

EXECUTIVE SUMMARY

Facility-related Control System Authorization Framework

ESTCP Project EW18-5266

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ACRONYMS AND ABBREVIATIONS

A&A	Assessment and Authorization
AO	Authorizing Official
APR	Army Policy Record
ASD-EI&E	Assistant Secretary of Defense for Energy, Installations, and Environment
ATO	Authority to Operate
CNSSI	Committee on National Security Systems Instruction
CRN	Closed Restricted Network
CCI	Control Correlation Identifier
DASD-E	Assistant Secretary of Defense for Energy, Installations, and Environment
DoD	Department of Defense
DoDI	Department of Defense Instruction
eMASS	Enterprise Mission Assurance Support Service
ESTCP	Environmental Security Technology Certification Program
FRCS	Facility Related Control Systems
GOTS	Government off the shelf
GUI	Graphical User Interface
HMI	Human Machine Interface
ICS	Industrial Control Systems
ISO	Information System Owner
IPC	Intelligent Power Controllers
NIST	National Institute of Standards and Technology
NVESD	Night Vision and Electronic Sensors Directorate
OSD	Office of the Secretary of Defense
OT	Operational Technology
PACS	Physical Access Control System
PM	Project Manager
PNNL	Pacific Northwest National Laboratory
POC	Point of Contact
P&P	Policy & Procedures
RMF	Risk Management Framework
RMF-KS	RMF Knowledge Service
R-SATRMF	Self-Assessment Tool

SCA-V	Security Control Assessor-Validator
SDLC	Software Development Lifecycle
SIPOC	Suppliers, Inputs, Process, Outputs, Customers
SLCM	System Level Continuous Monitoring
SO	System Owner
SP	Special Publication
SSP	System Security Plan
UFC	Unified Facilities Criteria
UMCS	Utility Monitoring & Control System
USAG-KA	US Army Garrison Kwajalein-Atoll
WHS	Washington Headquarter Service

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1.0 INTRODUCTION

The main objective of the design of Risk Management Framework (RMF) Self-Assessment Tool (R-SAT) is to provide a prescriptive, step-by-step method to facilitate and accelerate RMF Self-Assessments through automation.

Supporting objectives include:

- Low-cost implementation
- Effective resource for all aspects of Facility Related Control Systems (FRCS) owner security planning and implementation
- Intuitive, highly repeatable, and applicable across system types
- Clear delineation of cybersecurity stakeholder actions
- Government support of integration with RMF processes, such as Reciprocity and Reuse

2.0 TECHNOLOGY DESCRIPTION

The R-SAT is an Excel based tool that was designed to streamline the process for obtaining an Authority to Operate (ATO) for network-enabled FRCS by providing focused, step-by-step guidance and outputs supporting RMF Steps 1-3. R-SAT works in conjunction with the Enterprise Mission Assurance Support Service (eMASS) government-owned application. R-SAT was developed with full recognition and appreciation for what eMASS provides and serves to advance the overall ecosystem supporting the Department of Defense (DoD), rather than complicating DoD FRCS Owner's decision paths with alternative tool sets. R-SAT includes an extensive set of customized Microsoft Excel Visual Basic macros in order to execute automated aspects and perform various R-SAT functions. Ease of use is accomplished as the software's structure displays a familiar tab-based Excel workbook layout and each tab guides the user through basic input questions and utilizes embedded databases to autofill eMASS importable templates. R-SAT's workflow applies user inputs against a series of condition-specific integrated databases to produce data for additional tailoring and subsequent eMASS upload. Associated artifacts, including Policy & Procedure documentation with cross references to applicable Control Correlation Identifiers (CCIs), round out the resources available with R-SAT.

3.0 PERFORMANCE ASSESSMENT

The objectives of the project were assessed using quantitative (reduction of labor hours to complete RMF) and qualitative (user acceptance) performance metrics. FRCS Stakeholders were sampled between August 2018 and the Short Course demonstration at the ESTCP Symposium on December 5, 2019. The performance objectives and findings indicate that R-SAT will contribute a time savings and value to FRCS stakeholders. The performance assessment data is summarized below:

- A reduction in labor hours to tailor RMF controls of 87% (Low Impact Level), 71% (Moderate Impact Level) and 64% (High Impact Level) was demonstrated.

This is further supported by an estimated 80% reduction in labor hours to perform a pilot RMF Self Assessments (based on measured labor hours) and a 90% reduction in eMASS Data Entry (based on measured eMASS data entry time for individual CCIs).

- An endorsement of “significant” usefulness (based on Likert scale survey results) and positive comments in written endorsements received during outreach efforts indicate R-SAT is a value to FRCS Stakeholders.

In addition to measured performance metrics, the feedback received during outreach efforts identified that many FRCS Stakeholders are unfamiliar with the RMF Process. Many potential users that were asked to evaluate R-SAT were unable to provide quantitative feedback because of unfamiliarity with the process. The R-SAT User Guide and training video were modified during the design phase to partially address this issue and better guide users through the RMF-Self Assessment process while using the features of R-SAT. However, use of R-SAT assumes a basic understanding of the RMF process.

4.0 COST ASSESSMENT

R-SAT is free for public use and performance metrics demonstrate a cost savings in terms of labor hours. R-SAT functionality may be impacted by updates to eMASS or FRCS policy and guidance. Updates to R-SAT will be necessary to keep pace. Therefore, a cost estimate for ongoing maintenance of R-SAT by a designated Federal organization was estimated:

- **Initial Familiarization (\$1,120)** - Average of labor hours required to learn to use R-SAT based on metrics gathered during demonstration
- **Maintenance (\$16,000)** - Estimate based on labor hours required to incorporate pilot user feedback into R-SAT during demonstration and testing
- **Additional feature implementation (\$27,200)** - Estimate based on 50% labor hours required to identify, assess, and engineer R-SAT features during design phase
- **User training and materials update (\$20,560)** - Estimate based on development of user guide, webinar, and training course materials during demonstration
- **Publishing (\$1,600)** - Estimate based on labor hours to coordinate initial publishing of R-SAT and associated documents to two different websites.

5.0 IMPLEMENTATION ISSUES

Implementation issues are somewhat attributed to the short timeline for the project. The software development phase was extended to address several comments received by users throughout the outreach phase. This ensured that the R-SAT software and the corresponding User Guide addressed the needs of the FRCS stakeholders. In addition, a training video was developed to ensure that potential users have visual resources to facilitate the use of R-SAT. The following implementation issues were identified during the development and testing of the software:

- R-SAT is an Excel worksheet with Visual Basic programming and some users may have concerns with using a macro-enabled Excel sheet. Distributing MS Office documents with embedded macros can introduce some risk. Malicious code can reside within macros, so distributing R-SAT via email should be avoided. Download of R-SAT from the RMF Knowledge Service (RMF-KS) and ESTCP portals should be facilitated by the appropriate government personnel and process.
- R-SAT is a tool that requires a learning curve for users in order to understand the functionality and tailoring options. The software was designed to be intuitive and user friendly; however, users must be willing to invest upfront time in learning the software. This unwillingness to invest time in learning a new program was recognized by the team when attempting to obtain metrics for R-SAT's time savings and usefulness. The User Guide and training video are provided to decrease the user's investment in learning R-SAT.
- As previously mentioned, the use of R-SAT assumes a basic understanding of the RMF Self-Assessment process. Many FRCS Stakeholders are unfamiliar with this process. The R-SAT User Guide and training video are intended to partially address this issue and better guide users in using R-SAT to complete the RMF-Self Assessment process.