

FINAL
September 27, 2011

JOINT SERVICES

GUIDE FOR DEVELOPMENT OF A

SPECTRUM SUPPORTABILITY RISK ASSESSMENT
(SSRA)



FINAL
September 27, 2011

FOREWORD

1. This document provides guidance for preparing Spectrum Supportability Risk Assessments (SSRAs), as required by DoD Instruction (DoDI) 4650.01.
2. This document was prepared by a Joint-Service Ad Hoc Working Group chaired by the Defense Information Systems Agency/Defense Spectrum Organization (DISA/DSO) at the direction of the Assistant Secretary of Defense for Networks and Information Integration/DoD Chief Information Officer (ASD(NII)/DoD CIO).
3. Comments, recommendations, additions, or deletions and any other pertinent data that may improve this document should be submitted via e-mail to marcus.shellman@jsc.mil or addressed to the following:

Defense Information Systems Agency (DISA)
Joint Spectrum Center (JSC)
Attn: M. Shellman, Jr. (J5)
2004 Turbot Landing
Annapolis, MD 21402-5064

FINAL
September 27, 2011

CONTENTS

Paragraph	Page
FOREWORD.....	iii
1. INTRODUCTION	1
2. COMPONENTS OF THE SSRA	3
2.1 Regulatory Component	5
2.2 Technical Component	6
2.3 Operational Component	6
2.4 E3 Assessment for the SSRA.....	6
3. SUBMISSION OF SSRAs.....	6
3.1 First Submission of the SSRA	7
3.2 Second Submission of the SSRA.....	7
3.3 Third Submission of the SSRA.....	7
3.4 Fourth Submission of the SSRA.....	7
3.5 Updated SSRA	7
4. CLASSIFICATION OF RISKS.....	8
4.1 Impact of Risk.....	8
4.2 Risk Occurrence.....	8
4.3 Risk Classification Logic	9
5. SSRA REPORT	10

APPENDICES

APPENDIX A	SAMPLE CONTENT AND FORMAT FOR SSRA EXECUTIVE SUMMARY, SUPPORTING REPORT, AND COVER LETTER.....	11
APPENDIX B	REFERENCES AND ADDITIONAL RESOURCES.....	20
APPENDIX C	GLOSSARY	21

TABLES

Table I	Actions Required in the DAS Phases.....	2
Table II	SSRA Suggested Tasks.....	3
Table III	Impact of Risk (SAMPLE)	8
Table IV	Likelihood of Risk Occurrence (SAMPLE)	9
Table V	SSRA Issues.....	9
Table VI	Results of Risk Assessments (SAMPLE)	10

FINAL
September 27, 2011

This page left intentionally blank.

FINAL
September 27, 2011

1. INTRODUCTION

An SSRA is an assessment performed by program managers (PMs) and materiel developers (MATDEVs) on all programs that are acquiring or incorporating spectrum-dependent (S-D) systems or equipment. The purpose is to identify and assess an acquisition's potential to affect the required performance of the newly acquired system or other existing systems within the operational electromagnetic environment (EME). This assessment will be accomplished with due consideration given to regulatory, technical, and operational spectrum and electromagnetic (EM) environmental effects (E3) issues and assigned risks. Requirements for the submission of SSRAs during the Defense Acquisition System (DAS) process, as depicted in Table I, are established by the following:

- a. Department of Defense Instruction (DoDI) 4650.01 (Reference (a)) which requires the submission of an SSRA prior to each acquisition milestone (MS).
- b. Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 6212.01 (Reference (b)) which requires the submission of SSRAs prior to each acquisition MS and readiness reviews.
- c. DoDI 4630.8 (Reference (c)) which requires the results of the SSRAs for information technology and national security systems be included in the Information Support Plan (ISP).





SSRAs are required to determine and document if adequate spectrum is available to support system operation in DoD, Allied, and Coalition operations. Spectrum supportability (SS) and E3 risks and the steps that need to be taken to mitigate the risks are to be identified in the SSRA and provided to the Military Department (MILDEP) Spectrum Management Office (SMO) who will review the SSRA and forward their recommendations to the Service Chief Information Officer (CIO) for approval. A statement on the SS of an acquisition is then forwarded to the milestone decision authority (MDA). PM/MATDEVs should consult, as early as possible, with their respective MILDEP SMO regarding the application and tailoring of the SSRA, and to ensure that all user requirements are met.

The detail and scope of each SSRA depends upon the system's entry point into the DAS, the complexity of the system, knowledge of the S-D systems to be acquired or integrated, and the intended operational EME. In general, each PM/MATDEV is required to prepare and submit an SSRA when the acquisition includes or incorporates an S-D system or equipment, including commercial items (CI) and non-developmental items (NDI) that are S-D.

The suggested format and content for an SSRA Supporting Report, an SSRA Executive Summary, as well as a sample transmittal letter to the MILDEP SMO, are provided in Appendix A to this document.

FINAL
September 27, 2011

Table I Actions Required in the DAS Phases

					
DAS Phase	Materiel Solution Analysis	Technology Development	Engineering & Mfg Development	Production & Deployment	Operations & Support
SSRA	Prepare SSRA	Prepare/Update SSRA	Prepare/Update SSRA	Prepare/Update SSRA	Prepare/Update SSRA for specific missions, new HN deployments, system mods, etc
PMs/MATDEVs E3 Tasks (See DoDD 3222.3 (Reference (d)), MIL-HDBK-237 (Reference (e)) and MIL-HDBK-235-1C (Reference (f)) and its supplemental parts for guidance)	Perform E3 Assessment for SSRA Define EME Budget for E3 E3 Rqmts Definition	Prepare/Update E3 Assessments for SSRA Define/Update EME Prepare E3 inputs to ISP Address E3 in TEMP and Acquisition Documents	Prepare/Update E3 Assessments for SSRA Update E3 inputs to TEMP and ISP Establish E3 IPT Perform E3 DT&E & Analyses Define/Test Mitigation Measures Define/Update EME	Prepare/Update E3 Assessments for SSRA Finalize E3 Requirements for Production Spec and TEMP Perform Full E3 Testing E3 Assessment Report	Interference Resolution Deployed Support
PMs/MATDEVs Additional Spectrum Responsibilities (See References (a) and (e) and Service pubs for guidance.)	Stage 1 ESC (Conceptual) Ensure that the Solution Analysis identifies op parameters for defining spectrum parameters. Define initial spectrum requirements, frequency bands, and operational areas. Initiate discussions with appropriate SMO.	Stage 2 ESC (Experimental) Refine spectrum requirements. Continue spectrum discussions with SMO to support ESC and HNC. Consider obtaining HN comments through appropriate SMO.	Stage 3 ESC (Developmental) Perform detailed spectrum emission, receiver degradation and antenna tests. Request frequencies needed for US&P testing. Continue spectrum discussions with SMO to support ESC and HNC and request processing.	Stage 4 ESC (Operational) Request HNC through appropriate SMO	Stage 4 (Note to Holder) Maintain awareness of impact of nat'l and int'l spectrum access. Request training frequency approvals. Coordinate Homeland Defense spectrum requirements.

FINAL
September 27, 2011

Legend:

DT&E	Developmental test and evaluation	HNC	Host nation coordination
E3	Electromagnetic environmental effects	ISP	Information Support Plan
E3 IPT	E3 Integrated Product Team	SMO	Spectrum Management Office
EME	Electromagnetic environment	SSRA	Spectrum Supportability Risk Assessment
ESC	Equipment spectrum certification	TEMP	Test and Evaluation Master Plan
FRP	Full Rate Production	US&P	United States and Possessions

2. COMPONENTS OF THE SSRA

Components of the SSRA are described in the following paragraphs. Each component is to be updated throughout the DAS process, as shown in Table I, with the level of detail of each increasing as the design of the S-D system matures and the amount of information and data become available. The suggested tasks in Table II may be used for each component and should be tailored to the complexity of the acquisition for which the SSRA is being developed. The results of some of the tasks used to prepare the Technical and Operational components may also be used in the E3 assessment. The use of modeling and simulation (M&S) to support development of the technical and operational components is encouraged.

Table II SSRA Suggested Tasks

Regulatory Component of SSRA	
Tasks for Regulatory Component of the SSRA	<ul style="list-style-type: none"> • Determine countries for likely operational deployment within each Combatant Command (CCMD) area of responsibility • Determine the internationally recognized radio service of all S-D systems being developed or integrated by the acquisition. • Identify portions of the system’s tuning range supported by each HN’s Table of Allocation (TOA). • Determine the relative regulatory status (for example, co-primary or secondary, assigned to the radio service by the HN’s TOA). • Obtain international comments on United States (U.S.) military systems of the same radio service and with similar technical characteristics submitted for HNC (available via the DoD Host-Nation Worldwide Database Online (HNSWDO)). • Identify other U.S. military, U.S. civil, and non-U.S. in-band and adjacent-band and harmonically-related systems likely to be co-site or in close proximity by querying DoD system databases or the appropriate NTIA database. • Address guidance resulting from the ESC and HNC processes. • Consult with the DoD Component SMO regarding changes to U.S., Federal, or civil telecommunication regulations impacting the system’s frequency bands. • Determine if the system meets appropriate military, U.S., national and international spectrum standards for radiated bandwidth and transmitter characteristics. • Quantify the impacts of any changes to U.S. or HN spectrum regulations. • Identify the ESC stage and status for all S-D systems being developed or integrated by the acquisition. • Identify/update spectrum risks and develop recommendations for mitigation of regulatory issues.

FINAL
September 27, 2011

Table II (continued)
Technical Component of SSRA

Tasks for Technical Component of the SSRA	<ul style="list-style-type: none"> • Determine candidate technologies and their technical parameters: <ul style="list-style-type: none"> ○ Application: fixed, transportable, mobile ○ Host platform (dismounted soldier, airborne, tactical operations center, surface ship, submarine, ground vehicle, etc.) ○ Frequency range of operation ○ Required data throughput ○ Receiver selectivity ○ Receiver criteria required for desired operation ○ Required radiated bandwidth ○ Transmitter power output ○ Antenna performance characteristics • Identify other U.S. military and civilian and non-U.S. in-band, adjacent-band, and harmonically-related systems likely to be co-site or in close proximity by querying DoD system databases or the appropriate national database. • Perform/update analyses to identify undesired interactions that may require further study. The analysis should use initial and, when available, measured technical parameters for the candidate system and the technical parameters of S-D systems expected to be in the candidate’s operational environment. Use measured performance data of the system’s receiver, transmitter, antenna, and appropriate propagation models whenever feasible • Evaluate initial and, when available, measured system parameters with respect to U.S. and international spectrum standards; develop plans to address non-compliant systems. • Evaluate, using tests or M&S, system performance and effect on other S-D systems that may operate co-frequency or adjacent frequency expected to be found in the intended operational environment. • Determine acceptable received EM levels between the system being analyzed and other S-D systems to ensure neither is significantly degraded and that coexistence is feasible. • Determine any potential link degradation and blockage due to atmospheric conditions or terrain and building obstructions within intended deployment areas (use of appropriate M&S tools is encouraged). Consider overall system performance to include link availability, with and without EMI, while taking into account the effects of the environment (e.g. considering path loss, rain attenuation, humidity, climate, temperature, and water and oxygen absorption). • For non-communications systems (radar, passive sensors, etc.), determine the appropriate operational degradation as a function of the level of received environmental and co-site EMI. • Generate recommendations regarding mitigating potential technical issues by implementing channelization plans, advanced narrow-beam antennas (active, spot and contoured-beam, etc.), as well as use of passive radio frequency components (filters, diplexers, couplers, etc.). • Quantify, using tests or M&S, the impact of changes to the operational “signals-in-space” radio frequency (RF) parameters to co-site EMC. • Identify and quantify interactions with non-DoD, other Federal and commercial users in the environment. • Identify/update spectrum risks and develop recommendations for mitigation of technical issues. • Address how limitations or restrictions identified in the MCEB J/F-12 recommendations are being mitigated and/or resolved for each S-D equipment.
--	---

FINAL
September 27, 2011

Table II (continued)	
Operational Component of SSRA	
Tasks for Operational Component of the SSRA	<ul style="list-style-type: none"> • Identify the operational performance requirements, as specified in the Joint Urgent Operational Needs Statement (JUONS) or Operational Needs Statement (ONS), and the acquisition documents (e.g. initial capabilities document (ICD), capability development document (CDD), capability production document (CPD), or information support plan (ISP)) and assess the capability to meet or exceed the requirements. • Determine the complement of S-D systems anticipated to be in the system’s operating environment. The system should meet its operational performance requirements as part of the DoD response to conventional and non-conventional (i.e. disaster relief) missions. • Perform an extensive analysis quantifying the performance of the candidate system and the S-D systems used by other DoD units in the operational environment. Express the results in operational terms, e.g., the frequency-distance (F-D) separation requirements between a transmitter and a receiver that must be maintained to achieve compatibility • Refine the analyses as the expected complement of S-D systems (DoD, non-DoD, Federal and commercial) anticipated to be in the system’s operating environments is defined. • Identify/update spectrum risks and develop recommendations, including tactics, techniques, and procedures (TTPs), for mitigation of operational issues.
E3 Assessment for SSRAs	
Tasks for E3 Assessment for SSRA	<ul style="list-style-type: none"> • Perform assessments to determine the potential for EMC and for EMI interactions between the proposed system, other systems, and its anticipated operational EME. • Perform an extensive electromagnetic vulnerability (EMV) analysis to quantify the potential EMI between the candidate system and the S-D systems used by other DoD units in the operational environment. Determine the possible effect on overall system operational performance as a result of any EM interaction. • Quantify intra-platform EMI among co-sited emitters and receivers for complex system-of-systems (SoS) or platforms in terms of the possibility and influence of: <ul style="list-style-type: none"> ○ Inter-modulation ○ Transmitter Harmonic Interference ○ Transmitter Spurious Output Interference ○ Transmitter Noise Interference ○ Receiver Desensitization Interference • Using tests or M&S tools refine the E3 analysis; quantify the mutual EMI between the candidate system and S-D systems used by other DoD units in the operational environment. • Perform additional E3 analyses (e.g. hazards of electromagnetic radiation to personnel (HERP), volatile materials (HERF), and ordnance (HERO), electromagnetic pulse (EMP), lightning, electrostatic discharge (ESD), etc) as required by the MILDEP SMO. • Identify/update E3 risks and develop recommendations for mitigation of risks.

2.1 Regulatory Component

The Regulatory component of the SSRA addresses the ESC stage and status and the relative status of the acquisition with respect to the radio services authorized within the TOAs of the U.S. and intended HNs. The Regulatory component of the SSRA for a space station should also identify International Telecommunications Union (ITU) registrations for other space stations registered in the frequency band being sought for operation. As the system matures, the Regulatory component should contain additional spectrum insights from the ESC and HNC processes.

FINAL
September 27, 2011

2.2 Technical Component

The Technical component of the SSRA focuses on candidate technologies and available technical parameters, such as system type, platform type, bandwidth requirements, etc, to generate initial quantification of potential mutual interactions. For example, if sufficient data is available, an analysis may determine frequency-distance (F-D) relationships required to preclude EMI based on generic interference-to-noise (I/N) ratios and potential interactions that will require further study. Use of M&S tools is appropriate. As technologies mature and technical parameters are defined, potential mutual interactions can be better determined. The detailed analysis can use measured minimum carrier-to-interference ratios to determine F-D relationships to preclude EMI. Specific capabilities, such as automatic power control, which may affect the F-D curves, should be included.

2.3 Operational Component

The Operational component of the SSRA assesses the full complement of S-D systems anticipated to be in the operational environment. As data or hardware becomes available, analyses should be performed and/or updated to determine if the system meets its operational performance requirements as specified in the JUONS or ONS, or the acquisition documents (e.g. ICD, CDD, CPD, or ISP). F-D separations and mitigation measures and/or TTPs that may be needed to reduce risks to acceptable levels should also be identified.

2.4 E3 Assessment for the SSRA

DoD Components developing or acquiring S-D systems, including CI and NDI, are required to perform limited E3 assessments as part of the SSRA; as a minimum, EMC and EMI are to be addressed to determine the potential for interactions between the proposed system and its anticipated operational EME. The assessment also includes an analysis to determine the possible effect on operational performance as a result of any EM interaction. Analyses of additional E3 disciplines (e.g. HERP, HERF, HERO, EMP, lightning, ESD, etc) may be required; contact the MILDEP SMO for guidance. Systems procured by the Navy will require E3 analyses for all applicable E3 disciplines. S-D systems intended for use by more than one Service or on multiple platforms, systems, or vehicles must be analyzed for all possible uses and users. See References (d), (e), and (f) for guidance on conducting E3 assessments.

3. SUBMISSION OF SSRAs

As indicated herein, SSRAs are to be prepared, updated, and submitted for approval to the appropriate Service review authority prior to each acquisition MS and readiness reviews. The level of detail increases as the item's design matures and as more information becomes available. As indicated above, the PM/MATDEV must submit for approval an SSRA prior to the deployment of CI and NDI.

FINAL
September 27, 2011

3.1 First Submission of the SSRA

The first submission of the SSRA is prior to MS A, when applicable, with the components described earlier. This SSRA evaluates the acquisition's spectrum needs versus national and international spectrum regulatory requirements and availability as well as the ESC stage and status of possible candidate S-D systems. In addition, the operational requirements, as stated in the JUONS or ICD, and the potential for technical issues, including E3, are to be assessed.

3.2 Second Submission of the SSRA

The second submission of the SSRA is prior to MS B. It provides increased specifics on the Regulatory, Technical, Operational, and E3 components of the first SSRA based on new data and program maturity. Experimental data are to be reviewed for impact to system operation. Potential risks and mitigation measures should be discussed. The definition of the operational EME should be well along so as to support the early tailoring and development of the EME and planning of the E3 test requirements in the request for proposal and other acquisition documents during the Development Stage of the DAS. With more refined data and information, M&S tools can be used to enhance decision making and provide insight into developmental testing.

3.3 Third Submission of the SSRA

The third submission of the SSRA occurs prior to MS C. The components of the second SSRA, if one exists, are to be updated with more detailed spectrum and E3 analyses. A Stage 4 ESC is required for this SSRA for ALL of the S-D system(s) that are part of the acquisition program. Operational EMEs should be refined and spectrum compatibility, interoperability, and E3 risks reduced to acceptable levels through mitigation measures and/or TTPs.

3.4 Fourth Submission of the SSRA

The fourth submission of the SSRA is prior to Full Rate Production (FRP). The components of the third SSRA should be updated with completed spectrum and E3 analyses. This SSRA addresses final guidance from the ESC and, when applicable, HNC processes as well as changes to U.S., Federal, or civil regulations impacting the system's frequency bands. Risks should have been reduced to acceptable levels through mitigation measures and/or TTPs. At this point, the system is ready for operational deployment. As indicated above, procurement and use of CI and NDI does not relieve the PM/MATDEV from complying with the requirements of Reference (a).

3.5 Updated SSRA

SSRAs are to be updated as follows:

- a. For production and fielded systems to reflect changes to the S-D system or equipment spectral output, its operational deployment, HN regulations, or modifications and upgrades of the integrated system, family of systems (FoS) or system of systems (SoS).

- b. For readiness reviews

4. CLASSIFICATION OF RISKS

Risk management is an essential and integral part of technical program management throughout the life cycle. In general, risk can be classified into a program risk based on likelihood and consequence, or a performance or safety risk based on the probability or frequency of occurrence, and its severity. A standard format for evaluating and reporting risk assessment findings can facilitate a common understanding of program risks at all levels of an organization. Stop-light matrices are often used to illustrate the level of risks identified within a program. Examples are provided in the following paragraphs.

4.1 Impact of Risk

A sample matrix to illustrate the impact of a risk is shown in Table III. The impact or consequence of the potential risk may be reported as low, moderate, or high, as represented in the matrix with the colors **green** for minimal or minor impact, **yellow** for moderate, and **red** for significant or severe impact.

Table III Impact of Risk (SAMPLE)

Level	Impact
1	Minimal or no consequence to technical performance
2	Minor reduction in technical performance or supportability, can be tolerated with little or no impact on program; same approach retained
3	Moderate reduction in technical performance or supportability with limited impact on program objectives; workarounds available
4	Significant degradation in technical performance or major shortfall in supportability; may jeopardize program success; workarounds may not be available or may have negative consequences
5	Severe degradation in technical performance; Cannot meet supportability threshold; will jeopardize program success; no workarounds available

4.2 Risk Occurrence

The likelihood of occurrence of the risk should also be quantified. A suggested scheme is shown in Table IV where **green** denotes little or no likelihood of occurrence, **yellow** denotes a likely occurrence, and **red** denotes a highly likely or near certain occurrence.

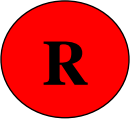


Table IV Likelihood of Risk Occurrence (SAMPLE)

Level	Likelihood of Occurrence	Probability of Occurrence
1	Not Likely	<20%
2	Low Likelihood	20-40%
3	Likely	40-70%
4	Highly Likely	70-90%
5	Near Certainty	>90%

4.3 Risk Classification Logic

The red, yellow, and green categories for describing the spectrum and E3 issues are shown in Table V.

Table V SSRA Risk Categories

	<ul style="list-style-type: none"> No certification or approved J/F-12 in the Military Communications Electronics Board (MCEB) archived database Operating in the incorrect or non-allocated frequency band or significant SS issues are known to exist for this system/equipment E3 or, as a minimum, EMC and EMI studies not completed, planned or anticipated; known mitigation measures will impact operational deployment and/or use in EME HNC process not started; operational and/or developmental use may be extremely limited and/or not permitted at all System will not likely receive HN spectrum support, or may be allowed to operate after lengthy bi-lateral negotiations with individual HNs.
	<ul style="list-style-type: none"> No certification or approved J/F-12 in the MCEB archived database, however similar equipment has been approved and is in the database System is operating in properly allocated frequency spectrum and ESC can be anticipated Requires minimal actions for ESC, i.e. Note-to-Holder or updated certification request E3/EMC studies funded/planned or completed with mitigation measures identified that will not adversely impact operations Minimum spectrum issues are known to exist for this equipment Operational and/or developmental use is anticipated to be supportable May receive HN spectrum support, but with numerous geographic, temporal, spectrum, or operational restrictions; spectrum use in a band may be restricted to a limited number of channels.
	<ul style="list-style-type: none"> Approved J/F-12 exists in the MCEB archived database (minimum Stage 2 for MS B) Requires no actions for spectrum support E3/EMC studies completed and compatible operations confirmed or acceptable mitigation measures identified that will not impact operations No SS issues are known to exist for this equipment in the intended operational area Operational and/or developmental use is or will be supportable High likelihood of receiving HN spectrum support to operate with few, or a minimum number of, possible spectrum or operational restrictions.

5. SSRA REPORT

The suggested contents and formats for the SSRA reports are provided in Appendix A. A 5x5 matrix and color scheme is a common method of depicting the results of risk assessments. An example of the format for reporting the results in the SSRA report is shown in Table VI. This table is constructed using the results of the analyses described in Tables III, IV, and V. A sample submittal letter is provided in the annex to the appendix.

Table VI Results of Risk Assessments (SAMPLE)

Likelihood of Occurrence	5					
	4					
	3					
	2					
	1					
		1	2	3	4	5
		Impact				

APPENDIX A

**SAMPLE CONTENT AND FORMAT FOR SSRA EXECUTIVE SUMMARY,
SUPPORTING REPORT, AND COVER LETTER**

CONTENTS

Paragraph	Page
A. INTRODUCTION	12
A.1 Front Cover.....	12
A.2 Introduction.....	12
A.3 Executive Summary.....	13
A.4 Regulatory Component of the SSRA.....	14
A.5 Technical Component of the SSRA.....	16
A.6 Operational Component of SSRA.....	16
A.7 E3 Assessment for the SSRA.....	17
A.8 Conclusions.....	17
A.9 Recommendation	17
A.10 References.....	17

TABLES

Table A-I	System Description (SAMPLE).....	13
Table A-II	Summary of Spectrum and E3 Issues (SAMPLE).....	14
Table A-III	Summary of Regulatory Information (SAMPLE) ⁽¹⁾	14
Table A-IV	Frequency Band of Operation vs. Host Nation (SAMPLE #1)	15
Table A-V	Frequency Band of Operation vs. Host Nation (SAMPLE #2)	15
Table A-VI	System Spectrum Requirements vs. Availability ⁽¹⁾⁽²⁾⁽³⁾⁽⁴⁾⁽⁵⁾ (SAMPLE).....	16
Table A-VII	System Description and Deployment (SAMPLE).....	16
Table A-VIII	Relative Rating of E3 Issues.....	17

FINAL
September 27, 2011

A. INTRODUCTION.

This appendix provides the sample content and format for an Executive Summary of an SSRA and for the SSRA Supporting Report. The SSRA Supporting Report should include all of the following paragraphs. The Executive Summary should include only A.1, A.2, and A.3, below.

The following guidance (suggested form, format, and content) is provided for the 3 Services:

- For the Army: There are three levels of documentation:
 - SSRA Supporting Document/Report,
 - SSRA Executive Summary of the SSRA Supporting Document/Report approved by the PM/MATDEV and submitted to the MILDEP SMO,
 - Cover or Transmittal letter, signed by the PM/MATDEV, and used to transmit the SSRA Executive Summary to the MILDEP SMO, requesting a Spectrum Supportability Determination.
- For the Navy: Compile a single SSRA Report containing all supporting SSRA components (regulatory, technical, operational, and E3) along with an Executive Summary. This product will be referred to as the SSRA and will be submitted for approval within the Department of the Navy under cover letter signed by the PM.
- For the Air Force: Compile a single SSRA Report containing all supporting SSRA components (regulatory, technical, operational, and E3) along with an Executive Summary. The SSRA during the lifecycle of the S-D system may require tailoring to address issues from the MDA in making the determination for that particular milestone or phase of acquisition.

A.1 Front Cover

The front cover should include the following information:

- a. Title of the document
- b. Month and year of publication
- c. Acquisition milestone or readiness review it supports
- d. Name(s) of the principal author(s)
- e. Program office or sponsor's name and address
- f. Distribution statements, as required, and
- g. Security classification markings, as required.

A.2 Introduction

The introduction should contain the following:

- a. A description of the purpose of the report and programmatic decision and/or readiness

FINAL
September 27, 2011

review it supports.

- b. A detailed system description including the following:
 - (1) Physical components (vehicle or platform mounted, stand alone, etc.)
 - (2) Materiel readiness level (MRL)
 - (3) Purpose of system and concept of operations
 - (4) Subsystem description and block diagrams

The system's description may be summarized as shown in Table A-I.

Table A-I System Description (SAMPLE)		
System Component	MRL	System Description (SA, VM, pm, Other (specify))
#1		
#2		
etc		

Legend:

MRL = materiel readiness level
SA = stand alone

VM = vehicle mounted
pm = personnel mounted

A.3 Executive Summary

The Executive Summary, which is meant to be an abridged version of the SSRA Report, should contain the following:

- a. A cover page (see A.1 above); however, the name and logo should apply to the PM/MATDEV required to submit the SSRA.
- b. Introduction (see A.2 above).
- c. A summary of spectrum and E3 issues. This should be a summation of A.4 through A.7, which follows below, the summarized conclusions should be here and presented in a Stop-Light chart format.
- d. The impact of the risks on the ability to obtain SS including a brief summarization of the important aspects from A.8 below. The summarized conclusions should be here and presented in a Stop-Light chart format (see sample Table A-II) using the guidance in Tables III, IV, and V of this document.
- e. Recommendation: If all risks can be mitigated, the suggested recommendation should read as follows: "The (**insert PM/MATDEV**) recommends that the (**insert Program name**) receive a Spectrum Supportability Determination to support (**insert review**).

FINAL
September 27, 2011

Table A-II Summary of Spectrum and E3 Issues (SAMPLE)				
Issue	Likelihood of Occurrence (See Table IV)	Impact of Risk (See Table III)		
Regulatory issue # 1 - ESC status				
Regulatory issue #.2 - HNC status		Insert colors, as applicable		
Technical spectrum issue				
Operational spectrum issues				
E3 issues				
		NONE/MINIMAL	MODERATE	SIGNIFICANT/SEVERE
RECOMMENDED MITIGATION MEASURES:				
Regulatory issue #1 (ESC status):				
Regulatory issue #2: (HNC status):				
:Technical spectrum issue:				
Operational spectrum issue:				
E3 issues				

A.4 Regulatory Component of the SSRA

The Regulatory component of the SSRA should include the results of the regulatory tasks outlined in paragraph 2.1 and Table II of this document. A suggested table format for summarizing the ESC and HNC information is shown in Table A-III.

Table A-III Summary of Regulatory Information (SAMPLE)⁽¹⁾				
Nomenclature	J/F 12 #	Stage/Status⁽²⁾⁽³⁾	US&P⁽⁴⁾	OCONUS⁽⁵⁾
NOTES:				
(1) For a FoS or SoS, include all S-D systems that are or will be integrated into the FoS or SoS.				
(2) Provide the Stage as 1, 2, 3, or 4; indicate status as Approved, (with date) or In-Process (at Equipment Spectrum Guidance Permanent Working Group awaiting MCEB guidance, etc).				
(3) For a FoS or SoS, include, as a note, the acquisition program under which the S-D system is being procured and POC information.				
(4) Provide a YES/NO or Probability (High, Medium, Low) of obtaining necessary frequencies for non-degraded operation. Provide MCEB guidance, operating conditions and/or restrictions. Include in table as notes.				
(5) Provide a YES/NO or Probability (High, Medium, Low) of obtaining necessary frequencies for non-degraded operation regarding OCONUS, HN approval status. Provide expanded status (which CCMDs have it) and guidance where the system or similar system has HN approval. Identify countries and the guidance, or restrictions. Information may be obtained from the MILDEP SMO as a result of the ESC/HNC processes.				

Tables A-IV and A-V are two examples which may be used, as applicable, to summarize the Regulatory component of the SSRA. In the first example, the subject of the SSRA is a platform that hosts four individual S-D systems (e.g. system A, B, C, and D). The shading of each cell is

FINAL
September 27, 2011

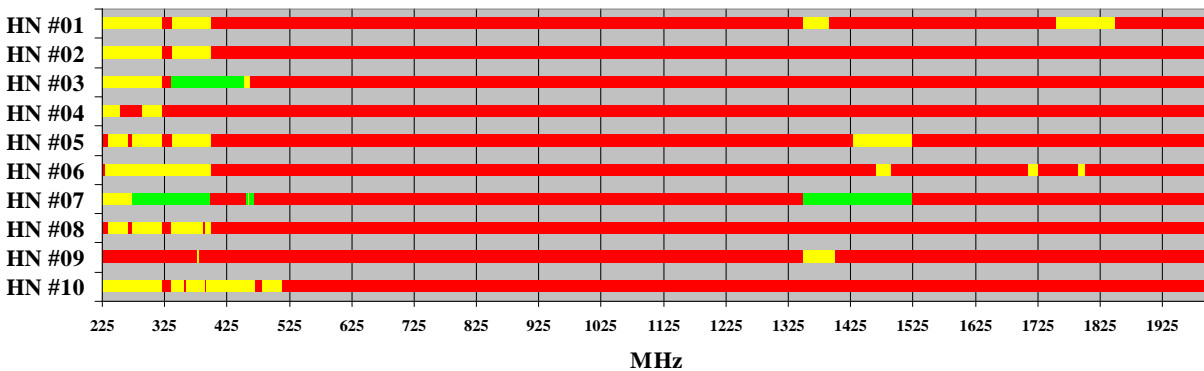
indicative of the degree of difficulty that might be experienced in obtaining SS for the individual system. As indicated by the **RED** boxes in Table A-IV, most of the HNs where the system is to be deployed will not likely grant spectrum support, or may allow operation after lengthy bi-lateral negotiations with the individual HNs. Systems having a high likelihood of receiving HN spectrum support to operate with few or a minimum number of spectrum restrictions, such as indicated for System D, are shown with **GREEN** boxes. The **YELLOW** boxes for Systems B and C indicate that the systems may receive support by a majority of HNs but spectrum support or use may be restricted to a limited number of channels. With these results, acquisition personnel can readily see that they should focus their efforts on early bi-lateral coordination of spectrum support for System A before deployment to the HNs with cells shaded **RED**.

Table A-IV Frequency Band of Operation vs. Host Nation (SAMPLE #1)

HOST NATION	FREQUENCY BAND OF OPERATION (MHz)			
	System A (f ₁ – f ₂)	System B (f ₃ – f ₄)	System C (f ₅ – f ₆)	System D (f ₇ – f ₈)
#1	RED	GREEN	GREEN	GREEN
#2	RED	GREEN	GREEN	GREEN
#3	RED	RED	GREEN	GREEN
#4	RED	RED	RED	GREEN
#5	RED	GREEN	RED	GREEN
#6	RED	RED	RED	RED
#7	RED	RED	RED	GREEN
#8	RED	GREEN	GREEN	GREEN
#9	RED	GREEN	GREEN	GREEN
#10	RED	GREEN	GREEN	GREEN
#11	YELLOW	YELLOW	YELLOW	GREEN
#12	RED	GREEN	GREEN	GREEN

In cases where a system has a broad tuning range, the presentation could be altered as shown in Table A-V. In this case, the 225-400 MHz frequency band is the part of the spectrum where the probability of obtaining HN approval is maximized. Table A-V also shows that early HNC should be initiated through the appropriate MILDEP SMO for HN #09.

Table A-V Frequency Band of Operation vs. Host Nation (SAMPLE #2)



A.5 Technical Component of the SSRA

a. The Technical component of the SSRA should contain a description of the technical parameters of system’s components (e.g. receivers, transmitters, antennas) as indicated in paragraph 2.2 and Table II of this document.

A suggested table format to relate and compare this information is shown in Table A-VI.

Table A-VI System Spectrum Requirements vs. Availability ⁽¹⁾⁽²⁾⁽³⁾⁽⁴⁾⁽⁵⁾ (SAMPLE)					
System Nomenclature and/or J/F 12#	Freq Range	Throughput Required/ Available	BW Required/ Available	Power Output	Antenna Gain Factor

NOTES:

(1) Availability may be a known quantity or an estimated quantity based on previous operation of the same or similar systems performing the same type or similar functions.

(2) Where table input may require lengthy or long explanation, use Note and include the information following the table as a note.

(3) For a FoS or SoS, include all S-D systems that are, or will be, integrated into the FoS or SoS.

(4) Cite source document for requirement.

(5) Cite security classification of data, where applicable.

b. The Technical component of the SSRA should also include the results of the Technical tasks outlined in Table II of this document.

A.6 Operational Component of SSRA

a. The Operational component of the SSRA should contain a statement of the program requirements, how they are being met, and a description of the intended operational deployment of the system.

A suggested table format to present this information is shown in Table A-VII.

Table A-VII System Description and Deployment (SAMPLE)				
System Component	Anticipated HNs	MRL	Deployment (SA, VM, pm, Other (specify))	Training Requirements

NOTES:

Legend:

MRL = materiel readiness level
SA = stand alone
HN = host nation

VM = vehicle mounted
pm = personnel mounted

FINAL
September 27, 2011

b. The Operational component of the SSRA should also include the results of the Operational tasks outlined in paragraph 2.3 and Table II of this document along with a POA&M for cases of non-compliance where the likelihood of being able to perform the operational mission is at risk.

A.7 E3 Assessment for the SSRA

The E3 assessment for the SSRA should include the results of the E3 tasks outlined in paragraph 2.4 and Table II of this document along with recommendations for mitigation of the E3 risks. A table or stop-light chart similar to that shown in Table A-VIII may be used to illustrate/ summarize results of the risk assessment using the risk logic in Table V of this document.

Table A-VIII Summary of E3 Issues	
Issue	Green/ Yellow / Red (see Risk Categories in Table V)
E3 Issue #1	
E3 Issue #2	Insert colors, as applicable
E3 Issue #3, etc	
NOTES:	

A.8 Conclusions

Provide a summary of the spectrum and E3 issues and the assessed risks identified and their impact on SS and potential degradation to the system’s operational performance. Specify the associated mitigation measures that are or can be employed to reduce the risks to an acceptable level. The results of the risk assessment may be summarized in a table or stop light chart (see sample Table A-II) using the guidance in Tables III, IV, and V of this document. The conclusion should also indicate whether the system will meet all user requirements.

A.9 Recommendation

Considering that all spectrum and E3 risks with potential to affect the required performance of the system or other systems within the operational EME, and that their associated mitigation measures have been identified, indicate whether the SSRA should be forwarded by the MILDEP SMO to their Service CIO for approval and forwarded to the MDA.

A.10 References

- a. Provide at least the DoD Information page or DD Form 1494 for each S-D system, subsystem, or equipment that is, or will be, integrated within a platform, FoS, or SoS.
- b. Copies of E3 Assessment Reports, when requested.
- c. DoDI 4650.01 (latest version)
- d. DoDD 3222.3 (latest version)
- e. MILDEP Spectrum and E3 policy regulations
- f. Source documents for performance requirements.

ANNEX TO APPENDIX A
SSRA SUBMITTAL LETTER

(Use PM Letterhead)

(Insert Date)

To: **(Insert MILDEP SMO or CIO, as appropriate)**

SUBJECT: Request for Favorable Spectrum Support Determination for the **XXX System**

References: (a) DoDI 4650.01 (latest version)
(b) MILDEP Spectrum Policy Regulation (latest version)
(c) CJCSI 6212.01 (latest version)
(d) DoDD 3222.3 (latest version)

Enclosures: (1) SSRA for **XXX System**

1. On **(insert date)**, a Defense Acquisition System event **(insert Milestone (MS) A, B, or C or readiness review)** is scheduled for the **(insert acquisition program name)**.
2. In compliance with References (a), (b), and (c), the subject system is requesting a favorable spectrum supportability determination based on the spectrum supportability risk assessment (SSRA) which is provided as Enclosure (1).
3. The results of the spectrum and E3 analyses performed in accordance with References (a) and (d), respectively, are summarized in the following chart.

Summary of Spectrum and E3 Issues (SAMPLE)			
Issue	Risk		
Regulatory issue # 1 - ESC status			
Regulatory issue #.2 - HNC status			
Technical spectrum issue			
Operational spectrum issues			
E3 issues			
<u>RECOMMENDED MITIGATION MEASURES:</u>			

4. All potential regulatory, technical, and operational spectrum and E3 issues have been assessed and mitigation measures identified. It is further concluded that the **(XXX system)** meets all user requirements. This office will also ensure that spectrum and E3 considerations continue to be an important programmatic consideration.
5. Based on the information provided, this office recommends that, prior to the **(XXX System)** Defense Acquisition System event **(insert MS A, B, or C or readiness review)**, a favorable spectrum supportability determination be forwarded through Departmental channels to the appropriate milestone decision authority (MDA).

FINAL
September 27, 2011

6. My point of contact is (insert name and information).

SIGNATURE BLOCK

APPENDIX B

REFERENCES AND ADDITIONAL RESOURCES

B.1 References

- (a) DoD Instruction 4650.01, "Policy and Procedures for Management and Use of the Electromagnetic Spectrum," January 9, 2009
- (b) Chairman of the Joint Chief of Staff Instruction 6212.01E, "Interoperability and Supportability of Information Technology and National Security Systems," December 17, 2008
- (c) DoD Instruction 4630.8, "Procedures for Interoperability and Supportability of Information Technology (IT) and National Security Systems (NSS)," June 30, 2004
- (d) DoD Directive 3222.3, "DoD Electromagnetic Effects (E3) Program," September 8, 2004
- (e) Military Handbook 237D, "Electromagnetic Environmental Effects and Spectrum Supportability Guidance for the Acquisition Process," May 20, 2005
- (f) Military Handbook 235-1C, "Military Operational Electromagnetic Environment Profiles, General Guidance" October 1, 2010 and supplemental parts thereto

B.2 Additional Resources

ITU web site: <http://www.itu.int>

NTIA web site: <http://www.ntia.doc.gov>

FCC web site: <http://www.fcc.gov>

Defense Acquisition University (DAU) web site: <http://www.dau.mil>

Acquisition Community Connection (ACC) web site: <https://acc.dau.mil>

MILDEP SMO web sites:

Army Spectrum Management Office (AMSO)

Navy and Marine Corps Spectrum Center (NMSC)

Air Force Frequency Management Agency (AFFMA)

Defense Information Systems Agency (DISA)/Defense Spectrum Organization (DSO) web site: <http://www.disa.mil/dso/index.html>

Defense Information Systems Agency (DISA)/Joint Spectrum Center (JSC) web site: <http://www.disa.mil/jsc/>

APPENDIX_C

GLOSSARY

CONTENTS

Paragraph	Page
C.1 Abbreviations and Acronyms.....	22
C.2 Definitions.....	24
C.2.1 Electromagnetic environmental effects (E3).....	24
C.2.2 E3 control.....	24
C.2.3 Electromagnetic environment (EME).....	24
C.2.4 Spectrum-dependent (S-D) systems.....	24
C.2.5 Spectrum supportability (SS).....	24
C.2.6 Spectrum supportability risk assessment (SSRA).....	25

FIGURES

Figure C-1	The overlap between E3 and SS.....	25
------------	------------------------------------	----

FINAL
September 27, 2011

C.1 Abbreviations and Acronyms

ASD(NII)/DoD CIO Assistant Secretary of Defense for Networks and Information
Integration/DoD Chief Information Officer

CCMD	Combatant Command
CDD	capability development document\
CJCSI	Chairman Joint Chiefs of Staff Instruction
CI	commercial item
CIO	Chief Information Officer
CONOPs	concept of operations
CPD	capability production document
DAS	Defense Acquisition System
DISA	Defense Information Systems Agency
DoD	Department of Defense
DoDD	Department of Defense Directive
DoDI	Department of Defense Instruction
DSO	Defense Spectrum Organization
E3	electromagnetic environmental effects
EM	electromagnetic
EMC	electromagnetic compatibility
EMD	engineering and manufacturing development
EME	electromagnetic environment
EMI	electromagnetic interference
EMP	electromagnetic pulse
EMV	electromagnetic vulnerability
ESC	equipment spectrum certification
ESD	electrostatic discharge
F-D	frequency-distance
FoS	family of systems
FRP	full rate of production
HERF	hazards of electromagnetic radiation to fuel
HERO	hazards of electromagnetic radiation to ordnance
HERP	hazards of electromagnetic radiation to personnel
HN	host nation
HNA	host nation approval
HNC	host nation coordination
ICD	initial capabilities document
I/N	interference-to-noise

FINAL
September 27, 2011

ISP	information support plan
ITU	International Telecommunications Union
JSC	Joint Spectrum Center
JUONS	Joint Urgent Operational Needs
LRIP	low rate initial production
M&S	modeling and simulation
MATDEV	Materiel Developer
MCEB	Military Communications Electronics Board
MDA	milestone decision authority
MHz	megahertz
MILDEP	Military Department
MRL	materiel readiness level
MS	milestone
NDI	non developmental item
NTIA	National Telecommunications and Information Administration
OCONUS	outside continental United States
ONS	operational needs statement
OSD	Office of the Secretary of Defense
OT	operational testing
PM	program manager
pm	personnel mounted
RF	radio frequency
SA	stand alone
S-D	spectrum-dependent
SM	spectrum management
SMO	Spectrum Management Office
SoS	system of systems
SS	spectrum supportability
SSRA	spectrum supportability risk assessment
TEMP	test and evaluation master plan
TOA	Table of Allocations
TTP	tactics, techniques, and procedures
U.S.	United States
US&P	United States and Possessions
VM	vehicle mounted

C.2 Definitions

C.2.1 Electromagnetic environmental effects (E3)

E3 is the impact of the EME on the operational capability of military forces, equipment, systems, and platforms. E3 encompasses the electromagnetic effects addressed by the disciplines of EMC, EMI, EM vulnerability, EM pulse, electronic protection, electrostatic discharge (ESD), and hazards of EMR to personnel, ordnance, and fuels or volatile materials. E3 includes the EM effects generated by all EME contributors including RF systems, ultra-wideband devices, high-power microwave systems, lightning, precipitation static, etc.

C.2.2 E3 control

E3 control is mitigating the effects of the EME starting early in the acquisition process so that an operational mission is not degraded, capabilities are not significantly reduced, or system vulnerability is not increased.

C.2.3 Electromagnetic environment (EME)

The EME is the resulting product of the power and time distribution, in various frequency ranges, of the radiated and/or conducted EM emission levels that may be encountered by a military force, system, or platform when performing its assigned mission in its intended operational environment. EME is dynamically comprised of EM energy from a multitude of natural sources (lightning, precipitation static, ESD, galactic and stellar noise, etc.) and man-made sources (electrical and electronic systems, RF systems, EM devices, ultra-wideband systems, high-power microwaves systems, etc).

C.2.4 Spectrum-dependent (S-D) systems

S-D systems are electronic systems, subsystems, devices, and/or equipment that depend on the use of the spectrum to properly accomplish their function(s) without regard to how they were acquired (full acquisition, rapid acquisition, Joint Concept Technology Demonstration, etc.) or procured (commercial off-the-shelf, government off-the-shelf, non-developmental items, etc.).

C.2.5 Spectrum supportability (SS)

SS is the assurance that the EM spectrum necessary to support the operation of an S-D equipment or system during its expected life cycle is, or will be, available from concept refinement phase, through developmental and operational testing, to actual operation in the EME. SS requires the following:

- a. ESC, including HN spectrum supportability assessment;
- b. Enforcement of compliance with E3 control requirements during the acquisition of DoD electrical and electronic equipment (to ensure EMC); and

c. A reasonable assurance from HNs of obtaining actual frequencies to operate the equipment when deployed. This assurance may be obtained during ESC coordination process.

The interrelationship between E3 and SS is depicted in Figure C-1. The overlap occurs primarily with SSRAs which require, as a minimum, EMC, EMI, and EMV assessments to identify potential EMI with S-D systems.

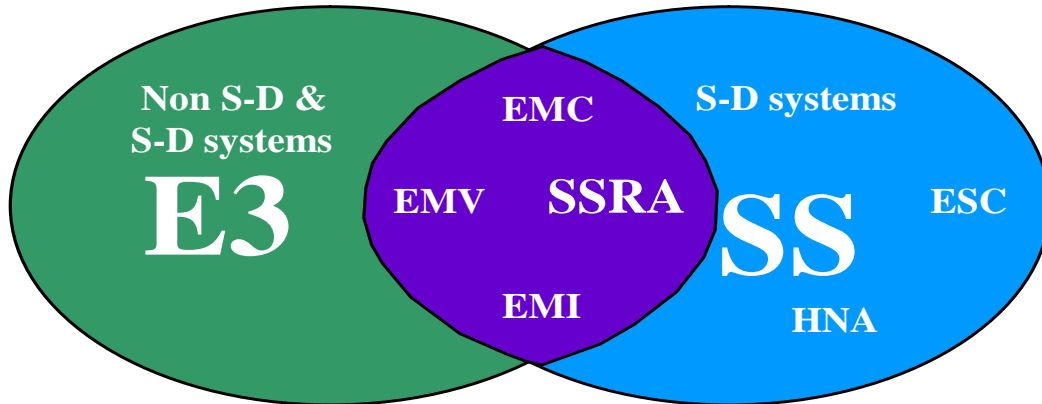


Figure C-1 The overlap between E3 and SS

C.2.6 Spectrum supportability risk assessment (SSRA)

An SSRA is a risk assessment performed by PMs and MATDEVs on all S-D systems to identify regulatory, technical, operational spectrum and E3 issues and assess the associated programmatic risks as early as possible and affect design and procurement decisions. These risks are reviewed at acquisition milestones and readiness reviews and are managed throughout the system's lifecycle.