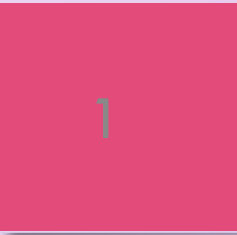




SPRING MEETING
EFCOG SQA SUB-TASK T7 - SOFTWARE
STANDARDS AND ORDERS

APRIL 21, 2021



ORIGINAL SCOPE FOR TEAM ON TASK 3 – SOFTWARE-RELEVANT DOE ORDERS

DETAILS:

- CREATE A MATRIX OF DOE ORDERS, POLICIES, AND GUIDELINES THAT HAVE REQUIREMENTS AND/OR GUIDANCE RELATED TO SOFTWARE
- HOW TO BETTER INTEGRATE 414 WITH OTHER DOE ORDERS (E.G., 200.1A, 205.1C, ETC.) AND/OR CLARIFY AREAS THAT SEEM TO CONTRADICT

ORIGINAL SCOPE FOR TEAM ON TASK 6 – STANDARD FOR SOFTWARE

DETAILS:

- SHOULD 414 HAVE AN ALTERNATE STANDARD FOR SOFTWARE QUALITY ASSURANCE?
 - 414 CURRENTLY REQUIRES NQA-1-2008 WITH 2009 ADDENDUM FOR SAFETY SOFTWARE (OR AN APPROVED EQUIVALENT) AND A RECOGNIZED NATIONAL STANDARD FOR NON-SAFETY SOFTWARE
- WHAT WOULD THAT BE? MAKE A CASE FOR AN ALTERNATE (OR ALTERNATES)
 - a. ARE THERE OTHER/BETTER ALTERNATE STANDARDS MORE APPROPRIATE FOR SOFTWARE?
 - b. THE GROUP WILL PRESENT PROS AND CONS OF OTHER STANDARDS

LETS MERGE THE TEAM!

EFCOG SQA SUB-TASK

T7 - SOFTWARE STANDARDS AND ORDERS

Software-Relevant Orders

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How can the **Software Standards and Orders** information help us?

Share the completed matrix with your site. It may help them compare this information with their policy and plans to make sure they have up to date flow down to their procedures.

We understand as this document stays live it will always need reviewed for completeness or the latest review. However, some will just appreciate a one stop shop to read these documents.



How can the **Software Standards and Orders** information help **Software Quality**?

Some typical **SQA Audit/Assessment Findings or Observations**

- Project documents providing guidance for software development work activities were not in records.
 - ❖ Too many multiple location and too many software owners.
- Utility calculations and other software tools are inconsistently classified, graded and managed.
 - ❖ Utility software tools not being CM controlled and qualification of legacy data was not performed.
 - ❖ Utility scripts used to support testing and calculation verification purposes are not CM controlled.
 - ❖ Utility script(s) coding conventions are not defined or documented.

Typical SQA Audit/Assessment Findings or Observations con't

- Project does not have a documented Software or System Requirement Document
- Project does not have a documented validation/verification/testing process.
- Software development life cycle work activities continue.
- The project software 10 Element are incomplete or non-existent.
- Follow-up on SQA Audits/Assessments for implementation effectiveness.



Matrix of Orders, Policies, and Guides with software requirements.

Orders and Polices Affecting Software EFCOG 2020 Fall Meeting.xlsx - Excel

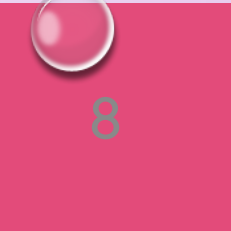
Renner, Cristy

Document	Title	Applicability	Section Number	Section Title	Software Requirements	Area of Interest	Major implications	Assignee	Comments
Document Number	Guide to the Software Body of Knowledge IEEE Computer Society	1. To promote a consistent view of software engineering worldwide 2. To specify the scope of, and clarify the place of software engineering with respect to other disciplines such as computer science, project management, computer engineering, and mathematics 3. To characterize the contents of the software engineering discipline 4. To provide a topical access to the Software Engineering Body of Knowledge 5. To provide a foundation for curriculum development and for	Chapter 1 (32 of 335)	Software Requirements		At its most basic, a software requirement is a property that must be exhibited by something in order to solve some problem in the real world. It may aim to automate part of a task for someone to support the business processes of an organization, to correct shortcomings of existing software, or to control a device—to name just a few of the many problems for which software solutions are possible.			
			Chapter 2 (50 of 335)	Software Design		Design is defined as both "the process of defining the architecture, components, interfaces, and other characteristics of a system or component" and "the result of [that] process" [1]. Viewed as a process, software design is the software engineering life cycle activity in which software requirements are analyzed in order to produce a description of the software's internal structure that will serve as the basis for its construction. A software design (the result) describes the software architecture—that is, how software is decomposed and organized into components—and the interfaces between those components. It should also describe the components at a level of detail that enables their construction.			
			Chapter 3 (66 of 335)	Software Construction		The term software construction refers to the detailed creation of working software through a combination of coding, verification, unit testing, integration testing, and debugging.			
			Chapter 4 (82 of 335)	Software Testing		Software testing consists of the dynamic verification that a program provides expected behaviors on a finite set of test cases, suitably selected from the usually infinite execution domain.			
			Chapter 5 (104 of 335)	Software Maintenance		Software maintenance is defined as the totality of activities required to provide cost-effective support to software. Activities are performed during the pre-delivery stage as well as during the post-delivery stage. Pre-delivery activities include planning for post-delivery operations, maintainability, and logistics determination for transition activities [T, c6s3]. Post-delivery activities include software modification, training, and operating or interfacing to a help desk.			
			Chapter 6 (118 of 335)	Software Configuration Management		A discipline applying technical and administrative direction and surveillance to: identify and document the functional and physical characteristics of a configuration item, control changes to those characteristics, record and report change processing and implementation status, and verify compliance with specified requirements.			
			Chapter 7 (133 of 335)	Software Engineering Management		Software engineering management can be defined as the application of management activities—planning, coordinating, measuring, monitoring, controlling, and reporting—to ensure that software products and software engineering services are delivered efficiently, effectively, and to the benefit of stakeholders.			
			Chapter 8 (148 of 335)	Software Engineering Process		Software engineering processes are concerned with work activities accomplished by software engineers to develop, maintain, and operate software, such as requirements, design, construction, testing, configuration management, and other software engineering processes. For readability, "software engineering process" will be referred to as "software process"			
			Chapter 9 (162 of 335)	Software Engineering Models and Methods		Software engineering models and methods impose structure on software engineering with the goal of making that activity systematic, repeatable, and ultimately more success-oriented. Using models provides an approach to problem solving, a notation, and procedures for model construction and analysis. Methods provide an approach to the systematic specification, design, construction, test, and verification of the end-item software and associated work.			
			Chapter 10 (174 of 335)	Software Quality		Software quality is defined as the "capability of software product to satisfy stated and implied needs under specified conditions" and as "the degree to which a software product meets established requirements"			
			Chapter 11 (191 of 335)	Software Engineering Professional Practice		The knowledge, skills, and attitudes that software engineers must possess to practice software engineering in a professional, responsible, and ethical manner.			
			Chapter 12 (206 of 335)	Software Engineering Economics		Software engineering economics is about making decisions related to software engineering in a business context. The success of a software product, service, and solution depends on good business management.			
			Chapter 13 (224 of 335)	Computing Foundations		The development and operational environment in which software evolves and executes. Because no software can exist in a vacuum or run without a computer, the core of such an environment is the computer and its various components. Knowledge about the computer and its underlying principles of hardware and software serves as a framework on which software engineering is anchored.			

Matrix | 10 CFR 830 | ASME NQA-1 | DOE G 414 | DOE G 420 | DOE O 200 | DOE O 205 | **SWEBOK 3.0** | DOE O 243 | DOE O 414,1D | DOE O 426 | DOE STD 1135-99 | DOE P 205 | EM-QA-001 | IAEA | IEEE Std 1012-2012 | IEEE Std 11 ...

READY | 70%

1:40 PM



Where do we stand today
Software Standards and Orders



Documents Affecting Software

Document Number

- 10 CFR Part 830 Subpart A
- ASME NQA-1-2008,
- ASME NQA-1a-2009
- DOE N 203.1

Title

Nuclear Safety Management, Quality Assurance Requirements #
Quality Assurance Requirements for Nuclear Facility Applications
Addenda to NQA-1-2008
Software Quality Assurance ##Expired

Documents Affecting Software

Document Number

Title

- DOE O 200.1A
Information Technology Management
- DOE O 200.1A - Chng 1
Information Technology Management
- DOE O 205.1A
DOE Cyber Security Management
 - DOE O 205.1B
DOE Cyber Security Program ###?
 - DOE O 205.1C
DOE Cybersecurity Program
- DOE O 243.1B
Reference to Department of Defense (DoD) 5015.2-STD, Electronic Records Management Software Application Design Criteria Standard ##
- DOE O 414.1D
Quality Assurance
 - DOE O 414.1D Chg1
Administrative Changes to DOE O 414.1D, Quality Assurance ##
- DOE O 426.2
Personnel Selection, Training, Qualification and Certification Requirements for DOE Nuclear Facilities

Documents Affecting Software

Document Number

Title

- DOE G 414.1-4 Safety Software Guide for Use with 10 CFR 830 Subpart A, Quality Assurance Requirements, and DOE O 414.1C, Quality Assurance ###
- DOE G 420.1-3 Implementation Guide for DOE Fire Protection and Emergency Services Programs for Use with DOE O 420.1B, Facility Safety
- DOE P 205.1 Departmental Cyber Security Management Policy ###
- DOE STD 1135-99 Guidance for Nuclear Criticality Safety Engineer Training and Qualification ###
- EM-QA-001, Rev 1 Quality Assurance Program (QAP) ###

Documents Affecting Software

Document Number

Title

- NAP 401.1 NNSA Policy Letter Weapon Quality Policy
- NIST SP 800-53 Rev. 4 Security and Privacy Controls for Federal Information Systems and Organizations ##
- NNSA SD 205.1 Baseline Cybersecurity Program
- NUREG/CR-6263 Volume 2 High Integrity Software for Nuclear Power Plants ##

Meeting-Agenda-Slides-and-Minutes
DOE G
DOE P
DOE O
IEEE-Software-Related
Orders and Polices Affecting Software.xlsx
NIST-SP-800-53-r4-Security-and-Privacy-Controls-for-FIS-and-Orgs.pdf
10-CFR-Part-830-Sub-A-Nuclear-Safety-Mgt-QA-Reqs.pdf
NUREG-CR-6263-V2-High-Integrity-Software-for-Nuclear-Power-Plants.pdf
EM-QA-001-r1-QA-Program.pdf
NQA-1-2008-2009-complete.pdf
Software-CGF-EPRI.pdf
SRS-E-7-Software-Engineering-Control-(E7-5.01-Rev3).pdf
Software-Dedication-Using-NQA-1-(ML12171A417).pdf
Software-Dedication-May-2012-EFCOG-Las-Vegas (1).pdf

Document Number	Title	Applicability	Software Requirements	How To	Area of Interest	Assignee
10 CFR Part 830 Subpart A	Nuclear Safety Management, Quality Assurance Requirements					
ASME NQA-1a-2009	Addenda to ASME NQA-1-2008, Quality Assurance Requirements for Nuclear Facility Applications					
DOE G 414.1-4	Safety Software Guide for Use with 10 CFR 830 Subpart A, Quality Assurance Requirements, and DOE O 414.1C, Quality Assurance					
DOE G 420.1-3 (Currently inactive, Superseded by DOE O 420.1C, Facility Safety)	Facility Safety (Old Text: Implementation Guide for DOE Fire Protection and Emergency Services Programs for Use with DOE O 420.1B, Facility Safety)	Nuclear safety design criteria, fire protection, criticality safety, natural phenomena hazard mitigation and cognizant system engineer program.	Safety SSCs and safety software must be designed to perform their safety function when called upon (DOE O 420.1C, 3(B)(6))	*Here we would recommend a doc or section in a doc on how to comply with the requirement	Facility Safety	Alvin
DOE O 200.1A, Chng 1	Information Technology Management	IT Programs	Implement a software quality assurance program that applies a graded, risk-based approach (DOE O 200.1A, Chng 1, Attachment 1 (4)(b))	*Here we would recommend a doc or section in a doc on how to comply with the requirement	IT	Alvin
DOE O 205.1A	DOE Cyber Security Management					
DOE O 205.1B	DOE Cyber Security Program					
DOE O 205.1C	DOE Cybersecurity Program					
DOE O 243.1B	Reference to Department of Defense (DoD) 5015.2-STD, Electronic Records Management Software Application Design Criteria Standard					
DOE O 414.1D	Quality Assurance					
DOE O 414.1D Chg1	Administrative Changes to DOE O 414.1D, Quality Assurance					
DOE O 426.2	Personnel Selection, Training, Qualification and Certification Requirements for DOE Nuclear Facilities	Technical Staff				
DOE P 205.1	Departmental Cyber Security Management Policy					
DOE STD 1135-99	Guidance for Nuclear Criticality Safety Engineer Training and Qualification	Nuclear Criticality Safety Evaluations				
EM-QA-001, Rev 1	Quality Assurance Program (QAP)					
IEEE Std 610.12	Software Terms					
IEEE Std 730-2002	Software Quality Assurance Plans					
IEEE Std 828-2005	Software Configuration Management Plans					
IEEE Std 829-1998	Software Test Documentation					

Lets Tackle These Together

Document Number

Title

- 10 CFR Part 830 Subpart A Nuclear Safety Management, Quality Assurance Requirements #____
- DOE O 205.1B DOE Cyber Security Program ###?
- DOE O 243.1B (DoD) 5015.2-STD, Electronic RM Software Application DC Standard ##
- DOE O 414.1D Chg1 Administrative Changes to DOE O 414.1D, Quality Assurance ##
- NAP 401.1 NNSA Policy Letter Weapon Quality Policy
- NIST SP 800-53 Rev. 4 Security and Privacy Controls for FIS & O ##
- NNSA SD 205.1 Baseline Cybersecurity Program
- NUREG/CR-6263 Volume 2 High Integrity Software for Nuclear Power Plants ##

ANY TAKERS !?!

DOCUMENT NAME

1. 10 CFR PART 830 SUBPART A
2. DOE O 205.1B
3. DOE O 243.1B
4. DOE O 414.1D CHG1
5. NAP 401.1
6. NIST SP 800-53 REV. 4
7. NNSA SD 205.1
8. NUREG/CR-6263 VOLUME 2
9. IEEE STD

EFCOG MEMBER

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
9. IEEE DOCUMENTS
1012,1016,1219,1228,610,12,830,23026,
DESIGNED FOR SOFTWARE QUALITY
ENGINEERING

Also you
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related job postings
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Questions?