

The Cost of Navy Coatings QA/QC

June 21, 2011 Project Outbrief
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BAE SYSTEMS

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?
- Form a working group to investigate cost reduction strategies for coatings process improvement

Project Activities

- Three sources of data
 - Query CQATK files, sanitized count of documented inspections performed
 - On-line survey of NBPI inspectors
 - Two workshops
 - November 2-3, 2010 NSRP meeting workshop on Cost of QA
 - June 23, 2011 – Cost reduction Strategies for Coatings Process Improvement

CQATK Data Review



COATINGS QUALITY ASSURANCE TOOL KIT



Product of **MOM**

User: paul@etby.com | [Change Password](#) | [Logout](#)

- ← Main Page
- ← List Inspections
- Inspection Users
- List Attachments
- View CAPS Sheet
- List Appendix 1
- List Appendix 2
- List Appendix 3
- View Appendix 4
- View Appendix 6
- List Appendix 7
- MS Excel Inspection Export/Import
- Obtain Paint Samples

View Inspection

Ship Name & Hull #: DDG-53 USS JOHN PAUL JONES
Contract/Task Order/CLIN: N0002407C4407
Date/Time: 07 Jul 2008 1701
Location: Potable Water Tank (4-150-2-W)
Work Item: 123-14-001
Para. No.: 3.2 & 3.5

I/V/G: / /

Product: DURA PLATE

Document Standard: NAVSEA.009-32.FY09

Change:
Table: 4
Line: 1, 3
Column: A,B,C,D

SOFT Of Area Preserved: 1000
Partial Area / Final: N/A / X

MID/UID:
FR:
 Exportable

Print Appendices

Print Appendix1	22 Jul 08 1000
Coat:	Surface Preparation
Sublocation:	
Print Appendix1	26 Jul 08 0800
Coat:	Surface Preparation
Sublocation:	
Print Appendix1	22 Jul 08 1000
Coat:	Surface Preparation
Sublocation:	
Print Appendix1	02 Aug 08 0800
Coat:	Top Coat
Sublocation:	
Print Appendix1	31 Jul 08 0730
Coat:	Stripe Coat
Sublocation:	
Print Appendix1	26 Jul 08 1000
Coat:	Primer
Sublocation:	
Print Appendix2	02 Aug 08 0800
Coat:	Primer
Sublocation:	

For Support:
1-800-540-9793 or cqatk@mitsinc.us

Query CQATK files

- Collect statistics from 900 or so “inspections” in the existing database
 - Descriptive project data
 - Square footage preserved
 - Appendices completed
 - Number of signatures
 - Count of inspection data points
 - DFT spot measurements (any coat)
 - Environmental Readings
 - Surface Profiles (Avg readings)
 - Dust test readings
 - Conductivity/Chloride Readings
- Data query completed in February 2011

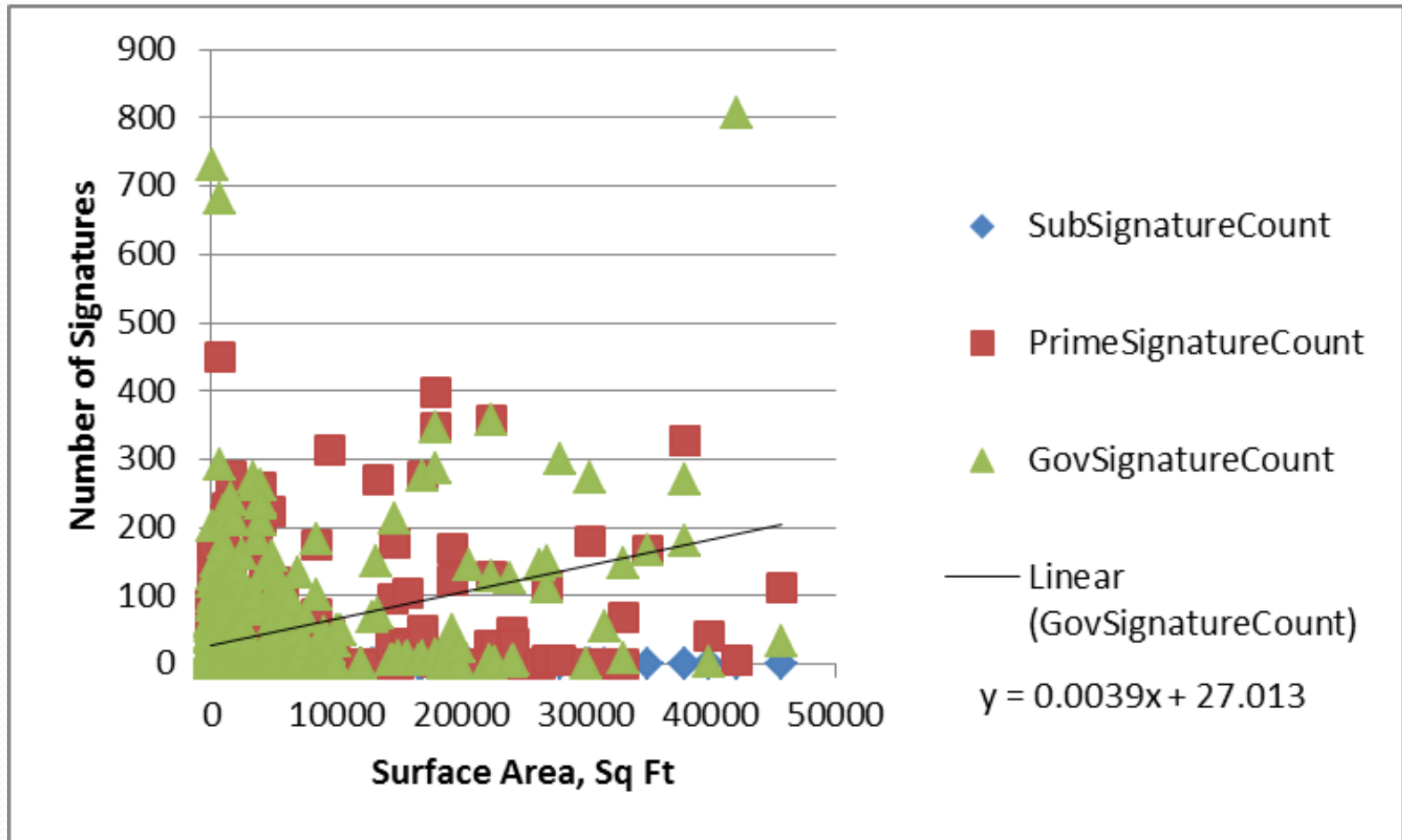
Query CQATK files

- Raw Data included 25 data fields for each of 936 items
 - 231 records unsuitable
- 705 records for analysis
 - 1,887,182 square feet of preserved surface
- Mathematical averages
 - 2,677 square feet surface area
 - 0.7 Subcontractor signatures
 - 28.3 Prime Contractor signatures
 - 37.3 Government signatures

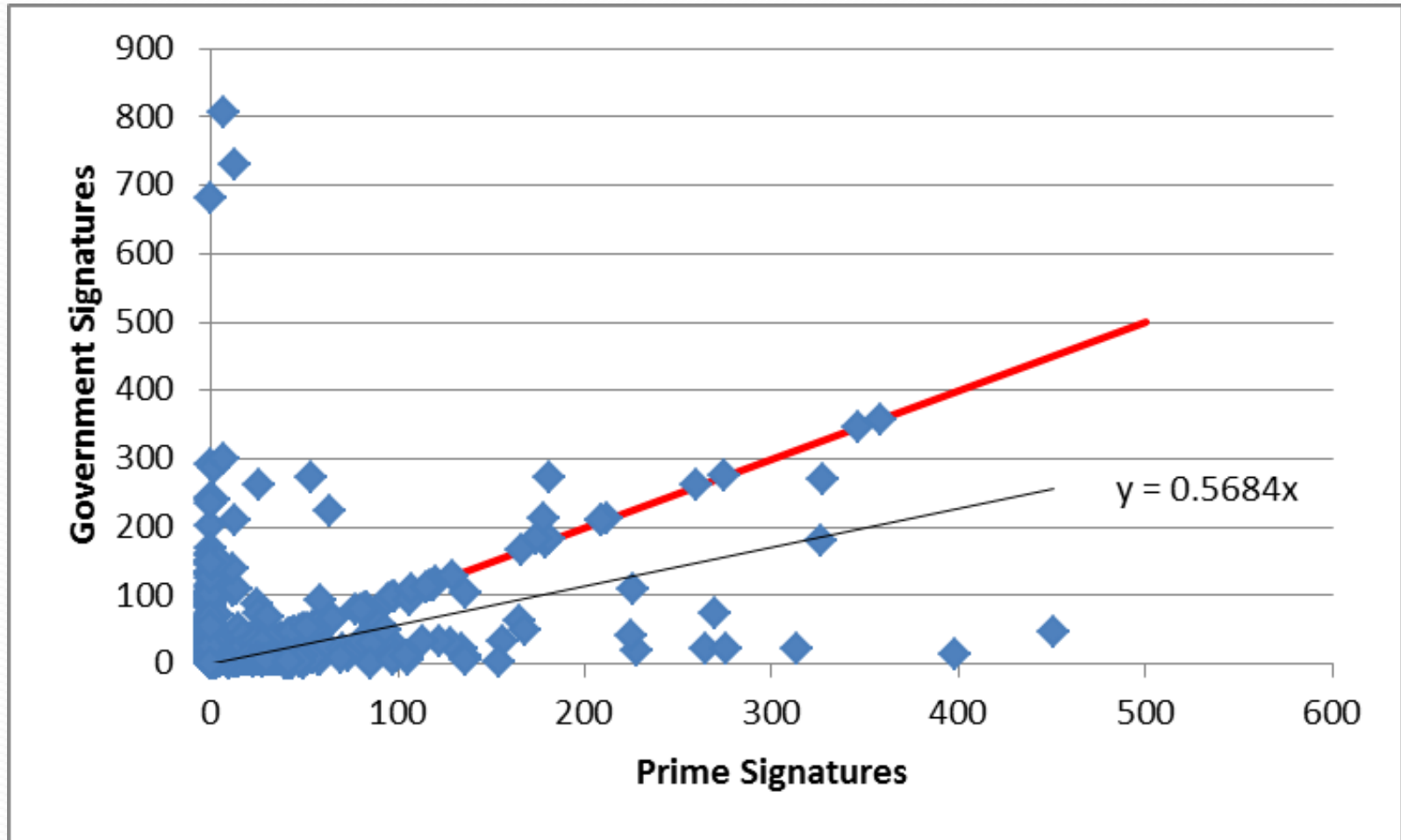
Volume of Data

	Average Number of Forms	Average Number of Readings
Appendix 1, QA Inspection Form – Environmental Readings & Paint/Nonskid Storage	3.1	65.1
Appendix 2, QA Inspection Form - SSPC-SP 1 Cleanliness Checkpoint	2.6	N/M
Appendix 3, QA Inspection Form - Surface Profile /Preparation & Cleanliness Log	2.0	9.3
Appendix 4, QA Inspection Form – Surface Conductivity/Chloride Log	1.9	14.2
Appendix 5, QA Inspection Form - Surface Cleanliness (Dust) Tape	0.4	2.9
Appendix 6, QA Inspection Form - Paint/Nonskid Application And Consumption Log	2.2	N/M
Appendix 7, QA Inspection Form – Dry Film Thickness Measurements	4.4	63.2
Appendix 7a, QA Inspection Form – Wet Film Thickness Measurements	0.7	0.7
Total for an “average” 2,677 square foot surface (less than a 30 by 30 foot room)	17.3	155.4

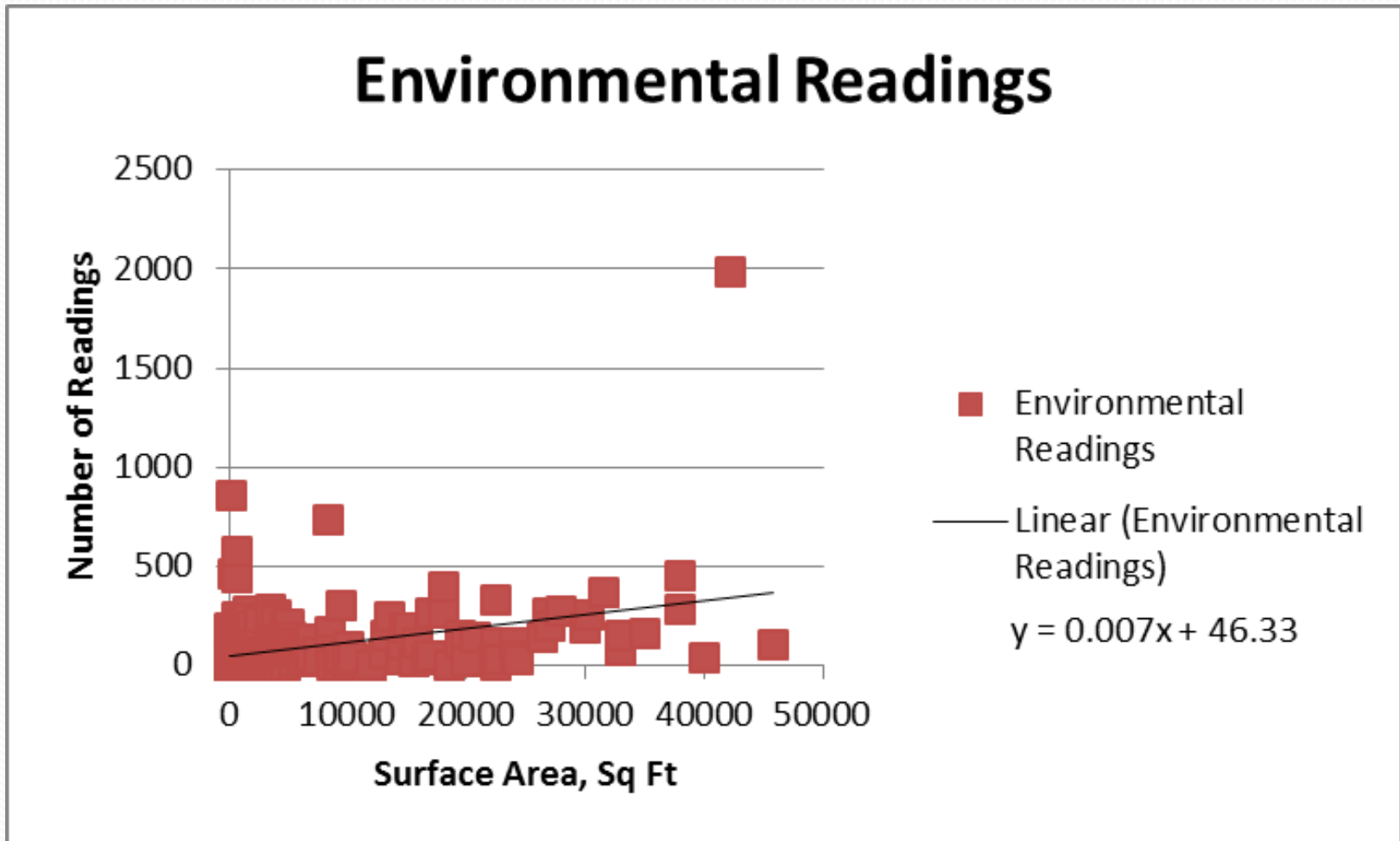
Signatures



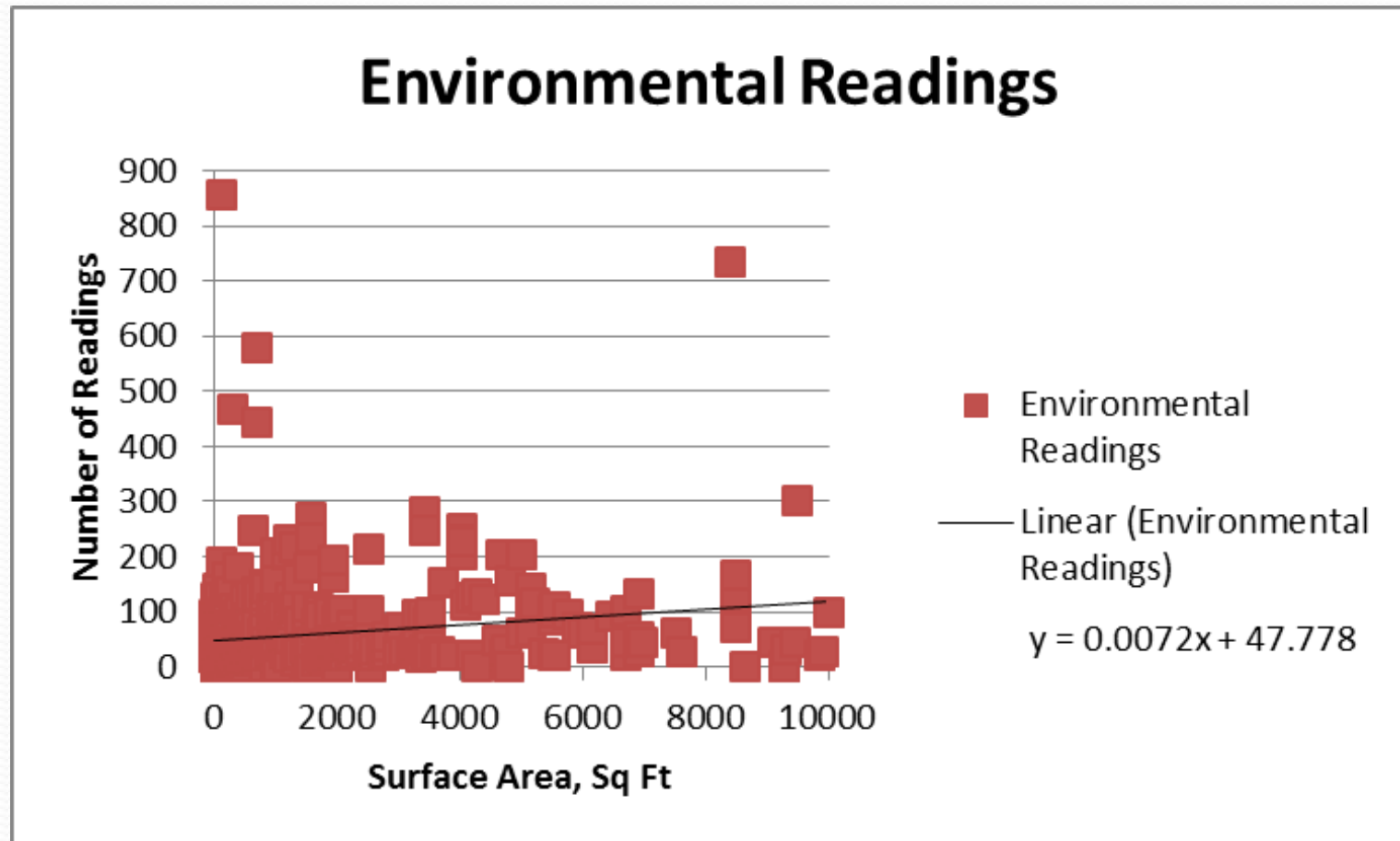
Prime vs Government Signatures



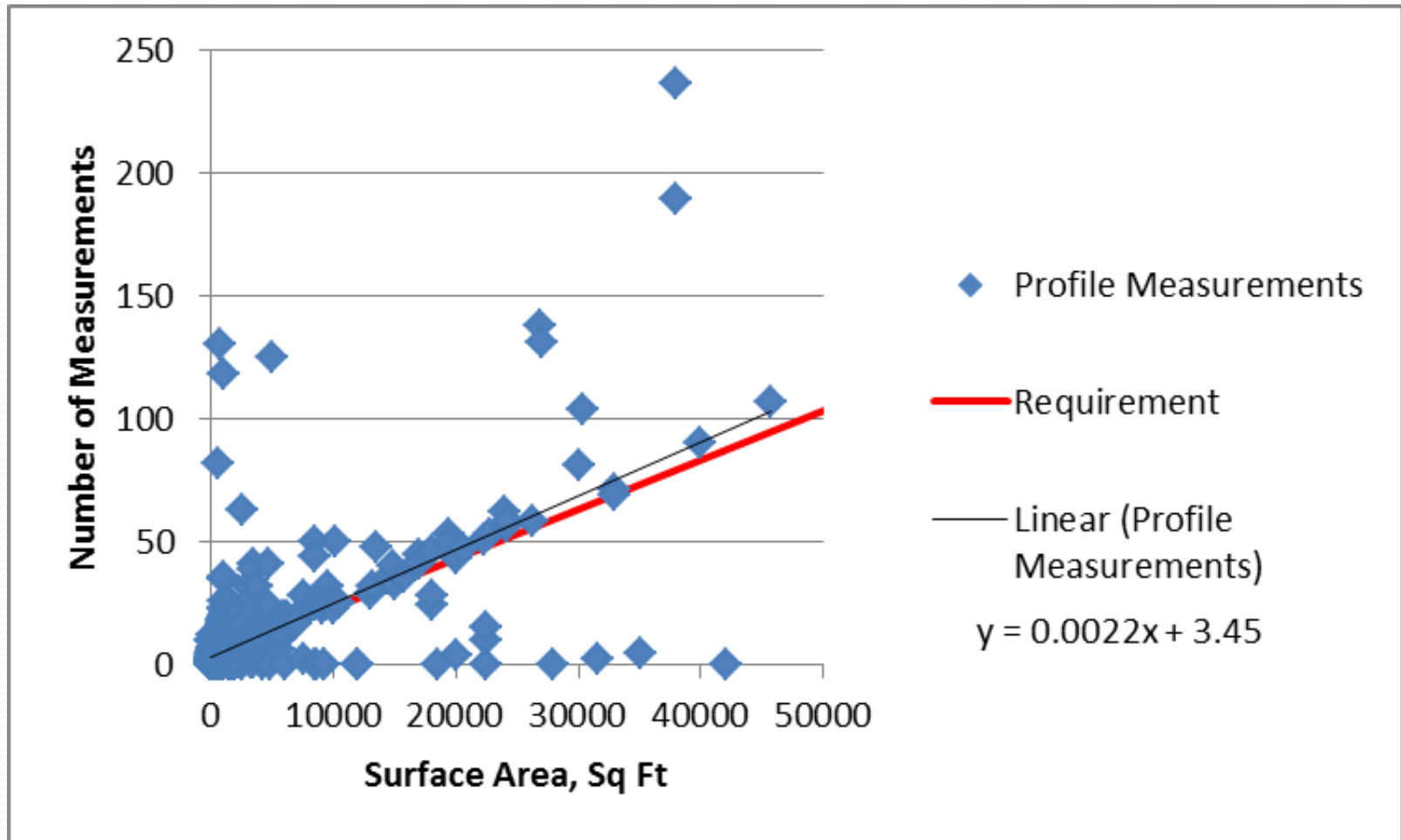
Environmental Readings



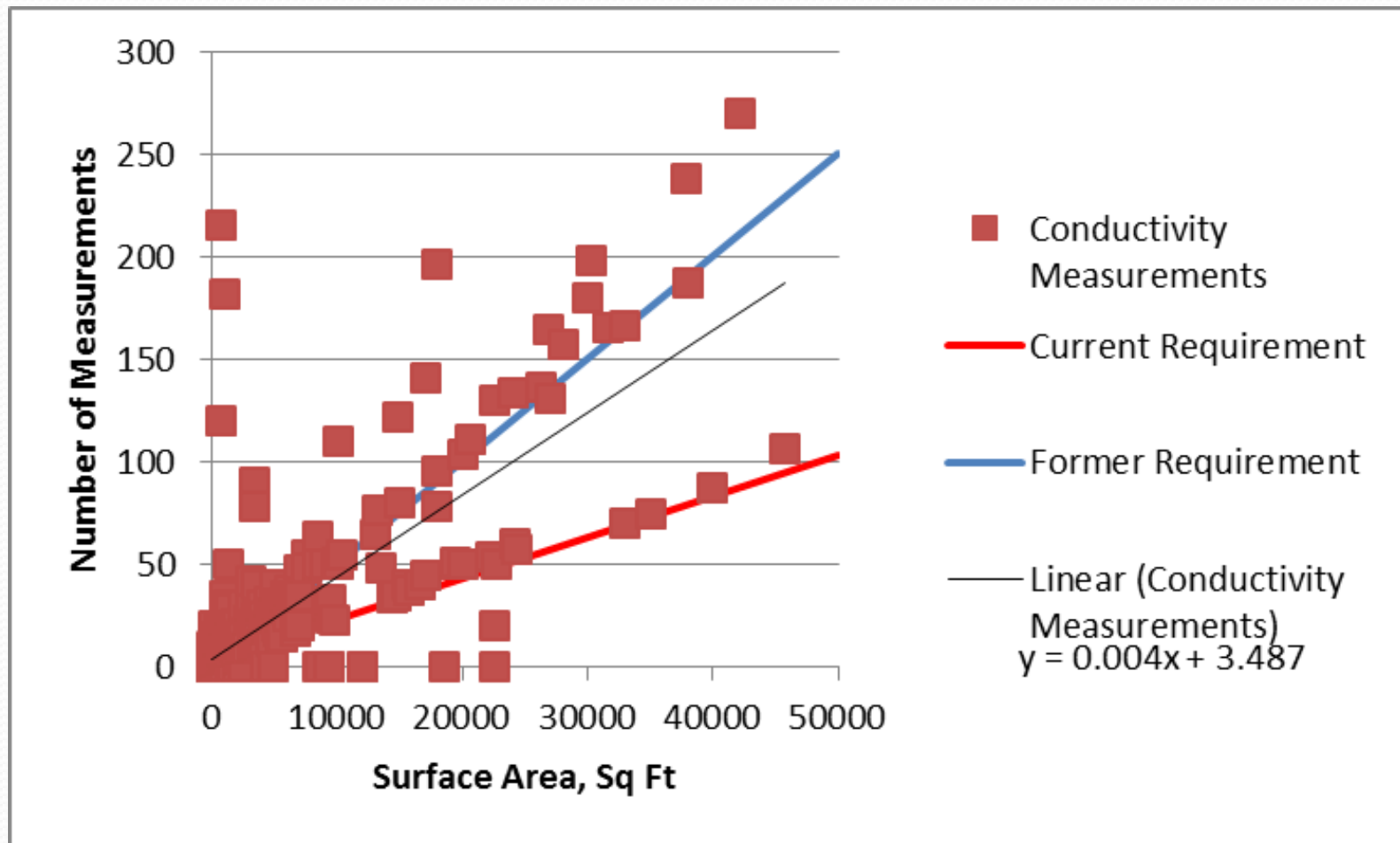
Environmental Readings Insensitive to Surface Area



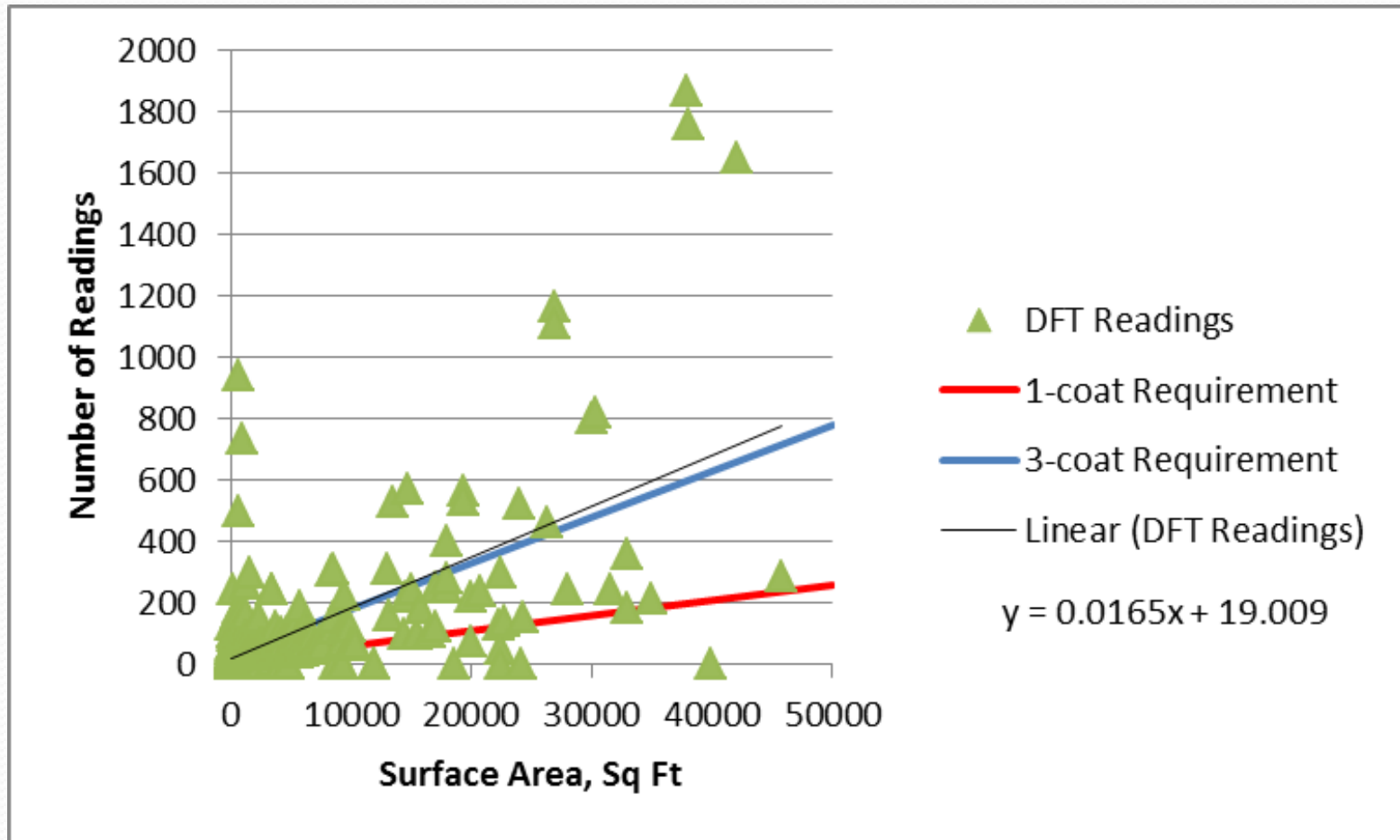
Surface Profile Measurements



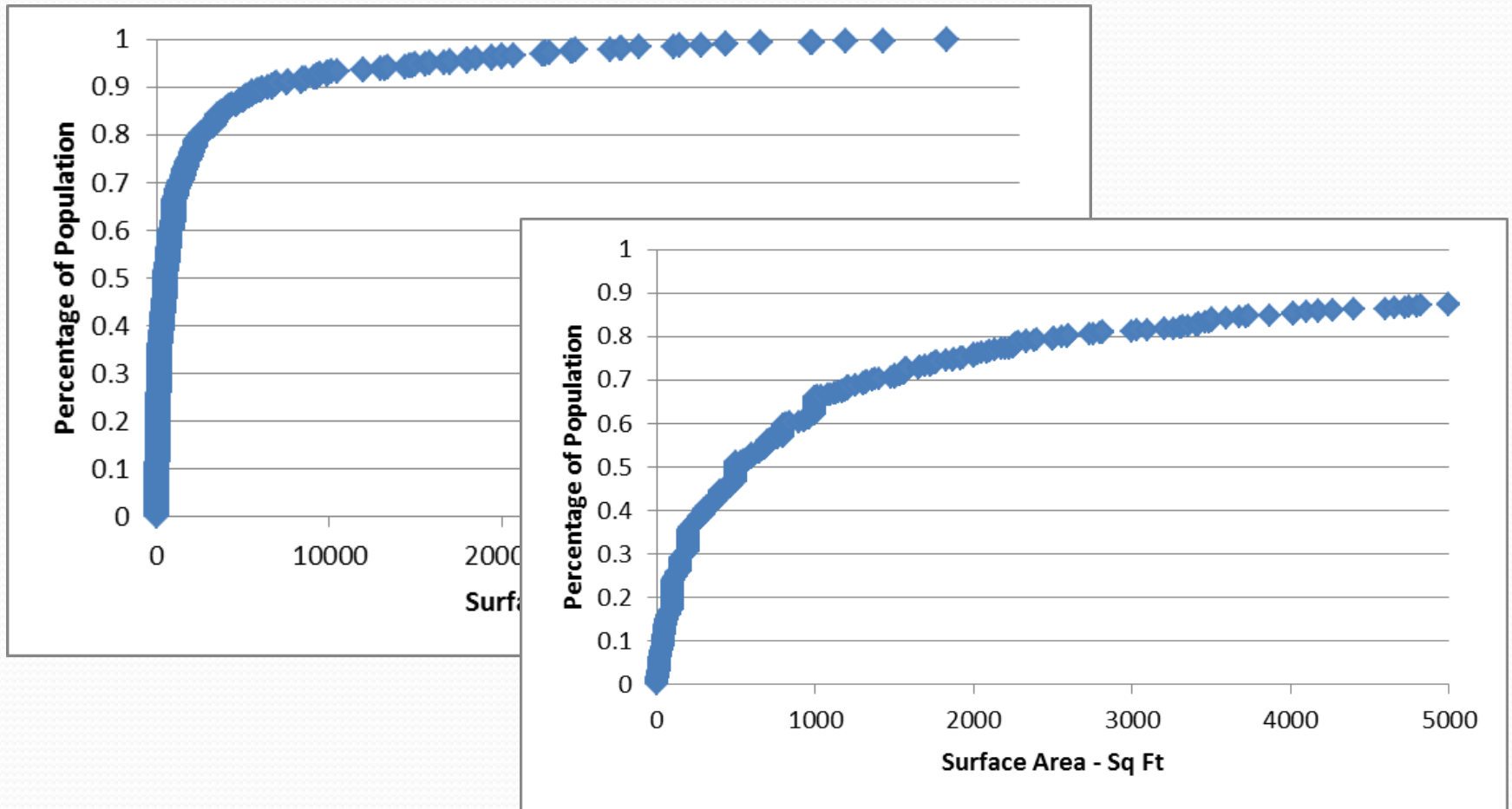
Conductivity Measurements



DFT Readings



Size of Jobs in CQATK



NBPI Inspector Survey

PREVIEW MODE: This survey on the Cost of Navy QA/QC - Internet Explorer powered by AOL

http://www.surveymonkey.com/s.aspx?PREVIEW_MODE=DO_NOT_USE_THIS_LINK_FOR_COLLECTION&srms=c7YlUyPvVluZWAZGh3%2bQ48%2fc0EhDKAu7F%2bMrysY%3d

File Edit View Favorites Tools Help

Norton Norton Safe Search Search Cards & Logins Share Browser WebEx

NSRP Survey on the Cost of Navy QA/QC

Exit this survey

2. Accessing the Work Area

When performing in-process coating inspections for critical coated areas on US Navy Ships in accordance with the procedures outlined in Navy Standard Item 009-32, the inspector must access the space being preserved multiple times. Furthermore, there is a variety of paperwork which must be completed. And of course, there is the actual inspection or measurement that must be performed.

Recognizing that jobs vary in size and duration, please do your best to estimate the time required for each of the following activities. There are three pages in this section - one regarding access time, one regarding paperwork and a third regarding specific inspection tasks.

1. How much time (in minutes) is required each time you must access the location being painted to perform an inspection?

Minimum	<input type="text" value="5"/>
Typical	<input type="text" value="15"/>
Maximum	<input type="text" value="60"/>

2. How often do you find yourself having to access the work area multiple times for a single checkpoint? (For example, separate visits to perform surface profile and conductivity as part of the surface preparation checkpoint or having to stand down in the middle of a checkpoint for some reason)

Almost always

Frequently

Sometimes

Almost never

3. Feel free to elaborate on issues surrounding multiple visits to the work area.

Sometimes, |

100% 6:50 PM

On-line Survey of NBPI Inspectors

- Collect estimates of time required to perform various tasks
 - Preparation and access work area
 - Perform specific measurements
 - Paperwork and reporting
- Space available for open-ended answers
- Survey invitations sent to individuals with NBPI certification
 - 106 Respondents

Survey Content

- Thirty-two questions

[SURVEY PREVIEW MODE] NSRP Survey on the Cost of Navy QA/QC - Internet Explorer provided by Dell

http://www.surveymonkey.com/s.aspx?PREVIEW_MODE=DO_NOT_USE_THIS_LINK_FOR_COLLECTION&sm=c7YtUgPVvluZWAZGhe3%2bQd8%2fc0EhDKAu7F%2bMysY%3d

File Edit View Favorites Tools Help

Norton Norton Safe Search Search Cards & Logins

Convert Select Share Browser WebEx

NSRP Survey on the Cost of Navy QA/QC

[Exit this survey](#)

3. Documentation Tasks

When performing in-process coating inspections for critical coated areas on US Navy Ships in accordance with the procedures outlined in Navy Standard Item 009-32, the inspector must access the space being preserved multiple times. Furthermore, there is a variety of paperwork which must be completed. And of course, there is the actual inspection or measurement that must be performed.

Recognizing that jobs vary in size and duration, please do your best to estimate the time required for each of the following activities. There are three pages in this section - one regarding access time, one regarding paperwork and a third regarding specific inspection tasks.

1. How much time (in minutes) is required to prepare the paperwork associated with each of the following appendices?

APPENDIX 1, QA INSPECTION FORM - ENVIRONMENTAL READINGS & PAINT/NONSKID STORAGE

APPENDIX 2, QA INSPECTION FORM - SSPC-SP 1 CLEANLINESS CHECKPOINT

APPENDIX 3, QA INSPECTION FORM - SURFACE PROFILE / PREPARATION & CLEANLINESS LOG

APPENDIX 4, QA INSPECTION FORM - SURFACE CONDUCTIVITY / CHLORIDE LOG

APPENDIX 5, QA INSPECTION FORM - SURFACE CLEANLINESS (DUST) TAPE

APPENDIX 6, QA INSPECTION FORM - PAINT/NONSKID APPLICATION AND CONSUMPTION LOG

APPENDIX 7, QA INSPECTION FORM - DRY FILM THICKNESS MEASUREMENTS

APPENDIX 7A, QA INSPECTION FORM - WET FILM THICKNESS MEASUREMENTS

APPENDIX 8, COATINGS APPLICATION PRODUCT SUMMARY (CAPS) SHEET

APPENDIX 9, QUALITY ASSURANCE INSPECTION FORM - SUBMARINE TOUCH UP AREAS

2. How much time (in hours) is required to assemble the final package of QA documentation for submittal (including internal reviews)?

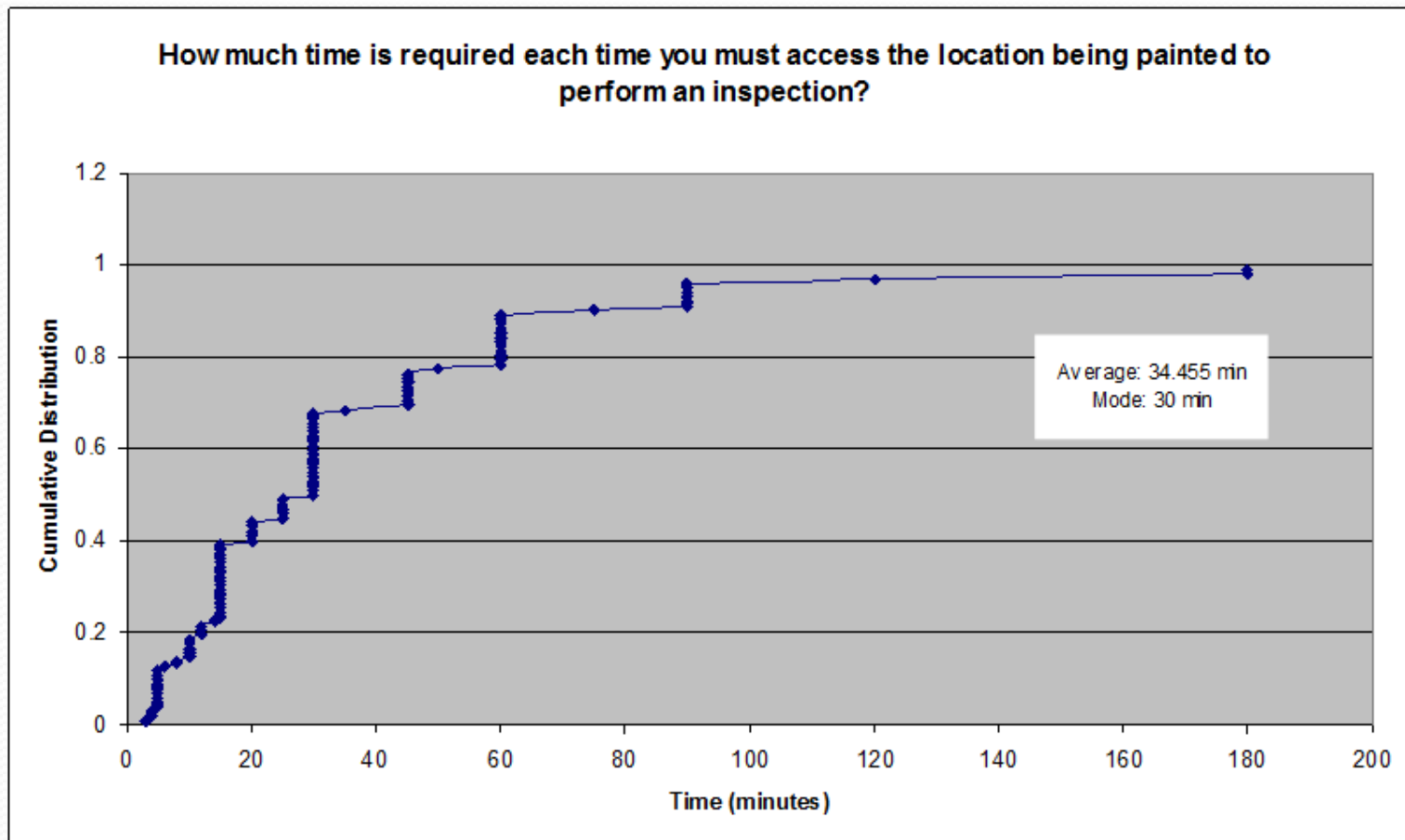
Minimum

Typical

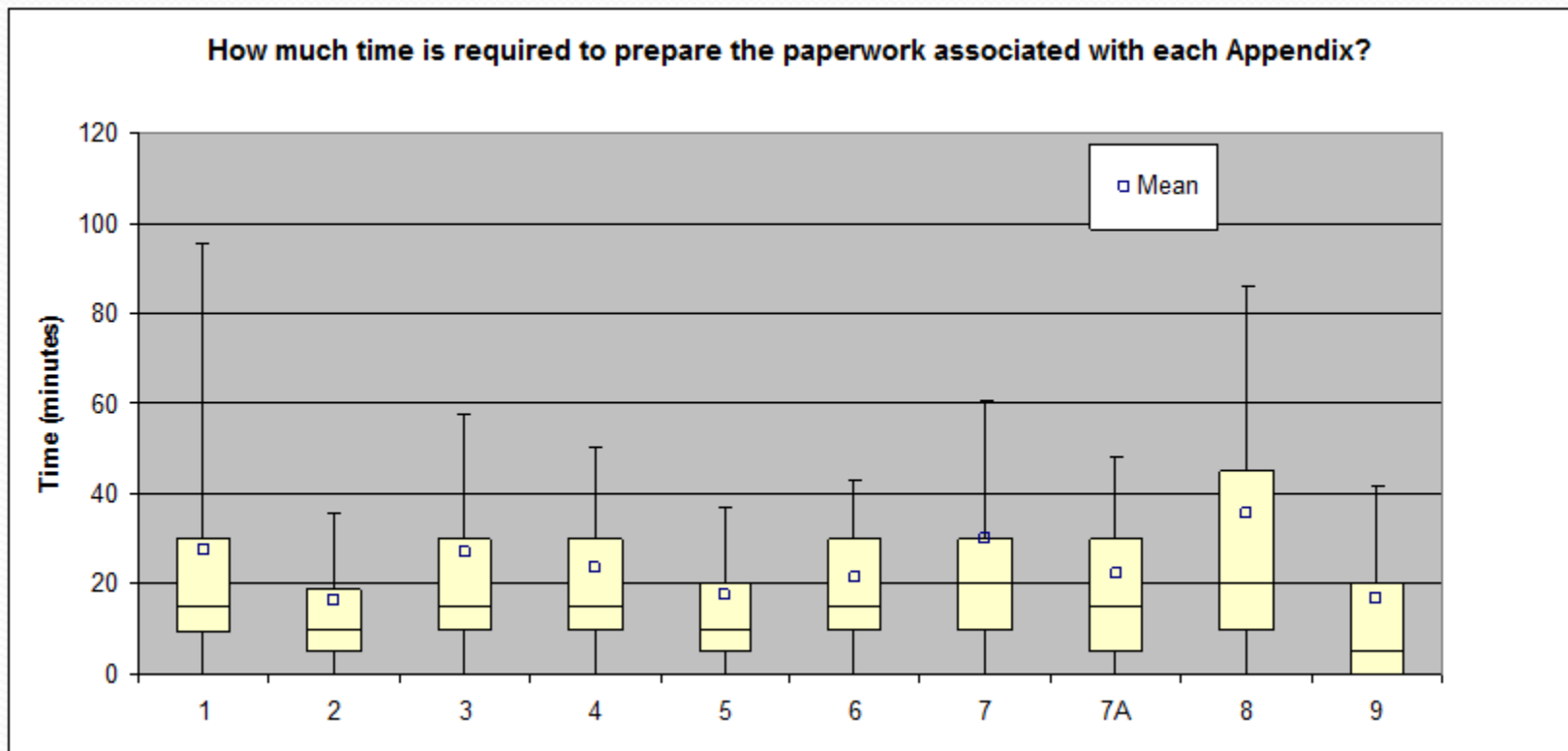
Maximum

100%

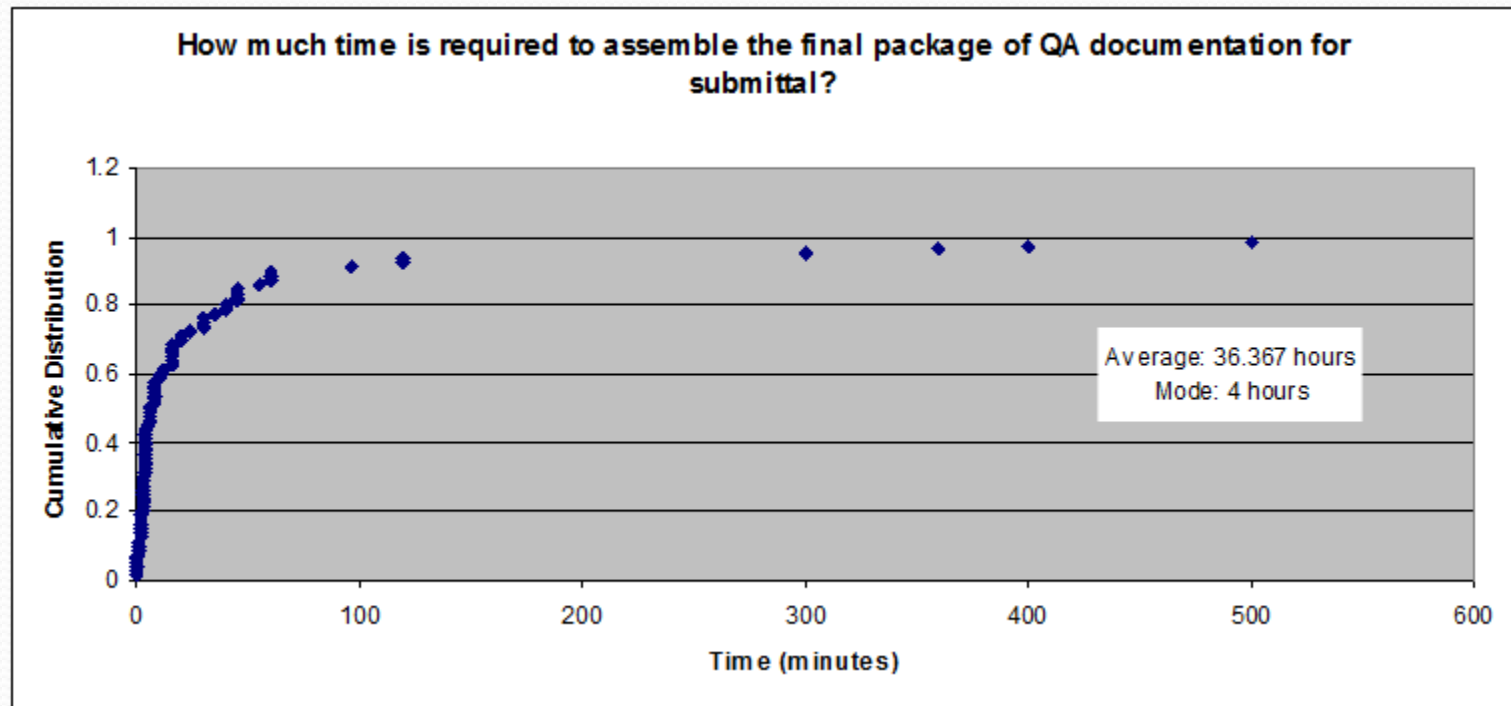
Importance of Access Time



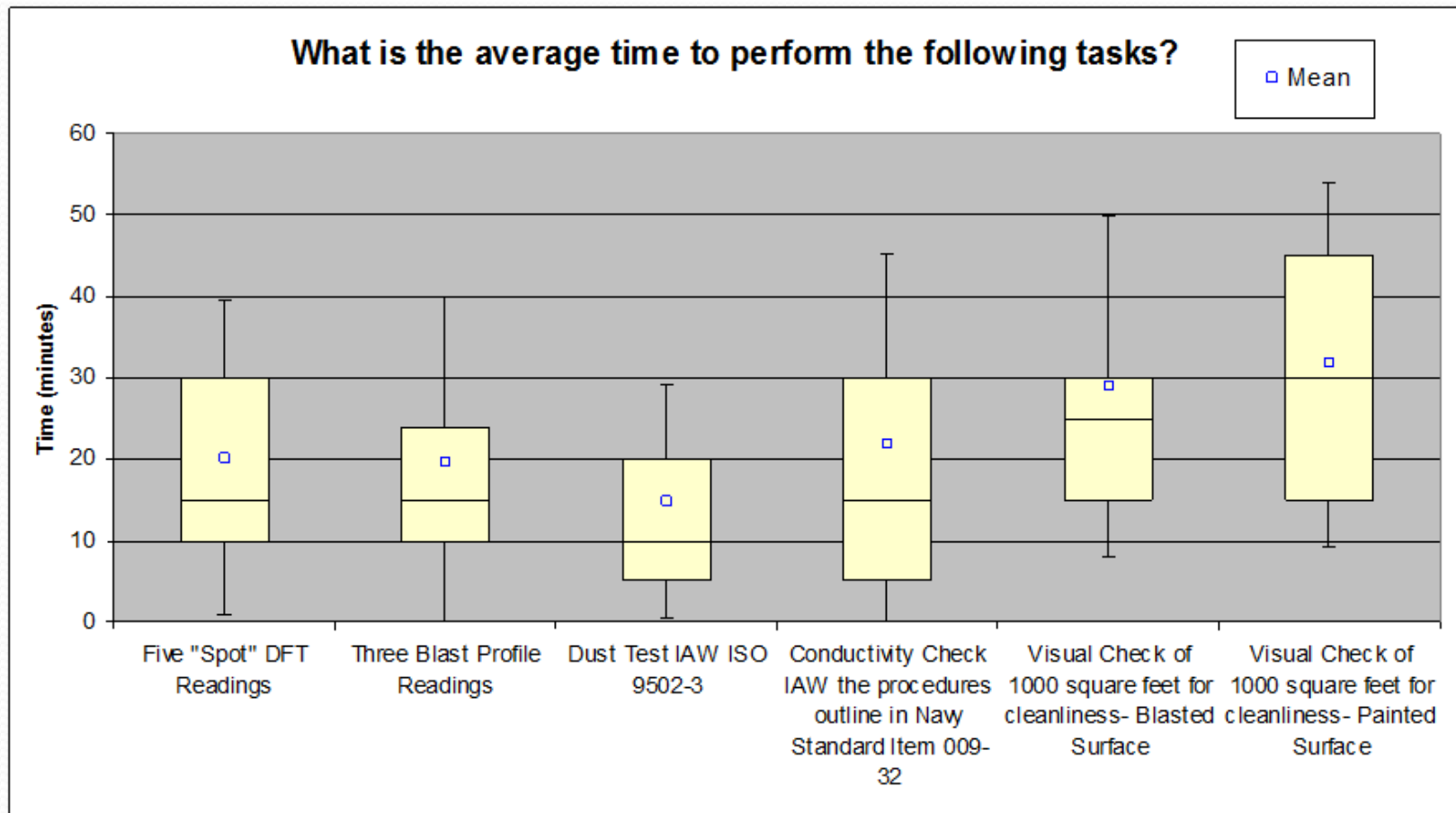
Time Required for Paperwork



Final Paperwork



Time to Actually Perform Readings

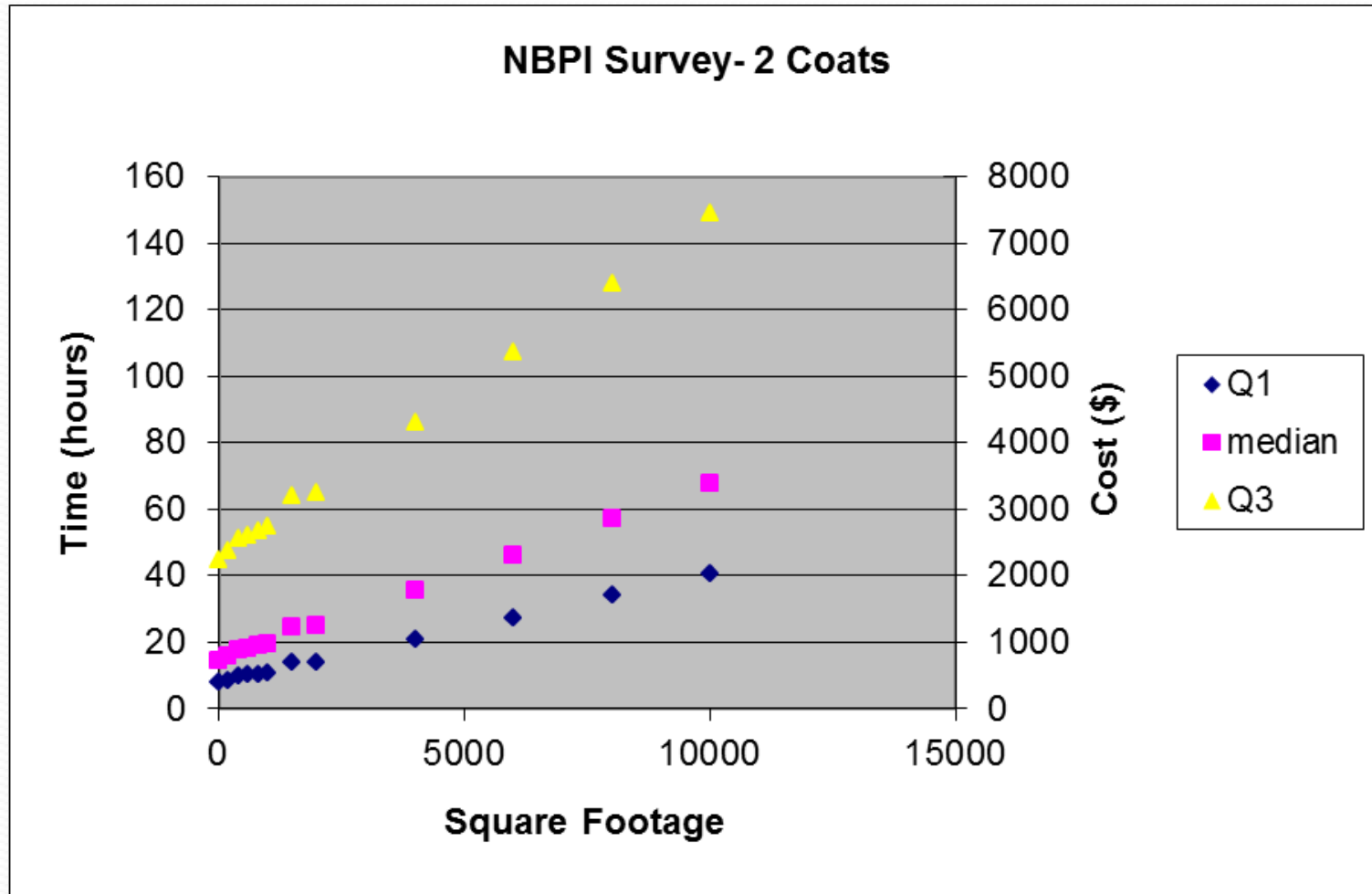


Time/Cost Required Based on Time Estimates

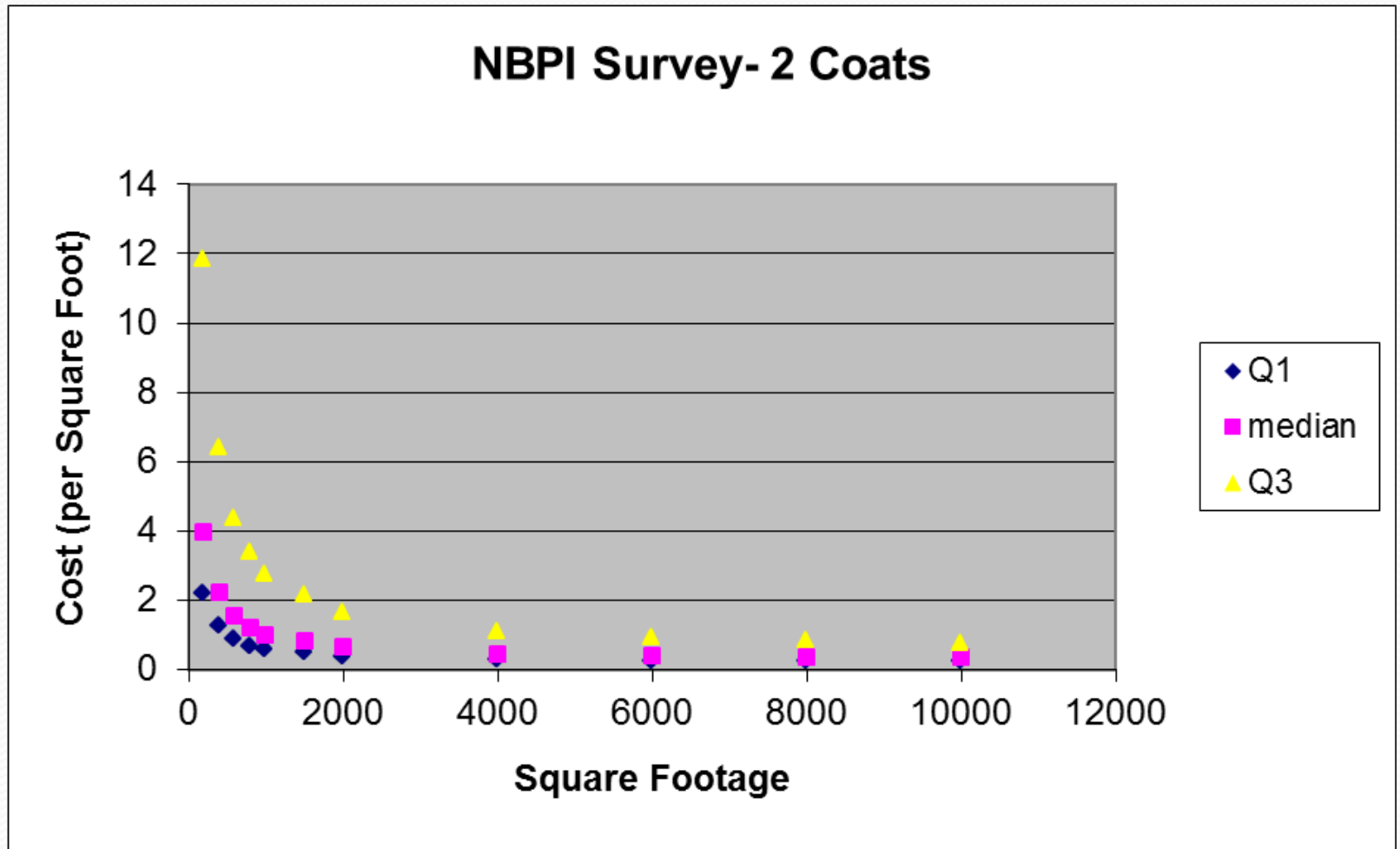
- Input Data Elements

- Appendix 1
- Appendix 2
- Appendix 3
- Appendix 4
- Appendix 5
- Appendix 6
- Appendix 7
- Appendix 8
- Compile Report
- Access Structure
- Visual of Surf Prep
- Visual of Coating
- Profile Calibrate
- Profile Measure
- Dust Calibrate
- Dust Measure
- Conductivity Calib
- Conductivity Meas
- DFT Calibrate
- DFT Measure

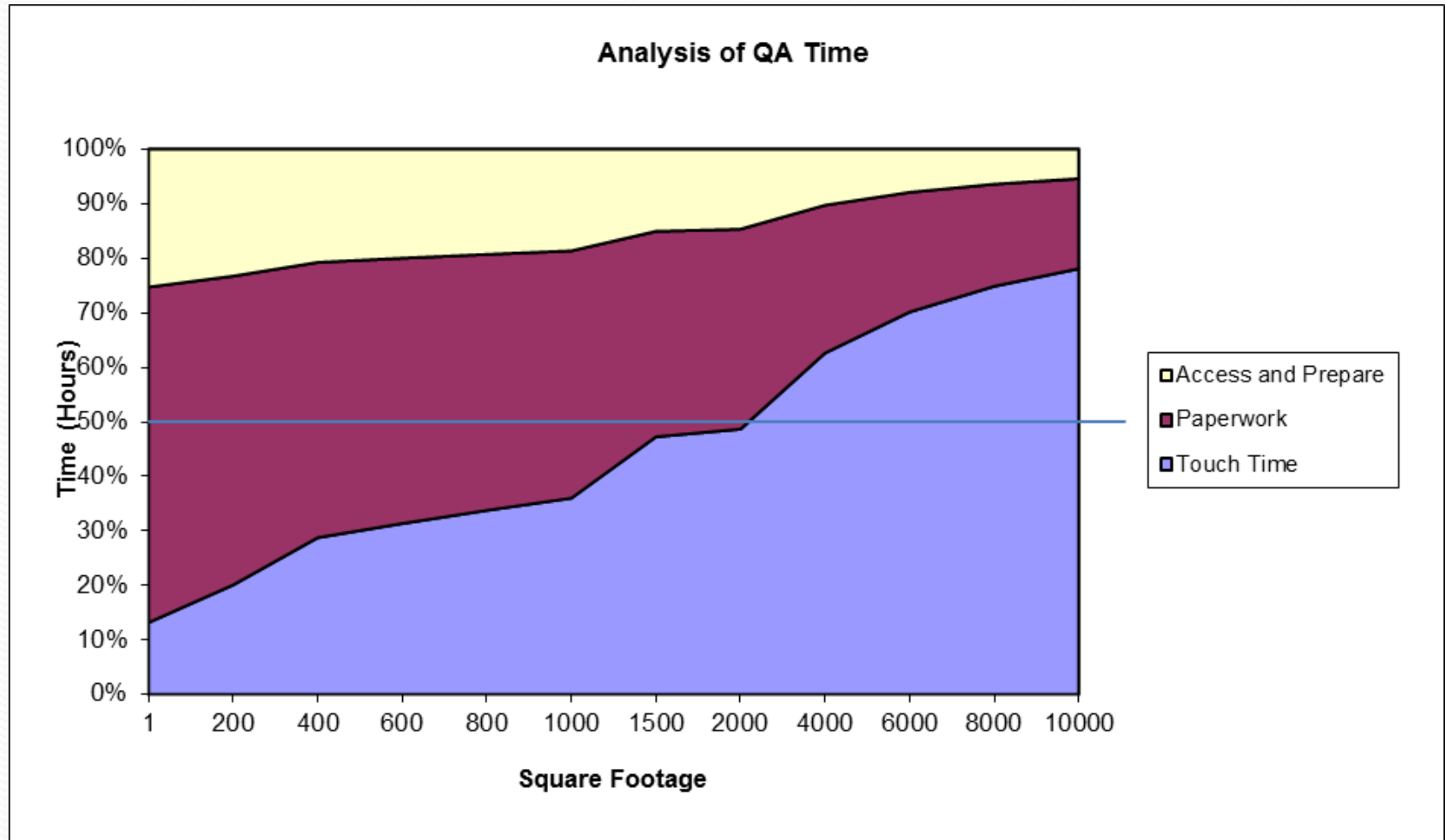
Time/Cost Required Based on Time Estimates



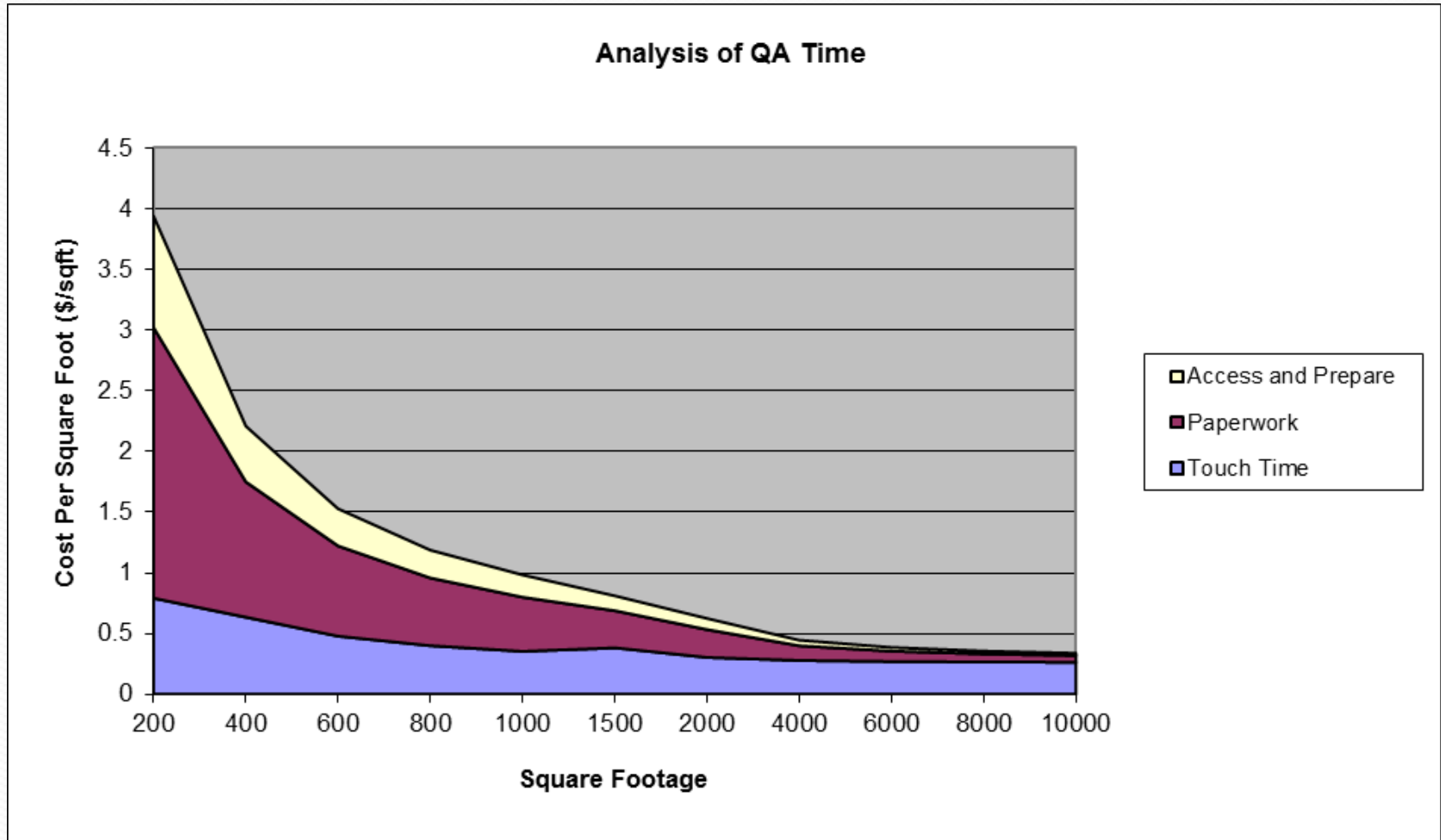
Time/Cost Required Based on Time Estimates



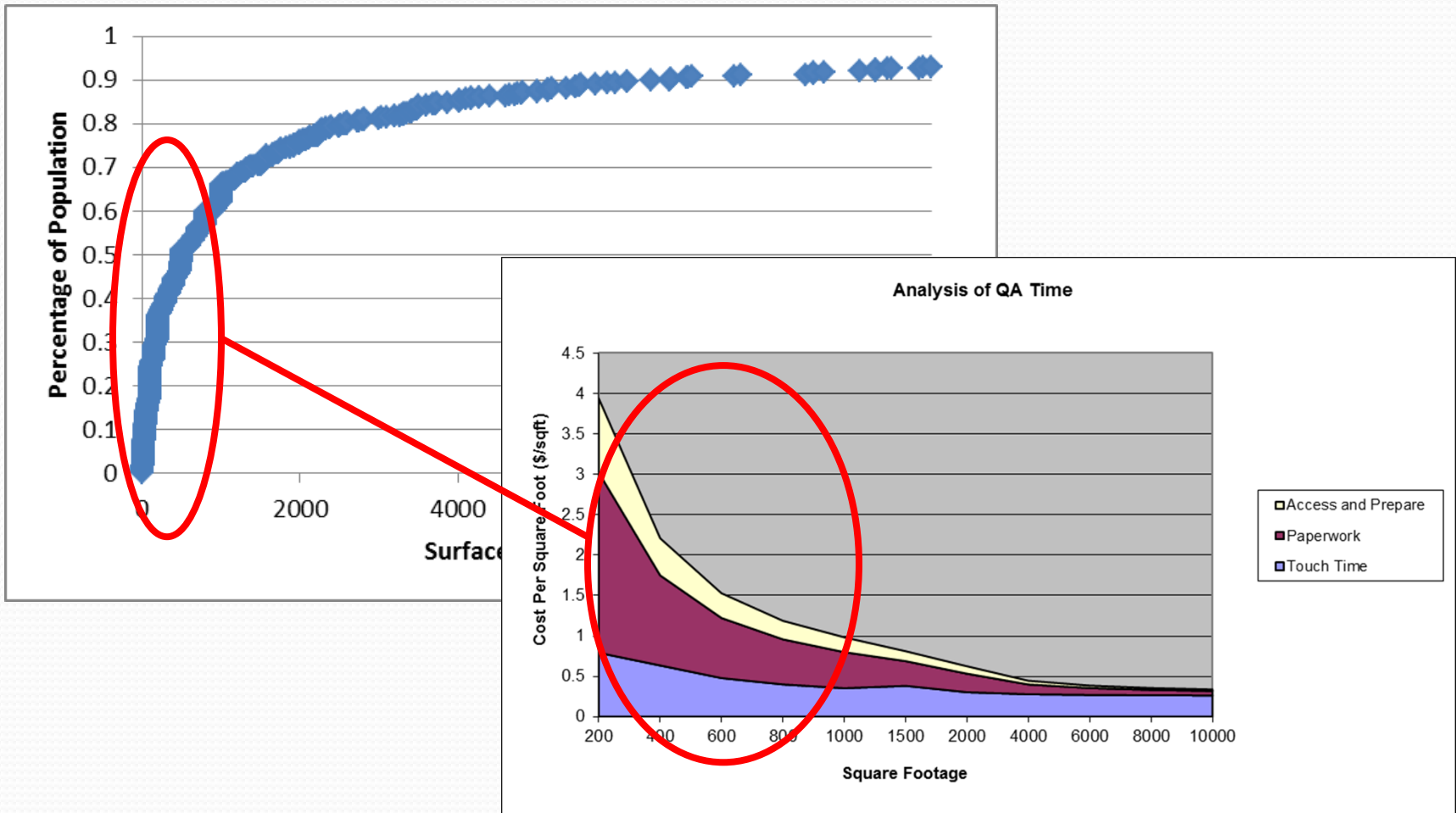
Percent of Time that is “Touch Time”



Percent of Time that is “Touch Time”



Size of Jobs in CQATK



Workshops

November 2-3, 2010 NSRP meeting workshop on Cost of QA

- Presentations on the approach to QA by the Navy, Military Sealift Command, USCG and IMO PSPC
 - To a great extent the technical requirements are similar
 - Details such as reporting and responsible parties vary
- Participants agreed that quality will suffer if the notion of checking/achieving the various things we measure was eliminated entirely
- Possible opportunities for reducing cost without affecting value
 - Reducing measurement frequency when targets are being accomplished
 - Reducing the detail of paperwork
 - Restructure responsibilities such that QA is a cooperative, constructive activity

June 23, 2011 – Cost Reduction Strategies for Coatings Process Improvement

- Objective to find barriers and constraints
 - Consider NSI 009-04 and 009-032 as applied to non-nuclear vessels
 - Start of process = start planning for preservation
 - End of process = government signs off on surface
- Goals
 - Complete SIPOC (suppliers, inputs, process, outputs, customers) map of entire process
 - Using the map, find constraints and/or barriers to improved cycle time (durations), find and eliminate waste
 - Complete the define phase – determine appropriate metrics, identify defect rate
- Deliverables
 - Process map that applies to contractor work
 - Clearly defined charter

June 23, 2011 – Cost Reduction Strategies for Coatings Process Improvement

- Facilitated by Pat Rupert
- Preliminary Participants
 - Steve Cogswell (BAE-Southeast)
 - Judie Blakey (NASSCO)
 - Charlie Simmons (PSNSY)
 - George Gray (Metro Machine)
 - Jeff Brown (UCC Earl)
 - Pete Ault (Elzly)
 - Phillip Sagasser (Marinette Marine)
 - Marinette TBD
 - Mark Ingle (NAVSEA 05P23)
 - Gordon White (Bath Sup Ship)
 - David Ciscon (Columbia Group)
 - Mark Schultz (Sherwin Williams)
 - Arcino Quiero (NNSB)
 - Darius Windley (NNSB)

Summary

- Project collected data to help quantify the cost of QA
 - Much of the cost is related to recordkeeping and reporting
 - Economies of scale suggest that defining “jobs” larger than 2,000 sq ft should help to optimize QA cost/value
- It is a challenge to define the value of QA
 - Depends on how many “failures” you attribute to the lack of QA
- Organized team to figure out a path forward
- Final project report to be delivered NLT 15JUL2011