Redefining QA’s Role in Process Compliance

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Company overview
The Role of QA
The Business Changes
Effects on Quality Engineers
Effects on Projects
Effects on the Organization
Wrap-up
Communications
Innovation: What We Do...

Aviation electronics

Space and ground satellite communications systems

Communications and information networks

Intelligence, surveillance, and reconnaissance

Operations and support services

We innovate, integrate, and manage technology.
QA has existed because of the need for auditing, inspection, and reporting

Historically in our organization QA was viewed as a "police force"
• Find a problem
• Write it up
• Walk away!

Seen as auditors who would come in and point out everything that was wrong

The role of QA typically carried a negative connotation
Å Foundation of QA was in HW and manufacturing operations

Å Assuring that standards and procedures are established

Å Evaluating the adherence to product standards, processes, and procedures
  ï End-line inspections
  ï Audits

Å Product focused
Software Quality Assurance (SQA) evolved from the HW model

Different standards, processes, and products

Different set of skills needed

Process monitoring
Product evaluation
Process evaluations/audits

Shifted a little towards a process focus

Still a major emphasis on inspecting quality into the product

Distinct roles and functions for HW and SW Quality Engineers emerged
Industry models were adopted by our organization
- SW-CMM
- ISO-9000
- Lean Initiatives
- AS-9100
- CMMI®

More focus on building quality into the process instead of inspecting it in at the end
- QA focus on prevention of problems, not just identifying them

Our way of doing business had to change
- Stovepipe mentality no longer acceptable
- Integrated processes must be the norm
What is a Process?

- Tasks
- Activities
- Procedures
- Inputs
- Outputs
- Plan
- Budget
- Schedule
- Roles
- Measures
- Corrective Action
- Monitor
- Exit Criteria
- Verifications / Reviews / QA
- Training
- Examples
- Metrics
- Reporting
- Templates
- Assets
- Historical Data
- Standard Process
- Entry Criteria
- Exit Criteria
- Reporting
- Training
- Verification / Reviews / QA
- Measures CM
- Assured Communications
- SEI Partner
- NDIA CMMI Conference - 8
  12-15 November 2007
Redefining QA's Role in Process Compliance

- Organizational-centric set of integrated processes
  - Integrated Process Manual (IPM)
  - Compliance mapping to CMMI®
- Collaboration across functional organizations
- Repeatable processes with objective criteria
  - Entry/exit criteria, inputs, outputs, verification, measures
- Planning each process, and tracking against plan
  - Tailoring standard processes and assets
- Budgets, schedules, resources
- Managing Stakeholder involvement
- Measuring progress and improvement
Documented Evidence í Every Qualifying Program
Evidence for all activities & products of each integrated process as each is performed
Verified by QA on frequent basis per an audit plan that aligns with program’s execution schedule
IPM compliance metric derived from PCM tool
Monitored throughout execution by program & division management
Periodic program metric meetings
Compliance reported at Monthly Program Reviews
Systemic issues reported at quarterly Quality System Management Reviews (QSMR) with division staff
Integrated Process Structure

Integrated Process Manual (IPM)

Program Management Processes
- Program Planning
- Estimation
- Program Monitoring and Control
- Supplier Acquisition & Management
- Change Management

Program Life-Cycle Processes
- Requirements Analysis
- System Architecting/Design
- Design
- Code and Unit Test
- Fabrication and Assembly
- Product Integration
- Verification
- Validation
- Production
- Field Support

Program Support Processes
- Requirements Management
- Risk Management
- Configuration and Data Management
- Program Metrics
- Decision Analysis and Resolution
- Work Product Inspections
- Design Review
- Quality Assurance
- Integrated Logistics Support

Organizational Processes
- Process Improvement
- Training
- Division Metrics

Program

Division

Redefining QA’s Role in Process Compliance
In keeping with the "integrated" aspect of CMMI®, the role of Quality Assurance has been redefined to encompass all of these integrated processes.

Quality engineers are moving away from end-line inspection and audit:
- More of an upfront, cross-functional, and consultative role
- Not strictly manufacturing- and product-based
- More business- and process-based

QA provides an active and visible independent check and balance:
- Ensure products and services are of the highest quality and create customer value
**Integrated view has blurred the distinction between HW QEs and SW QEs allowing for more consistency across programs**

**More enabled to be "organizational agents of change"**

**QEs need to have a comprehensive understanding of all facets of the business rather than a limited understanding of one area**
Quality Engineer’s responsibility has expanded beyond the engineering activities.

QE is not expected to be an expert in every area but they are expected to help focus on effective and repeatable process practices.

QEs conduct Integrated Process audits that span all of the IPM processes for each program:

- Determines program process compliance to the IPM
- Process Compliance Monitor (PCM) tool used as the audit checklist
- Compliance scores are entered into the PCM tool as the audit is performed
- Process compliance automatically reported monthly to management
QA's ability to influence and impact key decisions on the teams they support is no longer based on the old view of the "police force".

Better "connection" between the project and the Quality Engineer:
- Breaking out of the stovepipe mentality
- Stronger, more effective customer relationships (both internal and external)

Desire to be a "team player," to "fit in," to "not cause any waves" cannot take precedence over "doing the right thing."
Process compliance has become a high priority for the programs.

Program is not surprised by QA audits:
- Processes to be audited are well known
- Expected evidence from performing the process is defined by the program
## Overview
A brief description of the process intent

## Entry Criteria
State, Prerequisites, Criteria

## Exit Criteria
State, Criteria

## Inputs
Needed work products, resources

## Outputs
Resulting work products

## Required Activities
Mandatory tasks to implement the process

## Measures
Process performance against plans

## Organizational Improvement Information
Metrics, reusable work products

## Verification
Process compliance oversight

## Tailoring Guidance
Approved tailoring, process specific

## Implementation Guidance
Common implementation descriptions

## Supporting Documentation and Assets
Applicable organizational references

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**Program evidence needed to demonstrate IPM process compliance**
Redefining QA’s Role in Process Compliance

1. Program Plans
2. Program process baseline
3. Program execution
4. Compliance artifacts
5. QA verification
6. Non-compliance mitigation

Integrated Process Manual

Tailoring

Program Start-up

Program Phase Execution

Program Appraisals

Process Compliance Monitor (PCM)
Management at all levels now has insight into process compliance as determined by QA at any time

PCM Tool provides capability to roll up the data at multiple levels – program, product line, business unit, group, division

Systemic compliance issues are easily identified across multiple levels

QA Management provides a monthly report and analysis of the compliance issues and top process issues
Redefining QA's Role in Process Compliance

Program compliance view

A
- Represents overall process compliance score for program
- Based on lowest color score, harsh, but in keeping with CMMI standards

B
- Depicts scoring distribution over all process items
- More insight on overall project score

C
- Depicts score for each process executed or being executed by this program
- 3 columns identify types of processes

[EXAMPLE PROJECT]
Baseline Revision: 30
IPM Version: IPM v6

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• The QA role has been significantly redefined in our organization
• Transitioning to be less focused on end products and inspections
• More focused on integrated processes and process compliance
• Paradigm is shifting from a "reactive detection" model to a "proactive predictive" model
• Teams are leveraging QA and using them to help improve their processes
Some things have remained unchanged

- Customers (internal and external) still depend on and expect QA to have the courage and integrity to make the hard decisions that support "doing the right thing."
- QA retains its organizational independence to allow them to identify non-compliances and recommend corrective actions.

Overall the redefined role has had a positive impact for the Quality Engineers, our programs, and the organization as a whole.
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Questions???