



Naval Shipyard Project Management Lean Transformation Initiative



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Approved: 
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Current Naval Shipyard Environment



Why Change?

- **Uncertainty & Variability Exists**
 - Complex System of Trade Processes, Support Code Relationships, IT Tools, and Conflicting Priorities
 - AWP/SWLIN Scope Changes
 - Emergent/New activities
 - Schedule Conflicts
 - Different Skill Levels
 - Project Management done differently across Shipyards
 - Murphy's Law
- **Resources Limited**
 - Right People with Right Skills & Right Experiences
 - Subordinate all actions to keeping resources busy.
 - Have enough activities open at all times so that resources do not run out of work
- **Aggressive Schedules**
 - Cost, Schedule, & Quality Commitments are Essential
- **True Transformation (25-40%) Required Vice Tweaking (5-10%)**



Must Get More Activities Done with Less People in Less Time



End in Mind



The Goal

- **All** Availabilities **On or Ahead of Schedule**
- **All** Availabilities **25% Less Cost**
- **All** Availabilities **OT at 5-10% Levels**

The Focus

Non-Stop Execution of the Critical Chain in support of the Mechanic on the Jobsite

True Transformation is Required Vice Tweaking



How To Effect The Change?



Lean Basics

- Specify “Value” from the Customers’ Perspective
- Map and Analyze the “**Value Stream**”
 - End to end and across Organizational Boundaries
- Make the Value Stream “**Flow**”
 - Single Piece Flow/No batches or piles
 - Non-Stop Flow/No stops or back-ups
 - Low WIP, No Multi-Tasking
 - Visual Controls
 - Rapid Problem Resolution (Andon)
 - ***Finish What You Start!***
- Enable the Customer to “**Pull**” Value from the Value Stream
- Eliminate wastes
- Seek **Perfection!!**

“Lean” is a system of principles and practices to reduce cost by eliminating waste and all non-value added activities

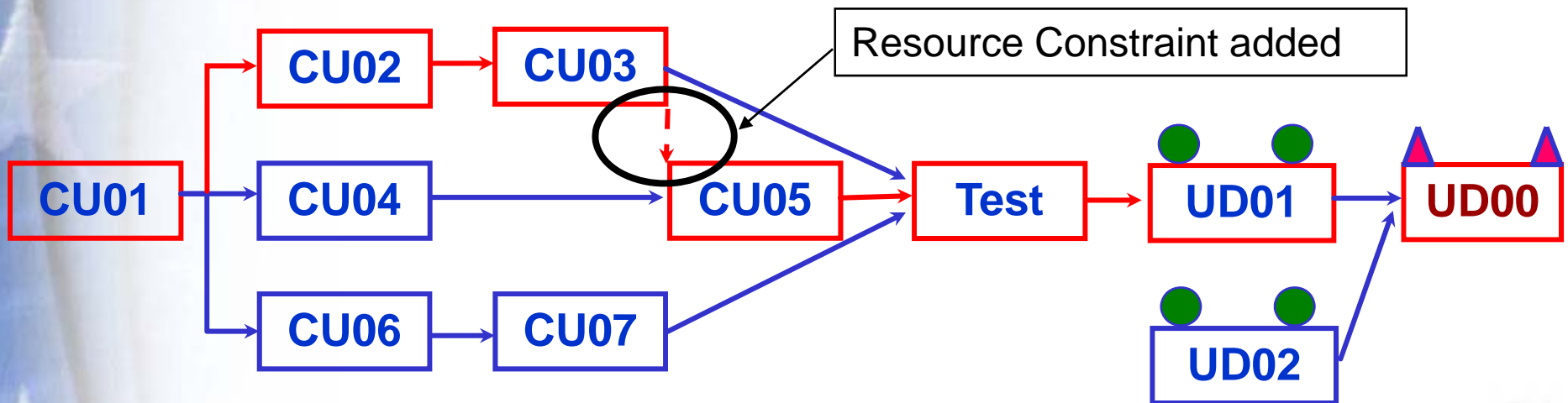


How To Effect The Change?



The **Critical Chain** (red boxes) is the Critical Path taking into consideration resource (labor and non-labor) limitations.

Any slippage of activities on the **Critical Chain** will negatively impact the Key Event and possibly the completion of the Project.



How To Effect The Change?



Theory of Constraints (TOC) Basics

Define The Goal

Five Focusing Steps

1. **Identify** the System Constraint
 - For NSYs, the System Constraint is the Critical Chain for the Availability
2. **Exploit** the System Constraint
 - Aggressive durations with buffers for uncertainty and variability
 - Parkinson's Law & Student Syndrome
3. **Subordinate** Everything Else to the System Constraint
 - ***The Focus: Non-Stop Execution of the Critical Chain in Support of the Mechanic on the Jobsite***
 - ***Never let the Critical Chain slow down or stop!!***
 - Low WIP, No Multi-Tasking
 - Whole Team/Shipyard Focus (People, Paper, Parts, Tools, etc.)
4. **Elevate** the System Constraint
 - Increase Capacity & Focus Applied to the Critical Chain
5. **Go back to Step 1**
 - Update & Monitor **Daily** for New Constraints to the Critical Chain



Project Management Deliverables



■ Lean Release 2.0

- NAVSEA 04 Lean Release Letter (04X/245) dtd 11 September 2006 directed:

- **Execution Priorities (Prioritization):** Execution WBS, Anticipated New Work, NMS Release 10.4.2, Network Validation, Resource Constrained Schedules (RCS) @ A-2, Daily Priority List (DPL), Short Range View (SRV), Event Readiness View (ERV).
- **Execution Support (Job Readiness):** Package and release activities in accordance with the DPL.
- **Execution (WIPCON):** Control Work in Process in accordance with the DPL.
- **Resource Allocation (Resource Allocation):** Allocate resources in accordance with Priorities.
- **Execution Support (Andon):** Resolve problems in accordance with the DPL and utilize Andon.
- **Execution (Overtime Allocation):** Allocate overtime in accordance with Priorities.

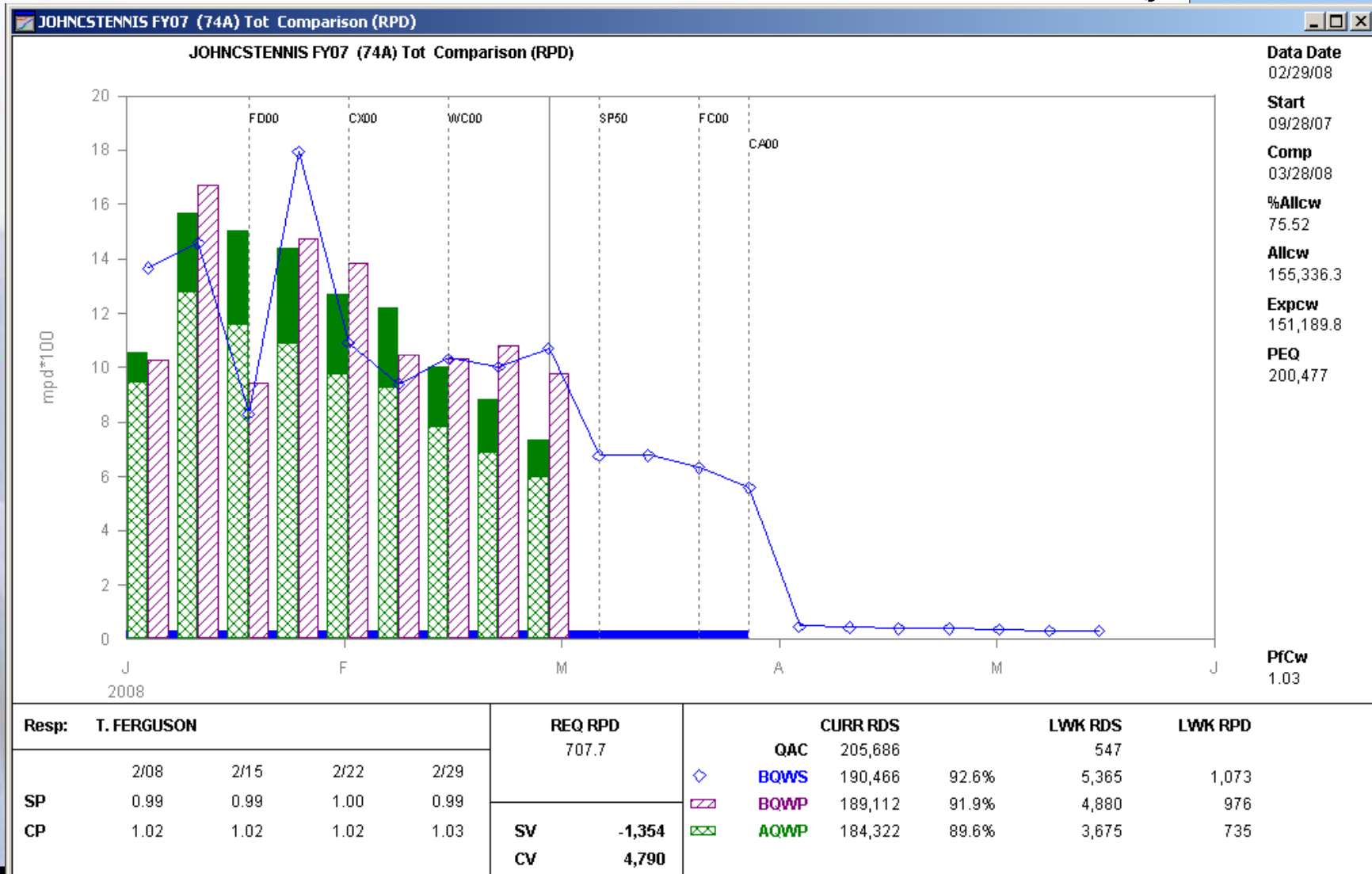
■ Lean Release 3.0

- NAVSEA 04 Lean Release Letter (04X/145) dtd 02 July 2007 directed:

- **Web AIM DPL across Projects within a Shipyard**
- **PSS Prioritized Resource Histograms for Total Shipyard, by Project, by Shop, etc. Visible & Accessible in WebAIM**



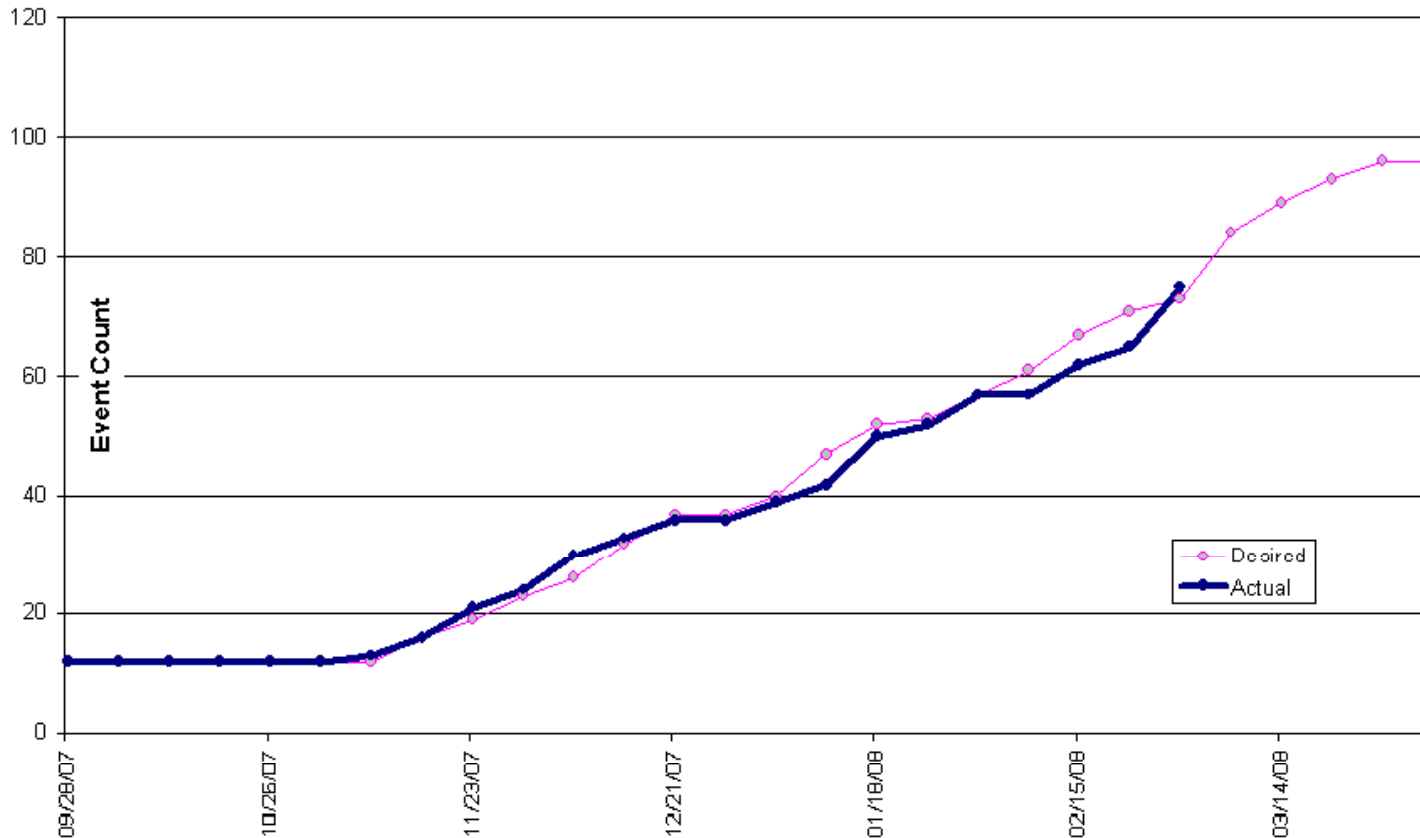
USS JOHN C. STENNIS Resource Comparison Total Project



USS JOHN C. STENNIS Key Event/Milestone Performance



USS John C. Stennis (CVN-74) 74A PIA
Key Event - Milestone Scheduled/Complete Graph



Scheduled	97	Total Completed	75
Past Due	0	Completed Early	26
Due This Wk	9	Completed On Time	28
Due Next Wk	5	Completed Late	21

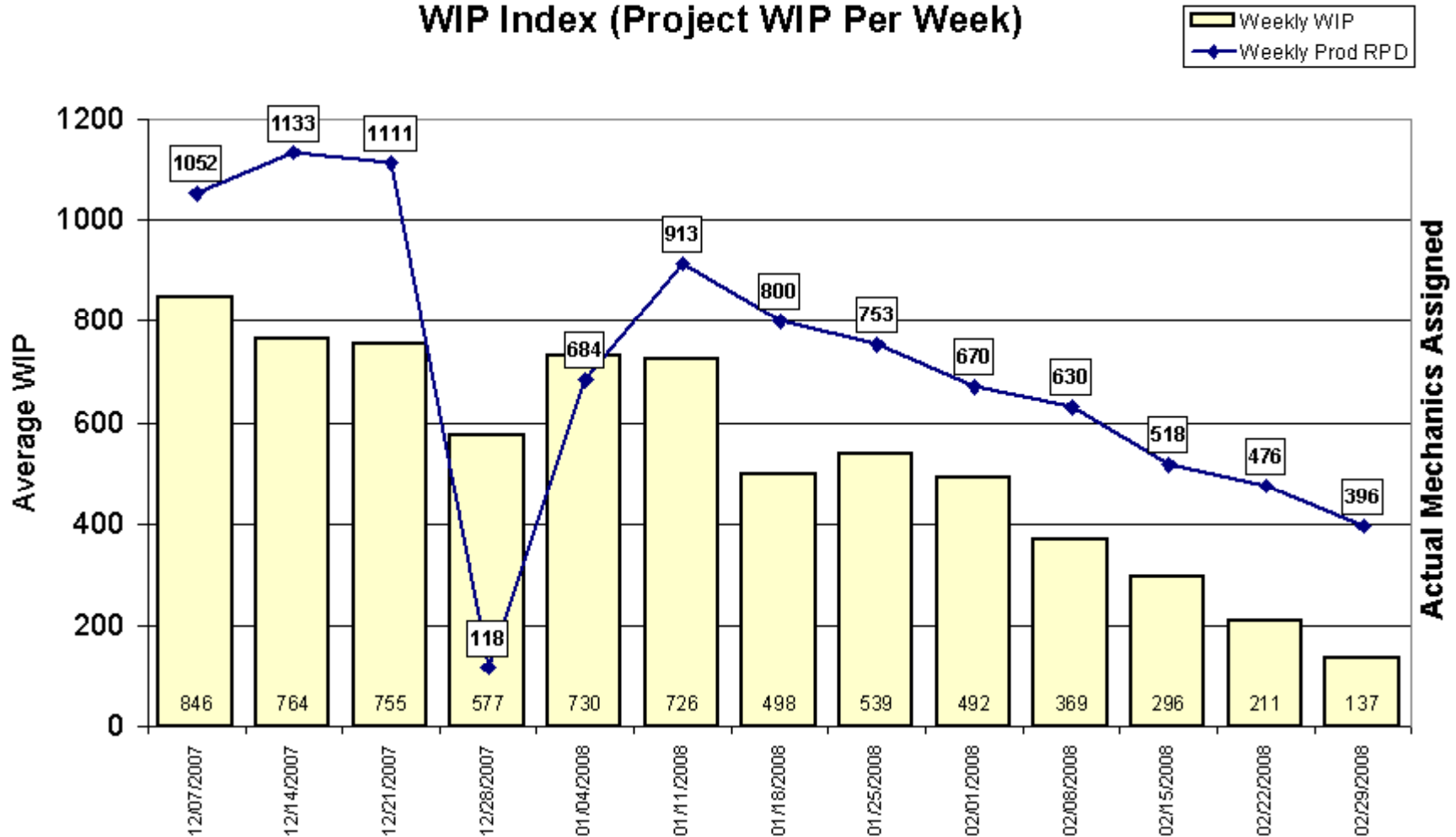
Current WK	Wk 22
CA00 Wk	Wk 26



USS JOHN C. STENNIS Total Project WIP



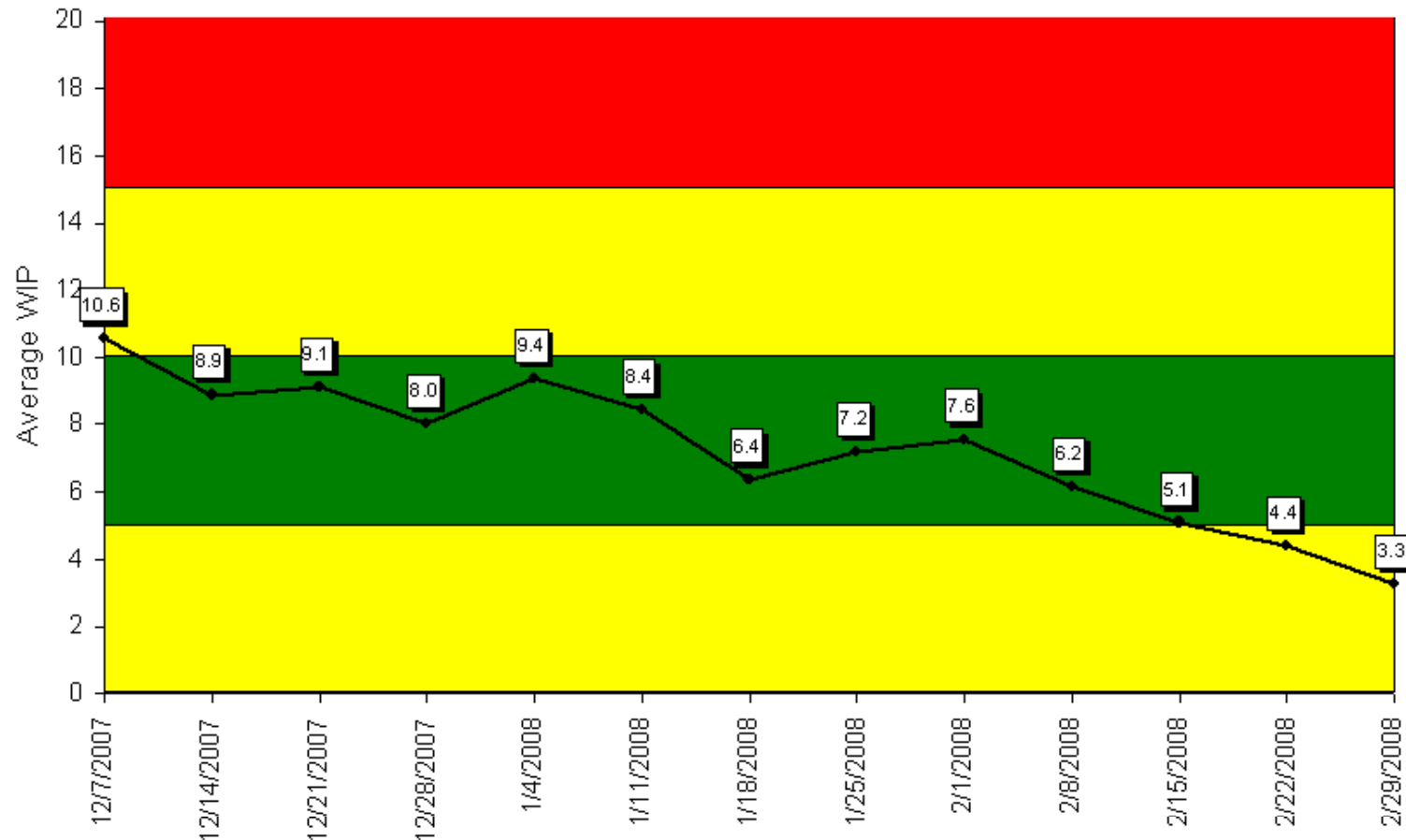
USS John C. Stennis (CVN-74) 74A PIA
WIP Index (Project WIP Per Week)



USS JOHN C. STENNIS Average WIP/Supervisor



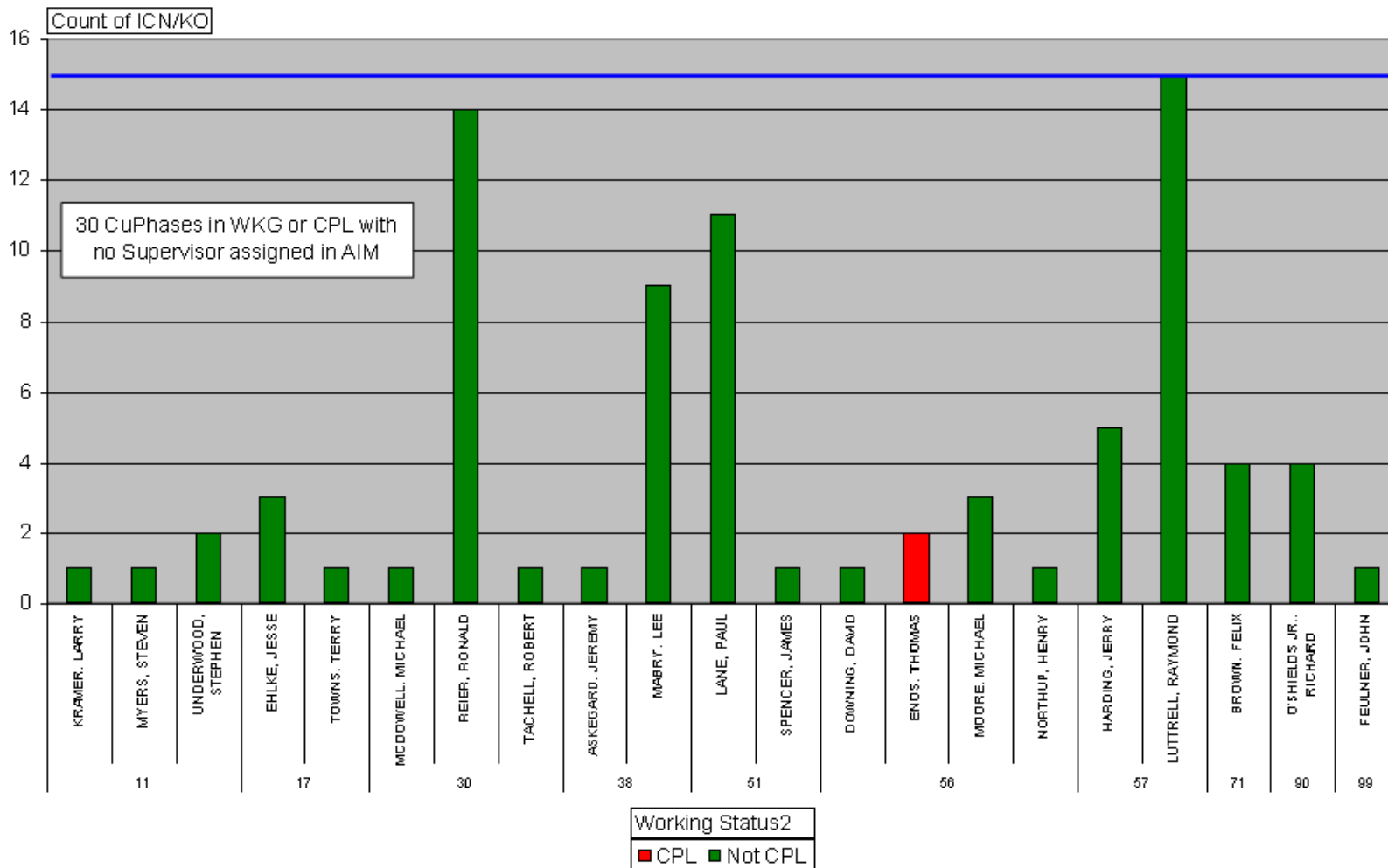
USS John C. Stennis (CVN-74) 74A PIA
WIP Index (Average Supervisor WIP Per Week)



USS JOHN C. STENNIS Supervisor WIP



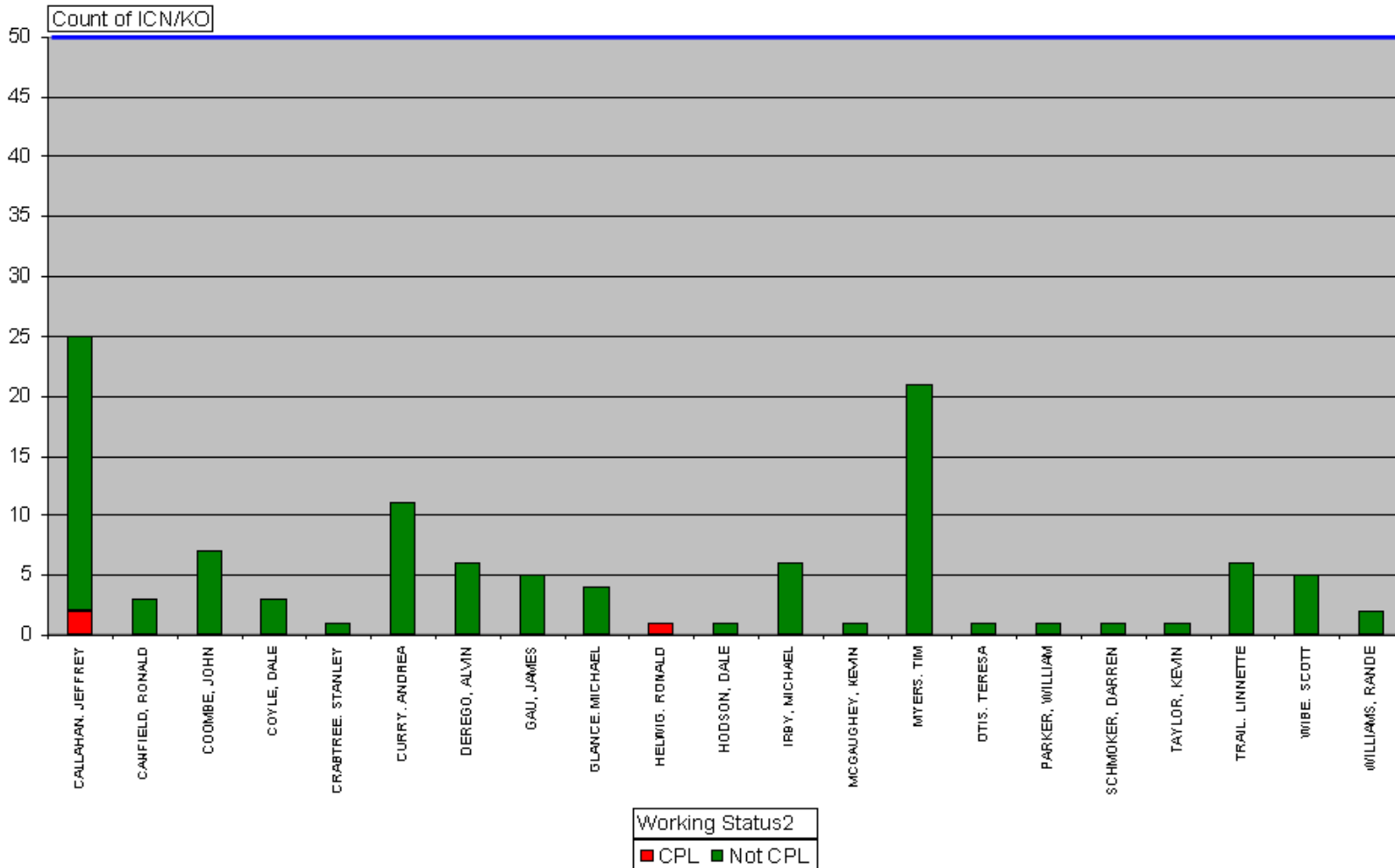
74A WIP for Supervisors by Shop as of 3/3/2008



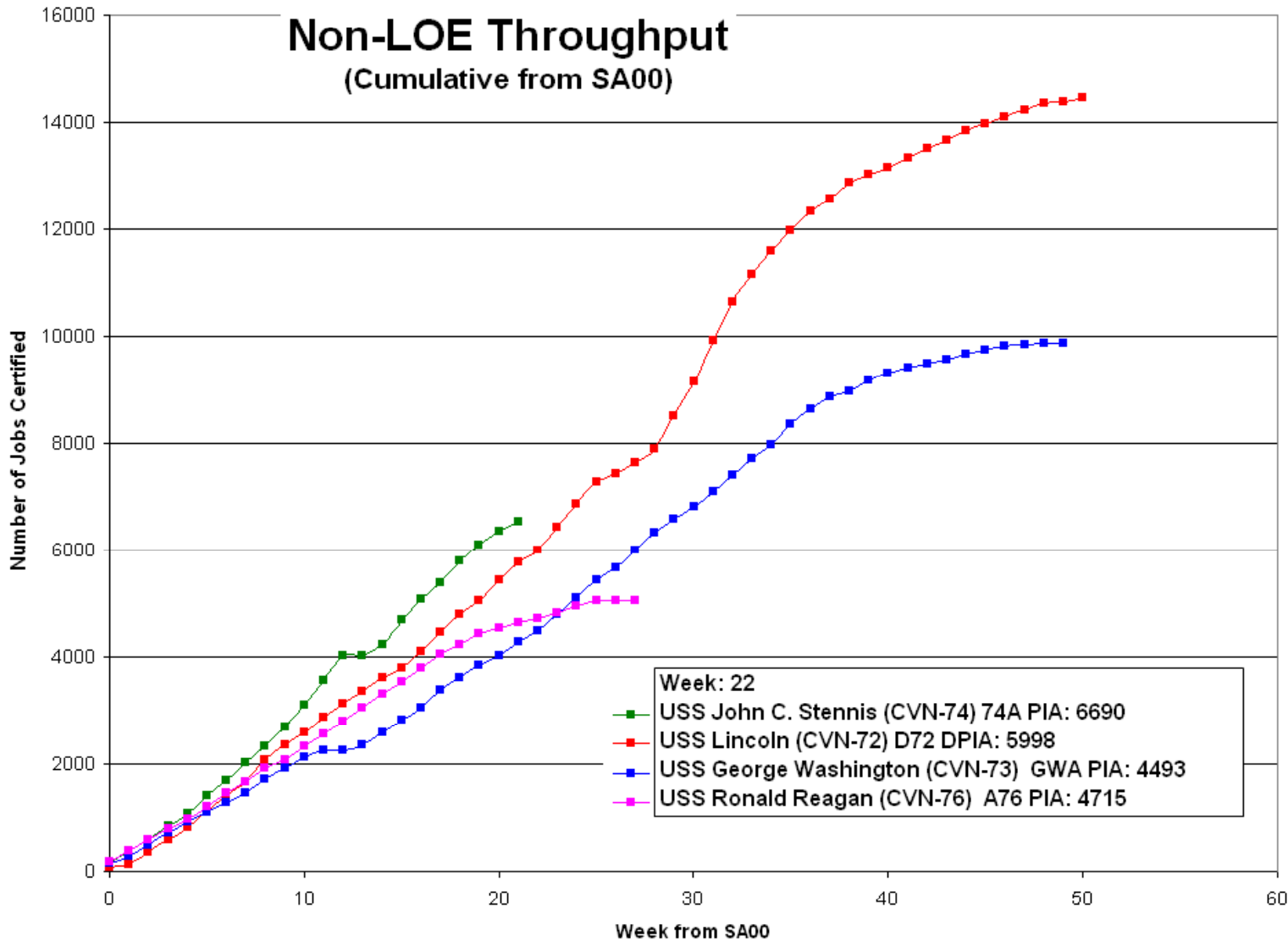
USS JOHN C. STENNIS ZM WIP



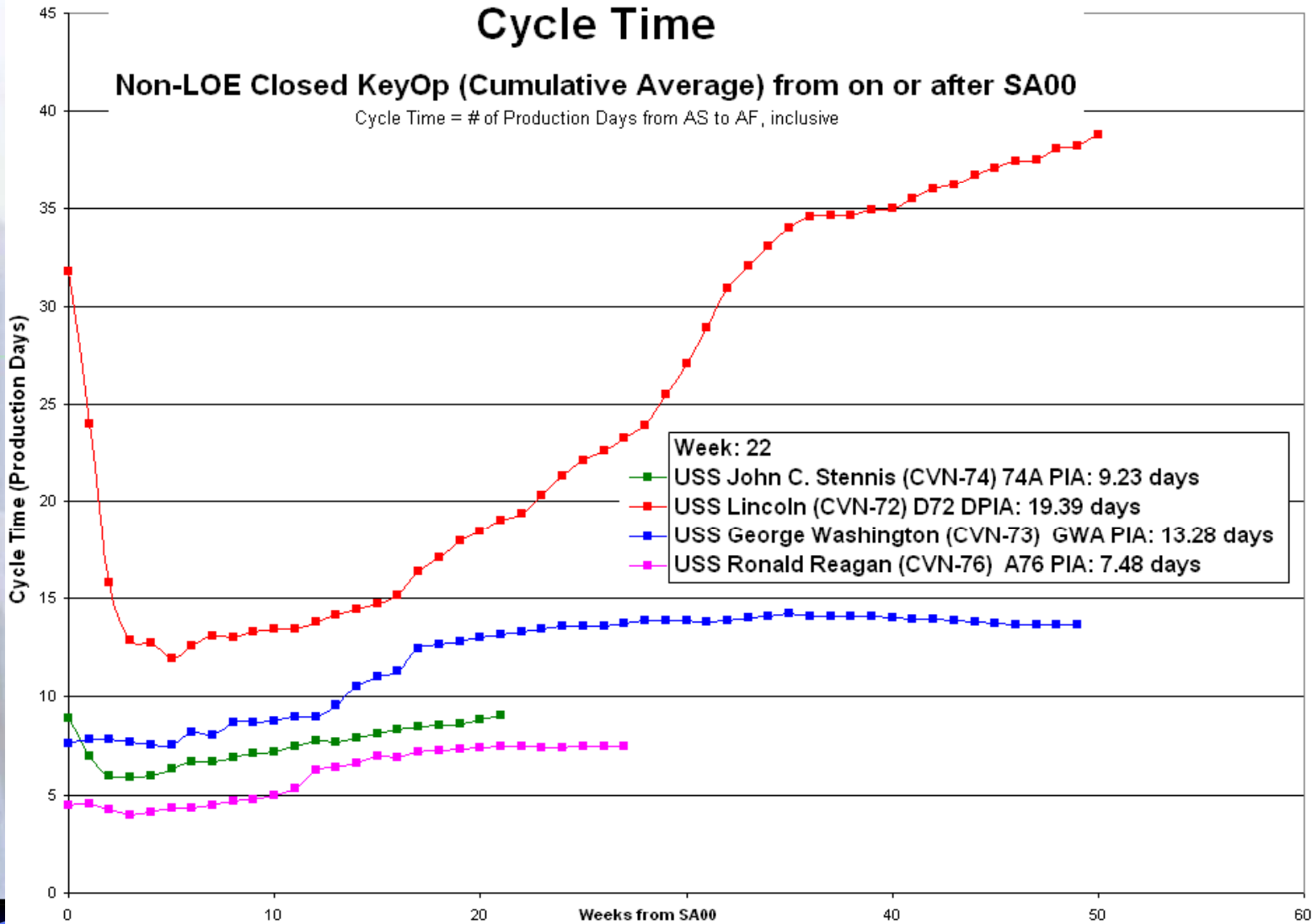
74A WIP for Zone Managers by Avail as of 3/3/2008



USS JOHN C. STENNIS Throughput



USS JOHN C. STENNIS Cycle Time



Lean Release 2.0/3.0 Summary



- **Focus on “Non-Stop Execution of the Critical Chain”!**
 - **Develop Your Plan the Way You Plan to Execute the Work!**
 - **Keep the *DPL* Accurate & Up-to-Date (When Will it *Finish*)!**
 - **Claim Actual Start Dates *DAILY*!**
 - **Input *RDU* for *WKG* activities on the *DPL DAILY* (NOT *PC* in *SUPDESK*, & NOT *THE MONEY*)!**
 - **Claim Actual Finish Dates *DAILY*!**
 - **Certify the activities *DAILY*!**
 - **Finish What you Start!!**
 - **Keep *WIP* Low!!**
 - **Resolve Problems *Quickly*!!**
 - **Keep *Manning* Lean!!**
 - **Keep *Overtime* Low!!**
 - **BEAT THE KEY EVENT DATES!**



Execute the Plan! Meet the Goal!!



Summary and Conclusion



- ***Lean & TOC/CCPM can dramatically...***
 - ***Improve Ship Delivery Date Reliability***
 - ***Shorten Overall Ship Schedule Durations***
 - ***Provide “Early Warning” of Threats to Ship Delivery***
 - ***Enable Earlier, Less Drastic Crisis-Oriented Responses***
 - ***Increase Throughput & Reduce Cycle Times***
 - ***Reduce Rework / Improve Quality***
 - ***Reduce Costs***
 - ***Reduce Overtime***

In other words... BETTER CONTROL, LESS CHAOS!

But, It Takes a Willingness to Dramatically Change Our Behaviors. Are We Willing?



Execution Priorities



Step 3: Subordinate to the Critical Chain:

■ Prioritization within a Project

- Uses Project Sequencing and Scheduling (PSS) software
- **Key Event** penetration is analyzed on a copy schedule with “Non-Held” constraints released to determine **Color**
- **The system will assign color based on the copied network’s released float.**
 - **RED – ACTIVITIES penetrating 10 days or less to a KEY EVENT**
 - **YELLOW – ACTIVITIES between 11 and 30 days to a KEY EVENT**
 - **GREEN – ACTIVITIES with more than 30 days to a KEY EVENT**
 - **BLUE – Level of Effort ACTIVITIES**



What To Change To – Execution Priorities



Step 3: Subordinate to the Critical Chain:

- **Prioritization across Projects within a Shipyard**
 - **Project Priorities are determined as stated previously**
 - **Projects are ranked by Operations Officer (Code 300)**
 - **Shipyard Priority Numbers** are assigned back to Project master schedules based on combination of Project Priority and the integrated Shipyard impact on completion and ability to work now
 1. **Least Float**
 2. **Earliest Start**
 3. **Highest Ranked Project**

Web AIM Default Screen lists the **TOP TEN SY Priorities**

Hot Activity List

SY Pri	Proj ID	KE	MS	JO-KO/SA#	Title
1	G72	SP00	CV81	38G7258705-R03	CLOSE CATAPULT ACCU
2	G72	SP00	CV81	36G7258707-R03	SF - RE-INSTALL 2CAT RI
3	G72	SP00	CV81	38G7258704-R04	CLOSE CATAPULT ACCU
4	G72	SP00	CV81	38G7258707-R04	CLOSE CATAPULT ACCU
5	G72	SP00	CV81	38G7258733-I05	TODD - 587-13-002 - CC
6	G72	SP00	CV81	36G7258712-R01	SF - RE-INSTALL 3CAT G
7	G72	SP00	CV81	38G7258703-R06	REINSTALL CAT 2 SEALI ASSOCIATED COMPONE



Execution Priorities-Project Ranking

Step 3: Subordinate to the Critical Chain:



DPL – How to determine Shipyard Priorities

- Shipyard Operations Officers manually select availability Priority

Prioritization ▾ Favorites ▾ Help ▾



Execution Prioritization > SY Project Ranking

SY Project Ranking

Submit Add... Remove Select All

Rank	Project ID	Project Name	Ship Type	Hull Number
<input type="text" value="1"/>	GWA	WASHINGTON FY07 PIA (D)	CVN	73
<input type="text" value="2"/>	CHR	USS CHARLOTTE FY 05 DMP	SSN	766
<input type="text" value="3"/>	ALK	USS ALASKA FY07 ERO	SSBN	732
<input type="text" value="4"/>	RET	USS ROOSEVELT FY07 PIA	CVN	71
<input type="text" value="5"/>	TSN	USS TUCSON FY07 DMP	SSN	770
<input type="text" value="6"/>	NAU	USS NASSAU PMA FY06	LHA	4



Default Screen

Step 3: Subordinate to the Critical Chain:



Prioritization ▾ Favorites ▾ Help ▾

AIM
Execution Prioritization

Hot Activity List

Default Screen is the **FIRST SCREEN** that **EVERYONE** who logs in will see

SY Pri	Proj ID	KE	MS	JO-KO/SA#	Title	ZM/SUP	Start	Finish	RDU	Cal	TGI	WKG	RSN	Note	Clr
1	CHR UD00 UD38			38CHR07103-ICP	PTI TD-29/30 AND 31 TORP TUBE EQUAL HULL JOINT TESTING	MEHRTENS, JOHN T / LAMBRIGHT, SCOTT A	02/28/07	03/06/07	5	15		REL			R
2	CHR UD00 UD38			38CHR07102-TFC	ASW PUMPS & ASSOC PPG AND CONSTANT VENT STR & TTNS	LAMBRIGHT, SCOTT A / LAMBRIGHT, SCOTT A	12/15/06	02/20/07	3	16		WKG			R
3	CHR UD00 UD38			38CHR07103-IGA	PTI HYD STBD SPLY & RTRN HDRS, PWR PLANT PRE-LIM AIR TEST & OPER TIGHTNESS	SILVER, WALTER / LAMBRIGHT, SCOTT A	12/18/06	02/21/07	1	15		WKG			R
4	CHR UD00 UD38			38CHR07102-TEO	EMBT BLOW HEADER PPG AFT TIGHTNESS	LAMBRIGHT, SCOTT A / LAMBRIGHT, SCOTT A	12/08/06	02/23/07	2	15		WKG			R
5	CHR UD00 UD38			38CHR07102-TAV	HYD STBD SPLY & RTRN HDRS, PWR PLANT PRE-LIM AIR TEST & OPER TIGHTNESS	LAMBRIGHT, SCOTT A / LAMBRIGHT, SCOTT A	01/10/07	02/27/07	5	16		WKG			R
6	CHR UD00 UD38			38CHR07103-IEH	PTI ALP 125# AIR HEADER TTNS AND OPER	MEHRTENS, JOHN T / LAMBRIGHT, SCOTT A	01/08/07	02/21/07	1	15		WKG			R

Hot Stopped Activity List

Default Screen lists the **TOP TEN SY Priorities** and the **TOP TEN Stopped Activities**

SY Pri	Proj ID	KE	MS	JO-KO/SA#	Title	ZM/SUP	Start	Finish	RDU	Cal	TGI	WKG	RSN	Note	Clr
12	CHR UD00 UD38			38CHR07102-TL	3000# AHP HDR AFT TO PORT & STBD FLD CONT, SS & SD HYD ACCUMM PPG TIGHTNESS	LAMBRIGHT, SCOTT A / LAMBRIGHT, SCOTT A	03/31/07	04/02/07	2	16		REL	WC	want to add plan start	R
20	CHR UD00 UD38			38CHR07102-TEG	ALP TO HYDRAULIC VENT & SUPPLY TANKS TIGHTNESS	LAMBRIGHT, SCOTT A / LAMBRIGHT, SCOTT A	03/01/07	03/02/07	2	26		REL	7L	test date	R
338	GWA FD00 PW08			36GWA21709-R28	DISCONNECT D/P TESTER	CARTER, WILLIAM C / ELKIE, MICHAEL A	02/02/07	02/05/07	10	35	REC	WCT	7D	PL 5285	R
387	GWA FD00 PW08			36GWA21709-R45	Relocate D/P Tester	CARTER, WILLIAM C / ELKIE, MICHAEL A	02/06/07	02/07/07	11	35	REC	WKG	7D	DL5, PL 4282	R
433	GWA PW00 PW09			36GWA21677-U16	(PSNS) Remove Tube Hangers	CALLAHAN, JEFFREY A / STEWART, EUGENE L	02/06/07	02/08/07	6	16	REC	WKG	7D	my note	R
436	GWA FD00 FD03			38GWA12317-K02	MARMC BLAST 2-148-6--V	HEINE, ANDY /	02/06/07	03/16/07	29	15		WKG	MAT	Shop Stores O-ring C/O 6244 - FISC delivered 2/6/07 to Shop Supv Smith on	R



SY DPL – All Prioritized Projects

Step 3: Subordinate to the Critical Chain:



Prioritization Favorites Help

AIM

Execution Prioritization > Shipyard DPL

Shipyard Daily Priority List

Project ID Shop/Code Job Order Nuclear Execute Add Favorite

Item #	SY Pri	Proj ID	KE	MS	JO-KO/SA#	Title	ZM/SUP	Start	Finish	RDU	Cal	TGI	WKG	RSN	Note	Clr
481	0	CHR UD00 UD61			38CHR08701-A20	DR1099 PL3066 TFR#030 AHP-500 LEAKS BY ITS SEAT @ 3100PSIG	MEHRTENS, JOHN T / JACKSON, MICHAEL E	11/09/06	01/12/07	0	15		CPL			R
482	0	TSN NE00			38TSN13203-F01	FABRICATE JACKING PADS, DOME HARDWARE AND INSPECT HANDLING FIXTURE	PICKENS, ELLEN M / JONES, DAVID L	11/16/06	02/02/07	0	15	REC	WKG			R
483	0	TSN CA00 CA42			36TSN84919-S06	PRODUCTION SUPERVISION SERVICES FOR S/A 4205(K)	DEZERN, PRESTON I /	01/12/07	02/05/07	19	15					R
484	0	CHR FC00 FC42			38CHR04402-AHO	Q-2R LUBRICATE CAPSTAN	QUINLOG, CHRISTOPHER M / QUINLOG, CHRISTOPHER M	05/22/06	02/13/07	0	15		CPL			R
485	0	ALK UD00 UD49			38ALK12602-U03	OPEN, CLEAN, AND INSPECT THE FWD TRIM TANK	ANDERSON, GERALD S / SMITH, CURTIS U	01/10/07	02/15/07	0	15	REC	WKG			R
486	1	CHR UD00 UD38			38CHR07103-ICP	PTI TD-29/30 AND 31 TORP TUBE E TESTIN	MEHRTENS, JOHN T / BRIGHT, SCOTT A	02/28/07	03/06/07	5	15		REL			R
487	2	CHR UD00 UD38			38CHR07102-TFC	ASW PL CONST	BRIGHT, SCOTT A / BRIGHT, SCOTT A	12/15/06	02/20/07	3	16		WKG			R
488	3	CHR UD00 UD38			38CHR07103-IGA	PTI HYD HDRS, P TEST &	YER, WALTER / BRIGHT, SCOTT A	12/18/06	02/21/07	1	15		WKG			R
489	4	CHR UD00 UD38			38CHR07102-TEO	EMBT B TIGHTN	BRIGHT, SCOTT A / BRIGHT, SCOTT A	12/08/06	02/23/07	2	15		WKG			R
490	5	CHR UD00 UD38			38CHR07102-	HYD ST	BRIGHT, SCOTT A /	01/10/07	02/27/07	5	16		WKG	TD	Tightened joint,	R



Highest Priority Working Job in the Shipyard



Project DPL – USS ALASKA

Step 3: Subordinate to the Critical Chain:



Prioritization ▾ Favorites ▾ Help ▾

AIM Execution Prioritization > Project DPL

Project Daily Priority List

*Project ID Shop/Code Job Order Nuclear

Item #	SY Pri	Proj ID	KE	MS	JO-KO/SA#	Title	ZM/SUP	Start	Finish	RDU	Cal	TGI	WKG	RSN	Note	Clr
21	0	ALK	SC00	UD40	38ALK11104-I64	PRE-BLAST MRC-003 INSPECTION OF THE SUPERSTRUCTURE FR 22-32.	KRAVA, THOMAS G / SEARS, GEORGE T	11/20/06	01/12/07	0	15	REC	WKG			R
22	0	ALK	SR00	SR13	36ALK82549-U11	REMOVE LOCKER 5-3006	KENNEY, EMMETT F / WATSON, RANDOLPH	01/10/07	01/12/07	0	35	REC	CPL			R
23	0	ALK	UD00	UD49	38ALK12602-U03	OPEN, CLEAN, AND INSPECT THE FWD TRIM TANK	ANDERSON, GERALD S / SMITH, CURTIS U	01/10/07	02/15/07	0	15	REC	WKG			R
24	16	ALK	RM00	RM14	38ALK90102-SBX	CW MISSILE COMPARTMENT SYSTEM TRANSFER	COOK, MARK A / BAYNOR, JOHN T	02/26/07	03/01/07	4	15		REL			R
25	17	ALK	RM00	RM14	38ALK90102-SBV	CW AFT SYSTEM TRANSFER	COOK, MARK A / RICKS, ROBERT P	02/26/07	03/01/07	4	15		REL			R
26	18	ALK	RM00	RM14	38ALK90102-SEY	R114 SYSTEM TRANSFER	COOK, MARK A / RICKS, ROBERT P	02/26/07	03/01/07	4	15		REL			R
27	23	ALK	RM00	SR01	36ALK86053-E01	REMOVE CONTAINMENT	KENNEY, EMMETT F / WATSON, RANDOLPH	02/20/07	02/23/07	4	15	REC	REL			R
28	25	ALK	UD00	SD01	38ALK07702-TFJ	SFT: TR-02-07, (MT 11) ARRIVAL INSPECTION- LAUNCH TUBE GROUP	SMITH, VINCE L /	02/14/07	02/16/07	3	15	REC	WCT			R
29	26	ALK	RM00	SR01	36ALK86011-R12	INSTALL LP AIR AND PURE WATER SYSTEM	KENNEY, EMMETT F / THOMPSON, BEN T	02/15/07	02/16/07	6	37	REC	REL			R
30	27	ALK	RM00	SR01	36ALK86011-	CONNECT	KENNEY, EMMETT F / WATSON, RANDOLPH	02/15/07	02/21/07	10	35	REC	WCT			R



Role Based DPL – C130

Step 3: Subordinate to the Critical Chain:

- Code 130 can find DPL for all C133 work



Prioritization ▾ Favorites ▾ Help ▾

AIM Execution Prioritization > Shipyard DPL

Shipyard Daily Priority List

Project ID Shop/Code Job Order Nuclear

Item #	SY Pri	Proj ID	KE	MS	JO-KO/SA#	Title	ZM/SUP	Start	Finish	RDU	Cal	TGI	WKG	RSN	Note	Clr
1	0	CHR	DT00	DT02	38CHR51806-H03	CALIBRATE HRD PRESSURE GAGES (SFT)	SILVER, WALTER / SMILEY, DONALD R	06/15/06	01/09/07	0	15	REC	WKG			R
2	208	ALK	RM00	RM14	36ALK84802-C02	CALIBRATE ALP GAGES	KENNEY, EMMETT F / MORGAN, JEFFERY S	02/13/07	02/21/07	6	15	REC	REL			R
3	379	RET	SA00	SA06	38RETS1301-S05	ASSEMBLE/STAGE/TEST EQUIPMENT FOR SEC CONT AIR TEST - PLANT 1	BOWERS, BAZEL R / EKLUND, BRUCE E	07/06/06	03/15/07	28	15	REC	WKG			R
4	405	RET	PW00	PW21	38RET99210-H01	ASSEMBLE, CLN & TEST DRYING EQUIP	BOWERS, BAZEL R / MCFADDEN, ANTHONY	02/05/07	02/26/07	15	15	REC	REL			R
5	427	RET	FB00		38RET98001-F01	PREFAB/STAGE FW FIRE FIGHTING EQUIPMENT FOR OFFICE TRAILERS	BOWERS, BAZEL R / PHELPS, TILGHMAN	01/04/07	02/26/07	15	15	REC	WKG			R
6	603	CHR	UD00	UD42	38CHR50801-R10	R/I INTERF TO TD-2/3/4/5/29/30/31/45/228 & TD PRIM PMP/MTR	MEHRTENS, JOHN T / MORRIS, GREGORY	08/10/06	02/15/07	1	15	REC	WKG			R
7	679	RET	SA00	SA03	36RET87703-H01	(NR) PREPARE TEMP EQUIPMENT	BOWERS, BAZEL R / MCFADDEN, ANTHONY	11/08/06	02/15/07	9	15	REC	WKG			R
8	739	CHR	UD00	UD42	38CHR56202-A02	INSPECT/REPAIR DRAIN PUMP CONTROL PANEL - SFT	MEHRTENS, JOHN T / CHARLTON, BARRY R	05/11/06	02/23/07	6	15	REC	WKG			R
9	756	CHR	UD00	UD42	36CHR54701-F06	4263K - Pre-Fabricate RO Direct Overboard Brine Piping	COLE, MELVIN R / BOONE, MARGARET A	04/17/06	02/27/07	8	15	REC	WKG			R
10	780	CHR	UD00	UD42	38CHR20301-H03	CALIBRATE SSW AND ALP GAGES - (SFT)	SILVER, WALTER / GAMMON, GORDON R	02/24/06	02/16/07	2	15	REC	WKG			R
11	797	RET	PW00	PW01	36RET88404-H03	PREP EQUIPMENT	HOLLAND, HOWARD T / LEWIS, LEO A	02/05/07	03/02/07	19	15	REC	ASM			R
12	798	TSN	NE00		36TSN08014-F02	Fabricate Equipment	MCVEY, CHARLES A /	02/05/07	03/05/07	20	15	REC	PKG			R



Execution – Resource Allocation



What To Change To?

Step 3: Subordinate to the Critical Chain

- **Execution Priorities** (R & B/Y/G) determine Resource Allocation
 - Low Churn
- **Multi-Pass Resource Allocation Process**
 - 1st Pass: 100% of the Most Penetrating Paths/Chains & Production Level of Effort work (**Red** & Production Blue) on all Projects in Ranking Order
 - 2nd Pass: 100% of the Less Penetrating Paths/Chains (**Yellow**) on all Projects in Ranking Order
 - 3rd Pass: Non-Penetrating Paths/Chains (**Green**), Limit Overall Project Manning to 80% of Total Project BQWS on all Projects in Ranking Order
 - Controls Costs
 - Controls WIP
 - Finishes Quicker

Must Keep Networks Up-To-Date Daily!



Resource Allocation– Project Resources

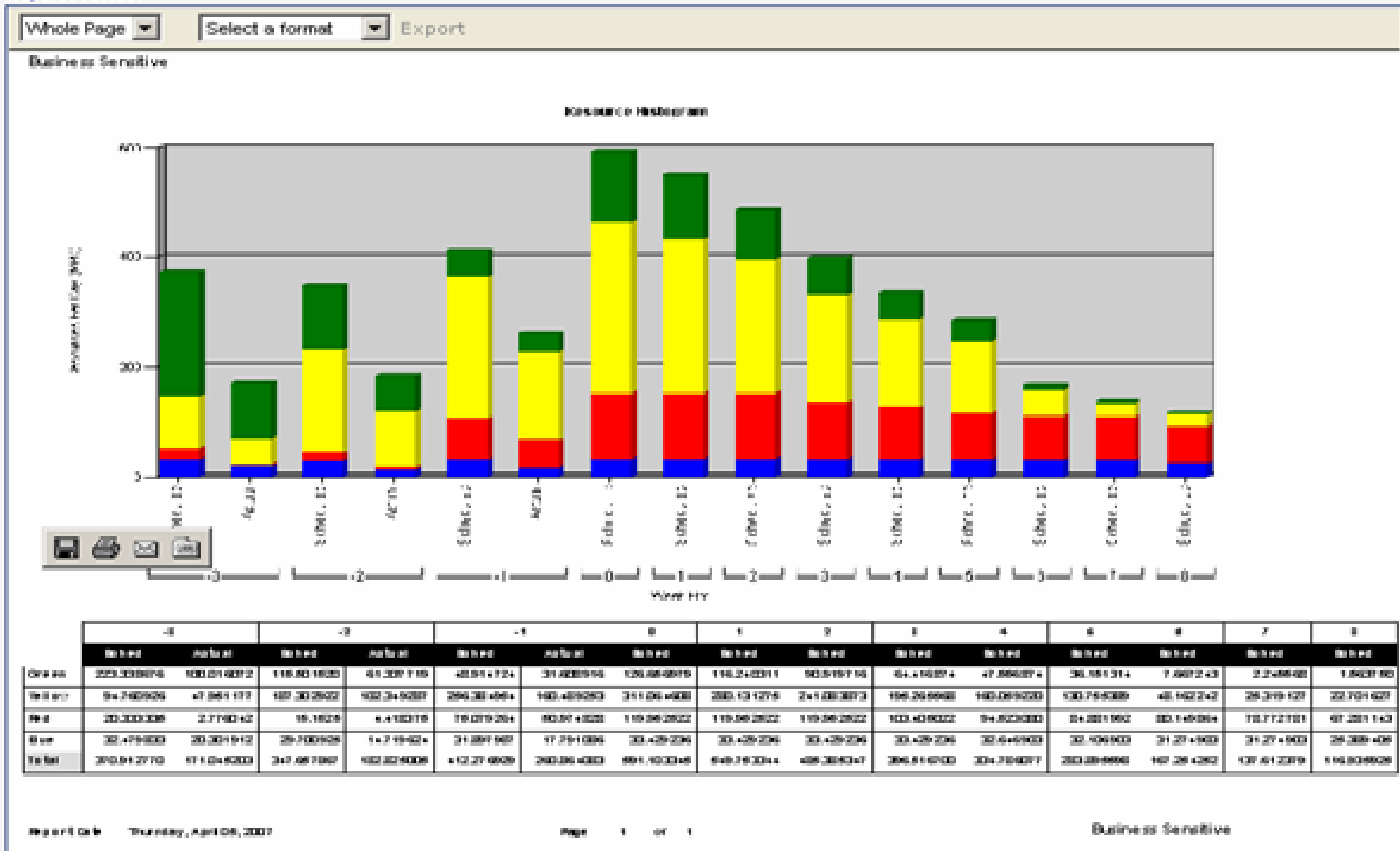


How To Validate Change?

Step 3: Subordinate to the Critical Chain

Resource Allocation Metrics (Typical)

Report Preview:



Resource Allocation – Shop/Code Resources

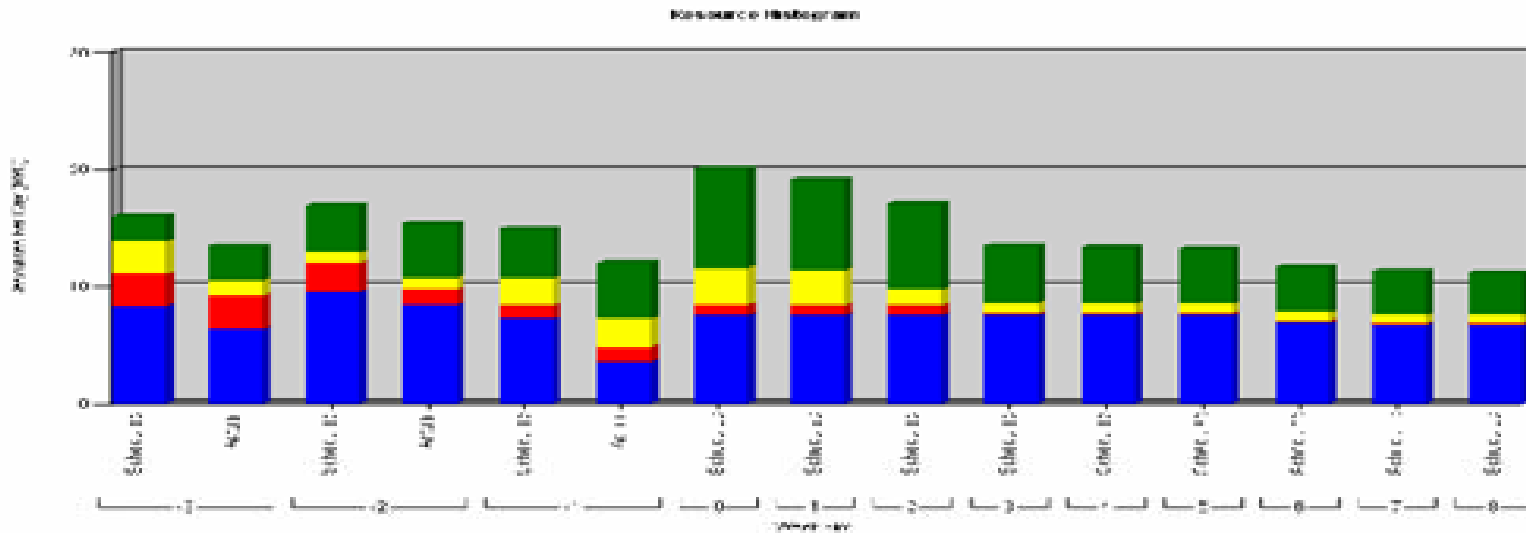


Step 3: Subordinate to the Critical Chain

Report Preview:

Whole Page | Select a format | Export

Business Sensitive



	-10		-9		-8		-7		-6		-5		-4		-3		-2		-1	
	No. of act	Act No. act	No. of act	Act No. act	No. of act	Act No. act	No. of act	Act No. act	No. of act	Act No. act	No. of act	Act No. act	No. of act	Act No. act	No. of act	Act No. act	No. of act	Act No. act	No. of act	Act No. act
Code act	2,115,000	2,000,000	3,000,000	4,000,000	4,000,000	4,000,000	5,000,000	5,000,000	7,000,000	7,000,000	4,000,000	4,000,000	4,000,000	4,000,000	4,000,000	3,000,000	3,000,000	3,000,000	3,000,000	3,000,000
Resource	2,000,000	1,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000
Code	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000
Code	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000
Total	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000

Report Date: Thursday, April 03, 2007

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Business Sensitive



Execution – Overtime Allocation



What To Change To?

Step 4: Elevate the Critical Chain

- **Execution Priorities (R & B/Y/G)** determine Overtime Allocation
- **Multi-Pass Overtime Allocation Process**
 - **1st Pass: Red & supporting Blue (Most Penetrating Paths/Chains) ONLY!**
 - **2nd Pass: Strategic in Very Rare Cases Only (Don't Do It!)**
 - Very Limited Specialty Skills
 - Achieve Strategic Key Events or Milestones Related to Other Project Goals
 - **Do Not Waste OT/Costs on Jobs Not Impacting the Critical Chain** ***Must Keep Networks Up-To-Date Daily!***



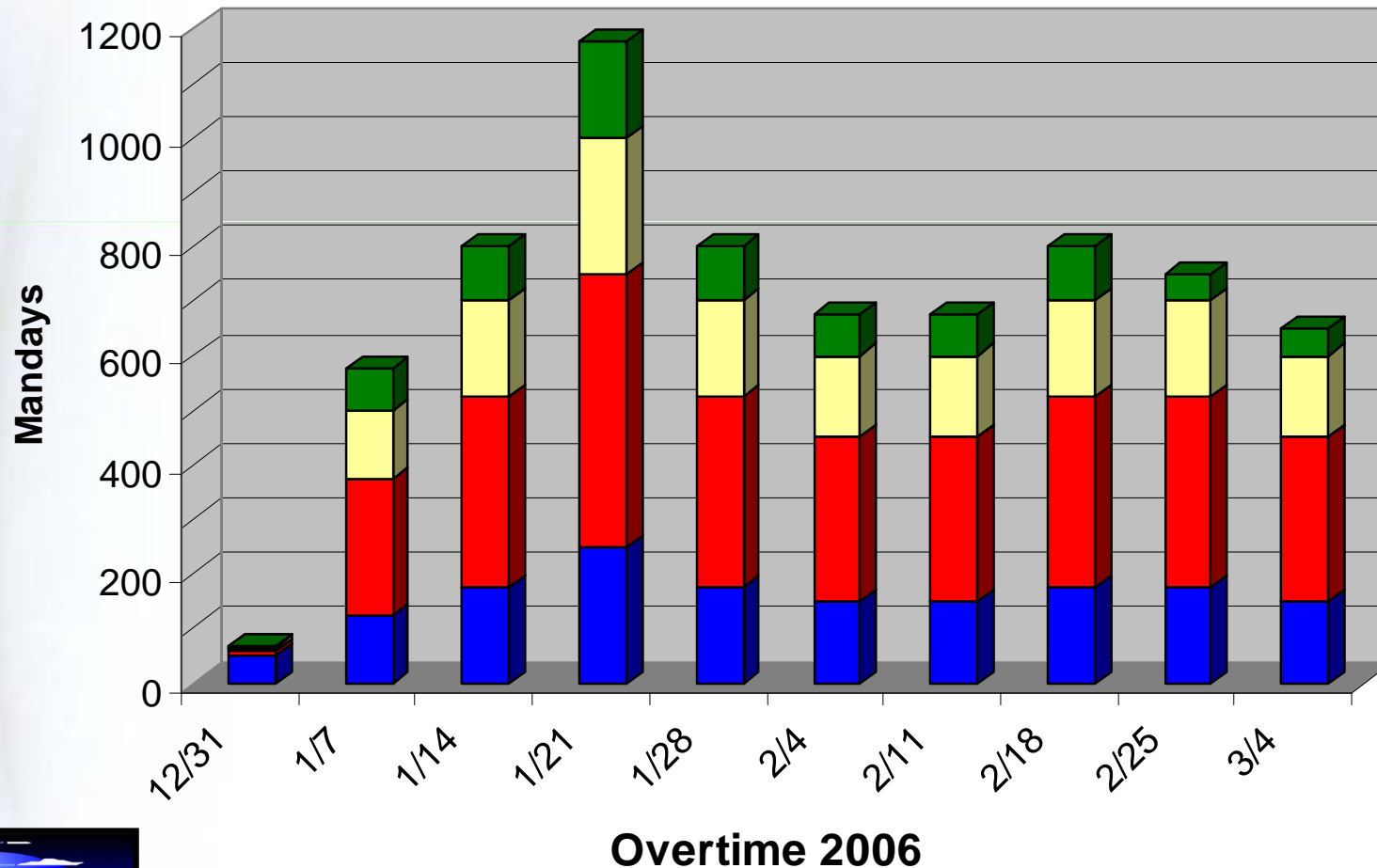
Execution – Overtime Allocation



Step 4: Elevate the Critical Chain

How To Validate Change?

Overtime Allocation Metrics (Typical)



Execution – WIPCON

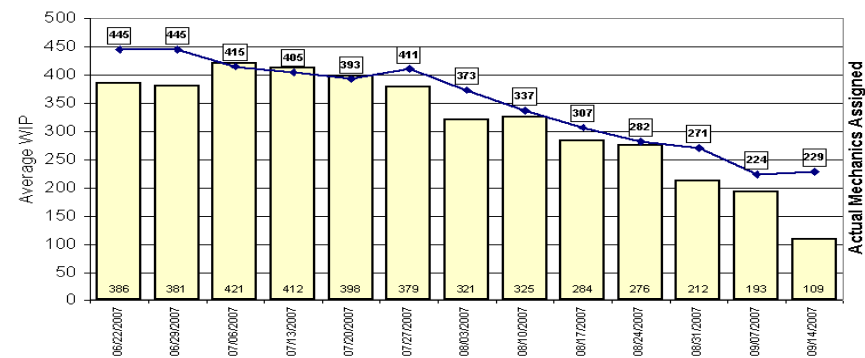
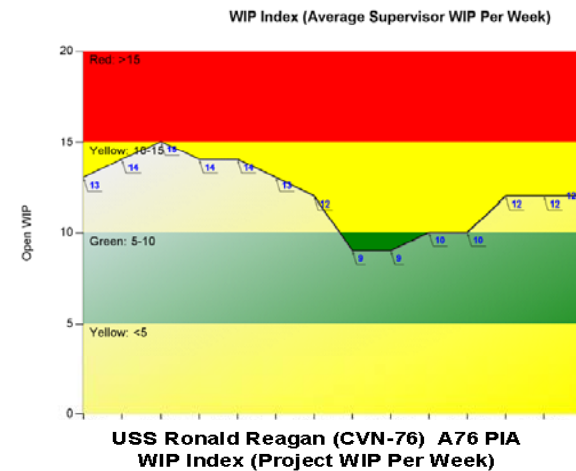


What To Change To?

Step 3: Subordinate to the Critical Chain

WIP - The Total Number of Task Packages that Have an Actual Start Date Claimed in the Daily Priority List (DPL) and are *Not* Certified.

- WIP levels will be monitored through a **WIP index (TGIs/Supervisor)** with the following indicator levels:
 - < 5 **yellow**
 - 5 - 10 **green**
 - > 10 - 15 **yellow**
 - > 15 **red**
- Zone Managers WIP levels ~ 50**
- Project WIP levels ~ # Mechanics**
- Provides Trigger for Project Team Investigation and Corrective Action**



Execution – WIPCON



Supervisors WIPCON Queue (PHNS & IMF)



Execution – Update Schedule



Step 5: Go Back to Step 1:

- Keep information about task current with **Daily Updates**
 - **Claim Actual Start Dates Daily**
 - **Claim Accurate Remaining Duration Daily**
 - **Update Work Stoppages Daily**
 - **Claim Actual Finish Dates Daily**
- **Eliminate Obstacles Daily**



Execution – Update Schedule



Step 5: Go Back to Step 1:

- **Why are Daily Updates Important?**
 - The Network is only as accurate as the Supervisor's Updates.
 - **Claiming Actual Start Dates, RDU, and Actual Finish Dates Determines:**
 - **Critical Chain Length**
 - **Impacts to Key Events**
 - **Priorities**
 - **Resource Demand**
 - **Earned Value Metrics**
 - **Weekly updates are not good enough**
 - The schedule is only as up-to-date as your job status



Execution Support – Andon

What to Change to?



Step 3: Subordinate to the Critical Chain & **Step 4:** Elevate the Critical Chain

- **Toyota Assembly Plants**
- **Mechanics are Surgeons**
- The **Andon** Signal serves to notify appropriate authorities when and where disruptions are occurring with the expectation that the authorities will **quickly move to that area** and **resolve the problem**.
- What does ‘authorities’ mean?
 - Supervisor
 - ZM
 - Engineering
 - **Job Readiness**
 - Other Support personnel that can **get the job back on track quickly**
- What does ‘signal’ mean?
 - Phone calls to **authorities** from **strategically placed shipboard phones with phone number placards**

Andon refers to a noticeable signal when production operations are interrupted



Execution Support – Andon

What to Change to?



Step 3: Subordinate to the Critical Chain & **Step 4:** Elevate the Critical Chain

- **Collocate Supervisors and Engineering** personnel as close to the Jobsites as possible
- Every effort is made to keep activities working **without opening additional jobs**
- For all problems that the Supervisors receive from mechanics, Supervisors will go to the Jobsite to resolve. Mechanic will remain on Jobsite until problem is resolved or be reassigned.
- Problems are always resolved **in DPL Priority Number Order**
- **Deficiency Forms will be generated only when necessary and by Engineering rather than Mechanics**



Non-Stop Execution of the Critical Chain in Support of the Mechanic at the Jobsite!

