Planning a Combined CMMI and AS9100 Appraisal

SEPG 2008

Kevin Schaaff
Senior Systems Engineer
Northrop Grumman Corporation

Agenda

- **Background**

- **Business Drivers**

- **Comparing CMMI-DEV to SAE AS9100B**

- SCAMPI Method versus ISO/AS Audit Requirements

- Planning the appraisal
  - Appraisal Team Member Training
  - Personnel Selection
  - Personnel Selection Exercise
  - Evidence
  - Interviews
  - Scheduling Exercise
  - Translating the Findings
  - Reporting Results

- Some Actual Results

- Lessons Learned

NORTHROP GRUMMAN

Background

- It is not unusual for companies to develop processes for use across a variety of projects

- These processes can span project lifecycle phases beginning with project inception through manufacturing

- It is not atypical for one process set to need to meet multiple standards

- Organizations spend significant cost and effort auditing and appraising their processes

    - A typical two week SCAMPI A on three projects can easily cost upwards of $80K when you include appraisal team time, project time, org time, Lead Appraiser fees, and logistics

    - A typical AS9100 audit can cost over $25K for a three day audit with similar assumptions

    - Done sequentially and independently the numbers add up fast!!

NORTHROP GRUMMAN

Business Drivers

- **Need to maintain multiple certifications and ratings to either bid or conduct business**

- **Customers want or demand the credentials but not willing to pay**

- **Growing need for more agile and innovative approaches to process improvement**

- **Need to reduce costs and minimize overlaps**

- **Ability to show compliance against various models and standards**
    - CMMI-DEV
    - CMMI-ACQ
    - ISO 9001:2000
    - SAE AS9100B
    - ITIL (Information Technology Infrastructure Library)
    - OPM3 (Organizational Project Management Maturity Model)
    - P-CMM (People Capability Maturity Model)
    - Etc.

NORTHROP GRUMMAN

Comparing CMMI-DEV to SAE AS9100B - 1

- **Model versus Standard**

- **Model**
  - Definition - A model is a representation containing the essential structure of some object or event in the real world.
  - Characteristics
    - Models are necessarily incomplete. Because it is a representation, no model includes every aspect of the real world. If it did, it would no longer be a model
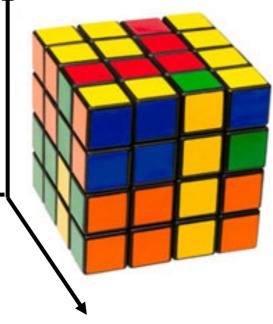
- **Standard**
  - Definition - A basis for comparison; a reference point against which other things can be evaluated
  - Characteristics – A set of requirements

This is NOT about which is better but how the two compliment each other!

NORTHROP GRUMMAN

Comparing CMMI-DEV to SAE AS9100B - 2

- **Before we do a direct comparison, lets consider in general how the two work together**

- **First a couple analogies**

- **Think of your process as a Rubic's Cube with the individual squares representing your various process elements.**

Depth-In how much detail
is the process looked at.

Breadth-How much of the
lifecycle and supporting
infrastructure is covered.

Model/Standard

Comparing CMMI-DEV to SAE AS9100B - 3

- Another way to look at it is consider going to McDonalds. As you enter the parking lot you encounter AS9100 . CMMI kicks in when you order your hamburger

- In general, AS9100 provides breadth, CMMI depth

Comparing CMMI-DEV to SAE AS9100B - 4

- **CMMI Structure**
  - 22 Process Areas
  - Each Process Area is comprised of:
    - Purpose
    - Introductory Notes
    - Related Process Areas
    - Specific Goals
    - Specific Practices
    - Typical Work Products
    - Subpractices
    - Generic Goals
    - Generic Practices
    - Subpractices
    - Generic Practice Elaborations
  - 573 pages (all inclusive)

- **AS9100 Standard Structure**
  - 8 Chapters
  - Each Chapter is comprised of 1-6 Clauses that may be further decomposed to the 4th or 5th level
  - 39 pages (all inclusive)

NORTHROP GRUMMAN

Comparing CMMI-DEV to SAE AS9100B - 5

- **More Detailed CMMI Sample**
  - Requirements Management

    The purpose of Requirements Management (REQM) is to manage the requirements of the project's products and product components and to identify inconsistencies between those requirements and the project's plans and work products.

    - SG 1 Manage Requirements
      - SP 1.1 Obtain an Understanding of Requirements
        - 1. Establish criteria for distinguishing appropriate requirements providers.
        - 2. Establish objective criteria for the evaluation and acceptance of requirements.
        - Lack of evaluation and acceptance criteria often results in inadequate verification, costly rework, or customer rejection.
        - 3. Analyze requirements to ensure that the established criteria are met.
        - 4. Reach an understanding of the requirements with the requirements provider so that the project participants can commit to them.

Comparing CMMI-DEV to SAE AS9100B - 6

- **More Detailed AS9100 Sample**
  - 7 Product Realization
  - 7.1 Planning of Product Realization:

    The organization shall plan and develop the processes needed for product realization. Planning of product realization shall be consistent with the requirements of the other processes of the quality management processes of the quality management system (see 4.1).

    In planning product realization, the organization shall determine the following, as appropriate:

    a) quality objectives and requirements for the product
    b) the need to establish processes, documents, and provide resources specific to the product and the criteria for product acceptance;
    c) required verification, validation, monitoring, inspection and test activities specific to the product and the criteria for product acceptance;
    d) records needed to provide evidence that the realization processes and resulting product meet requirements (see 4.2.4);
    e) *the identification of resources to support operation and maintenance of the product.*

    The output of this planning shall be in a form suitable for the organization's method of operations.

    NOTE 1: A document specifying the processes of the quality management system (including the product realization processes) and the resources to be applied to a specific product, project or contract, can be referred to as a quality plan.

    NOTE 2: The organization…..

NORTHROP GRUMMAN

SAE AS9100B		CMMI PA	CMMI Practice	Comments
4	Quality Management System:			
4.1	General Requirements:			
	Establish QMS	All	GP2.1	
4.1. a)	identify processes	OPD	SP1.1	
4.1. b)	determine sequence and interaction	OPF ALL	SP2.1, SP2.2 GP2.2	
4.1. c)	determine criteria and methods to ensure operation and control of processes are effective	All	GP2.2, GP2.6	
4.1. d)	resources and information necessary to support the operation and monitoring of these processes	All	GP2.3, GP2.8	
4.1. e)	monitor, measure and analyse these processes	All	GP2.8	
4.1. f)	implement actions to achieve planned results and continual improvement	OPF All	SP3.3, SP3.4 GP3.2	
	processes managed using ISO standard	All	GP 2.1	
	Control outsourced processes	SAM	SP1.3, SP2.2	
NOTE	Outsourced process control in QMS	SAM	GP2.2, GP2.3, SP 2.3	

NORTHROP GRUMMAN

CMMI to AS9100 Matching Exercise (15 min)

CMMI	AS9100
GP2.1	4.2.4
OPD SP1.6	4.2.1 d)
SAM GP2.6	4.2.1 a)
CM GP 2.2	4.2.1 f)
OPD SP1.5	4.3
OPF GP2.8	4.1
OPF SP1.1	4.2.3
PP SP2.3	

CMMI to AS9100 Matching Solution

CMMI	AS9100
GP2.1	4.1
OPD SP1.6	4.2.1 f)
SAM GP2.6	4.2.4, 4.2.3
CM GP2.2	4.2.4, 4.3
OPD SP1.5	4.2.1 f)
OPF GP2.8	4.2.1 d)
OPF SP1.1	4.2.1 a)
PP SP2.3	4.2.4

NORTHROP GRUMMAN

Agenda

- **Background**

- **Business Drivers**

- **Comparing CMMI-DEV to SAE AS9100B**

- **SCAMPI Method versus ISO/AS Audit Requirements**

- **Planning the appraisal**
  - Appraisal Team Member Training
  - Personnel Selection
  - Personnel Selection Exercise
  - Evidence
  - Interviews
  - Scheduling Exercise
  - Translating the Findings
  - Reporting Results

- **Some Actual Results**

- **Lessons Learned**

SCAMPI Key Method Requirements

- **Coverage determined by scope (ABC), type (staged vs. continuous), model (CMMI-Dev)**

- **Training**
  - SEI authorized Intro to CMMI course
  - Appraisal Team Member training

- **Personnel**
  - Minimum and Maximum team size depending on SCAMPI type
  - Minimum individual and team experience requirements depending on SCAMPI type

- **Objective Evidence**
  - Direct
  - Indirect
  - Affirmations

- **Performed in accordance with the SCAMPI MDD**

NORTHROP GRUMMAN

AS9100 Key Audit Requirements

- **Coverage determined by scope (size, nature, complexity of organization), type (initial registration, surveillance),**

- **Training**
  - Either AS9100 lead (5 day) or internal auditor (3 day) training
  - Appraisal Team Member training

- **Personnel**
  - Minimum and Maximum team size depends on scope and duration (usually 2 – 4)
  - Individual knowledge and skills selected based on audit plan

- **Evidence Based Approach**
  - Records
  - Statements of Facts
  - Other Verifiable Information

- **Audit Objectives**
  - Evaluate adequacy or intent of documentation to SAE AS9100 Rev B
  - Judge conformity of implementation
  - Determine the effectiveness of a quality management system in meeting requirements

- **Adhere to auditing principles in EN ISO 19011**

NORTHROP GRUMMAN

Similarities between SCAMPI and an AS9100 Audit

- Require a plan

- Require trained and experienced team members

- Work to a detailed schedule

- Review objective evidence

- Conduct interviews

- Provide draft findings

- Provide final findings

- Rate or score the results

- Report results to the sponsor and governing body

Differences between SCAMPI and an AS9100 Audit

- **SCAMPI**
  - Follows a published method
  - Tends to stay with original schedule and scope
  - Appraisal team generally stays in a room
  - Appraisal team uses script for interviews with follow-up questions
  - Appraisal team may follow a thread
  - Results require team consensus
  - Findings guidance clearly defined

- **AS9100**
  - Follows a audit standard
  - Schedule tends to be more fluid
  - Auditors generally walk around
  - Auditor uses standard for guidance and it tends to be more conversational
  - Auditor usually follows a thread
  - Results tend to be auditor dependent, lead mitigates
  - Findings guidance more general

NORTHROP GRUMMAN

Agenda

- **Background**

- **Business Drivers**

- **Comparing CMMI-DEV to SAE AS9100B**

- **SCAMPI Method versus ISO/AS Audit Requirements**

- **Planning the appraisal**
  - Personnel Selection
  - Personnel Selection Exercise
  - Evidence
  - Interviews
  - Developing the Schedule
  - Scheduling Exercise
  - Translating the Findings
  - Reporting Results

- **Some Actual Results**

- **Lessons Learned**

NORTHROP GRUMMAN

SCAMPI Team Selection

- Minimum acceptable team size for a SCAMPI A is four, B is two, C no team required (including the appraisal team leader)

- All team members must have completed the SEI-licensed Introduction to CMMI course

- Team (as a group) must have an average of at least 6/5 years of engineering experience, and total must be at least 25/10 years in each of the disciplines to be covered in the appraisal.

- Team (as a group) must have a total of at least 10/5 years of management experience, and at least one team member must have at least 6/5 years experience as a manager.

- The team must, in aggregate, have representative experience in the (majority of) lifecycles being appraised.

AS9100 Audit Team Selection

- Audit objectives, scope, criteria, and duration

- All team members must have completed either AS9100 lead or internal auditor training

- Identify knowledge and skills necessary to achieve audit objectives

- Select team members to ensure all needed knowledge and skills are represented in the audit team

NORTHROP GRUMMAN

Personnel Selection Exercise (30 min)

- You are planning to conduct a combined SCAMPI B/AS9100 audit of a large organization that produces avionics components. The organization comprises three projects spanning the full systems engineering lifecycle

- The purpose of the SCAMPI is to ensure the three projects are maintaining Maturity Level 5

- The purpose of the AS9100 audit is to ensure readiness for an upcoming surveillance audit

- Pick a team composition of eight that provides the skill set and experience to allow the organization to best accomplish its objectives. There is more than one possible solution set

Personnel Selection Exercise (30 min)

| Person | CMMI Intro | ATM | SCAMP LA | AS9100 Lead | AS9100 Auditor | Project Management | Engineering | | Lifecycle |
							SW Eng	SE Eng	
A	Y	Y			Y	6	9	0	Y
B	Y				Y	3	7	0	Y
C	Y	Y			Y	3	22	0	Y
D	Y	Y				2	10	7	Y
E					Y	12	19	8	Y
F	Y	Y		Y		7	0	0	
G					Y	15	6	8	Y
H	Y	Y		Y		15	21	16	Y
I						9	5	14	Y
J	Y					15	0	0	
K	Y	Y	Y		Y	5	3	0	Y
L	Y	Y			Y	18	23	10	Y
M	Y	Y				0	0	0	Y
N	Y	Y	Y	Y	N	22	8	27	Y
O	Y	Y							Y
P					Y	4	0	10	Y
Q	Y	Y				2	0	0	
R	Y	Y			Y	6	8	0	Y
S	Y	Y			Y	10	20	15	Y
T	Y	Y	Y			13	6	4	Y
U	Y					1			Y
V	Y	Y		Y		3	0	3	Y
W					Y	0	5	0	Y
X	Y					0	0	2	Y
Y	Y	Y		Y		4	0	0	Y
Z	Y	Y			Y	2	5	0	Y

Personnel Selection Solution (More than one possible)

| Person | CMMI Intro | ATM | SCAMP LA | AS9100 Lead | AS9100 Auditor | Project Management | Engineering | | Lifecycle |
							SW Eng	SE Eng	
A	Y	Y			Y	6	9	0	Y
B	Y				Y	3	7	0	Y
C	Y	Y			Y	3	22	0	Y
D	Y	Y				2	10	7	Y
E					Y	12	19	8	Y
F	Y	Y		Y		7	0	0	
G					Y	15	6	8	Y
H	Y	Y		Y		15	21	16	Y
I						9	5	14	Y
J	Y					15	0	0	
K	Y	Y	Y		Y	5	3	0	Y
L	Y	Y			Y	18	23	10	Y
M	Y	Y				0	0	0	Y
N	Y	Y	Y	Y	N	22	8	27	Y
O	Y	Y							Y
P					Y	4	0	10	Y
Q	Y	Y				2	0	0	
R	Y	Y			Y	6	8	0	Y
S	Y	Y			Y	10	20	15	Y
T	Y	Y	Y			13	6	4	Y
U	Y					1			Y
V	Y	Y		Y		3	0	3	Y
W					Y	0	5	0	Y
X	Y					0	0	2	Y
Y	Y	Y		Y		4	0	0	Y
Z	Y	Y			Y	2	5	0	Y

Evidence Requirements

- **SCAMPI**
  - Organized using a Practice Implementation Indicator Description (PIID)
  - Preparation checked during Readiness Review
  - Implementation verified during Appraisal

- **AS9100**
  - Documentation usually reviewed before the on-site period
  - Asked for during interviews
  - Can also be observed activities

Interviews

- **SCAMPI**
  - Interviews conducted in pairs (mini-team) or larger group
  - Usually follow a script
  - Usually conducted in large functional groups
  - Three types (planned, office hours, ad-hoc)
  - Interview result is not disclosed

- **AS9100**
  - Interviews conducted by single auditor
  - Usually initiated by asking interviewees to describe their work
  - Usually conducted in small settings (1-2 people) at work place
  - Auditor summarizes and reviews results with interviewees at end

SCAMPI Method Planning Example

Phase	Process	Purpose	Activities
Plan and Prepare for Appraisal	1.1 Analyze Requirements	Understand the business needs of the organizational unit for which the appraisal is being requested.	1.1.1 Determine Appraisal Objectives 1.1.2 Determine Appraisal Constraints 1.1.3 Determine Appraisal Scope 1.1.4 Determine Outputs 1.1.5 Obtain Commitment to Appraisal Input
	1.2 Develop Appraisal Plan	Document requirements, agreements, estimates, risks, method tailoring, and practice considerations associated with the appraisal. Obtain, record, and make visible the sponsor's approval of the appraisal plan.	1.2.1 Tailor Method 1.2.2 Identify Needed Resources 1.2.3 Determine Cost and Schedule 1.2.4 Plan and Manage Logistics 1.2.5 Document and Manage Risks 1.2.6 Obtain Commitment to Appraisal Plan
	1.3 Select and Prepare Team	Ensure that an experienced, trained, qualified team is available and prepared.	1.3.1 Identify Appraisal Team Leader 1.3.2 Select Team Members 1.3.3 Prepare Team
	1.4 Obtain and Inventory Initial Objective Evidence	Obtain information that facilitates site-specific preparation. Identify potential issue areas, gaps, or risks to aid in refining the plan. Get preliminary understanding of the organizational unit's processes.	1.4.1 Obtain Initial Objective Evidence 1.4.2 Inventory Objective Evidence
	1.5 Prepare for Appraisal Conduct	Plan and document specific data-collection strategies.	1.5.1 Perform Readiness Review 1.5.2 Prepare Data Collection Plan 1.5.3 Replan Data Collection (if needed)

Green: Consistent with AS9100 audit

Red: Not required for AS9100 audit

NORTHROP GRUMMAN

Specific Example: SCAMPI B

- **In progress check**

- **One project all Maturity Level 5 project specific PAs**

- **Appraisal team size of five**

- **Five days allotted for SCAMPI**

NORTHROP GRUMMAN

SCAMPI B Example Schedule

Time (local)	Monday 17-Mar-08	Tuesday 18-Mar-08	Wednesday 19-Mar-08	Wednesday 20-Mar-08	Thursday 21-Mar-08	Time (local)
0800	On-Site Training	Team Meeting	Team Meeting	Team Meeting	Team Meeting	0800
0815						0815
0830		Evidence Review *Appraisal team*	Interview REQM/MA	Consolidation *Appraisal Team*	Collect/Review Evidence	0830
0845						0845
0900					Draft Final Findings in Mini-Teams (all evidence due 0900)	0900
0915						0915
0930			Interview RD/TS/PI			0930
0945						0945
1000	Opening Briefing				Review Final Findings as a TEAM	1000
1015						1015
1030						1030
1045	Interview PM Brief					1045
1100			Interview RSKM/DAR			1100
1115						1115
1130						1130
1145						1145
1200	Working Lunch *Appraisal Team*	Working Lunch *Appraisal Team*	Working Lunch *Appraisal Team*	Working Lunch *Appraisal Team*	Working Lunch *Appraisal Team*	1200
1215						1215
1230						1230
1245						1245
1300	Evidence Review *Appraisal team*	Evidence Review *Appraisal team*	Interview PPQA/CM	Consolidation Appraisal Team	Final Findings	1300
1315						1315
1330						1330
1345						1345
1400					Final Team Activities *(if needed)*	1400
1415						1415
1430			Interview QPM/CAR	Prepare Draft Findings Brief		1430
1445						1445
1500						1500
1515						1515
1530		Interview PP/PMC/SAM/ IPM				1530
1545						1545
1600			Consolidation Mini-teams			1600
1615						1615
1630				Draft Findings Presentation		1630
1645						1645
1700		Evidence Review *Appraisal team*				1700
1715						1715
1730						1730
1745						1745

28

Specific Example: Surveillance Audit

- **Three auditors**

- **Three tracks**

- **Preparing for a surveillance audit**

Day 1 — Key AS9100 Clauses

Day 1 Time	Site	Track 1 (Auditor A)	Track 2 (Auditor B)	Track 3 (Auditor C)	Reserved conference	Track 1	Track 2	Track 3
0830 - 0900	A	Assessors arrive, badge in, coordination			X			
0900 - 0930		Opening Meeting - In-briefs (Org, Audit Team)						
0930 - 1000	Project	Project In-Brief						
1000 - 1030 / 1030 - 1100	A	Production Documentation	Security	Control of Work Transfer		7.5.1.1	6.3	7.5.1.4
1100 - 1130 / 1130 - 1200		Previous Findings Review	Quality Policy & Planning; Quality Objectives; Responsibility, Authority and Communication	PRA		8.2.2	5.3, 5.4, 5.4.1, 5.4.2, 5.5, 5.5.1, 5.5.2, 5.5.3	5.6
1200 - 1230 / 1230 - 1300		Lunch						
1300 - 1330 / 1330 - 1400		Control of Documents & Control of Records	Management Commitment / Provsion of Resources	Production and Service Provision		4.2.3, 4.2.4	5.1 / 6.1	7.5, 7.5.1, 7.5.1.1, 7.5.1.2, 7.5.1.3, 7.5.1.4, 7.5.1.5
1400 - 1430 / 1430 - 1500		Customer Related Processes	Management Review	Circuit Card Assembly & Design		7.2, 7.2.1, 7.2.2, 7.2.3	5.6, 5.6.1, 5.6.2, 5.6.3	7.3.2, 7.3.3, 7.3.4
1500 - 1530 / 1530 - 1600		Planning of Product Realization	Software CM	Infrastructure		7.1	4.3	6.3
1600 - 1630 / 1630 - 1700		Daily Debrief						

Day 2 — Key AS9100 Clauses

Day 2 Time	Site	Track 1 (Auditor A)	Track 2 (Auditor B)	Track 3 (Auditor C)	Reserved conference	Track 1	Track 2	Track 3
0800 - 0830	A	Assessors arrive, badge in, coordination			B			
0830 - 0900 / 0900 - 0930		Human Resources & Training	Control of Documents & Control of Records	Customer Property		6.4	4.2.3, 4.2.4	7.5.4
0930 - 1000 / 1000 - 1030		Verification of Purchased Product	Kitting Process & Stores	Contorl of Monitoring and Measuring Devices		7.4.1, 7.4.3	6.3, 7.5.1	7.6
1030 - 1100 / 1100 - 1130		Preservation of Product	Contracts	H/W Design and Development		7.5.5, 7.5.1	7.4	7.3, 7.3.1, 7.3.2, 7.3.3, 7.3.4, 7.3.5, 7.3.7
1130 - 1200		Control of Non-conforming Product	Continuous Improvement	Continuous Improvement		8.3	8.5.1	8.5.3
1200 - 1230 / 1230 - 1300		Lunch						
1300 - 1330 / 1330 - 1400		Manufacturing	Customer Focus, Customer Satisfaction	Health and Safety & Work Environment		6.2, 6.2.1, 6.2.2	5.2, 8.2.1	6.3, 6.4
1400 - 1430		Corrective Action	Receiving & Inspection	IT Back-up and Recovery		8.5.2	6.3	6.3
1430 - 1500		Preventive Action - Risk Management		First Article Inspection		8.5.3		8.2.4.2
1500 - 1530 / 1530 - 1600		Final Presentation Preparation						
1600 - 1630 / 1630 - 1700		Final Closing Meeting						

Combined Planning Exercise (45 min)

- **Using the previous information provided for the sample SCAMPI and AS9100 Assessments develop a possible schedule**

- **Team size is eight**

- **Five days are allocated for the assessment**

NORTHROP GRUMMAN

Time (local)	17-Mar-08	18-Mar-08	18-Mar-08	18-Mar-08	19-Mar-08	19-Mar-08	19-Mar-08	20-Mar-08	21-Mar-08	Time (local)	Track 1	Track 2	Track 3	Track 1	Track 2	Track 3
0800	On-Site Training	Team Meeting Track 1	Team Meeting Track 2	Team Meeting Track 3	Team Meeting Track 1	Team Meeting Track 2	Team Meeting Track 3	Team Meeting	Team Meeting	0800						
0815										0815						
0830		Evidence Review Appraisal team	Evidence Review Appraisal team	Evidence Review Appraisal team	Customer Related Processes REQM/RD/RSKM	Purchasing SAM	Continual Improvement	Consolidation Appraisal Team	Collect/Review Evidence	0830				7.2	7.4	8.5.1
0845										0845						
0900							Quality Policy & Planning		Draft Final Findings in Mini-Teams	0900						5.3, 5.4
0915										0915						
0930					Design and Development TS/PI	Measurement MA	Control of Nonconforming Product			0930				7.3.1, 7.3.2, 7.3.3	8.1, 8.2.1, 8.2.3, 8.2.4, 8.4	
0945	Opening Briefing ATL/Org								Review Final Findings Appraisal Team	0945						8.3
1000										1000						
1015										1015						
1030						Production and Servicing	Customer Property			1030					7.5.1, 7.5.1.1, 7.5.1.2, 7.5.1.3, 7.5.1.4	7.5.4
1045	PM Brief IPM/PP/PMC									1045						
1100					Planning of Product Realization GP2.2					1100				7.1		
1115							Preservation of Product			1115						7.5.5
1130										1130						
1145										1145						
1200	Working Lunch Appraisal Team	Working Lunch Appraisal Team	Working Lunch Appraisal Team	Working Lunch Appraisal Team	Working Lunch Appraisal Team	Working Lunch Appraisal Team	Working Lunch Appraisal Team	Working Lunch Appraisal Team	Working Lunch Appraisal Team	1200						
1215										1215						
1230										1230						
1245										1245						
1300	Evidence Review Appraisal team	Evidence Review Appraisal team	Evidence Review Appraisal team	Evidence Review Appraisal team	Management Commitment GP2.4	Verification and Validation VER/VAL/CM	First Article Inspection PPQA	Consolidation Appraisal Team	Prepare Final Findings Brief	1300				5.1, 5.2, 5.3, 5.4, 5.5	7.3.5, 7.3.6, 7.3.7	8.2.4.1, 8.2.4.2
1315										1315						
1330										1330						
1345										1345						
1400					Management Review GP2.10	Control of Service Documentation and Special Processes	Control of Monitoring and Measuring Devices			1400				5.6	7.5.1.5, 7.5.2	7.6
1415								Prepare Draft Findings Brief		1415						
1430										1430						
1445										1445						
1500		Human Resources & Training GP2.5	Document & Records Control CM/GP2.6	Customer Property SAM	QPM/CAR/DAR	Identification and Traceability	Internal Audit PPQA/GP2.9		Final Findings	1500	6.4	4.2.3, 4.2.4, 4.3	7.5.4		7.5.3	8.2.2
1515										1515						
1530										1530						
1545										1545						
1600		Consolidation Mini-teams	Consolidation Mini-teams	Consolidation Mini-teams	Consolidation Mini-teams	Consolidation Mini-teams	Consolidation Mini-teams		Final Team Activities (if needed)	1600						
1615										1615						
1630								Draft Findings Presentation		1630						
1645										1645						
1700										1700						
1715										1715						
1730		Draft Findings	Draft Findings	Draft Findings	Draft Findings	Draft Findings	Draft Findings			1730						
1745										1745						
1800										1800						
1815										1815						

How it works

- **Use parallel interviewing, mini-team lead should also be AS9100 auditor for dual coverage**

- **Modify PIIDs to include supplemental information from Quality Management System**

- **Conduct more interviews with smaller groups**

- **Team walks the process**

- **Conduct multiple draft findings sessions give both result sets**

- **Requires more discussion between mini-teams sooner**

NORTHROP GRUMMAN

Translating the Findings

- **Not an exact science**

- **Team Lead, Sponsor, and Organization must agree prior to appraisal**

- **Team must understand the rating system**

- **No correlation of "Not Yet" within AS9100**

- **AS9100 findings do not roll up to an Organizational Characterization, they are a total score, functionals plus projects, no goal rating**

SCAMPI A	SCAMPI B/C	AS9100
NI/PI	High	Major
LI	Medium	Minor
FI	Low	Sat
NY	NY	N/A
NR	NR	N/E
OFI	OFI	OFI

OFI – Opportunity for Improvement is not a finding/characterization in either system. It is a recommendation

NORTHROP GRUMMAN

34

Characterizing Practice Implementation

Fully Implemented (FI)	▪ **Direct artifacts present and adequate** ▪ **Supported by indirect artifact and/or affirmation** ▪ **No weaknesses noted**
Largely Implemented (LI)	▪ **Direct artifacts present and adequate** ▪ **Supported by indirect artifact and/or affirmation** ▪ **One or more weaknesses noted**
Partially Implemented (PI)	▪ **Direct artifacts absent or judged inadequate** ▪ **Artifacts or affirmations indicate some aspects of the practice are implemented** ▪ **One or more weaknesses noted** **OR** ▪ **Direct artifacts present and adequate** ▪ **No other evidence supports direct artifacts** ▪ **One or more weaknesses noted**
Not Implemented (NI)	▪ **Direct artifacts absent or judged inadequate** ▪ **No other evidence supports the practice** ▪ **One or more weaknesses noted**
Not Yet (NY)	▪ **Project has not yet reached the stage in lifecycle**

NORTHROP GRUMMAN

SCAMPI B/C Characterizations

Label	Meaning
High	**The intent of the model practice is judged absent, or inadequately addressed in the approach – goal achievement is judged unlikely because of this absence or inadequacy.**
Medium	**The intent of the model practice is judged to be partially addressed in the approach – and only limited support for goal achievement is evident.**
Low	**The intent of the model practice is judged to be adequately addressed in the set of practices (planned or deployed) – in a manner that supports achievement of the goal in the given process context.**

NORTHROP GRUMMAN

Finding Categories

Severity	Description
Major	▪ Absence of or system failure against a requirement of the standard ▪ Failure to comply with an element of the quality system, causing significant risk of product failure ▪ A pattern of minor nonconformities, when combined represents a symptom of a system failure
Minor	▪ An isolated failure to comply with a procedure or a requirement of the standard, and which has not caused nor significantly increases the risk of product/service defects
Observation	▪ Meets the standard but there is a potential problem
Satisfactory	▪ Meets requirement of the standard
Opportunity For Improvement	▪ Meets the standard but there is an opportunity for improvement

SCAMPI Results

Practice	L2REQM	L2PP	L2PMC	L2SAM	L2MA	L2PPQA	L2CM	L3RD	L3TS	L3PI	L3Ver	L3Val	L3OPF	L3OPD	L3OT	L3IPM	L3RSKM	L3DAR	L4QPM	L4OPP	L5CAR	L5OID
SP 1.1	G	G	Y	R	Y	G	G	G	G	G	R	R				G	G	G	NY		NY	
SP 1.2	NY	G	Y	R	Y	G	G	G	G	Y	NY	R				G	G	G	NY		NY	
SP 1.3	NY	G	G	R	R		NY			Y	NY	R				G	G	G	NY			
SP 1.4	NY	G	R		Y											G		G	NY			
SP 1.5	NY		Y													R		G				
SP 1.6			Y													G		G				
SP 1.7			G																			
SP 2.1		G	Y	R	NY	G	G	G	NY	Y	NY	NY				Y	G		NY		NY	
SP 2.2		G	Y	R	NY	G	G	G	NY	R	NY	NY				G	Y		NY		NY	
SP 2.3		Y	Y	R	NY			G	NY		NY					R			NY		NY	
SP 2.4		G		R	NY				R										NY			
SP 2.5		G		R																		
SP 2.6		G																				
SP 2.7		G																				
SP 3.1		G					G	G	NY	NY	NY					G	R					
SP 3.2		NY					NY	G	NY	NY	NY					Y	Y					
SP 3.3		G						G		NY						R						
SP 3.4								G		NY						Y						
SP 3.5								G								Y						
GP 2.1	G	G	G	G	G	G	G	G	G	G	G	G				G	G	G	G		G	
GP 2.2	G	G	G	G	G	Y	G	G	G	G	G	G				G	G	G	Y		G	
GP 2.3	G	G	G	G	G	G	G	G	G	G	G	G				G	G	G	Y		G	
GP 2.4	G	G	G	G	G	G	G	G	G	G	G	G				G	G	G	G		G	
GP 2.5	G	G	G	G	G	G	G	G	G	G	G	G				G	G	G	R		R	
GP 2.6	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y				Y	Y	Y	Y		Y	
GP 2.7	Y	Y	Y	NY	NY	G	G	Y	NY	NY	NY	Y				Y	Y	G	Y		Y	
GP 2.8	G	Y	Y	NY	NY	G	G	Y	NY	NY	NY	Y				Y	Y	R	NY		NY	
GP 2.9	NY	G	NY	NY	NY	NY	NY	NY	NY	NY	NY	NY				G	NY	NY	NY		NY	
GP 2.10	G	G	G	NY	G	G	NY	G	NY	NY	NY	NY				G	G	NY	NY		NY	
GP 3.1	G	G	G	G	G	G	G	G	G	G	G	G				G	G	G	G		G	
GP 3.2	NY	NY	NY	NY	NY	NY	NY	NY	NY	NY	NY	NY				NY	NY	NY	NY		NY	

Sample Assessment Report Summary

Elements	Result				CAR Number
	S	Ma	Mi	N/A	
4 – Quality Management System					
4.1 General Requirements	X				
4.2 Documentation Requirements			X		1209
4.3 Configuration Management		X			1210

NORTHROP GRUMMAN

Lessons Learned

- **Need to get management buy-in early**

- **To conduct a combined appraisal requires a greater skill level by the team lead initially**

- **Initially finding qualified people can be challenging**

- **Interviewers require greater knowledge of the model and standard**

- **Need to understand how to correlate and reconcile the findings**

- **To keep it simple for users present results in respective formats**

- **TIME MANAGEMENT IS CRITICAL!**

NORTHROP GRUMMAN

Summary

- **Combined appraisals are possible**

- **Success requires management understanding and support**

- **Significant cost savings can result**

- **Initially requires a more experienced team**

- **Team member selection is critical**

- **Either need two leads on the team or the team lead needs to be both SCAMPI LA and AS9100 Lead Auditor qualified**

- **Organization will gain improved understanding of their processes**

Contact Information

Kevin Schaaff, PMP, CSQE

Northrop Grumman

Corporation

(703) 803-5945

kevin.schaaff@ngc.com

NORTHROP GRUMMAN