13	Department of the Navy's Policy on Insensitive Munitions (IM).
OPNAVINST 8020.14/ MCO P8020.11	Department Of The Navy, Explosives Safety Policy Manual
OPNAVINST 8023.213	U.S. Navy Explosive Policy, Requirements and Procedures
SECNAVINST 5100.10	Dept. of the Navy Policy for Safety, Mishap Prevention, Occupational Health and Fire Protection Programs
SECNAVINST 8020.3	Responsibilities for Issuance and Administration of Waivers of and Exemptions from Department Of Defense (DoD) Explosive Safety Standards

Air Force

AFI 13-112V1	Joint Terminal Attack Controller Training Program
AFI 13-112V2	Joint Terminal Attack Controller Standardization/Evaluation Program
AFI 13-212V1	Range Planning and Operations
AFPD 91-2	Safety Program
AFPD 91-4	Directed Energy Weapons Safety
AFI 91-202	The USAF Mishap Prevention Program
AFI 91-205	NonNuclear Munitions Safety Board
AFI 91-401	Directed Energy Weapons Safety
AFI 21-201	Conventional Munitions Maintenance Management
AFMAN 91-201	Explosive Safety Standards
AFOSH Std 48-139	Laser Radiation Protection Program

Marine Corps

MCO 5100.29	Marine Corps Safety Program
MCO 5100.8	Marine Corps Occupational Safety and Health Program Manual
MCSCO 5100.29	Safe and Ready Certification and Safety Releases

Appendix B. Acronyms

A&E	Ammunition and Explosives
ACAT	Acquisition Category
ADM	Acquisition Decision Memorandum
AE	Acquisition Executive
AFI	Air Force Instruction
AFMAN	Air Force Manual
AFOSH	Air Force Occupational, Safety and Health
AFPD	Air Force Policy Directive
AKSS	AT&L Knowledge Sharing System
AMCOM	Army Aviation and Missile Command
ANSI	American National Standards Institute
AR	Army Regulation
ARDEC	Army Armament Research, Development, and Engineering Center
AT&L	Acquisition Technology & Logistics
ATP TF	Acquisition and Technology Programs Task Force
BUMED	Navy Bureau of Medicine
CJCSI	Chairman, Joint Chiefs of Staff Instruction
CJCSM	Chairman, Joint Chiefs of Staff Manual
COCOM	Combatant Commander
CONOPS	Concept of Operations
COTS	Commercial Off The Shelf
DAG	Defense Acquisition Guidebook
DA PAM	Department of Army Pamphlet
DAU	Defense Acquisition University
DDESB	DoD Explosives Safety Board
DDFP	Deputy Director for Force Protection
DID	Data Item Description
DoD	Department of Defense
DODD	Department of Defense Directive
DODI	Department of Defense Instruction

DSOC	Defense Safety Oversight Council
EIA	Electronic Industries Alliance
FAA	Federal Aviation Administration
FDA	Federal Drug Administration
FMECA	Failure Modes, Effects, & Criticality Analysis
FTA	Fault Tree Analysis
GOTS	Government Off The Shelf
HAR	Hazard Assessment Report or Hazard Action Record
HDBK	Handbook
HHA	Health Hazard Assessments
HMMP	Hazardous Material Management Plan
IEEE	Institute of Electrical and Electronics Engineers
IM	Insensitive Munitions
IPT	Integrated Product Team
JCIDS	Joint Capabilities Integration and Development System
JROC	Joint Requirements Oversight Council
JSSS	Joint Software System Safety
JWSTAP	Joint Weapon Safety Technical Advisory Panel
LSLSRA	Lead Service Laser Safety Review Authority
LSLSRC	Lead Service Laser Safety Review Coordinator
LSRB	Laser Safety Review Board
LSSRB	Laser System Safety Review Board
LSSRC	Lead Service Safety Review Coordinator
LSSWG	Laser System Safety Working Group
MCO	Marine Corps Order
MCSCO	Marine Corps Systems Command Order
MDA	Milestone Decision Authority
MOA	Memoranda of Agreement
MSDS	Material Safety Data Sheet
NAVSEA	Naval Sea Systems Command
NAVSEAINST	Naval Sea Systems Command Instruction
NDI	Non-Developmental Items

NFPA	National Fire Protection Association
O&SHA	Operating & Support Hazard Analysis
OPNAV	Office of Chief of Naval Operations
OPNAVINST	Office of Chief of Naval Operations Instruction
OPR	Office of Primary Responsibility
OSD	Office of the Secretary of Defense
PEO	Program Executive Office or Program Executive Officer
PFS	Principal for Safety
PHA	Preliminary Hazard Analysis
PHL	Preliminary Hazard List
PM	Program Manager or Project Manager
POC	Point of Contact
PoR	Program of Record
SAR	Safety Assessment Report
SHA	System Hazard Analysis
SLSRA	Service Laser Safety Review Authority
SLSRC	Service Laser Safety Review Coordinator
SME	Subject Matter Expert
SOCOM	Special Operations Command
SR/CA	Safety Requirements/Criteria Analysis
SSA	System Safety Assessment
SSAR	System Safety Assessment Report
SSE/DT&E	Systems and Software Engineering, Development Test and Evaluation
SSHA	Subsystem Hazard Analysis
SSL	System Safety Lead
SSP	System Safety Program
SSPP	System Safety Program Plan
SSRA	System Safety Risk Assessment
SSRC	Service Safety Review Coordinator
SSSTRP	Software System Safety Technical Review Panel
TB	Technical Bulletin
TO	Technical Order

T&E	Test and Evaluation
UMS	Unmanned Systems
USC	U.S. Code
USD(AT&L)	Under Secretary of Defense (Acquisition, Technology and Logistics)
USSOCOM	United States Special Operations Command
WSESRB	Weapon System Explosives Safety Review Board

Appendix C.

Service Safety Review Coordinators (SSRC) and Service Laser Safety Review Coordinators (SLSRC)

I. SSRC POC For Weapons Safety

Army: Army Materiel Command, System Safety Office

Primary: AMC (AMCPE-SF), phone: (703) 806-8706

Alternate: AMC (AMCPE-SF), phone: (703) 806-8705

Marine Corps: Marine Corps Systems Command

Primary: MARCORSYSCOM, Code 2041, phone: (703) 432-3145

Alternate: MARCORSYSCOM, Code 00T, phone: (703) 432-3778

Navy: Naval Ordnance Safety and Security Activity

Primary: NOSSA, Code N712, phone: (301) 744-6094

Alternate: NOSSA, Code N314, phone (301) 744-4932,

Air Force: USAF Air Armament Center

Primary: USAF Air Armament Center (AAC/SES), phone: (850) 882-7306

Alternate: USAF Air Armament Center, (AAC/SES), phone: (850) 882-7340

II. Service Laser Safety Review Coordinators (SLSRC)

Army:

Primary: Laser Optical Radiation Program, USA CHPPM, phone: (410) 436-3932; (DSN 584-3932)

Alternate: USA CHPPM, phone (410) 436-3002; (DSN 584- 3002)

Navy/Marine Corps:

Primary: NSWCDL, phone: (540) 653-1060; (DSN 249-1060)

Alternate: NSWCDL, phone: (540) 653-1149; (DSN 249-1149)

Air Force:

Primary: Laser Safety Hotline, AFRL/RHDO, phone (800) 473-3549 (DSN 240- 4784)

Alternate: AFRL/RHDO, phone: (210) 536-4784; (DSN 240-4784)

Appendix D. System Safety Technical Data Package Criteria

1. Purpose

This Appendix outlines the minimum safety data items that must be included with the package that is submitted for joint service safety review. Pertinent references are listed in Appendix A.

2. Joint USSOCOM Program Characteristics

The USSOCOM joint operational acquisition initiatives are frequently in response to urgent and critical needs. These acquisition items may be exposed to non-traditional packaging, shipping and transportation modes and environments within rapidly changing operational environments. Logistical demands typically will be abbreviated, but will require a significantly faster reply. Also, the quantities of developmental hardware or software available for testing will typically be less than with traditional acquisition programs, as will the fielded quantities. Programmatically, USSOCOM acquisition programs will have less definitive requirements and will be developed or procured within a compressed schedule, as compared to a traditional acquisition Program of Record (PoR).

In order to meet these unique USSOCOM development and acquisition constraints and requirements, the approach to the systems engineering and system safety processes, as delineated in MIL-STD 882, must be followed, as discussed in Section 2.2 of the Guide.

2.1. Descriptions of Hazard Analysis Techniques and Methodologies

SSPs must include hazard analyses to identify those hazardous conditions which must either be eliminated or controlled. In general, hazard analyses are used to systematically identify and evaluate hazards, both real and potential, for their elimination or control. Tasks are performed to examine the system, subsystem(s), components and their various interrelationships and interactions, including logistic support, training, maintenance, and operational environments.

Analysis and potential mishap risk prioritization may be accomplished either subjectively, using qualitative analytical techniques resulting in a technical but subjective hazard risk assessment, or quantitatively, using an objective and numeric characterization of the probability of occurrence of a potential mishap risk. While qualitative analysis may take many forms, the common industry accepted quantitative analytical techniques are Fault Tree Analysis (FTA), Failure Modes, Effects, & Criticality Analysis (FMECA), and Sneak Analyses. Typical analyses performed during the design and integration phases include, but are not limited to, Preliminary Hazard Analysis (PHA), System Hazard Analysis (SHA), Sub-System Hazard Analysis (SSHA), Safety Requirements Criteria Analysis (SRCA), Operating & Support Hazard Analysis (O&SHA), and Health Hazard Assessments (HHA). SOCOM Programs may combine or exclude certain analyses based upon review of and concurrence with the safety plan by the Joint Board, as discussed in Section 2 of the Guide.

3. Joint Review Board Data Package Criteria

For all Joint Safety Review Boards, a safety assessment accompanied by appropriate safety analysis is required. In preparation for a safety review, a technical data package will be submitted to the LSSRC. The SSRC, in turn, will forward the data package to the other SSRCs for review and concurrence by appropriate personnel. Section 4.2 below provides detailed technical data package content requirements for submission to a Joint meeting of the cognizant weapon safety boards/organizations.

3.1. Safety Assessment

The safety assessment provides the SSL, SSRC, PM, PEO, and user with objective data to form the basis for risk reduction and risk acceptance in support of the decision being made. In order for reviewing authorities to adequately and objectively assess the level of mishap risk, appropriate safety data (e.g., hazard analyses, test result analyses, etc.) must also accompany the safety assessment. The safety assessment is used to convey the SSL's assessment of the status of hazard mitigations and the resolutions of potential mishap risk, as well as the status of residual risk acceptance for each individual hazard. If the assessment is being conducted and documented to support a pre-fielding acquisition decision, the assessment provides a snapshot of the SSP, at that point in time, illustrating whether or not safety program objectives and plans are in keeping with acquisition milestones. A safety assessment is typically generated several times during the life of a program to assist in evaluating system safety status at each program development milestone.

Other names for a safety assessment include Safety Assessment Report (SAR), System Safety Assessment (SSA), and System Safety Assessment Report (SSAR). Two other terms are frequently used in the execution of a system safety program. These are: (1) System Safety Risk Assessment (SSRA), and (2) Hazard Assessment Report (HAR). An SSRA, as defined in Army Regulation 385-16, DA PAM 385-16 and DA PAM 73-1, and a HAR as defined by the Navy in NAVSEA Instruction 8020.6E and SWO20-AH-SAF-010 is developed for each individual risk. The SSRA and HAR are used to characterize the overall level of each risk. In practice, however, the Army uses the SSRA more as a summary of the overall safety of the system, rather than a description of an individual hazard. Regardless of what the safety assessment is called (SAR, SSA, SSAR, or SSRA), only <u>one</u> safety assessment is required to support a Joint Board review. If there is ever a doubt as to what safety data, or reports, are required to support a joint review, contact the LSSRC, who, in turn, will coordinate with the other SSRCs to provide clarification. The intent is to only provide one safety assessment that satisfies each Military Department's or Service's weapon safety requirements. The safety assessment serves as a single document articulating such things as safety program actions, analyses, design recommendations, and risk mitigation recommendations for each individual hazard.

Safety assessments in support of particular acquisition milestone decisions or testing events should state whether the system is ready to proceed to its next milestone or is ready to be operated or tested. In addition, Commercial Off the Shelf (COTS), Government Off the Shelf (GOTS), or Non-Developmental Items (NDIs), must be addressed in the safety assessment, as

well as recommendations applicable to the safe interfacing of this system with the other system(s).

The safety assessment should conclude with a statement reflecting whether or not all identified hazards have been eliminated, or their associated risks mitigated to levels deemed acceptable. It must be signed by both the Safety Manager and the PM. The content of a safety assessment is discussed in Section 4.2 below.

3.2. Safety Assessment Content

3.2.1 The safety program evaluates and documents in a safety assessment all safety features of the hardware, software and system design, and identifies procedural, hardware and software related hazards that may be present in the system being developed. This includes specific procedural controls and precautions that should be followed. The safety assessment should:

a. Summarize the safety criteria and methodology used to classify and rank hazards, including any assumptions on which the criteria or methodologies were based or derived, including the definition of acceptable risk as specified in the SSPP.

b. Summarize the results of analyses and testing performed to identify hazards inherent in the system, including residual risk and the actions taken to reduce the associated risk to a level specified as acceptable, and results of testing conducted to validate safety criteria, requirements and analyses.

c. Evaluate, document, identify and verify compliance with military, federal, national, international, and industry codes to ensure safe design of a system, and to or at contract completion.

d. Identify the contractually imposed standards, specifications and codes appropriate to the safety of the system, and document compliance with these requirements.

e. List the hazardous materials generated by or used in the system.

3.2.2 The safety assessment does not use an analysis worksheet because the assessment is intended as a summary of all the safety analyses, risk assessments, tests and safety studies already performed. As a minimum, the following basic information is required in the safety assessment document:

a. Introduction and Purpose of the safety assessment

b. System description (including hardware, software and COTS/NDI)

c. Summary Concept of Operations (CONOPS) for the system

d. Configuration Management process and associated configuration controls for safety critical design specifications, safety critical components, or safety critical manufacturing processes.

e. Test and Evaluation Plan and how system safety and any safety control is integrated into T&E events.

f. System Interface description

g. Safety Critical functions assessment

h. SSP description

i. Hazard assessment and hazard closure status

j. Risk management and risk assessment, including the status of residual risk acceptance.

k. Hazardous materials assessment. This should include the identification of material type and quantity, and potential hazards for each; safety precautions and procedures associated with the hazardous materials necessary during use, packaging, handling, storage, transportation, and disposal (e.g., explosive ordnance disposal); include all explosives hazard classifications; discussion of the lifecycle requirements for any hazardous materials; effects on the environment; contributions to any hazards; plans to minimize or eliminate these materials, and Copies of Material Safety Data Sheets (MSDS), and; after launch safety-related activity of expendable launch vehicles and their payloads including deployment, operation, and recovery (if required) of launch vehicles/payloads.

l. Operational limitations or controls

m. Conclusions

n. Recommendations

o. Safety Statement

p. Appendices. Copies of HARs or SSRAs; pertinent analyses, e.g., fault tree; Program safety documents, such as the SSPP; Safety Requirements/Criticality Analysis (SR/CA); Preliminary Hazard List (PHL); PHA; SHA; SSHA; O&SHA; a copy of all hazard analysis reports; Hazardous Materials Management Plan (HMMP); and the Demilitarization and Disposal Plan.

q. Signature page

3.3. Safety Assessment Specific References

Further information and additional guidance regarding Safety Assessments, SARs, SSRAs, and their technical content can be found in:

a. DID DI-SAFT-80102A, Safety Assessment Report.

b. DoD Joint Software System Safety Handbook, December 1999.

c. Navy SWO20-AH-SAF-010; Navy Weapons System Safety Guidelines Handbook

d. DA PAM 385-16, System Safety Management Guide

e. AR 385-16, System Safety Engineering and Management

f. AFPD 91-2, Safety Programs