

# The Cost of Navy Coatings QA/QC

Project Update  
November 2, 2010

# Project Goals and Objectives

- Define the costs of individual QA/QC steps averaged across the fleet
  - Determine value added versus cost
- Provide SSRAC proposals
  - Graduated QA and/or QA reduction
    - Graduated QA VTC is set up for 1430 Nov. 3rd

# Project Status

- Obtained relevant related studies for review and evaluation
  - VSM Map for Tank Painting
  - Published studies of QA costs
- Project team change
  - GIG is unable to dedicate the resources required to complete the project
  - Elzly will assist with the remainder of the project

# Go Forward Plan

- Four sources of data to be pursued
  - Sanitized shipyard reporting (BAE, NASSCO, BIW & TODD)
  - On-line survey of NBPI inspectors
  - Query CQATK files, sanitized count of documented inspections preformed
  - Tomorrow afternoon's workshop

# Hidden areas of Cost in QA

- Pre-inspections must be conducted by Prime Ktr.
- Documentation must be reviewed prior to being submitted.
- Private and Public in house QA requirements must be documented.
- SSPC QP-1 certification requirements must be maintained.

# CQATK & 009-01,04,32

- Notification requirements
- Out of Spec reporting requirements (DSR/DFS)
  - Does a failed G point because of weather affect a PVI?
- Required documentation and audit process
  - Does an audit hit for a typo reflect as a negative score on a PVI/CAR/CPAR, yes. Does it affect the quality of the preservation accomplished?

# Data retrieved from CQATK

- UWH of a CG, area (sqft processed) < 38K
- CQATK entries for blast & prime = 550

# CQATK Notifications

Inbox Search Inbox

Click here to enable Instant Search

From

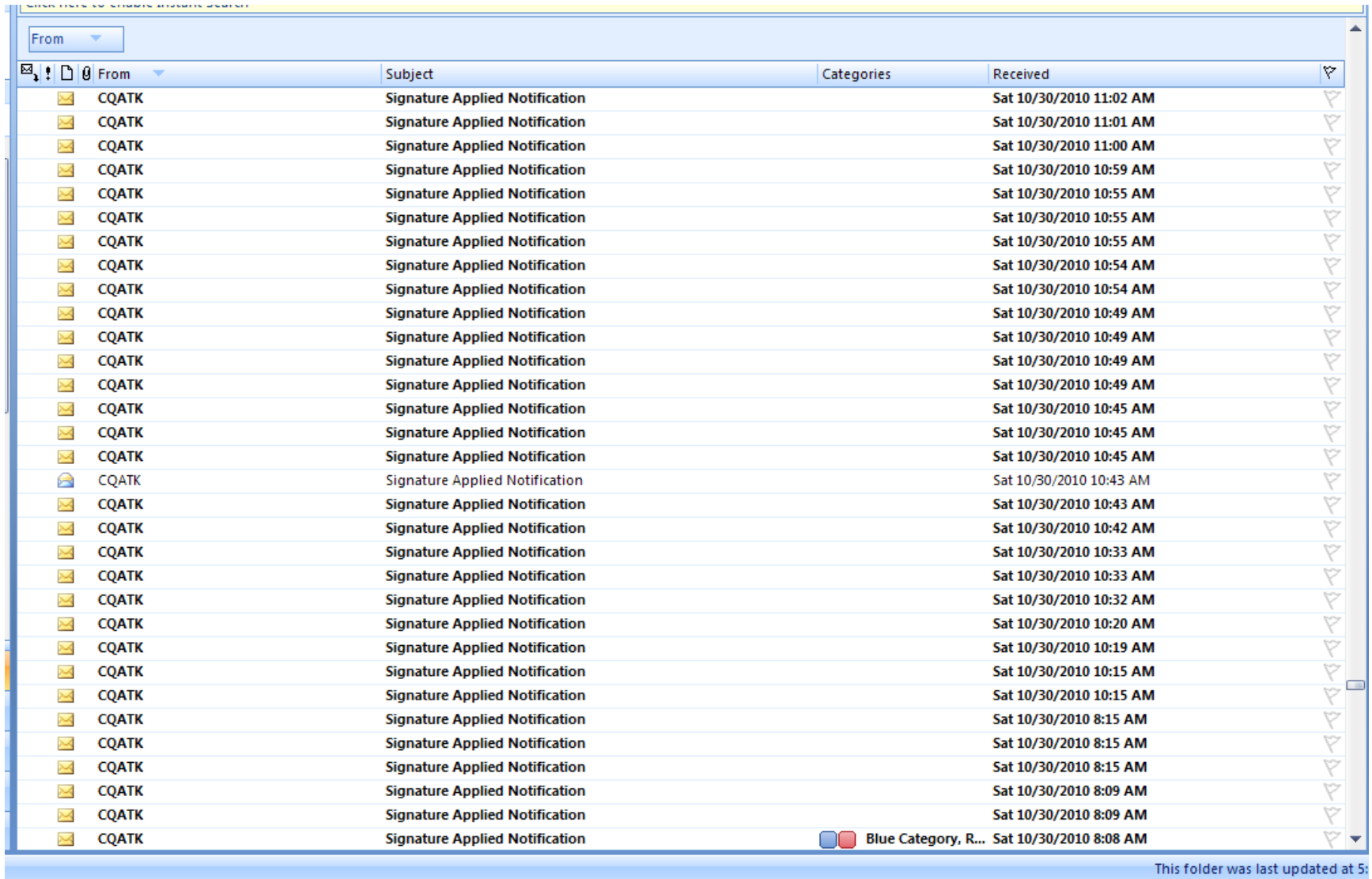
From Subject Categories Received

From: CQATK (410 items, 189 unread)

From	Subject	Categories	Received
CQATK	Signature Applied Notification		Sun 10/31/2010 5:12 PM
CQATK	Signature Applied Notification		Sun 10/31/2010 5:12 PM
CQATK	Signature Applied Notification		Sun 10/31/2010 5:12 PM
CQATK	Signature Applied Notification		Sun 10/31/2010 5:12 PM
CQATK	Signature Applied Notification		Sun 10/31/2010 5:07 PM
CQATK	Signature Applied Notification		Sun 10/31/2010 5:07 PM
CQATK	Signature Applied Notification		Sun 10/31/2010 5:06 PM
CQATK	Signature Applied Notification		Sun 10/31/2010 5:06 PM
CQATK	Signature Applied Notification		Sun 10/31/2010 4:59 PM
CQATK	Signature Applied Notification		Sun 10/31/2010 4:59 PM
CQATK	Signature Applied Notification		Sun 10/31/2010 4:58 PM
CQATK	Signature Applied Notification		Sun 10/31/2010 4:35 PM
CQATK	Signature Applied Notification		Sun 10/31/2010 4:34 PM
CQATK	Signature Applied Notification		Sun 10/31/2010 4:34 PM
CQATK	Signature Applied Notification		Sun 10/31/2010 4:34 PM
CQATK	Signature Applied Notification		Sun 10/31/2010 4:33 PM
CQATK	Signature Applied Notification		Sun 10/31/2010 4:32 PM
CQATK	Signature Applied Notification		Sun 10/31/2010 4:32 PM
CQATK	Signature Applied Notification		Sun 10/31/2010 4:30 PM
CQATK	Signature Applied Notification		Sun 10/31/2010 4:30 PM
CQATK	Signature Applied Notification		Sun 10/31/2010 4:30 PM
CQATK	Signature Applied Notification		Sun 10/31/2010 4:30 PM
CQATK	Signature Applied Notification		Sun 10/31/2010 4:30 PM
CQATK	Signature Applied Notification		Sun 10/31/2010 4:29 PM
CQATK	Signature Applied Notification		Sun 10/31/2010 4:28 PM
CQATK	Signature Applied Notification		Sun 10/31/2010 4:27 PM
CQATK	Signature Applied Notification		Sun 10/31/2010 4:25 PM
CQATK	Signature Applied Notification		Sun 10/31/2010 4:24 PM
CQATK	Signature Applied Notification		Sun 10/31/2010 4:24 PM
CQATK	Signature Applied Notification		Sun 10/31/2010 4:21 PM
CQATK	Signature Applied Notification		Sun 10/31/2010 4:21 PM

This folder was last updated at 5:

# CQATK Notifications Cont'd...



The screenshot shows an email client window with a list of 30 notifications. Each notification is from 'CQATK' and has the subject 'Signature Applied Notification'. The 'Received' column shows dates and times on Saturday, October 30, 2010. The times range from 8:08 AM to 11:02 AM. A status bar at the bottom right indicates 'This folder was last updated at 5:'. A legend at the bottom right shows a blue square and a red square next to the text 'Blue Category, R...'. The interface includes a 'From' dropdown menu at the top left and a search bar at the top right.

From	Subject	Categories	Received
CQATK	Signature Applied Notification		Sat 10/30/2010 11:02 AM
CQATK	Signature Applied Notification		Sat 10/30/2010 11:01 AM
CQATK	Signature Applied Notification		Sat 10/30/2010 11:00 AM
CQATK	Signature Applied Notification		Sat 10/30/2010 10:59 AM
CQATK	Signature Applied Notification		Sat 10/30/2010 10:55 AM
CQATK	Signature Applied Notification		Sat 10/30/2010 10:55 AM
CQATK	Signature Applied Notification		Sat 10/30/2010 10:55 AM
CQATK	Signature Applied Notification		Sat 10/30/2010 10:54 AM
CQATK	Signature Applied Notification		Sat 10/30/2010 10:54 AM
CQATK	Signature Applied Notification		Sat 10/30/2010 10:49 AM
CQATK	Signature Applied Notification		Sat 10/30/2010 10:49 AM
CQATK	Signature Applied Notification		Sat 10/30/2010 10:49 AM
CQATK	Signature Applied Notification		Sat 10/30/2010 10:49 AM
CQATK	Signature Applied Notification		Sat 10/30/2010 10:49 AM
CQATK	Signature Applied Notification		Sat 10/30/2010 10:45 AM
CQATK	Signature Applied Notification		Sat 10/30/2010 10:45 AM
CQATK	Signature Applied Notification		Sat 10/30/2010 10:45 AM
CQATK	Signature Applied Notification		Sat 10/30/2010 10:43 AM
CQATK	Signature Applied Notification		Sat 10/30/2010 10:43 AM
CQATK	Signature Applied Notification		Sat 10/30/2010 10:42 AM
CQATK	Signature Applied Notification		Sat 10/30/2010 10:33 AM
CQATK	Signature Applied Notification		Sat 10/30/2010 10:33 AM
CQATK	Signature Applied Notification		Sat 10/30/2010 10:32 AM
CQATK	Signature Applied Notification		Sat 10/30/2010 10:20 AM
CQATK	Signature Applied Notification		Sat 10/30/2010 10:19 AM
CQATK	Signature Applied Notification		Sat 10/30/2010 10:15 AM
CQATK	Signature Applied Notification		Sat 10/30/2010 10:15 AM
CQATK	Signature Applied Notification		Sat 10/30/2010 8:15 AM
CQATK	Signature Applied Notification		Sat 10/30/2010 8:15 AM
CQATK	Signature Applied Notification		Sat 10/30/2010 8:15 AM
CQATK	Signature Applied Notification		Sat 10/30/2010 8:09 AM
CQATK	Signature Applied Notification		Sat 10/30/2010 8:09 AM
CQATK	Signature Applied Notification	Blue Category, R...	Sat 10/30/2010 8:08 AM

# **Cost of QA is much more than how much does it cost to conduct each one of these inspections. How we document, monitor and measure the preservation process**

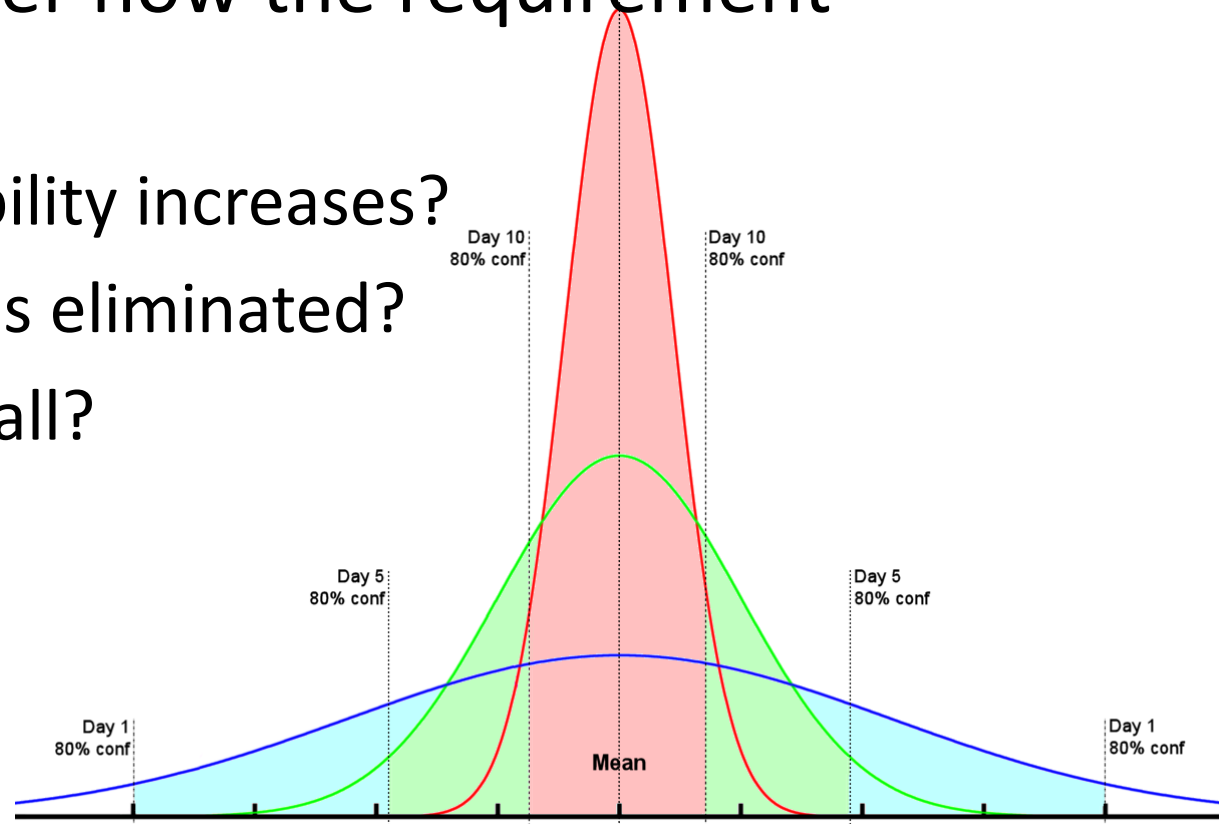
- SP-1,
- conductivity
- Prep to spec
- Conductivity
- Profiles
- WFT, holiday check
- DFT, holiday check
- Final DFT's

# What Drives QA Requirements?

- Requirements within NSI 009-04, Quality Management System
- Paperwork required with QA Appendices
- Checkpoints Called out in NSI 009-32
- Work product mandated by the QA requirement

# Cost of QA vs Cost of Requirements

- Notionally, if we eliminate the QA step we need to consider how the requirement changes
  - Process variability increases?
  - Requirement is eliminated?
  - No change at all?



# Non-Conformity Impact

Impact on Life	Negligible	5% Reduction	10% Reduction	25% Reduction	50% Reduction	Catastrophic
Poor coating adhesion	4%	0%	16%	12%	25%	43%
Improperly cured coating	8%	2%	10%	10%	27%	44%
Invisible surface contamination (e.g. salts)	8%	6%	12%	23%	29%	23%
Holidays or bare areas (entire system)	6%	10%	16%	22%	24%	24%
Insufficient film thickness (complete system)	10%	15%	13%	27%	33%	2%
Insufficient surface profile	14%	14%	16%	24%	22%	12%
Improper environmental conditions	19%	12%	15%	19%	19%	15%
Holidays or bare areas (individual coat)	8%	24%	20%	18%	20%	12%
Missing stripe coat	8%	16%	25%	31%	18%	2%
Steel surface irregularities (weld splatter rough edges etc)	10%	25%	18%	29%	18%	0%
Insufficient film thickness (individual coat)	19%	15%	21%	21%	17%	6%
Visible surface contamination (e.g. dust)	19%	22%	19%	19%	13%	9%
Flash Rusting	25%	25%	15%	15%	17%	2%
Excessive surface profile	48%	13%	12%	8%	13%	6%
Excessive film thickness (complete system)	35%	27%	13%	15%	6%	4%
Excessive film thickness (individual coat)	38%	23%	19%	15%	2%	2%

# Ranking of Inspection Processes

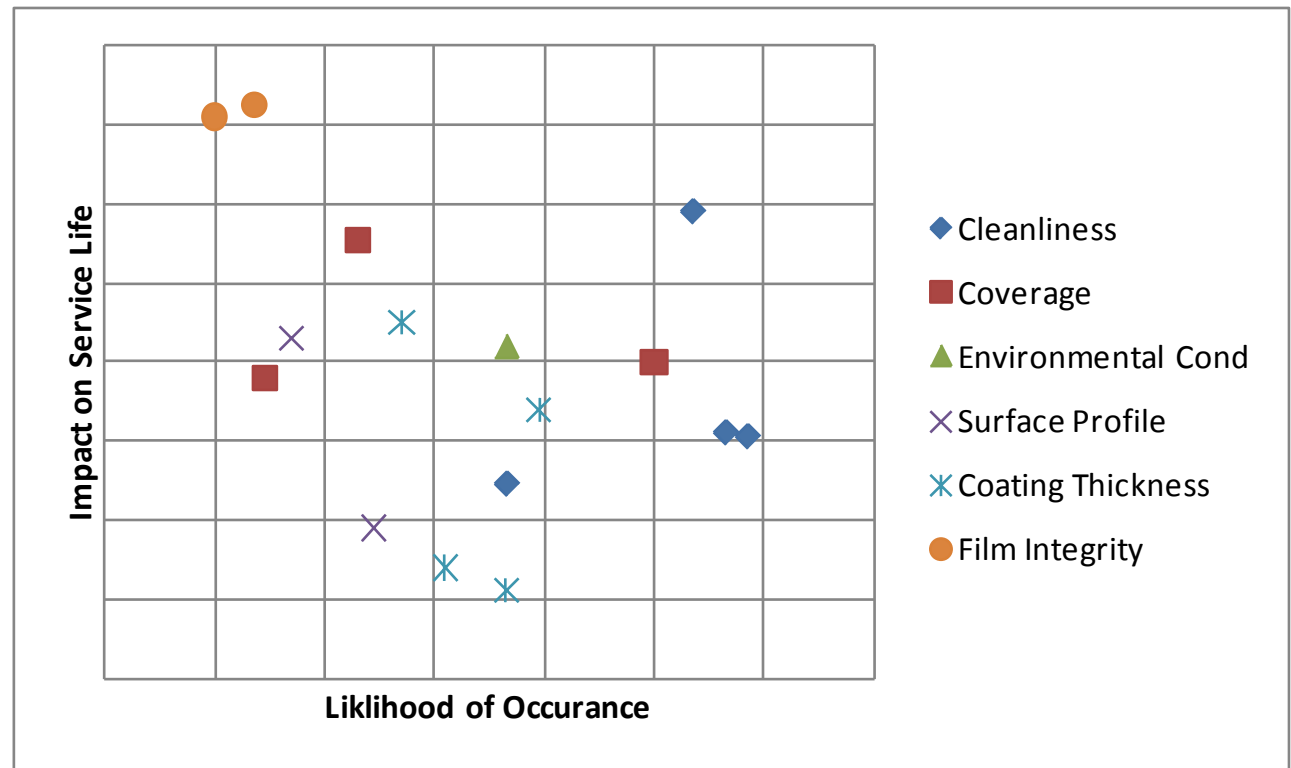
Inspection Processes	1 to 10	Cost	Dispute	Effectiveness
Field check of coating properties (e.g. viscosity)	5.52	5.00	3.37	8.19
Surface Salts (Conductivity Measurement)	5.15	5.78	4.15	5.52
Electrical Holiday Detection	5.04	6.90	3.02	5.19
Visual Surface Irregularities (weld splatter edge prep etc)	5.02	4.55	4.28	6.23
Degree of Flash Rusting	5.01	3.64	5.53	5.86
Surface Salts (Chloride Measurement)	4.99	5.57	3.83	5.58
Anchor Profile (Comparator)	4.94	4.05	3.98	6.78
Continuous Environmental Monitoring	4.93	6.23	3.22	5.35
UV Surface Cleanliness (oil grease etc)	4.92	4.47	4.15	6.14
Recordkeeping (report to owner)	4.92	5.67	3.44	5.64
Laboratory QA of Coating Material	4.87	6.67	2.90	5.04
Visual Holiday Detection – Intermediate Coats	4.77	3.60	3.56	7.16
Containment Integrity	4.74	5.16	3.10	5.95
Anchor Profile (Dial Depth Gauge)	4.73	4.37	3.53	6.29
Visual Holiday Detection – System	4.68	3.64	3.48	6.93
Visual Holiday Detection – Primer	4.62	3.60	3.52	6.74
Dry Film Thickness (SSPC PA-2) – Intermediate Coats	4.52	4.32	3.86	5.36
Visual Surface Cleanliness	4.48	2.74	4.52	6.18
Dry Film Thickness (SSPC PA-2) – System	4.42	4.24	3.94	5.09
Dry Film Thickness (SSPC PA-2) – Primer	4.40	4.05	3.86	5.27
Environmental Conditions during cure	4.36	4.52	3.26	5.32
Dust (Tape Test)	4.32	4.25	3.77	4.95
Environmental Conditions Monitoring	4.17	4.37	3.30	4.84
Environmental Conditions during coating application	4.16	4.04	3.26	5.18
Anchor Profile (Testex Tape)	4.13	4.63	3.22	4.55
Dust (Visual)	4.05	2.35	3.76	6.05
Wet Film Thickness	3.89	2.77	2.80	6.09
Substrate Surface Temperature	3.67	3.14	2.95	4.91

Increasing Concern >>>

# What “Value” comes from QA?

- Fewer failures
- Longer service life
- ...

...for every process failure, there is an equal and opposite QA checkpoint established.



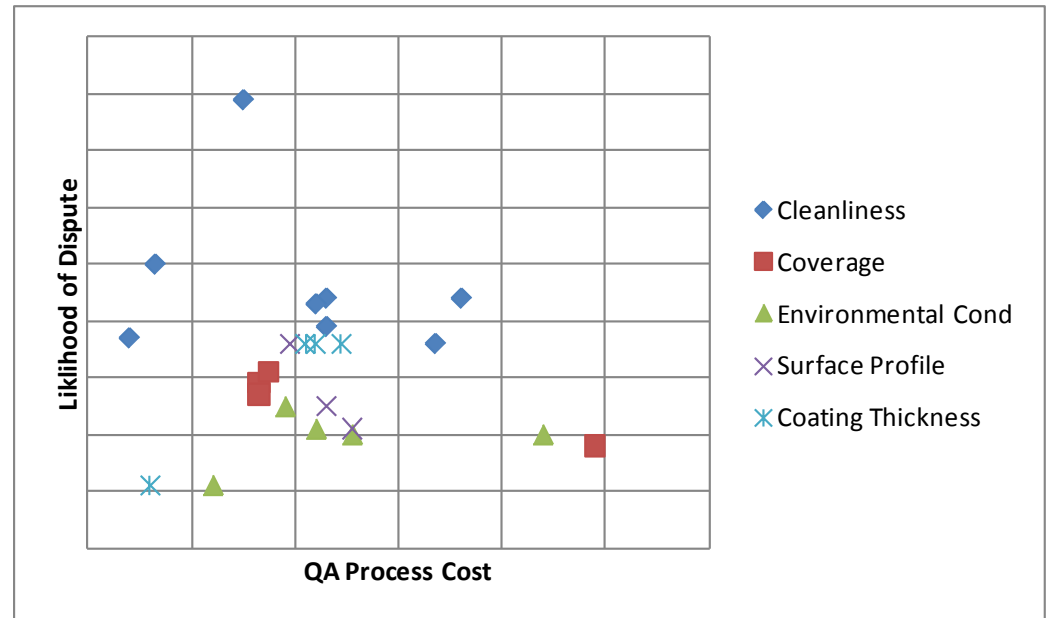
# What are the “Costs” of QA?

- Direct Cost

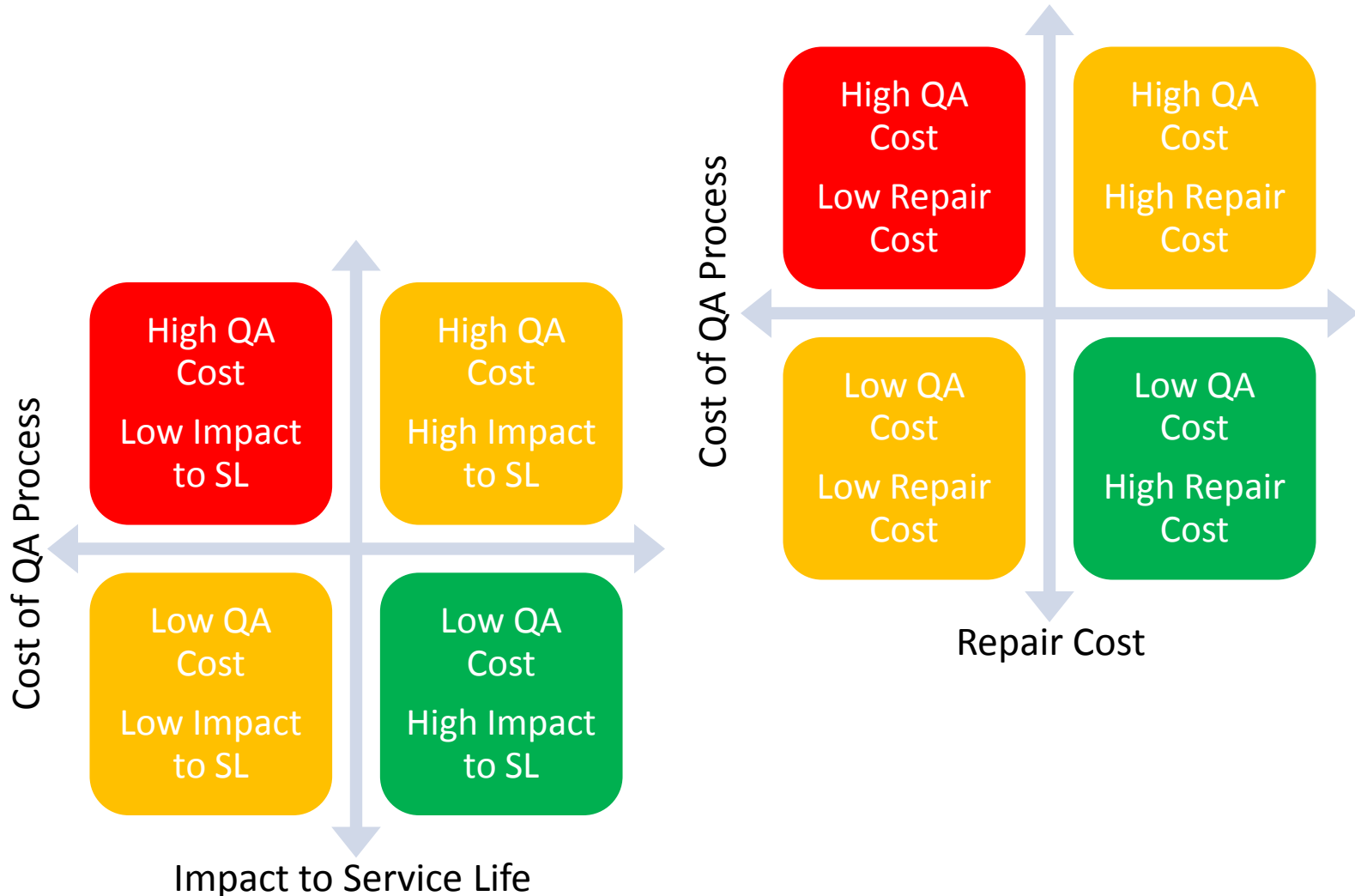
- Time
- Materials
- ...

- Indirect Cost

- Dispute Resolution
- Cost of Incorrect Results
  - Too stringent implies unnecessary work
  - Too lax implies unsat work is obtained
- ...



# Cost of QA vs Benefit of Detection



Questions, Comments?