

# A Question of Response Rate

(within US Army Cargo Helicopter PM)



SSTC – April 2010  
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# Report Documentation Page

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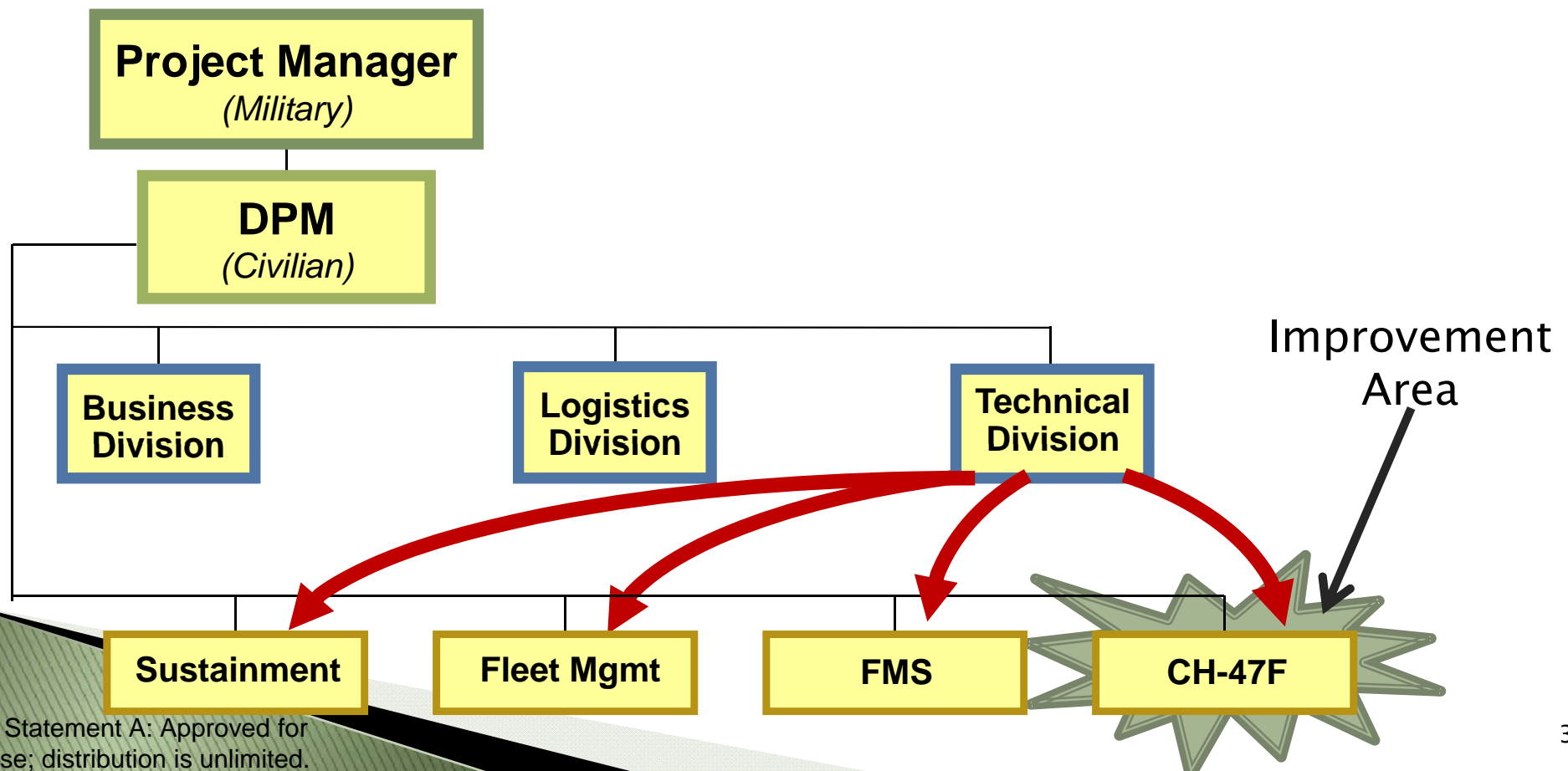
# Agenda

- ▶ Environment / Infrastructure
- ▶ What Needed to be Done
- ▶ What We Did
  - Lean Six Sigma Project
    - Define
    - Measure
    - Analyze
    - Improve
    - Control
- ▶ The Results
- ▶ Challenges
- ▶ What We Learned



# Environment/Infrastructure

- ▶ The environment is a typical high-visibility, rapid fielding government *acquisition* organization; our process, while repeatable, only deals with “custom” articles whose lead time is 18+ months per item.



# What Needed to be Done

- ▶ DoD 5010.12–M *Procedures for the Acquisition & Management of Technical Data*, May 1993:

“An organizational element shall be assigned responsibility for *monitoring the distribution* of contractor–prepared data. Specifically, procedures shall be established to *ascertain actual receipt* of the data and to *ensure that all contractual requirements relative to technical data have been met...*”



- ▶ Lack of a management tool & a documented process in CH–47F Product Office meant:

- No predictive analysis
- Lack of document version control
- Data not readily available when needed
- Unclear document status
- Redundancies
- Lack of cross–checks
- No review time gates
- Lack of CDRL “ownership”
- No automatic routing
- No way for management to view status
- Time–intensive reporting

Why

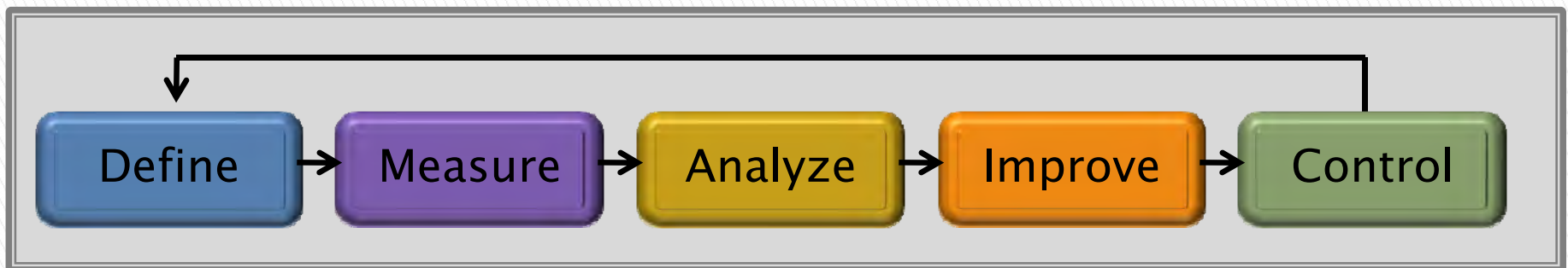
Issues

# What We Did – 2-Pronged Approach

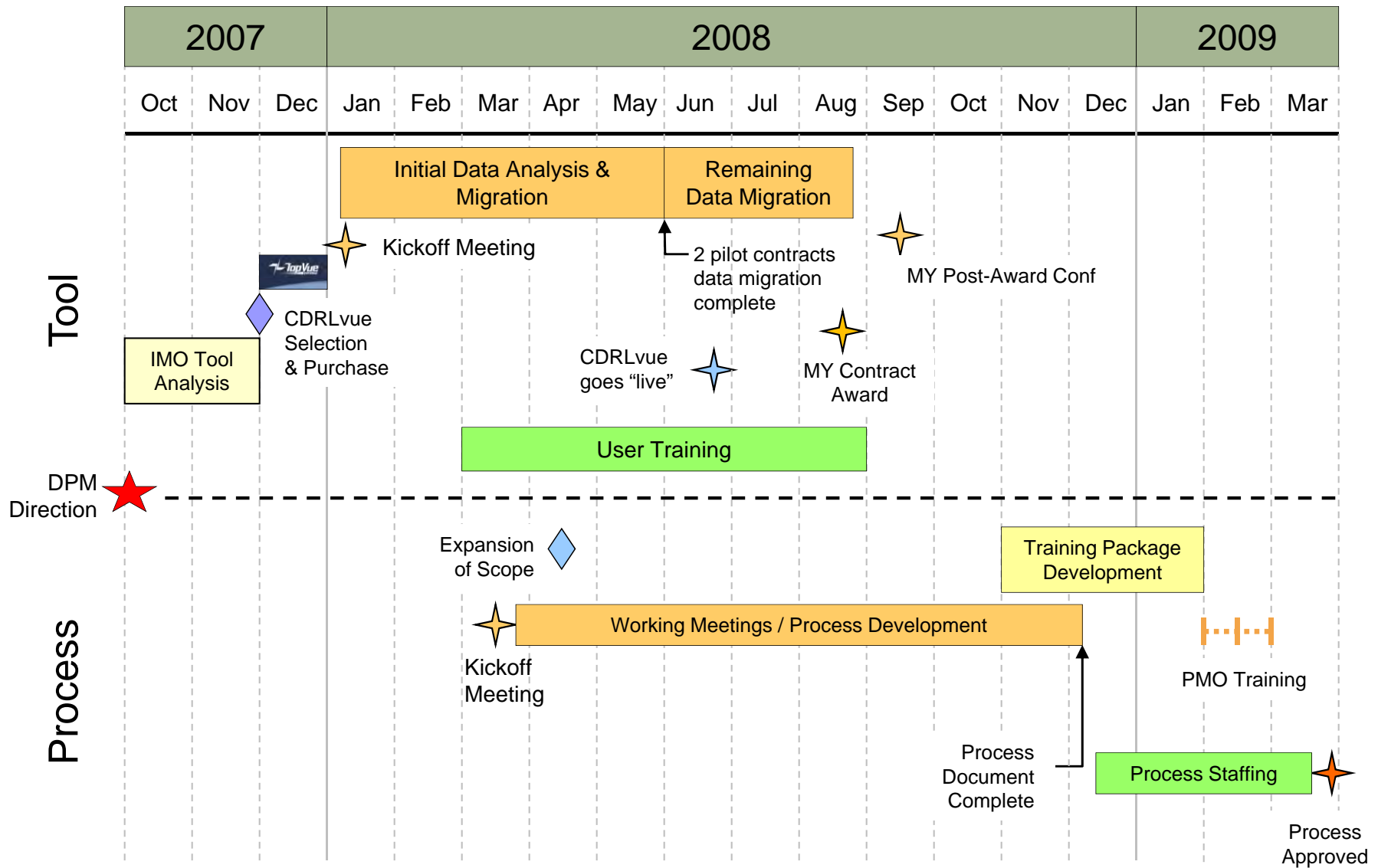
▶ **Tool:** CH-47F DPM provided direction to CM/DM Lead (Mike) to investigate, evaluate, and purchase a CDRL management software tool

▶ **Process:** CH-47F DPM directed Cargo Process Improvement Lead (Mamie) to charter a process action team addressing CDRL review

## Lean Six Sigma Project



# Timelines



# LSS Project

- ▶ **Project Title:** Improving the Product Line's Data Item Deliverable Response Rate
- ▶ **Definitions**
  - Contract Data Requirements List (CDRL) – DD Form 1423: The standard format for identifying potential data requirements in a solicitation and deliverable data requirements in a contract.
  - Data Item Deliverable (DID) – DD Form 1664: A form that defines the intended use, preparation instructions, and content and format requirements for a specific data product.

# The Charter

## ▶ Project Description

- Improve response rate to the customer (vendor) after internal product line review.

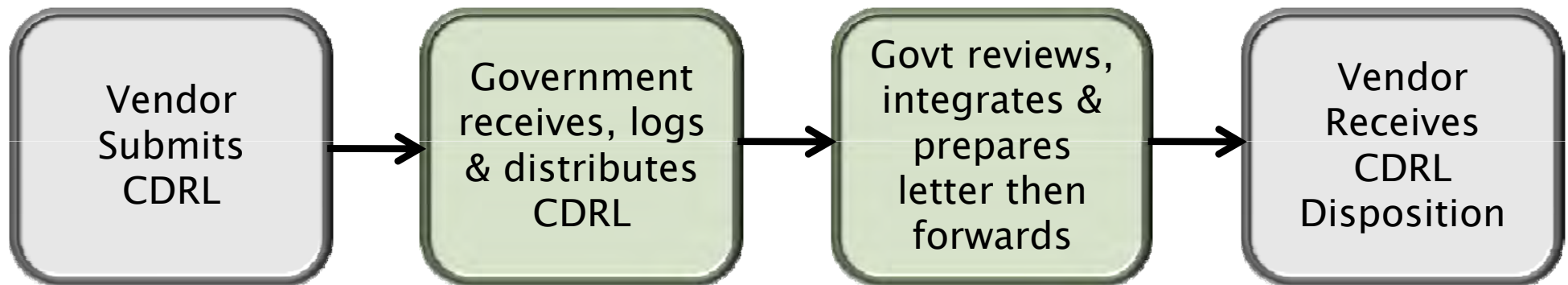
## ▶ Business Case

- Internal Government review of Vendor (Contractor) CDRLs were exceeding that period of time that was designated in the contract.
  - The lateness of responses causes delays in testing efforts, suspension of sub-contractor production, and impedes acquisition of long-lead items.
  - This has a domino effect, slipping an already tight production and fielding schedule of a critical wartime asset.

# Process – Receipt & Review of Data Items

Suppliers = Vendors  
(Contractors/OEMs)

Customers = Vendors  
(Contractors/OEMs)



Inputs = CDRLs

- Analysis Documents
- Contract Documents
- Cost Reports
- ECPs
- Plans
- Prod Specs (PD)
- Technical Reports
- Test Plans

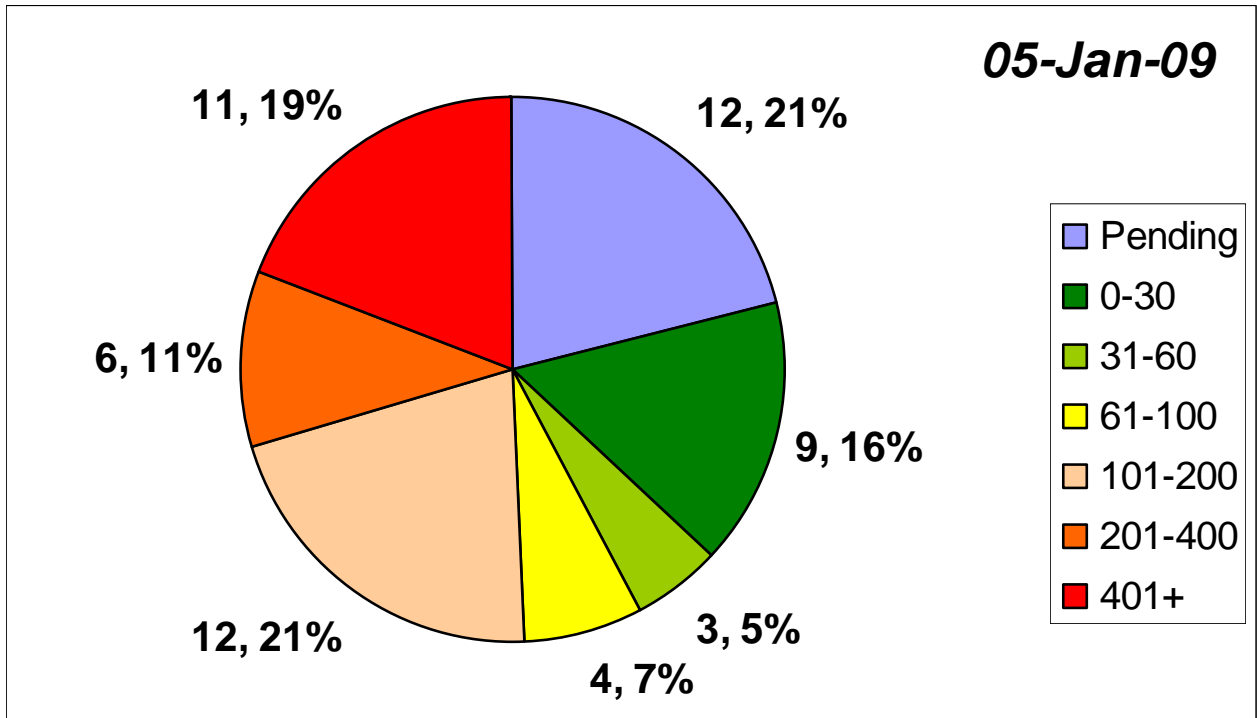
Outputs =

- Disposition
- Recommendations
- Official Letter

**The product line's response dates are specified in the contract with each requirement having a unique due date.**

# Starting Metrics

Response rates to the customer (vendor) after internal Government review.

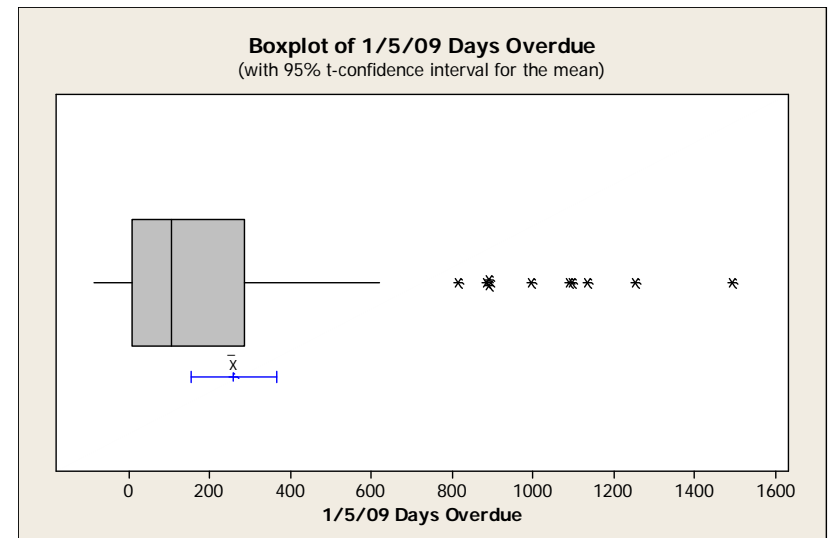
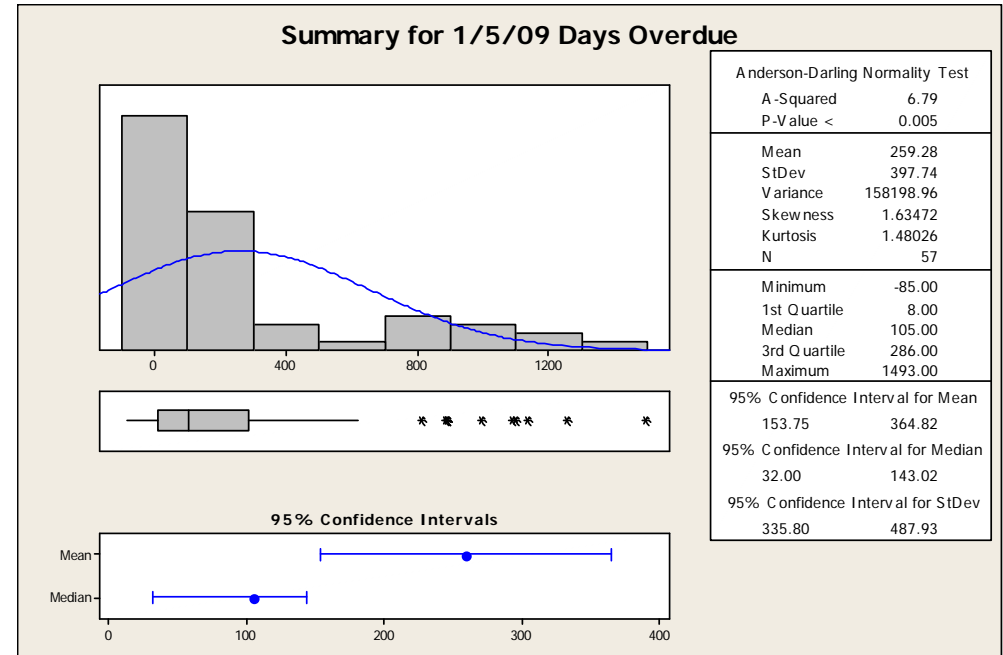


**Goal:**  
Increase percentage rates of:  
1. 61-100 days overdue,  
2. 31-60 days overdue;  
3. 0-30 days overdue; &  
4. Pending

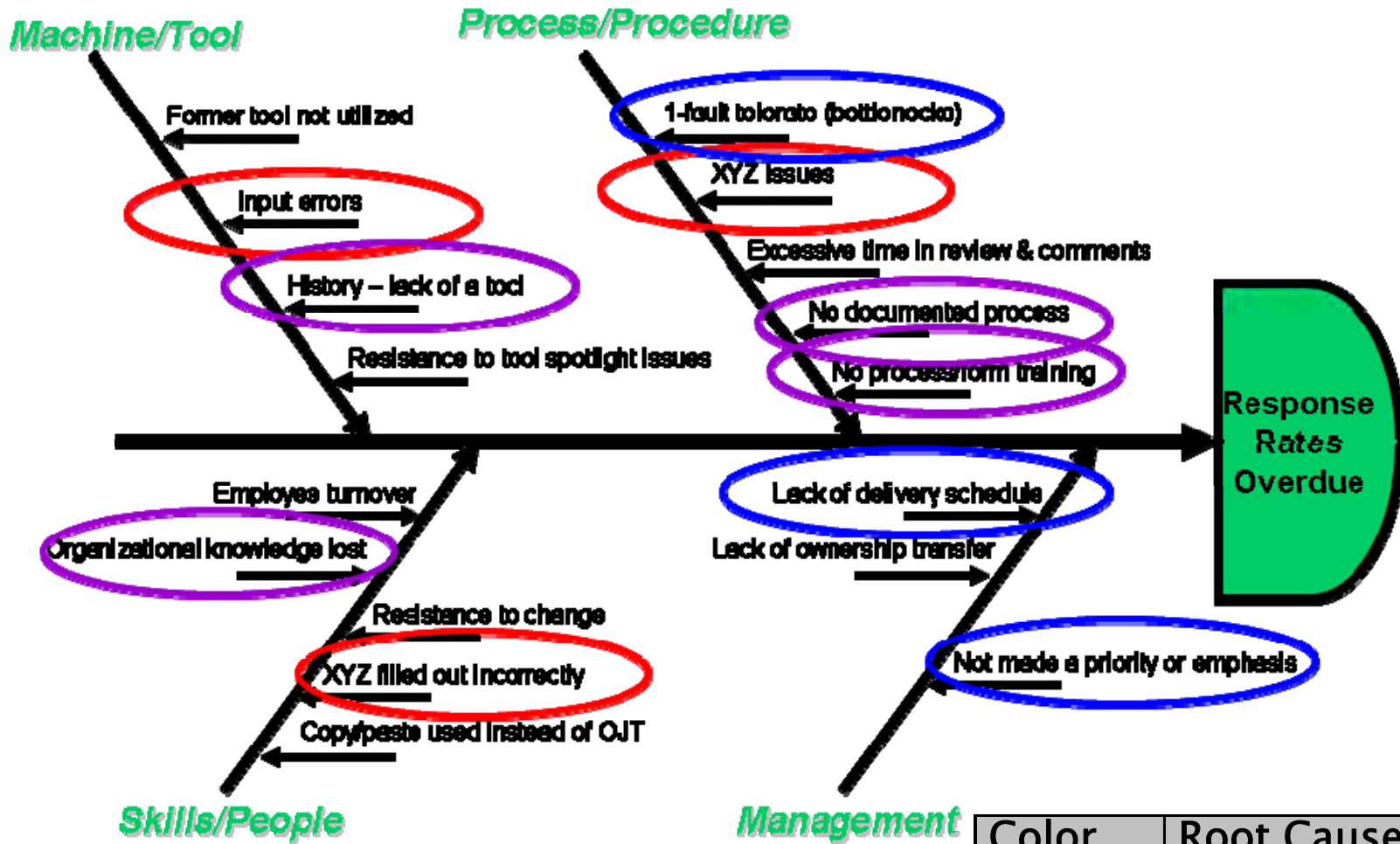
**Project Sponsor/Owner imposed acceptable limit:  
Upper Requirement Limit < 120 days**

# Starting Metrics (cont)

- ▶ **Descriptive Statistics**
  - Distribution = Non-Normal
  - Mean = 259
  - Median = 105
  - Standard Deviation = 397.7
- ▶ **Confidence Interval for the Mean: One-Sample T, Box Plot & Histogram**
  - Conclusion: It is taking too long to respond to the data item deliverable.
- ▶ **Process Capability** – process is NOT capable.
- ▶ **Process Probability** – low probability that we can make predictions.



# Cause & Effect Diagram (or Fishbone)



Color	Root Cause
Red	Old data in database & XYZ Form
Blue	Little Management Support
Purple	Lack of Standard Operating Procedure (SOP)/Training

# Action Plan

## ▶ **Root Cause** –XYZ Form

- Research the form and interview individuals to identify the “problem areas”.

- “App Code” field
- “Authority” field
- “Requiring Office” field
- “Remarks” field
- “Distribution” field

Out-of-date, but  
DoD Mandated Form

Addressed all findings  
in Form Training/  
Cheat Sheet

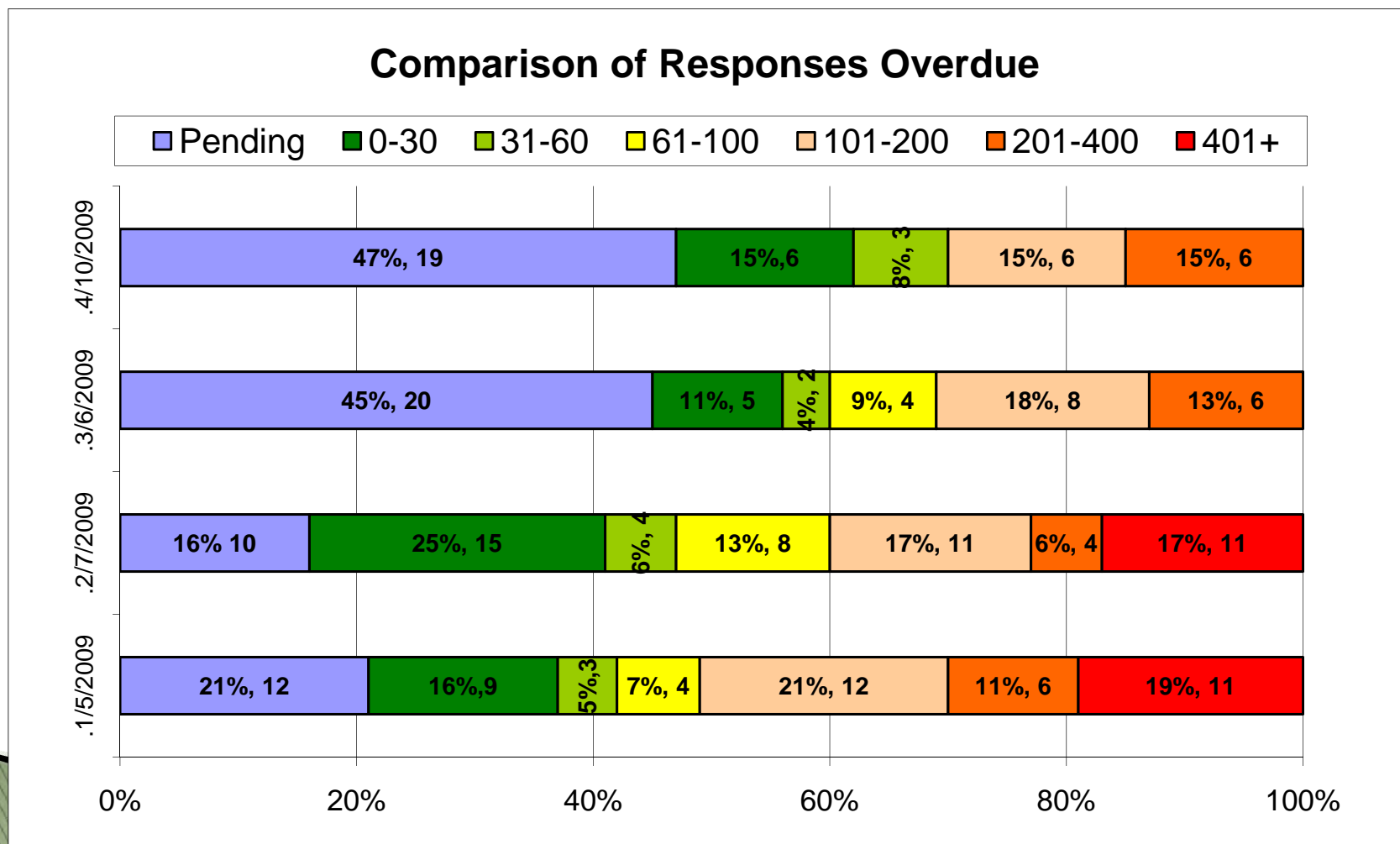
## ▶ **Root Cause** – Old data in database

- Perform housecleaning – reviewed & dispositioned every single CDRL



# Action Plan (cont)

- ▶ **Root Cause** – Little Management Support
  - Develop a Dashboard

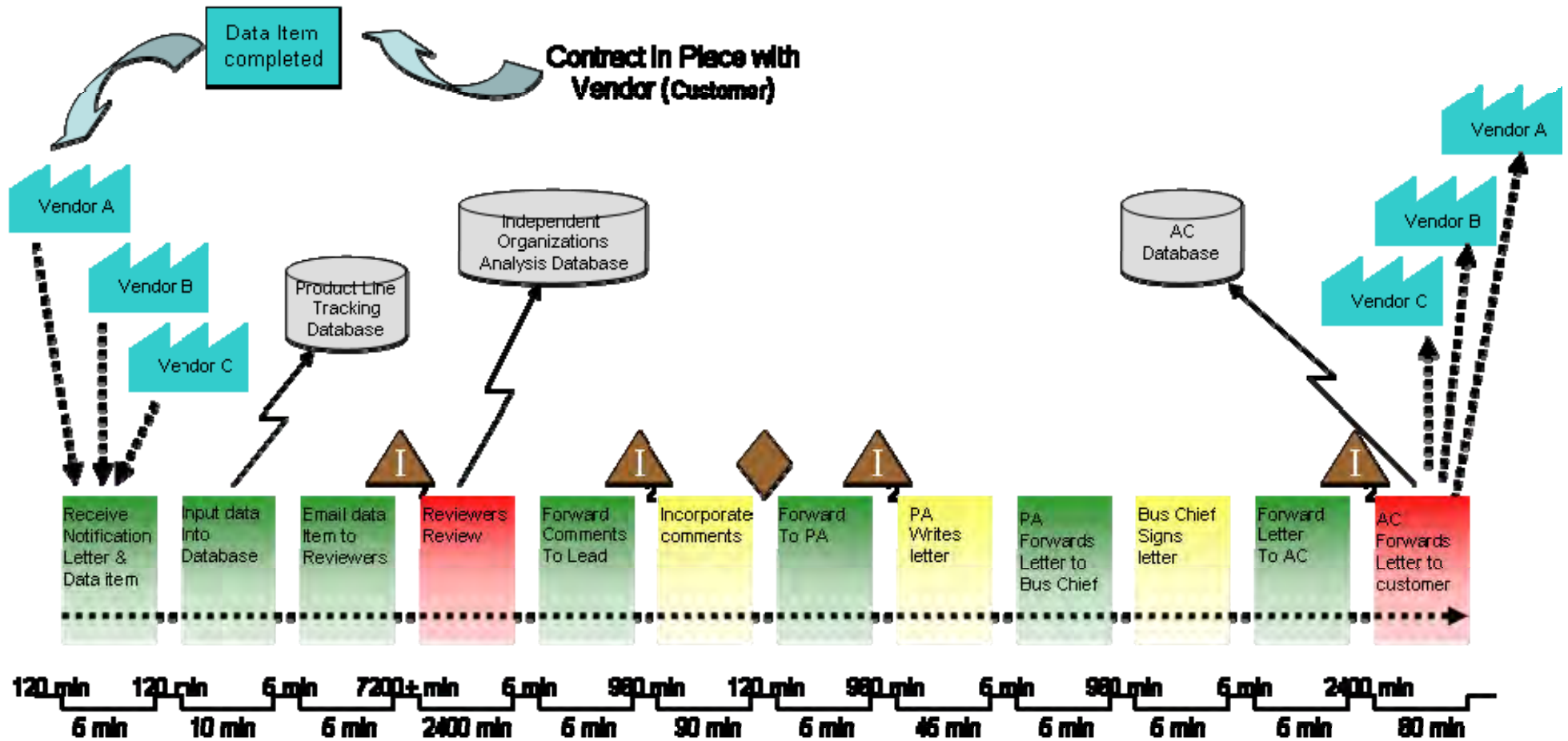


# Action Plan (cont)

- ▶ **Root Cause** – Lack of Standard Operating Procedure (SOP) / Training
  - Develop a Value Stream Map
  - Voice of the Customer (VOC) Questionnaires
  - Draft SOP & Training Materials
    - SOP Training
    - Form Training
    - Cheat Sheet



# Value Stream Map



Indication of time being spent on each task

Good

Moderate

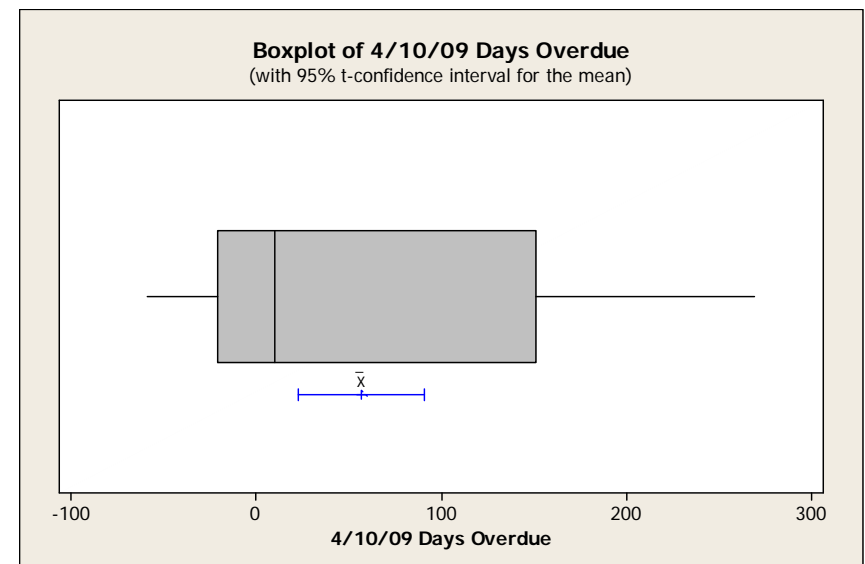
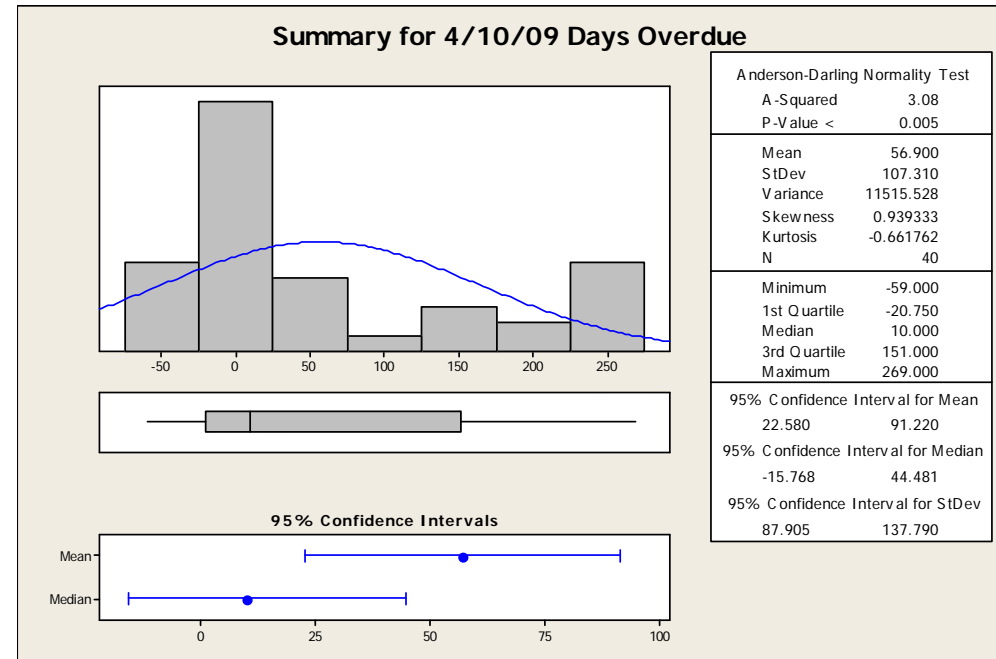
Poor

Process Cycle Time	12,980 minutes	216 hours	5.4 work weeks
Process Time	2,640 minutes	44 hours	1.1 work weeks

What should be taking 1.1 work weeks (or 5.5 days) is taking 5.4 work weeks (27 days).

# Ending Metrics

- ▶ **Descriptive Statistics**
  - Distribution = Non-Normal
  - Mean = 57
  - Median = 10
  - Standard Deviation = 107.3
- ▶ **Confidence Interval for the Mean: One-Sample T, Box Plot & Histogram**
  - Conclusion: It is taking too long to respond to the data item deliverable.
- ▶ **Process Capability** – process is NOT capable.
- ▶ **Process Probability** – low probability that we can make predictions.



# Descriptive Statistics Comparison

- ▶ **Conclusion:** The Mean, Standard Deviation and Variance have all been decreasing throughout the efforts per the data collected and compared below, but the *process remains incapable, unstable, and unpredictable*. There is still a high level of variability in the process.

Variable	Total Count	N	N*	Mean	SE Mean	StDev	Variance	Minimum
1/5/09 Days Overdue	57	57	0	259.3	52.7	397.7	158199.0	-85.0
2/7/09 Days Overdue	72	72	0	201.4	41.8	354.9	125929.0	-38.0
3/6/09 Days Overdue	45	45	0	60.8	16.1	108.1	11681.4	-69.0
4/10/09 Days Overdue	40	40	0	56.9	17.0	107.3	11515.5	-59.0
5/13/09 Days Overdue	47	47	0	41.6	13.9	95.1	9045.3	-61.0
Variable	Q1	Median	Q3	Maximum	Skewness	Kurtosis		
1/5/09 Days Overdue	8.0	105.0	286.0	1493.0	1.63	1.48		
2/7/09 Days Overdue	-3.0	71.5	154.3	1460.0	2.03	3.07		
3/6/09 Days Overdue	-22.0	8.0	166.5	289.0	0.76	-0.81		
4/10/09 Days Overdue	-20.8	10.0	151.0	269.0	0.94	-0.66		
5/13/09 Days Overdue	-13.0	12.0	51.0	302.0	1.73	2.00		



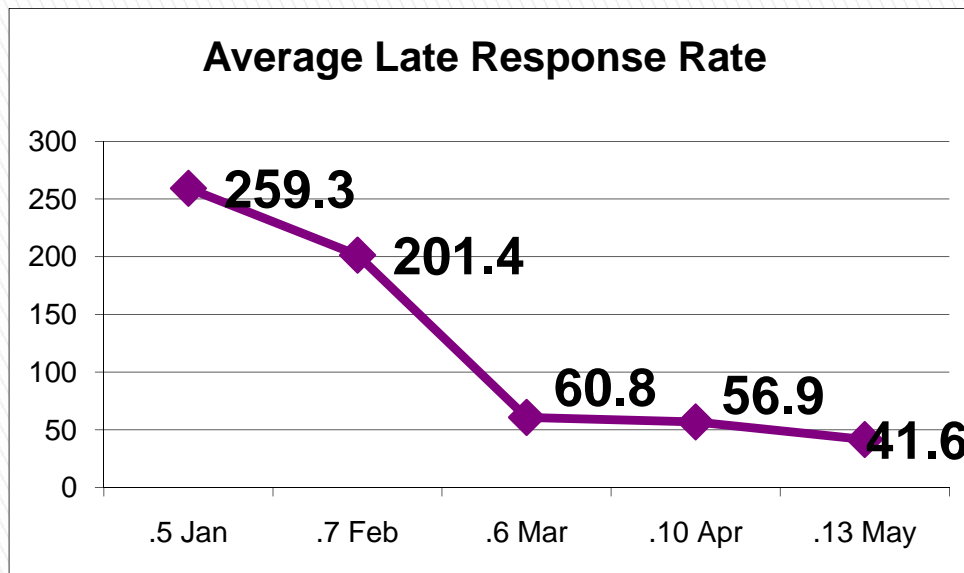
# Sustaining

- ▶ Utilize Dashboard
- ▶ SOP & Form Training completed
- ▶ Cheat Sheet distributed
- ▶ Control Plan put in place
- ▶ Data collection continues



# The Results

- ▶ Reduced the average late response rate from ~260 days to ~ 42 days in 6 mo.
- ▶ Captured a one-time cost avoidance of ~\$623,000.
- ▶ A large reduction in the backlog of data item deliverable responses
- ▶ Reduced waste and increased throughput
- ▶ Improved organizational capability to operate more efficiently and effectively.



Objective

Warm & Fuzzy

# The Results – Calculations

	Every how many days	Time it takes (manhours)	\$\$	total per 10 days
Updating Schedule	10	N	\$N	\$
DM sends Reminders	10	N	\$N	\$
Reviewers (3) Re-Education	20	N	\$N	\$
			total	<b>\$NNN</b>

1/5/09 Days Overdue / 10 days + ~ \$647,318

4/10/09 Days Overdue / 10 days = ~ \$23,722

**Cost Avoidance = ~ \$623,596**

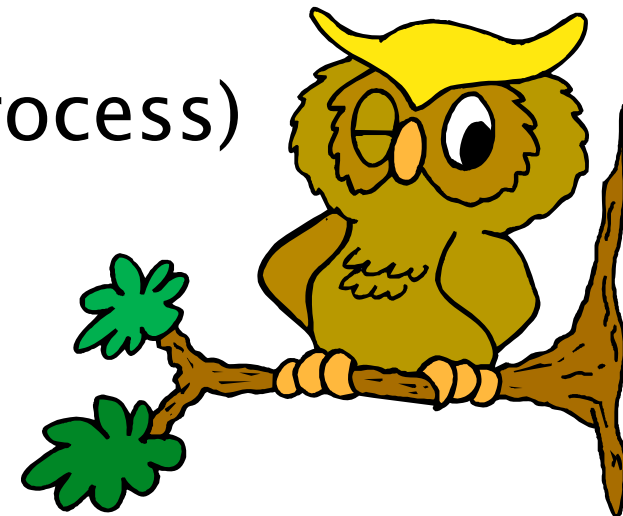


# Challenges

- ▶ Installation of a new integrated software system to manage data deliverables;
  - ▶ Regulatory requirements to operate within strict DoD Acquisition processes and guidelines;
  - ▶ An out-of-date, but DoD mandated form;
  - ▶ Need of an organizational Standard Operating Procedure (SOP); and
  - ▶ Lack of an effective means of reporting review and response status to the management.
- 
- ▶ **Will not realize any benefits from SOP & Form Training for 12+ months**

# What Did We Learn

- ▶ Need to make improvements personal – how does it affect “me”
- ▶ Improvement has a domino effect
- ▶ Improvements build on each other
- ▶ Need for closely managing the pace of change
- ▶ Commonality & consistency
- ▶ Importance of training (tool & process)



# Contact Information

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