

Improvement of Management Assurance System Processes using Six Sigma Plus Methodologies

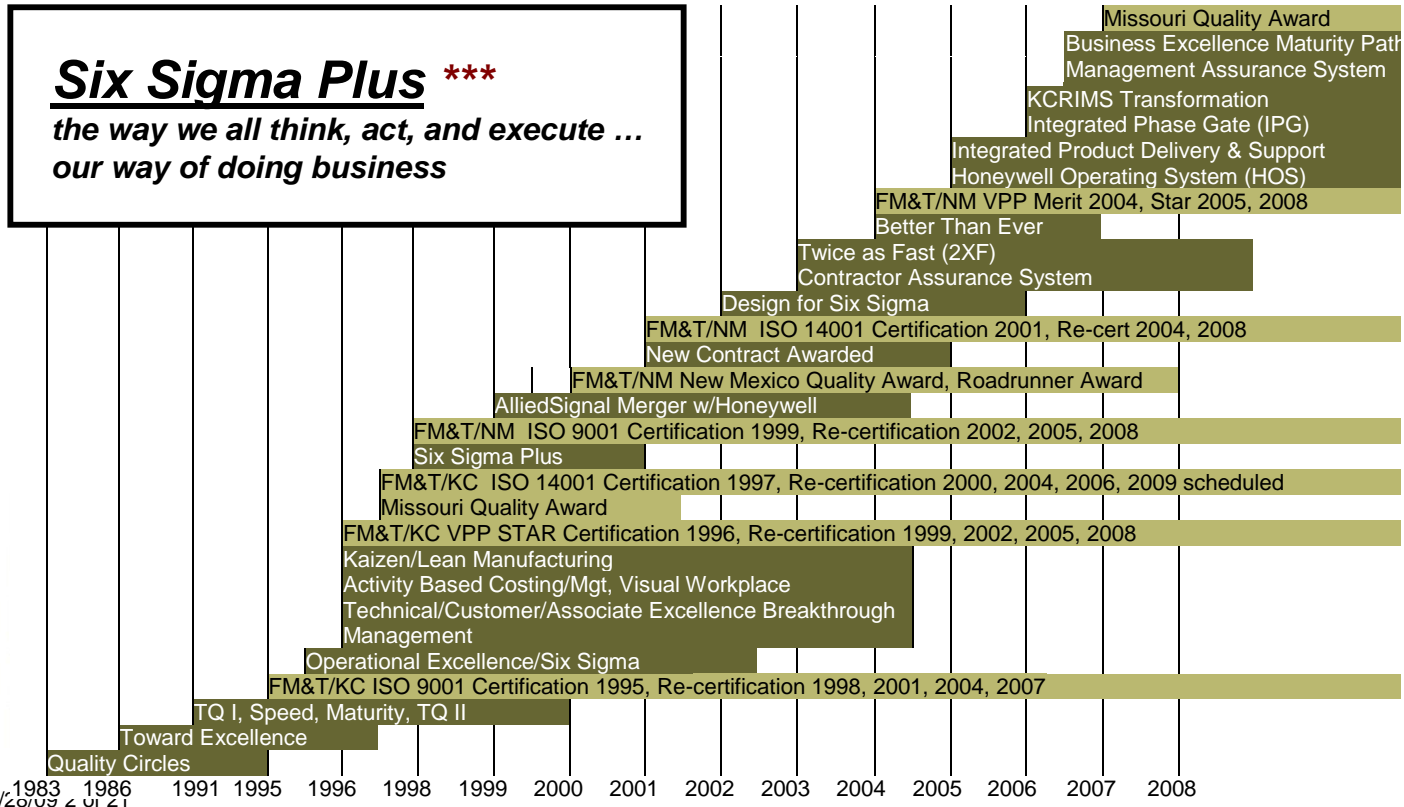
Jane Fitzpatrick
Director, Quality
Honeywell FM&T
November 4, 2009



Continuous Improvement

- Continuous improvement is a cultural element of work at FM&T and began formally in 1983.
- Use of Six Sigma Plus (Lean and Six Sigma) has been institutionalized since the 90's

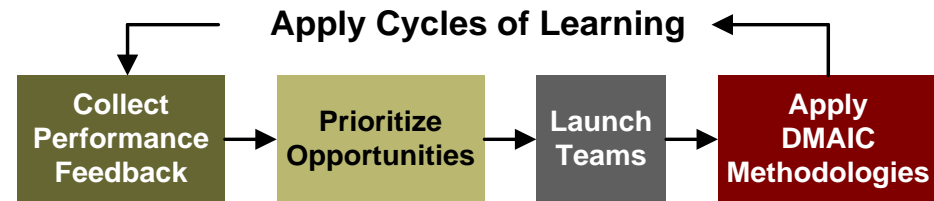
Figure P.2.c-3 FM&T's Continuous Improvement Journey***



Process Management

- FM&T primarily designs, innovates, and implements its overall work systems and work processes utilizing the Six Sigma Plus Continuous Improvement Model (SSP CIM) and deploys them through a formal ISO 9001 Quality Management System in Command Media
- The SSP CIM requires that FM&T systematically approach improvement projects with the logical DMAIC methodology.
 - *Define* the customer-critical parameters
 - *Measure* how the process performs
 - *Analyze* the causes of problems
 - *Improve* the process to reduce defects and variations
 - *Control* the process to ensure continued and improved performance.

SSP Continuous Improvement Model

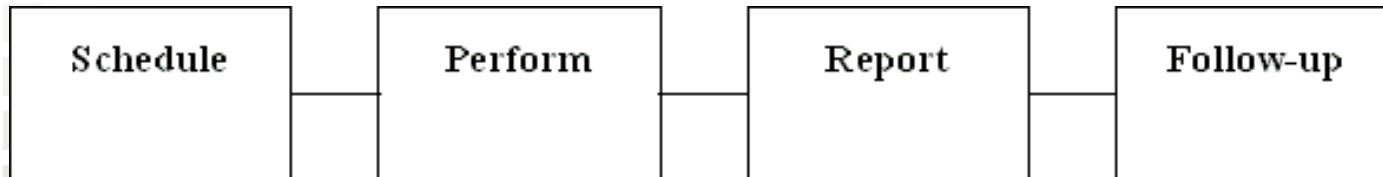


FM&T Command Media System



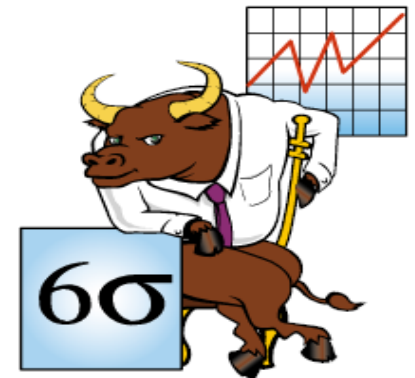
Internal Audit and Self Assessment

- **Process Description 6.61 Internal Audit**
- **Primary method of Internal Audit and Self Assessment for MAS**
 - **Other methods include:**
 - **Management Operating System (MOS) activities**
 - **Scorecards**
 - **Application of Six Sigma methodologies**
 - **Internal peer reviews**
- **Operating Requirements: 10 CFR 830; ISO 9001:2000; ISO 14001:2004; QC-1, Revision 10; QA-5; DOE O 414.1C Attachment 2, Section 4“**



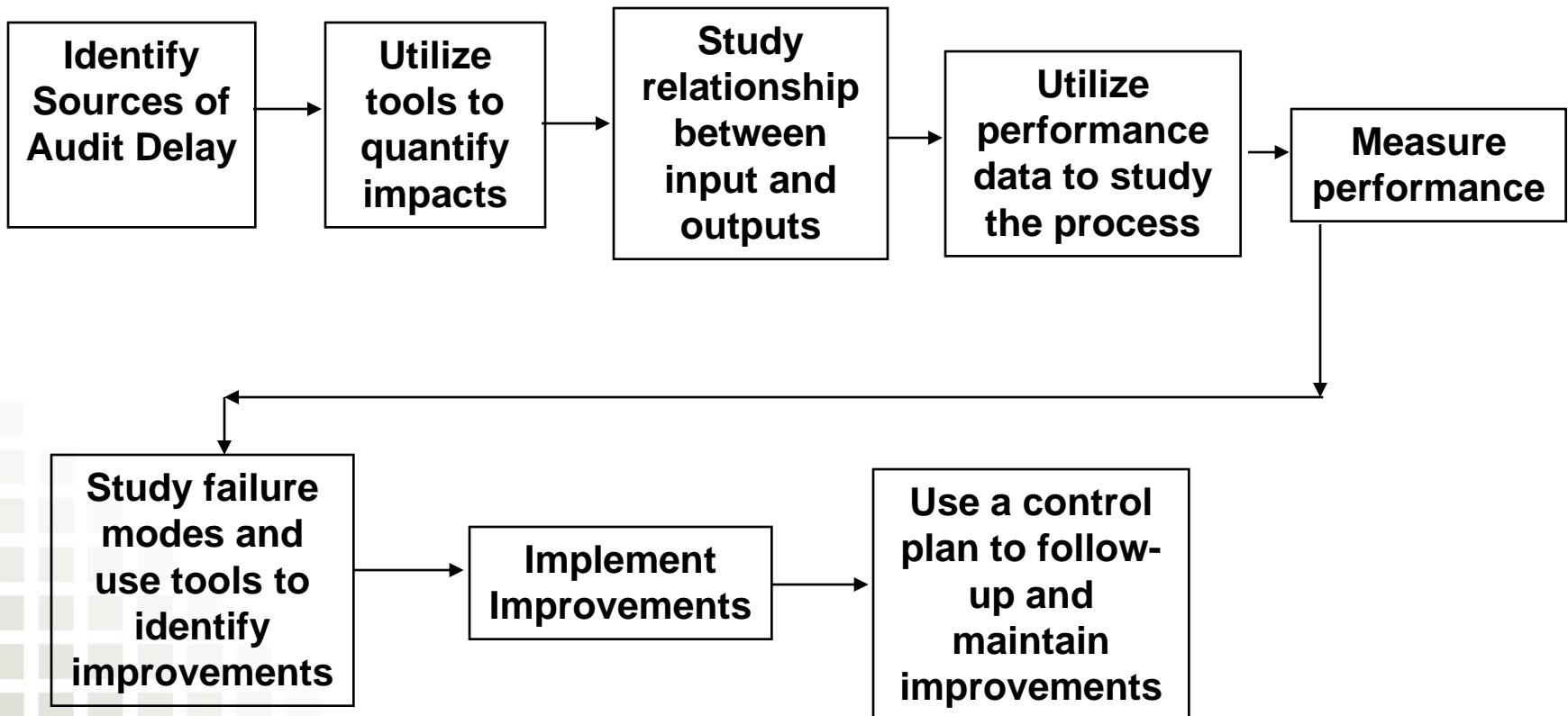
Define – Problem Statement

- Maintain Audit coverage and performance with reduced staff (Functional Transformation Initiative, KCRIMS)
 - Stretch goal to achieve efficiency improvement equivalent to \$100k (1 FTE)
- Maintain ISO 9001 and 14001 certifications
- Maintain audit quality (MAS support)
- Black Belt
 - Steve Mandl, Manager Quality Audits



Define

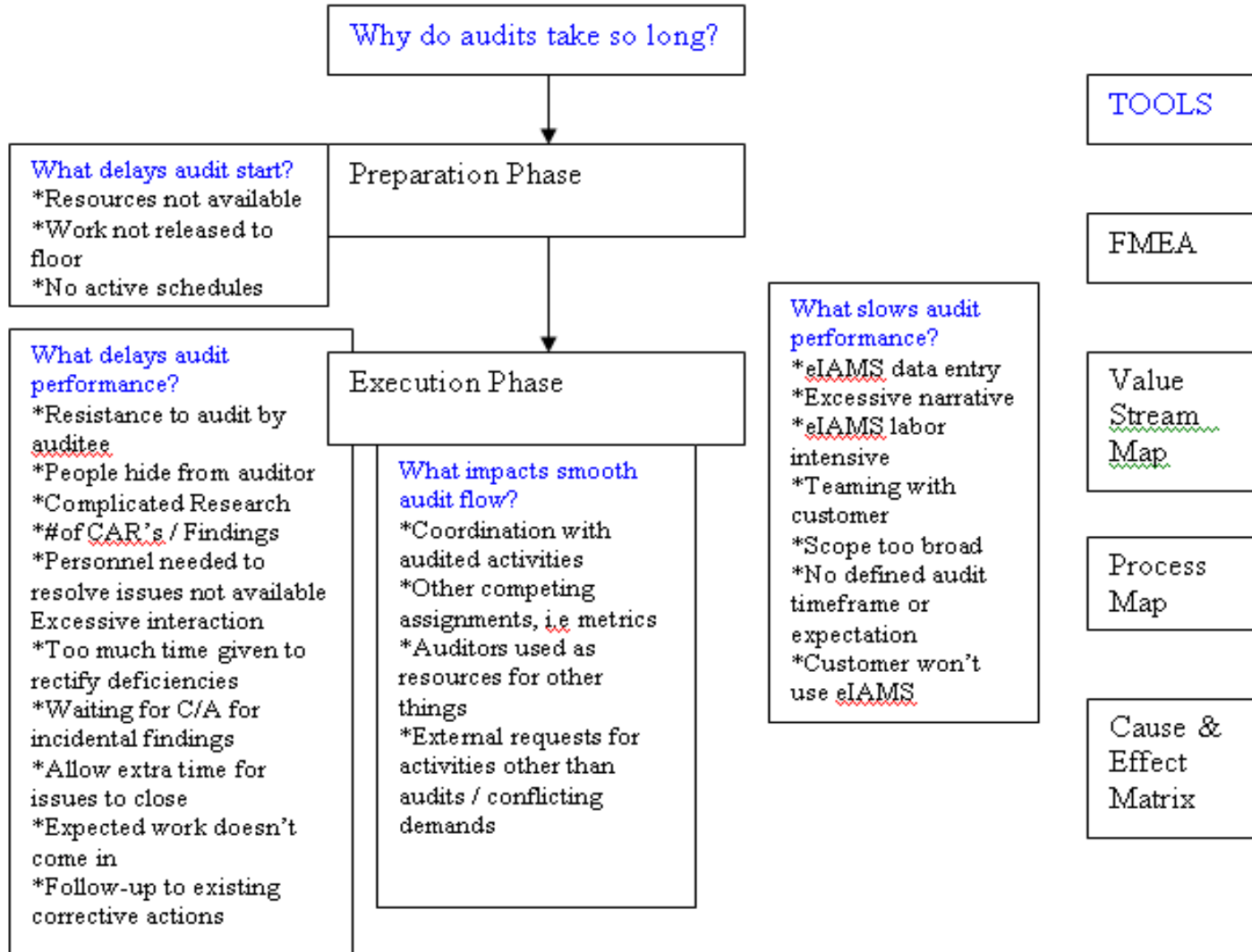
High Level Project Map



Application of SSP Methodologies

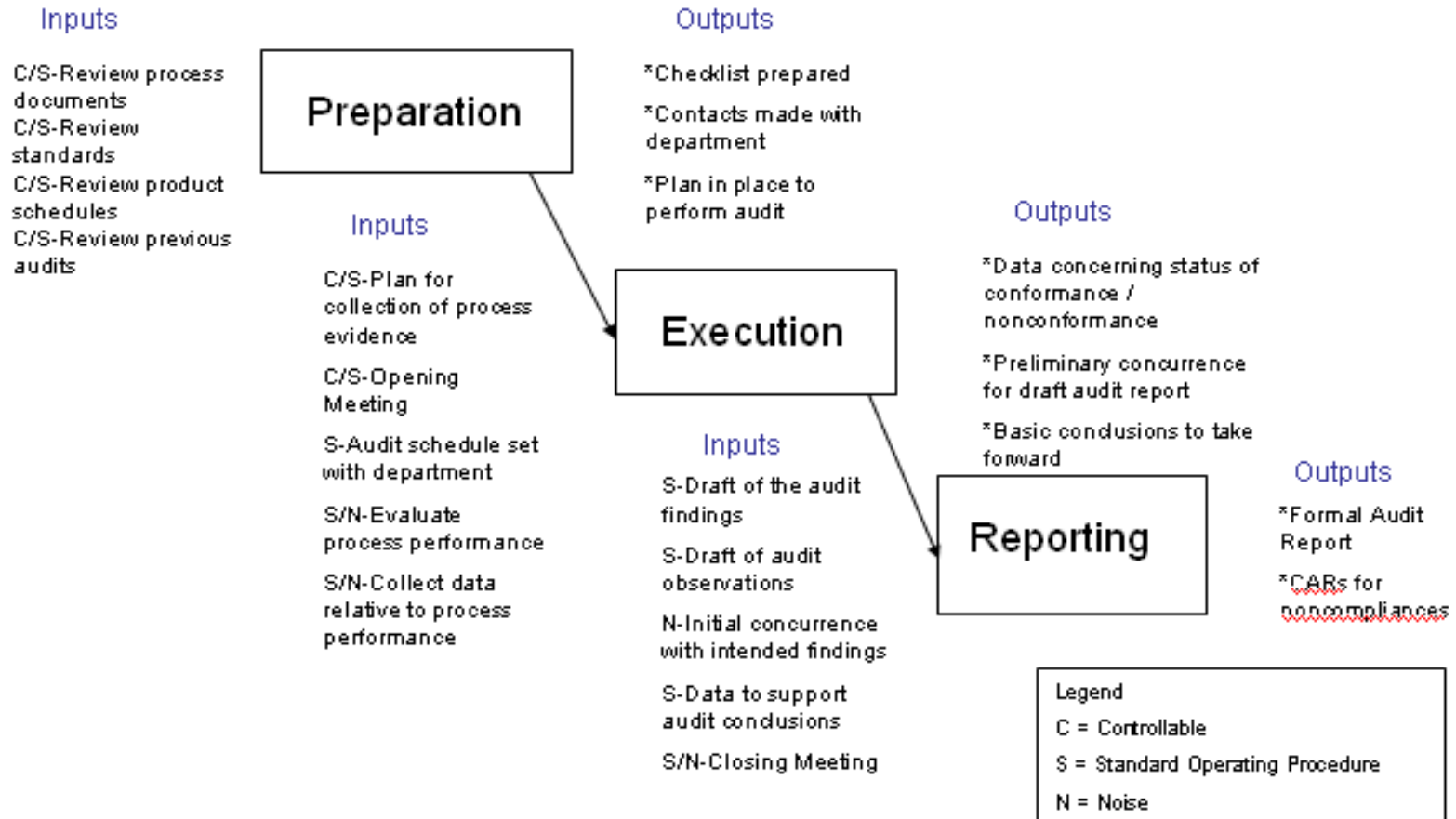
- Thought process map
 - Identified process steps for further evaluation
 - Brainstormed a list of key obstacles to timely audit conclusion
- Process map
 - Identified key process inputs and outputs
- Cause/effect diagram
 - Identified key customer expectations
 - Identified key contributors to audit inefficiency and the relationship between them
- FMEA
 - Used the FMEA to identify key process steps to work
- Control Plan
 - To measure and sustain gains

Measure – Thought Map



Measure – Process Map

Process Map



Analyze - FMEA

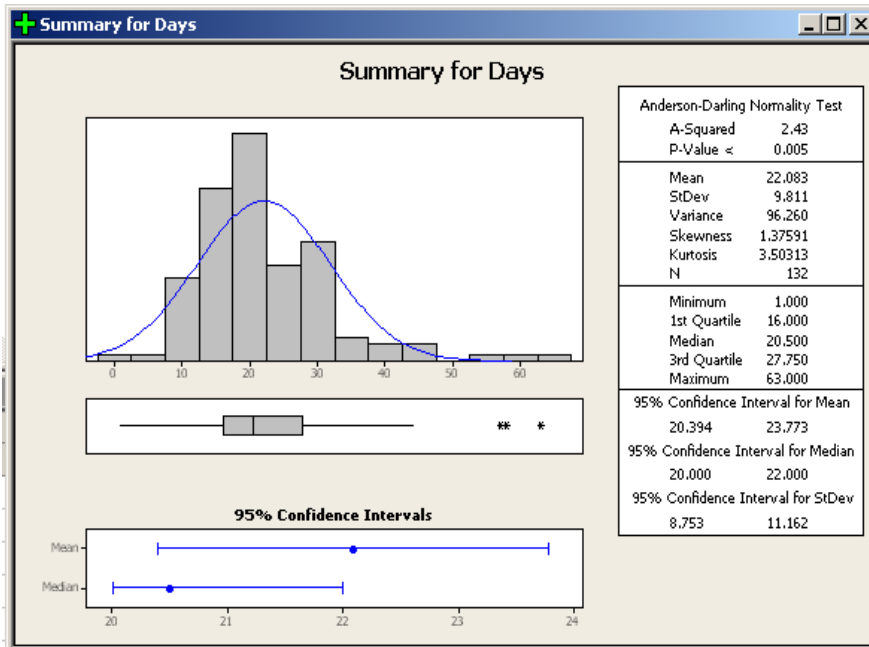
Process Step/Input	Potential Failure Mode	Potential Failure Effects	S E V	Potential Causes	O C C	Current Controls	D E T	R P N
Execution	Other competing assignments of the auditor	Interrupts audit flow / adds additional time to complete the audit	9	Competing business needs / wants interfere with audit	7	Manager to run interference, auditor can manage to some degree	9	567
Reporting	No defined audit timeframe or expectation	No driver to delineate what constitutes timely completion	7	Performance measured at aggregate not individual audit level	9	None at this level.	9	567
Reporting	Variety of department size affects audit time	Not clear what is the audit focus and extends/wastes audit time	7	Large departments, multiple processes, potential issues in associated areas	7	Auditor	9	441
Execution	Expected work doesn't come in	Can slow or stop the performance of the audit	9	Forget to contact auditor, priorities, just don't call auditor,	5	None	9	405
Reporting	Teaming with the customer	Adds audit time and lose control of audit timeliness	9	Differing expectations regarding expectations for timeliness- not leader	5	Auditor has limited control - attempt to set limits	9	405
Execution	Complicated topic - research	Slow research - lot of reading and investigation	7	Topic has numerous threads	7	None	5	245

Analyze

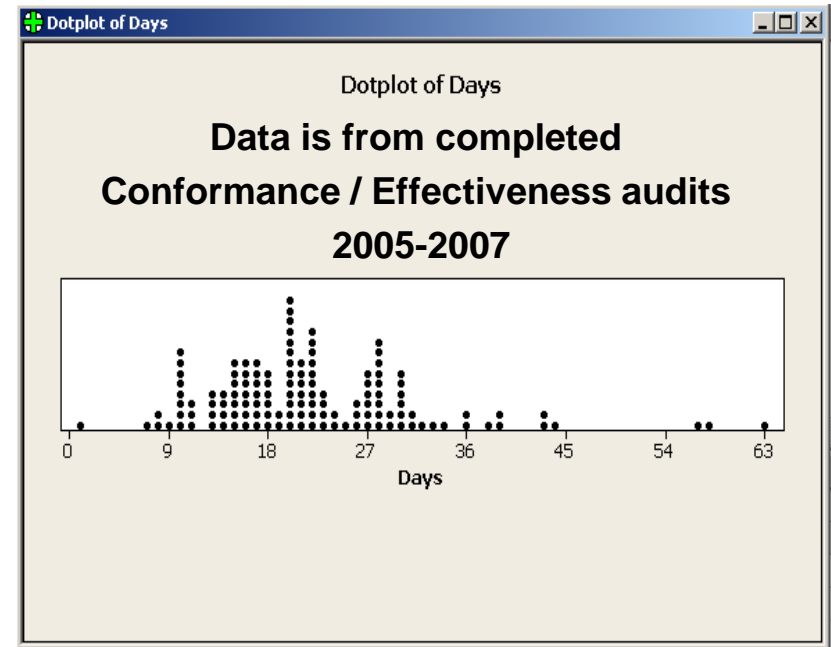
- Utilized

- audit data (completion time frames) to establish current level of performance
- Minitab to analyze data
- Benchmark data to determine performance objectives

- Reviewed results from 134 audits over a three year window
 - Average audit duration is 22.08 days
 - Audit duration median is 20.5 days
 - Standard Deviation is 9.8 days



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Analyze

- Analyzed data to study variation
- Captured delays and causes of variation
- Validated the top issues on the FMEA
- Used “*Voice of the Customer*” data to seek improvement opportunities from the customer perspective
- Worked the FMEA RPNs to improve the process
- Used existing data to measure process performance (days in departments and overall time from start to report publish)

Improve

Improvements:

- Used data to measure performance and projected goals
- Team utilized known benchmarks to derive goals (i.e. field quality supplier surveys, Olathe process)
- Used VOC data to alter reporting methods to shorten reports and reduce eIAMS entry time
- Worked on “Service Agreement” with ISC, Engineering, and QTM’s to enable shorter audit times with full access to work in process
- Worked a plan to implement desired changes to drive improvements
- Developed a control plan to monitor, maintain, and identify potential future improvements

Service Agreement Proposal

Service Agreement Meeting Topics

March 3, 2008

Mandl/Stubenhofer/Spangler/Madrid

Main Point: Intent is to perform conformance audits quicker.

- Blackbelt Project
- Current average is 22 calendar days
- Voice of the Customer asks for quicker audits
- Voice of the Customer asks for shorter reports

Our Goal to Deliver:

- Opening meeting that seeks a mutual agreement / Plan for action to complete audit.
- Spend <= 5 days in the departments. Not to exceed 7 days. (excludes FU issues)
- Quicker reviews
- Shorter reports

What we need to enable this performance:

- Mutual agreement / Plan for action to complete the audit (similar to vendor)
- List of work that will happen during the audit: PIDs, Shop Order #s (prep items)
- List of people that work in the department with support personnel shown
- Overall view of what will be happening in the department over the next 5-7 days
- People available to audit. (Extremely helpful to have 4 hours notice of work so audit can be prepped and ready to observe.) Not disappearing.
- Staff and appropriate back-ups to resolve issues – available and responsive
- Audit contact to take an active role in resolution of issues

Benefits to D/431:

- Provide more coverage of plant departments to permit reduced oversight by NNSA
- Frees up auditor time for other assignments in the non-weapons areas to provide better coverage of these areas

Benefits to Operating Departments:

- Quicker audits – less time and distraction to the departments operations
- Shorter reports – easier to read and interpret
- Fewer CARs – quick resolution of issues that can reduce the need for CARs
- Better partnering so that audits can be more effective at reviewing things that really matter versus administrative items of lesser importance

Improve

- Piloted Process
 - Piloted the revised process for three audits
 - Three completed audits average 13.33 days / reduction of audit time of 39%
 - Auditor feedback has been mostly favorable
- Savings
 - Averaged 44.6 Conformance Audits per year
 - Reduced time to perform audits by 39.6%
 - Added potential to perform 17.7 additional audits
 - Goals per auditor is 15 audits per year
 - Benefit is approximately 1.13 FTE
 - Evaluation Specialist Senior cost is \$97000/year
 - Savings = $1.13 \times 97000 = \$109,610$ per year

Interesting Learnings

- Teaming with customer does not affect audit duration
- Departmental size does not have an obvious effect on duration
- There is significant variation between auditors time to complete audits



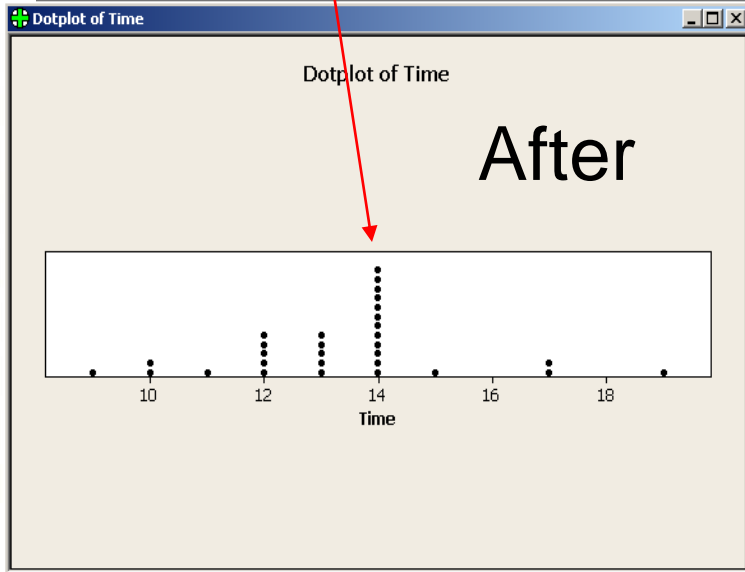
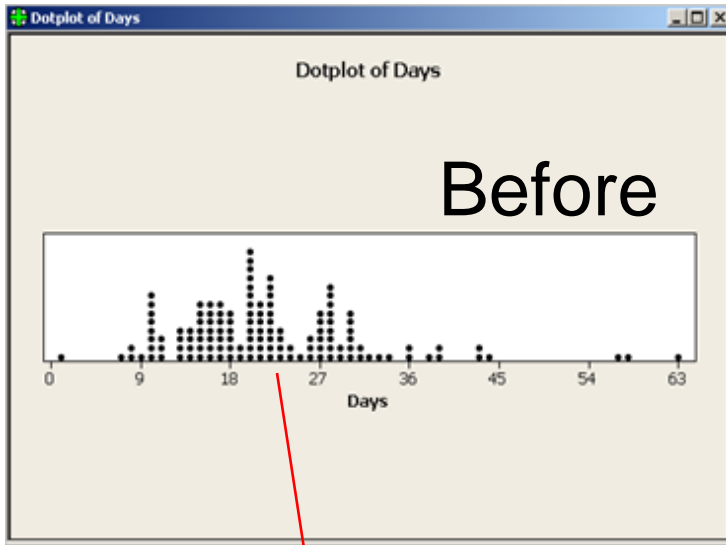
Control Plan

- Identified key process metrics to measure and collect
 - Included on Quality Balanced Scorecard
- Introduced individual accountability for performance to the new goal
 - Honeywell Performance and Development Goals



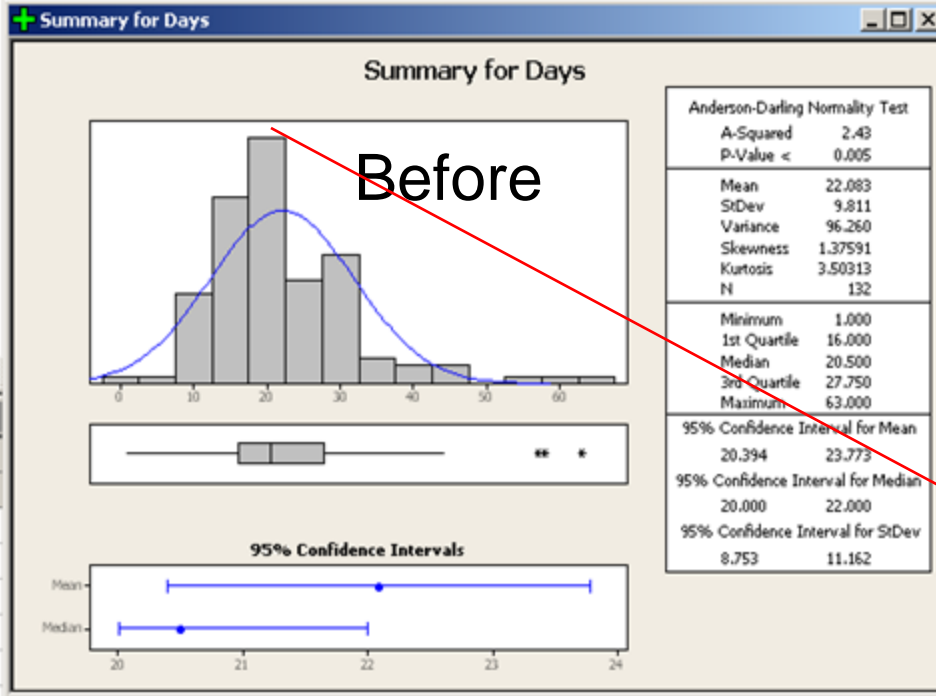
CY 2009 Performance

(through 10/27)

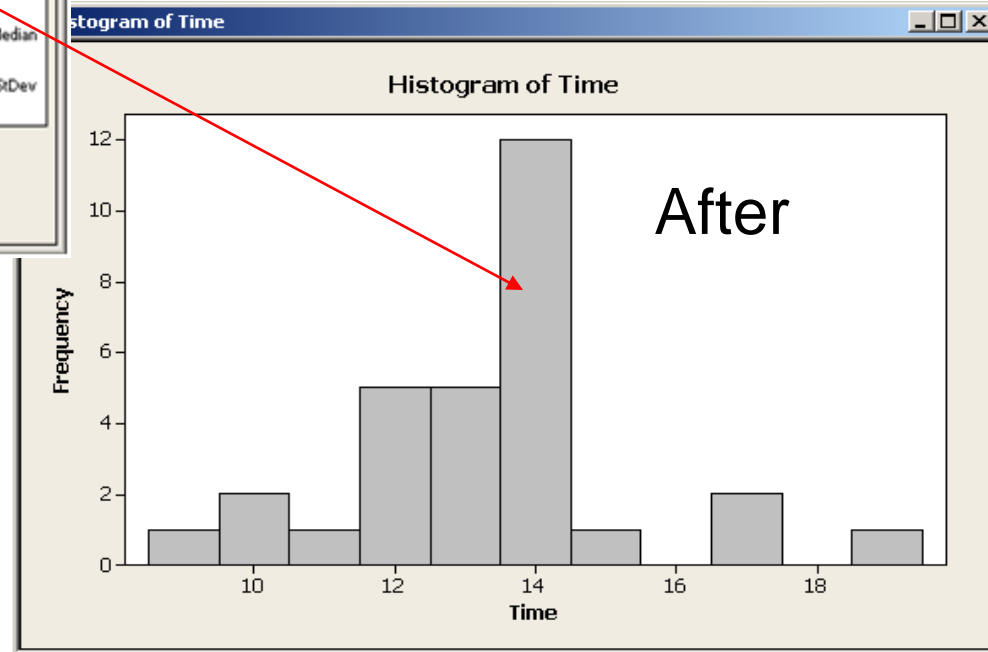


- Dramatic shift moving the bulk of audit timeliness from between 18-30 days to 14 with only 4 points above 14 with none higher than 19.
- Audit quality has not been negatively affected with this improvement.

Results – Continued CY2009

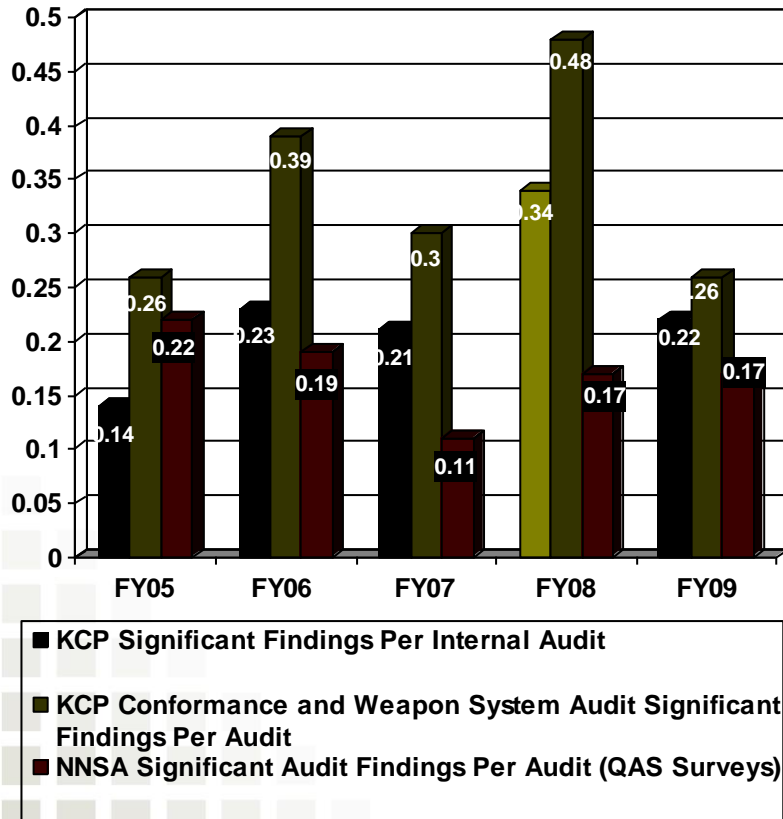


- Mean shifted from over 22 to 13.36, a 39.3% reduction
- Worst case times fell from over 60 days to 19.

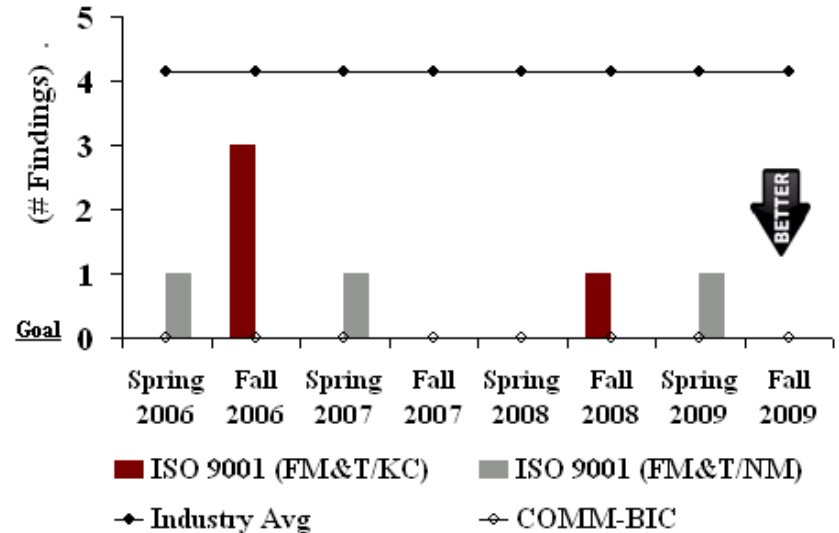


Process Quality Not Impacted

Significant Findings



ISO9001 Minor Findings



We are identifying and fixing our significant issues before external sources identify them

Questions?

