

SQA At DOE

-- The BIG Picture

- Legislation
- Departmental Software Quality and Systems Engineering Program
- SQA Notice, N 203.1
- SASG & DNFSB Technical Report 25
- CIO/SQAS Collaboration

Legislation

- Clinger-Cohen Act
- Government Performance and Results Act
- The Acquisition Streamlining Act, Paperwork Reduction Act, Freedom of Information Act, Circular A-11 Preparation and Submission of Budget Estimates, Circular A-130 Management of Federal Information Resources, OFPP Policy Letter 91-2 Service Contracting, Raines Rules, etc.

Departmental Software Quality & Sys. Engineering Program

- Project Management
 - DOE O 413.3 Facilities, Overarching
 - DISE Volume 2 Software (planned)
- Software Systems Engineering
 - DOE O 430.1 Facilities, Overarching
 - DOE G 200.1-1 Software, SEM
- Quality Assurance
 - DOE O 414.1A Facilities, Overarching
 - DOE N 203.1 Software

Discipline Components

- **Project Management**
 - i.e., Project Planning, Project Tracking, Requirements Management, Risk Management, Configuration Management
- **Software Systems Engineering**
 - i.e., lifecycle phases from cradle to grave
- **Quality Assurance**
 - i.e., structured walkthroughs, peer reviews, inspections, audits/assessments

Background for N 203.1, SQA

- Clinger-Cohen and GPRA, as interpreted by OMB, and other Federal directives
- 10CFR830.120, Nuclear Safety Management, Quality Assurance
- DOE O 414.1A, Quality Assurance
- External Deficiency Reports; i.e., DNFSB Tech Report 25, various IG & GAO reports.

N 203.1, SQA Requirements

- Implement SQA Program -- the framework
 - all DOE software
 - Departmental Element specified, local needs
 - risk-based, graded lifecycle approach
 - include standards, training, oversight, integration
- Implement SQA Plans -- project-by-project
 - reflects Departmental Element program
 - SQA processes and product qualification

Elements of DOE O 1330.1D in N 203.1, SQA

- All DOE software and modifications to commercial software
- Program based on local needs and conventions
- Risk-based, graded lifecycle approach
- Concepts of SQA and quality control

Elements of DOE O 1330.1D in N 203.1, SQA (cont.)

- Standards, procedures, training
- Systematic reviews, improvement, and self-enforced, external assessments
- Protection of DOE investment in data and software/hardware infrastructure
- Security and safety

Impacts & Cost of N 203.1, SQA

- **Impacts**
 - Increased security and protection of data, reducing penetration of terrorist and virus attacks
 - Better integration with standards, security, and safety management programs
 - Reduced rework and costly changes
 - Improved delivery and product satisfaction
 - Most sites have SQA programs

Impacts & Cost of N 203.1, SQA (cont.)

- Cost
 - Program implementation
 - Sites develop implementation plan -- 90 days
 - PSOs approve -- 120 days
 - Evolve and cost the program for local needs
 - Project implementation, industry rule-of-thumb
 - Typical, 3% to 5% of project cost
 - High-risk, 10 to 20% of project cost

SASG & DNFSB Tech Report

25

- Actions 1 to 5 - Completed or near compl.
- Action 6 - Focus on Safety Software; esp., I&C and safety analysis
- Actions 7 to 11 - Deliverables
 - Toolbox of codes
 - Toolbox of standards
 - Training for the toolbox of codes
 - Procedures for the toolbox of codes; esp., CM, SQA, and ongoing support

CIO / SQAS Collaboration

- SQAS Spring Meeting, April 3-4, 2001
Topic: “SQA Implementations”
- SQAS Work Items
 - SQA Control of Existing Systems
 - Model-based Acceptance of Product
 - Resource Directory of SQA Program Elements
 - SQA of Nuclear Safety Systems

Web Sites

- Departmental Software Quality and Systems Engineering
<http://cio.doe.gov/smp>
- Software Quality Assurance Subcommittee
<http://cio.doe.gov/sqas>