UNITED STATES MARINE CORPS
MARINE CORPS SYSTEMS COMMAND
2200 LESTER STREET
QUANTICO, VA 22134-6050

IN REPLY REFER TO:
2400
MCSC4.0/xxx
01 Jan 13

ENGINEERING POLICY LETTER 01-13

From: Spectrum Manager, Marine Corps Systems Command, Systems Engineering, Interoperability, Architectures & Technology (SIAT)
To: Distribution

Subj: STANDARD OPERATING PROCEDURES (SOP) FOR SPECTRUM SUPPORTABILITY RISK ASSESSMENT (SSRA)

Ref: (a) Department of Defense Instruction 4650.01, “Policy and Procedures for Management and Use of the Electromagnetic Spectrum,” dtd 9 Jan 09
(b) SECNAV Instruction 5000.2E, “Department of the Navy Implementation and Operation of the Defense Acquisition System and the Joint Capabilities Integration and Development System,” dtd 1 Sept 11
(c) MCO 2400.2A, “Marine Corps Management and Use of the Electromagnetic Spectrum”, dtd 7 Oct 09
(d) Joint Services Guide For Development of Spectrum Supportability Risk Assessment (SSRA), 27 Sep 11
(e) DISA Data Item Description, “DI-EMCS-81543A,” 05 Feb 13

Encl: (1) MCSC SOP for SSRA

1. Purpose. To establish policy, guidance and procedures for the effective and efficient management of the SSRA process and ensure the Marine Corps provides equipment, capabilities and services to the Operating Forces and Supporting Establishments that enable commanders to utilize Spectrum-Dependent (S-D) equipment and systems in the successful completion of their assigned missions. Consideration of the electromagnetic spectrum and operational environment is critical to acquisition, operations and sustainment and must continually be evaluated across the strategic, operational and tactical planning levels of the Marine Air Ground Task Force (MAGTF) to ensure effective employment in the numerous and various locations in which the Marine Corps deploys. The Marine Corps utilization of the SSRA must be guided by national, DOD and Department of Navy (DON) policy and regulations, while providing flexible and responsive support to the Marine Corps acquisition process in accordance with references (a)-(e). Through a streamlined policy and

coordinated efforts, the Marine Corps management and use of the SSRA process and its habitual relationship with spectrum certification and Electromagnetic Environmental Effects (E3) will effectively and successfully support Marine Corps operational requirements.

2. Cancellation. None.

3. Scope and Applicability. This policy applies to all MARCORSYSCOM and PEO LS ACAT I-IV programs consistent within the scope of reference (b). Nothing within this policy is intended to conflict with the DoD/SECNAV policy. In the event that a conflict arises, direction as provided in the reference (b) shall take precedence.

4. Background. Effective 9 January 2009, the Department of Defense published DoDI 4650.01 codifying the policy and procedures for the management and use of electromagnetic spectrum. In that, the SSRA was identified as a means of identifying and mitigating regulatory, technical and operational spectrum supportability risks.

5. Policy. MARCORSYSCOM (SIAT/TT&S) provides supervision and management of the spectrum supportability, certification and SSRA processes throughout all phases of the acquisition lifecycle to ensure seamless integration of S-D equipment and systems into the electromagnetic environment (EME) in support of the Marine Corps Operational Forces, Installations, Organizations and Activities.

6. Responsibilities.

a. DC, SIAT, Technology, Test and Specialties (TT&S) shall:

(1) Act as the focal point for and provide administrative and technical support to MARCORSYSCOM PO; PEO (LS); Joint Program Office (JPO) where the Marine Corps is the executive agent (EA); Marine Corps War Fighting Lab (MCWL); procurements by the Marine Corps OPFOR; installations and other entities for spectrum supportability, certification and SSRA guidance in the genesis of and throughout the Defense Acquisition System (DAS) process.

b. Program Managers (MCSC/PEO-LS)

(1) Shall ensure approval for the SSRA is obtained in accordance with the procedure outlined in enclosure (1) for S-D systems.

7. Effective. Immediately.

J. S. SMERCHANSKY

Distribution: A, COMMAND Library
HQMC C4
Deputy Commander, SIAT

STANDARD OPERATING PROCEDURES
FOR
SPECTRUM SUPPORTABILITY RISK ASSESSMENT
(SSRA)

MARINE CORPS SYSTEMS COMMAND

Subject: STANDARD OPERATING PROCEDURES (SOP) FOR SPECTRUM SUPPORTABILITY RISK ASSESSMENT (SSRA)

Location: _____
(Indicate the location(s) of the copy(ies) of this SOP.)

RECORD OF CHANGES

Log completed change action as indicated.

Change Number	Date of Change	Date Entered	Signature of Person Incorporated Change

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Chapter 1

Background

1.1. Introduction. An SSRA is an assessment performed by program managers (PMs) and material 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.(Joint Services Guide For Development of SSRA, 2011) The following reference provides the statutes and regulations for the requirements of submitting an SSRA:

a. DoDI 4650.01 (Enclosure 3, para 3.a, Submission of SSRA prior to each Milestone)

	Defense Acquisition System (DAS) Phase	**Materiel Solution Analysis**	**Technology Development**	**Engineering and Manufacturing Development**	**Production and Development**	**Operations and Support**
MS	**Event**	MS A	MS B	MS C	Request Authorization to Operate - other than Testing	
ESC	**Required USG and HN Coordination**	Stage 1 Conceptual	Stage 2 Experimental	Stage 3 Developmental	Stage 4 Operational	Stage 4 (Note-to-Holder)
SSRA	**Required SSRA for Each Event**	Prepare SSRA	Prepare/Update SSRA	Prepare/Update SSRA	Prepare/Update SSRA	Prepare/Update SSRA for specific missions, new HN deployments, system mods, etc

USG- United States Government
HN- Host Nation
ESC-Electromagnetic Spectrum Certification

Figure 1-1 DAS ESC & SSRA timeline

1.2. Scope. The intent of the SSRA is to identify and assess Electromagnetic Spectrum and E3 issues that may affect the required operational performance of the overall system based on the mission needs defined by the combat developer and/or Joint Staff in the Initial Capabilities Document (ICD), Capability Development Document (CDD) and Capability Production Document (CPD). “Spectrum supportability (SS) and E3 risks and the steps that need to be taken to mitigate the risks are to be identified within 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).”(Joint Services Guide For Development of SSRA, 2011) Program Managers and or Material Developers should consult (as early as possible) with MCSC/SIAT/TT&S/Spectrum regarding the application and tailoring of the SSRA so that the risks and mitigation measures may be evaluated by the MDA prior to a major milestone decision. Lastly, it must be mentioned that Electromagnetic Spectrum Certification (ESC) and the SSRA are two completely separate staffing processes and that one is not meant to be a substitute for the other.

Chapter 2

SSRA Components

2.1. Cover Page. The cover page (at a minimum) will contain the following information:

a. Title of the document

b. Month and year of the publication

c. Acquisition milestone and/or readiness review it supports

d. Name(s) of the principal author(s)

e. Program office or sponsor’s name (address if required)

f. Distribution statement (if required)

g. Security classification (if required)

h. Version Control Number of the publication

2.2. Signature Page. The signature page will contain the following sections and meet the specified criteria:

a. Submitted By. The purpose of this section is to identify the originator of the document. The originator can be the Lead Systems Engineer or a designee identified by the Deputy/Product Manager and will be accompanied by Product Manager (ref Appendix A). No more than two signature blocks will be resident in this section.

b. Concurrence. The purpose of this section is to ensure that the proper staffing of the SSRA is being conducted from Product Management level through the Program Manager and subsequent command staffing. Concurrence is provided by the Competency Engineer, Program Manager and the Systems Engineering, Interoperability, Architecture & Technology (SIAT) Spectrum Manager, (ref Appendix A). No more than four signatures blocks will be resident in this section.

c. Approval. The purpose of this section is to provide the Final Approving Authority the opportunity to approve or disapprove the final document. The staffing work flow for SSRA approval is provided in Figure 2-1. The planning guidance for the SSRA approval process is to allocate two weeks per signature authority to allow for the proper staffing and analytical research required for each submission.

The Final Approving Authorities with the corresponding Acquisition Category (ACAT) programs are provided below:

(1) Final approval authority for all ACAT I, IC, ID, IA, IAM or IAC programs resides with the Department of Navy (DON) Chief Information Officer, or their assigned delegate.

(2) Final approval authority for all ACAT II, III, IV and Abbreviated Acquisition Program (AAP) resides at the Headquarters Marine Corps (HQMC) Chief Information Officer, or their assigned delegate

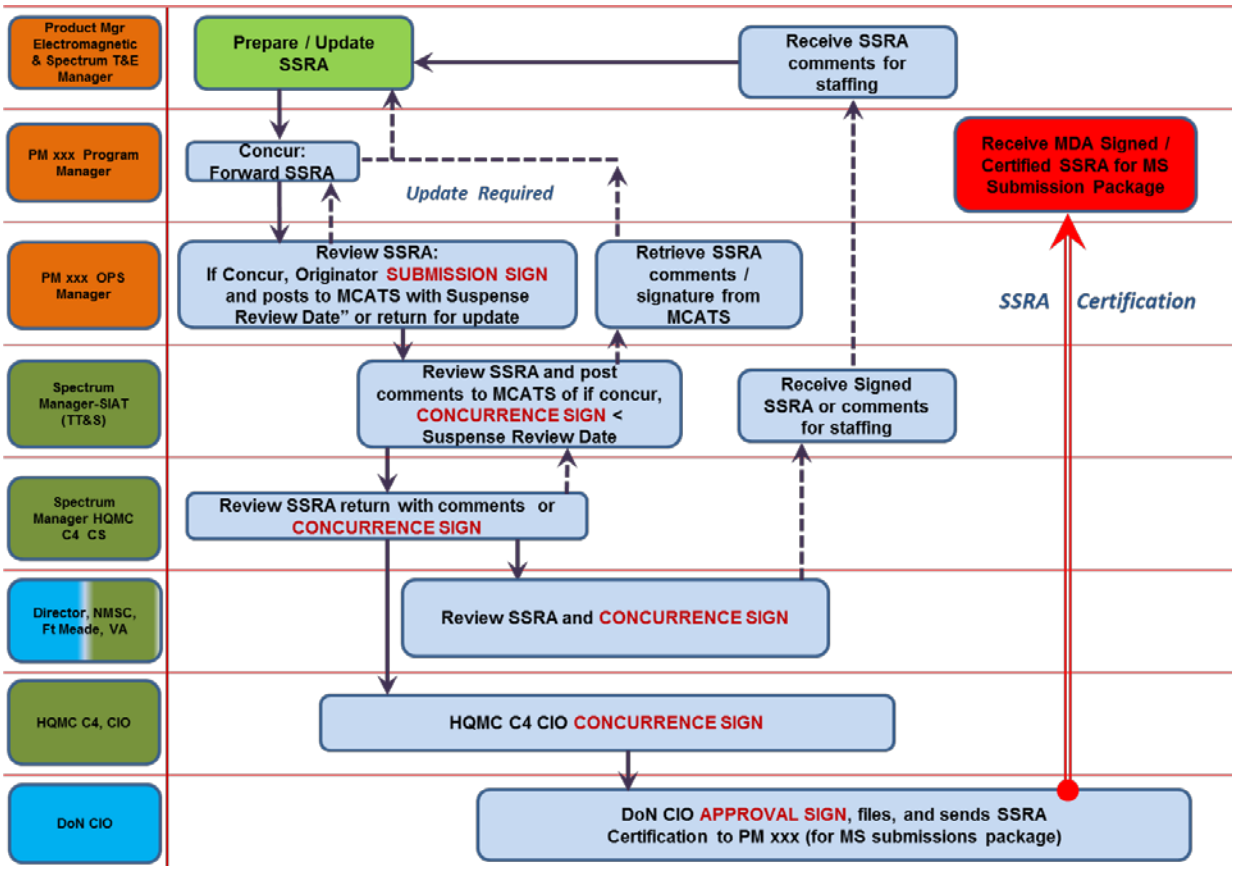


Figure 2-1 SSRA Staffing Flow Chart

2.3. Introduction. The introduction will contain a brief description of the report and how it is associated with the milestone decision and or the readiness review it supports. The format of the introduction is included in Appendix A of this SOP. Additionally, the description (at a minimum) will contain the following items:

a. Physical components of the system

b. Technical Readiness Level

c. Purpose of the system and Concept of Operations

d. Subsystem description and associated block diagrams

2.3.1. Risk Management. 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.

2.3.1.a. Define Impacts of Risk. 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. A sample matrix to illustrate the impact of a risk is shown in Table xx of Appendix A.

2.3.1.b. Define Risk Occurrence. The likelihood of occurrence of the risk should also be quantified. The suggested scheme is depicted in Table xx of Appendix A where green denotes little or no likelihood of occurrence, yellow denotes a likely occurrence, and red denotes a highly likely or near certain occurrence.

2.3.1.b. Define Risk Categories. 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 shall be used to illustrate the level of risks identified within a program. The suggested format of this stop-light matrix can be found in Table xx of Appendix A.

2.4. Executive Summary. The Executive Summary is meant to be an abridged version of the SSRA and will only be generated on an as required basis. The Executive Summary will contain the following:

a. Cover Page

b. Introduction

c. A summary of all spectrum and E3 issues identified in the SSRA. The red, yellow, green matrix (stop light matrix) will be used to identify levels of risk and or supportability.

d. The impact of the risks on the ability to obtain spectrum supportability and a brief summarization of the important aspects from the Conclusion sub section of the SSRA.

2.5. Regulatory Component. The Regulatory Component addresses the compliance of the RF system with US national and international tables of frequency allocation as well as with regulatory agreements reached at the International Telecommunication Union. The format of this component is represented in Appendix A of this policy.

2.6. Technical Component. The Technical Component is used to quantify the mutual interactions between a candidate system and other co-band, adjacent band, and harmonically related RF systems, including the identification of suggested methods to mitigate the effects of possible mutual interference.

2.7. Operational Component. The Operational Component is used to identify and quantify the mutual interactions among the candidate system and other US military RF systems in the operational environment and identifying suggested methods to mitigate for possible instances of interference.

2.8. E3 Assessment. The E3 Assessment will be an all inclusive E3 assessment conducted on the candidate system and will be commensurate with the milestone or readiness review it supports.

2.9. Conclusions. The Conclusions section will provide a summary of spectrum and E3 related issues and their assessed risks. Additionally, it will include how they impact spectrum supportability process, any potential degradation to the system's operational performance (and 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 will be summarized in a table or stop light matrix. The conclusion should also indicate whether the system will meet all user requirements. The format of this component is represented in Appendix A of this policy.

2.10. Recommendations. 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 Navy & Marine Corps Spectrum Center (MILDEP SMO) to the Department of the Navy CIO (Service CIO) for approval and forwarded to the MDA.

2.11. References. The Reference section will contain any Department of Defense (DoD) related publication, instruction, or order that was used within the SSRA. Additionally, the following may be included:

a. DoD Information Page from the associated DD-1494 or Equipment Location Certification Information Database (EL-CID) certification package (as required)

b. Copies of the E3 assessment (as required)

c. Source documents for performance requirements

Chapter 3

Definitions

3.1. 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 Electromagnetic Radiation (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.

3.2. 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.

3.3. 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).

3.4. 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.).

3.5. 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:

ESC, including HN spectrum supportability assessment;

Enforcement of compliance with E3 control requirements during the acquisition of DoD electrical and electronic equipment (to ensure EMC); and

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 identified in the image below. The overlap occurs primarily with SSRAs which require, as a minimum, EMC, EMI, and EMV assessments to identify potential EMI with S-D systems.

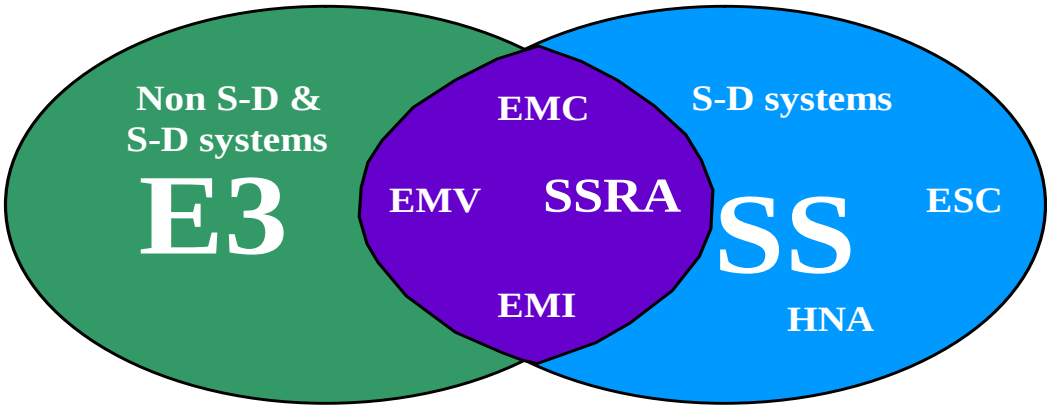


Figure 3-1 The overlap between E3 and SS

3.6. 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.

Appendix A

PROGRAM NAME-ACAT LEVEL xx

SPECTRUM SUPPORTABILITY RISK ASSESSMENTS (SSRA)

SUPPORTING MILESTONE-X

Mr. I.M. Marine
Marine Corps Systems Command Project Office
2200 Lester Street
Quantico, VA xxxxx-xxxx

Version X.X
MM, DD, YYYY

SAMPLE TEMPLATE - SPECTRUM SUPPORTABILITY RISK ASSESSMENTS (SSRA)
CONTENT AND FORMAT

SUBMITTED BY

_____	_____	_____	_____
Name, Lead Systems Eng, AdPM-E Marine Corps Systems Command Quantico, VA	Date	Name, Product Manager, PMO-XX Marine Corps Systems Command Quantico, VA	Date

****

CONCURRENCE

_____	_____	_____	_____
Name, Lead Systems Eng, PMO-xx Marine Corps Systems Command Quantico, VA	Date	CWO3 I.M. Marine Spectrum Manager-SIAT (TT&S) Marine Corps Systems Command Quantico, VA	Date
_____	_____	_____	_____
CWO4 I.M. Hardcharger Spectrum Manager HQMC C4 CS Washington, D.C.	Date	Mr. Leatherneck Director Navy & Marine Corps Spectrum Center Ft. Meade, MD	Date

****

HQMC APPROVAL

_____	_____
BGen Kevin Nally Headquarters Marine Corps C4 Chief Information Officer Washington, D.C.	Date

****

DON APPROVAL

_____	_____
Mr. Terry Halvorsen Chief Information Officer Department of the Navy Washington, D.C.	Date

SAMPLE TEMPLATE - SPECTRUM SUPPORTABILITY RISK ASSESSMENTS (SSRA)
CONTENT AND FORMAT

1. Introduction.

The Introduction of the SSRA shall contain the following:

a. A description of the purpose of the report and programmatic decision and/or readiness review it supports.

b. A detailed system description including the following in a table format (see Table 1 for sample format):

(1) Physical components (vehicle or platform mounted, stand alone, etc.)

(2) Technology readiness level

(3) Purpose of system and concept of operations

(4) Subsystem description and block diagrams

Table I Format			
System Component	**TRL**	**S-D (Y/N)**	**System Description (SA,VM, PM, other (specify))**

Legend:
TRL- Technology Readiness Level
S-D- Spectrum Dependent
SA- Stand Alone
VM- Vehicle Mounted
PM- Personnel Mounted

SAMPLE TEMPLATE - SPECTRUM SUPPORTABILITY RISK ASSESSMENTS (SSRA)
CONTENT AND FORMAT

Table II

	M S A	*MS B*	*MS C*	*FRP*	
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.**

2.0 Risk Management

2.1 Define Impact of Risk

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

2.2 Define Risk Occurrence

The likelihood of occurrence of the risk is quantified below in Table 4. The below table denotes green as little or no likelihood of occurrence, yellow as a likely occurrence, and red as 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%

2.3 Define 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

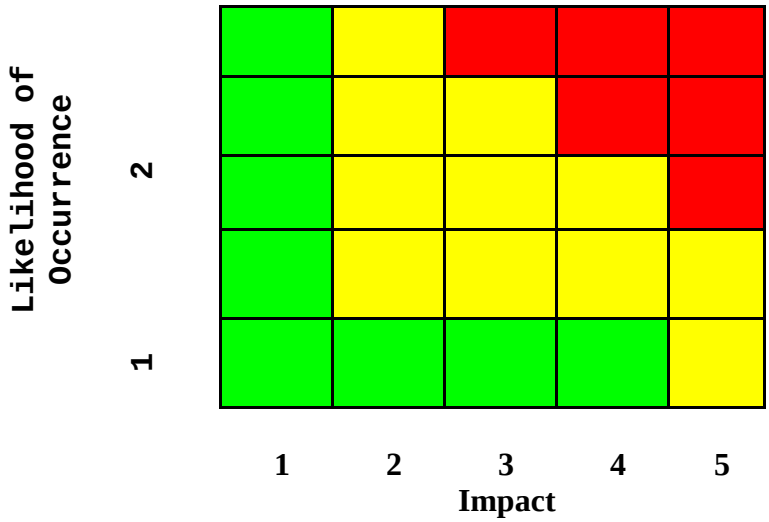
R	• No certification or approved J/F-12 in the Military Communications Electronics Board (MCEB) archived database • Operating in the incorrect or non-allocated frequency band or significant SS issues are known to exist for this system/equipment • E3 or, as a minimum, EMC and EMI studies not completed, 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.
Y	• 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.
G	• 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.

2.4. SSRA REPORT MATRIX

The content and format 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 appendix.

SAMPLE TEMPLATE - SPECTRUM SUPPORTABILITY RISK ASSESSMENTS (SSRA)
CONTENT AND FORMAT

Table VI Results of Risk Assessments (SAMPLE)



3. Components.

3.1. Regulatory.

A table format (Table 7) for addressing the Regulatory Component Tasks is provided below. The regulatory component should include, but not be limited to the following:

Table VII 3.1.1 Initial Regulatory SSRA Tasks (SAMPLE)			
3.1.1	**Initial Regulatory SSRA Tasks**	**Risk (Y/N)**	**Determinations, Findings and Rationale**
3.1.1.1	Determine countries for likely operational deployment within each COCOM area of responsibility.	N	United States and Possessions (US&P)
3.1.1.2	Determine the internationally recognized radio service of all S-D systems being developed or integrated by the acquisition.	Y	
3.1.1.3	Identify portions of the system's tuning range supported by each HN's Table of Allocation (TOA).	Y	
3.1.1.4	Determine the relative regulatory status (for example, co-primary or secondary, assigned to the radio service by the HN's TOA).		
3.1.1.5	Obtain international comments on 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)).		
3.1.1.6	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.		
3.1.1.7	Identify risks and develop recommendations for mitigation of regulatory issues.		
3.1.2	**Detailed Regulatory SSRA Tasks**		
3.1.2.1	Address MCEB, NTIA and other guidance resulting from the ESC and HNC processes.	N	
3.1.2.2	Consult with the DoD Component SMO regarding changes to U.S. Federal or civil telecommunication regulations impacting the system's frequency bands.	Y	
3.1.2.3	Determine if the system meets appropriate military, U.S. national, and international spectrum standards for radiated bandwidth and transmitter characteristics.	Y	
3.1.2.4	Quantify the impacts of any changes to U.S. or HN spectrum regulations.		
3.1.2.5	Identify/update spectrum risks and develop recommendations for mitigation of regulatory issues.		
3.1.3	**Updated Regulatory SSRA Tasks**		
3.1.3.1	Address as required.	N	As required.

A table format (Table 8) for summarizing the ESC and HNC information is provided below:

Table VIII Summary of Regulatory Information (SAMPLE)

J/F 12#	Nomenclature(1)	Stage/Status(2)(3)	CONUS(4)	OCONUS(5)
09999/1	AN/PRC-xxxx	Stage 4 / PEO LS	Y	Y
08888/3	RF-xxxxx	Stage 4 / PG 10	N	N

Notes:

(1) For a Family of Systems (FoS) or System of Systems (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 ESG 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 COCOM has it) and guidance where the system or similar system has HN approval. Identify countries and the guidance, or restrictions. Information may be obtained from NMSC as a result of the ESC/HNC processes.

3.2 Technical.

A table format (Table 9) for addressing the Technical Component Tasks is provided below. The technical component should include, but not be limited to the following:

Table IX 3.2.1 Initial Technical SSRA Tasks (SAMPLE)			
3.2.1	**Initial Technical SSRA Tasks**	**Risk (Y/N)**	**Determinations, Findings and Rationale**
3.2.1.1	Determine candidate technologies and their technical parameters: o Application: fixed, transportable, mobile o Host platform (dismounted soldier, airborne, tactical operations center, surface ship, submarine, ground vehicle, etc.) o Frequency range of operation o Required data throughput o Receiver selectivity o Receiver criteria required for desired operation o Required radiated bandwidth o Transmitter power output o Antenna performance characteristics o Anticipated HNs for deployment	N	See attached DD Form 1494 / EL CID certificate
3.2.1.2	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.	Y	
3.2.1.3	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.	Y	
3.2.1.4	Evaluate initial and, when available, measured system parameters with respect to U.S. and international spectrum standards; develop plans to address non-compliant systems.		
3.2.1.5	Identify risks and develop recommendations for mitigation of technical issues.		

SAMPLE TEMPLATE - SPECTRUM SUPPORTABILITY RISK ASSESSMENTS (SSRA)
CONTENT AND FORMAT

3.2.2	**Detailed Technical SSRA Tasks**		
3.2.2.1	Evaluate, using tests or Modeling & Simulation (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.	N	
3.2.2.2	Determine the acceptable received EM level between the system being analyzed and other S-D systems to ensure neither is significantly degraded and that coexistence is feasible.	Y	
3.2.2.3	Determine any potential link degradation and blockage due to atmospheric conditions or terrain and building obstructions within intended deployments 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).	Y	
3.2.2.4	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.		
3.2.2.5	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.).		
3.2.2.6	Quantify, using tests or M&S, the impact of changes to the operational "signals-in-space" RF parameters to co-site EMC.		
3.2.2.7	Identify and quantify interactions with non-DoD, other Federal and commercial users in the environment.		
3.2.2.8	Identify spectrum risks and develop recommendations for mitigation of technical issues.		
3.2.2.9	Address how limitations or restrictions identified in the MCEB J/F 12 recommendations are being mitigated and or resolved for each S-D equipment.		
3.2.3	**Updated Technical SSRA Tasks**		
3.2.3.1	Address as required.	N	As required.

SAMPLE TEMPLATE - SPECTRUM SUPPORTABILITY RISK ASSESSMENTS (SSRA)
CONTENT AND FORMAT

A table format (Table 10) to relate and compare spectrum requirements with availability is shown below:

Table X System Spectrum Requirements vs. Availability (SAMPLE)						
S-D Nomenclature and or J/F 12 #	**Frequency Range of Operation**	**Through put required/ available**	**Bandwidth (BW) Optimization (Y/N)**	**BW Required/ Available**	**Power**	**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 Family of Systems (FoS) or Systems of Systems (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.

3.3. Operational.

A table format (Table 11) for addressing the Operational Component Tasks is provided below. The operational component should include, but not be limited to the following:

Table XI 3.3.1 Initial Operational SSRA Tasks (SAMPLE)			
3.3.1	**Initial Operational SSRA Tasks**	**Risk (Y/N)**	**Determinations, Findings and Rationale**
3.3.1.1	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), Capabilities Development Document (CDD), Capability Production Document (CPD), or Information Support Plan (ISP) and assess the capability to meet or exceed the requirements.	N	United States and Possessions (US&P)
3.3.1.2	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.	Y	
3.3.1.3	Perform an extensive analysis quantifying the performance of the candidate system	Y	

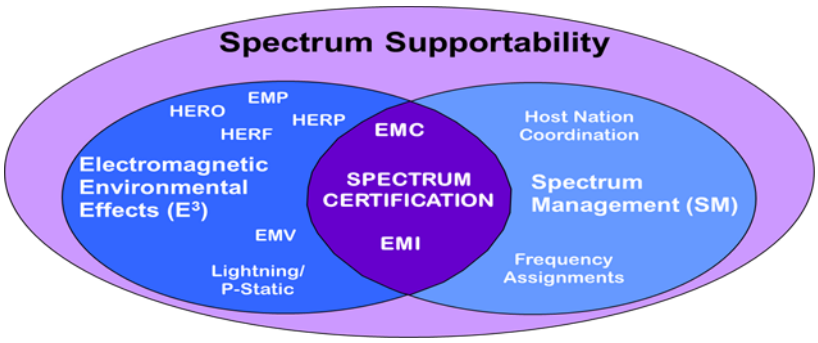
	and the S-D systems used by other DoD units in the operational environment. Express the results in operational terms, e.g., the frequency-distance (F-D) separation requirements between a transmitter and a receiver that must be maintained to achieve compatibility.		
3.3.1.4	Refine the analyses as the expected complement of S-D systems (DoD, non-DoD, Federal and commercial) anticipated to be in the system's operating environments is defined.		
3.3.1.5	Identify/update spectrum risks and develop recommendations, including tactics, techniques and procedures (TTP) s, for mitigation of operational issues.		
3.3.2	**Updated SSRA Tasks**		
3.3.2.1	Address as required.	N	As required.

Summary. The Operational component of the SSRA shall contain a description of the intended operational deployment of the system. A table format (Table 12) to present this data is provided below:

Table XII System Description and Deployment (SAMPLE)					
System Component	**Anticipated HNs**	**TRL**	**S-D (Y/N)**	**Deployment (SA, VM, PM, other (specify))**	**Training Requirement**
Notes:					
Legend: TRL- Technology Readiness Level S-D- Spectrum Dependent SA- Stand Alone	VM- Vehicle Mounted PM- Personnel Mounted HN- Host Nation				

3.4 E3.

"Operational impact assessments of SS and E3 control must be accomplished during the Developmental Testing & Evaluation (DT&E) and Operational Testing & Evaluation (OT&E). Doing so, has proven to be cost-effective and greatly reduces risks associated with system deployment and supportability."[i] The overlap in the below picture occurs when the end state to achieve Electromagnetic Compatibility while mitigating Electromagnetic Interference of all spectrum dependent systems.



A table format (Table 13) for addressing the E3 Component Tasks is provided below. The E3 component should include, but not be limited to the following:

Table XIII 3.4.1 Initial E3 SSRA Tasks (SAMPLE)			
3.4.1	**Initial E3 SSRA Tasks**	**Risk (Y/N)**	**Determinations, Findings and Rationale**
3.4.1.1	Perform assessments to determine the potential for EMC and for EMI interactions between the proposed system, other systems and its anticipated operations EME.	N	
3.4.1.2	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 an EM interaction.	Y	
3.4.1.3	Quantify intra-platform EMI among co-sited emitters and receivers for complex "system-of-systems" platforms in terms of the possibility and influence of: o Inter-modulation o Transmitter Harmonic Interference o Transmitter Spurious Output Interference	Y	

	o Transmitter Noise Interference o Receiver Desensitization Interference		
3.4.1.4	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.		
3.4.1.5	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.		
3.4.1.6	Identify/update E3 risks and develop recommendations for mitigation of risks.		
3.4.2	**Updated SSRA Tasks**		
3.4.2.1	Address as required.	N	As required.

A table format (Table 14) for summarizing the E3 issues is provided below:

Table XIV Summary of E3 Issues (SAMPLE)	
Issue	**Green / Yellow / Red**
E3 Issue #1	
E3 Issue #2	
E3 Issue #3	
Notes:	

4. Conclusions.

The conclusion shall contain a summary of the spectrum and E3 risks identified and the impact on the SS and potential degradation to the system's operational performance. Additionally, indicate whether the system has met or exceeds the user's requirements. Summarize the results of the risk assessment in the table below:

Table XV Relative Rating of Spectrum and E3 Issues (SAMPLE)													
Issue	**Likelihood of Occurrence**	**Impact of Risk**											
Spectrum issue # 1	**HIGH**												
Spectrum issue #.2													
Spectrum issue, etc													
E3 issue # 1													
E3 issue #.2													
E3 issue etc													
	LOW	**NONE/MINIMAL**			**MODERATE**						**SIGNIFICANT/SEVERE**		
NOTES:													

5. Recommendations.

Provide a recommendation as to whether the SSRA should be sent by the Marine Corps Systems Command Spectrum Management Office for approval and forwarded to the milestone decision authority.

6. References.

a. Provide at least the DoD Information Page of the DD 1494 for each S-D subsystem or equipment that is/will be integrated within a platform, FoS or SoS.
b. Copies of the E3 Assessment Report, when requested.
c. DoDI 4650.01, dtd 9 Jan 2009
d. DODD 3222.3, dtd 8 Sep 2004
e. MCO 2400.2A
f. DISA DI-EMCS-81543
g. Source documents for performance requirements

[i] Marcus Shellman, "Electromagnetic Spectrum Test and Evaluation Process", ITEA Journal. 2010

SAMPLE TEMPLATE – EXECUTIVE SUMMARY FOR SPECTRUM SUPPORTABILITY RISK ASSESSMENTS (SSRA) CONTENT AND FORMAT

Appendix A

PROGRAM NAME-ACAT LEVEL xx

SPECTRUM SUPPORTABILITY RISK ASSESSMENTS (SSRA)

SUPPORTING MILESTONE-X

Mr. I.M. Marine
Marine Corps Systems Command Project Office
2200 Lester Street
Quantico, VA xxxxx-xxxx

Version X.X
MM, DD, YYYY

SAMPLE TEMPLATE – EXECUTIVE SUMMARY FOR SPECTRUM SUPPORTABILITY RISK ASSESSMENTS (SSRA) CONTENT AND FORMAT

1.0. Introduction.

The Introduction of the SSRA shall contain the following:

a. A description of the purpose of the report and programmatic decision and/or readiness review it supports.

b. A detailed system description including the following in a table format (see Table 1 for sample format):

(1) Physical components (vehicle or platform mounted, stand alone, etc.)

(2) Technology readiness level

(3) Purpose of system and concept of operations

(4) Subsystem description and block diagrams

Table 1 Format			
System Component	**TRL**	**S-D (Y/N)**	**System Description (SA,VM, PM, other (specify))**

Legend:
TRL- Technology Readiness Level
S-D- Spectrum Dependent
SA- Stand Alone
VM- Vehicle Mounted
PM- Personnel Mounted

Within the Components of the Executive Summary, a summary of spectrum and E3 issues is provided. This should be a summation of all the components (regulatory, technical, operational and E3 assessments) and should be formatted in a Stop-Light Chart.

SAMPLE TEMPLATE – EXECUTIVE SUMMARY FOR SPECTRUM SUPPORTABILITY RISK ASSESSMENTS (SSRA) CONTENT AND FORMAT

3. Components.

3.1. Regulatory.

R

Table 4 Summary of Regulatory Information (SAMPLE)				
J/F 12#	**Nomenclature(1)**	**Stage/Status(2)(3)**	**CONUS(4)**	**OCONUS(5)**
09999/1	AN/PRC-xxxx	Stage 4 / PEO LS	Y	Y
08888/3	RF-xxxxx	Stage 4 / PG 10	N	N

Notes:

(1) For a Family of Systems (FoS) or System of Systems (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 ESG 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 COCOM has it) and guidance where the system or similar system has HN approval. Identify countries and the guidance, or restrictions. Information may be obtained from NMSC as a result of the ESC/HNC processes.

3.2 Technical.

Y

Table 6 System Spectrum Requirements vs. Availability (SAMPLE)						
S-D Nomenclature and or J/F 12 #	**Frequency Range of Operation**	**Through put required/ available**	**Bandwidth (BW) Optimization (Y/N)**	**BW Required/ Available**	**Power**	**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 Family of Systems (FoS) or Systems of Systems (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.

3.3. Operational.

G

Table 8 System Description and Deployment (SAMPLE)					
System Component	**Anticipated HNs**	**TRL**	**S-D (Y/N)**	**Deployment (SA, VM, PM, other (specify))**	**Training Requirement**
Notes:					
Legend: TRL- Technology Readiness Level S-D- Spectrum Dependent SA- Stand Alone	VM- Vehicle Mounted PM- Personnel Mounted HN- Host Nation				

3.4 E3.

Y

Table 10 Summary of E3 Issues (SAMPLE)	
Issue	**Green / Yellow / Red**
E3 Issue #1	
E3 Issue #2	
E3 Issue #3	
Notes:	

4. Conclusions.

The conclusion shall contain a summary of the spectrum and E3 risks identified and the impact on the SS and potential degradation to the system's operational performance. Additionally, indicate whether the system has met or exceeds the user's requirements. Summarize the results of the risk assessment in the table below:

Table 11 Relative Rating of Spectrum and E3 Issues (SAMPLE)				
Issue	**Likelihood of Occurrence**	**Impact of Risk**		
Spectrum issue # 1	**HIGH**			
Spectrum issue #.2				
Spectrum issue, etc				
E3 issue # 1				
E3 issue #.2				
E3 issue etc				
	LOW	**NONE/MINIMAL**	**MODERATE**	**SIGNIFICANT/SEVERE**
NOTES:				