Naval Surface Warfare Center

Port Hueneme Division

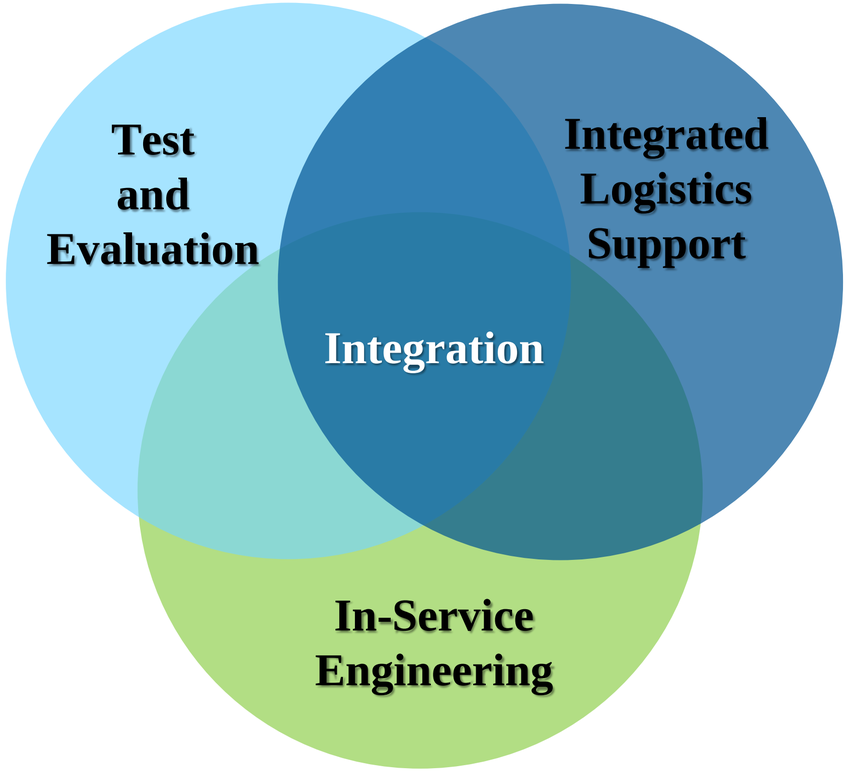
Supporting Combat Systems In-Service Engineering (ISE) Through Agile

Richard Watanabe
James Kong

20 April 2017

PORT HUENEME

What We Do and Support



Weapon Engagement Systems

Surface Surveillance Systems

Radars

Command & Control Systems

Digital Networks



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Agile introduced at NSWC PHD in May 2015

Provides opportunities to improve fleet readiness

Why Agile Scrum?

In-Service Engineering Work	How Agile Solves
Daily churn on priorities	*Adapts to change*
Complex systems/processes	*Expands Knowledge Management*
Budget constraints	*Aligns resources to priorities*
Rework	*Builds-in Quality*

Waterfall vs Agile

Waterfall
The Plan creates the cost/schedule estimates

Agile
The Vision creates the requirement estimates

Constraints:	**Requirements**	**Cost**	**Schedule**

Estimates:	**Cost**	**Schedule**	**Requirements**

Waterfall vs Agile

Waterfall

VS

Agile

Source: Standish Group 2015 chaos report

Fleet Readiness Impacts

Ship's Hardware:
Commercial Off The Shelf (COTS)

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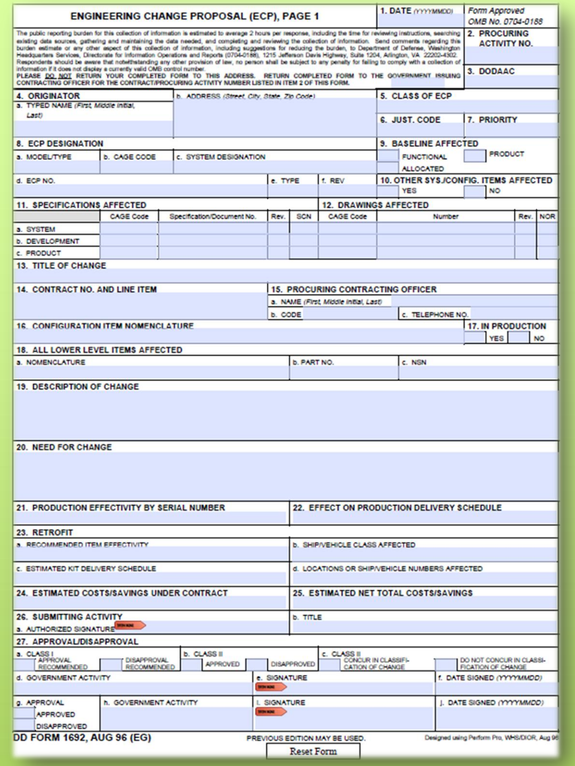
Hardware Engineering

Research & prototype hardware design changes



ENGINEERING CHANGE PROPOSAL (ECP), PAGE 1

1. DATE (YYYYMMDD) — Form Approved OMB No. 0704-0188

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PLEASE DO NOT RETURN YOUR COMPLETED FORM TO THIS ADDRESS. RETURN COMPLETED FORM TO THE GOVERNMENT ISSUING CONTRACTING OFFICER FOR THE CONTRACT/PROCURING ACTIVITY NUMBER LISTED IN ITEM 2 OF THIS FORM.

2. PROCURING ACTIVITY NO.
3. DODAAC
4. ORIGINATOR
a. TYPED NAME (First, Middle Initial, Last)
b. ADDRESS (Street, City, State, Zip Code)
5. CLASS OF ECP
6. JUST. CODE
7. PRIORITY
8. ECP DESIGNATION
a. MODEL/TYPE
b. CAGE CODE
c. SYSTEM DESIGNATION
9. BASELINE AFFECTED — FUNCTIONAL ALLOCATED — PRODUCT
d. ECP NO.
e. TYPE
f. REV
10. OTHER SYS./CONFIG. ITEMS AFFECTED — YES NO
11. SPECIFICATIONS AFFECTED
12. DRAWINGS AFFECTED

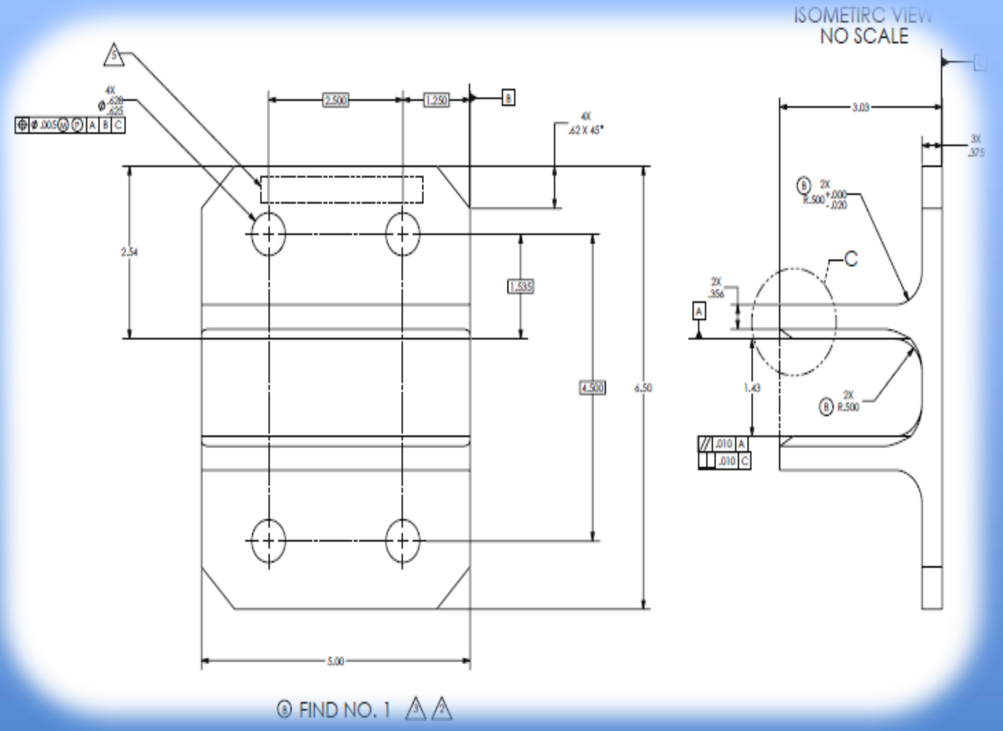
	CAGE Code	Specification/Document No.	Rev.	SCN	CAGE Code	Number	Rev.	NOR
a. SYSTEM								
b. DEVELOPMENT								
c. PRODUCT								

13. TITLE OF CHANGE
14. CONTRACT NO. AND LINE ITEM
15. PROCURING CONTRACTING OFFICER
a. NAME (First, Middle Initial, Last)
b. CODE
c. TELEPHONE NO.
16. CONFIGURATION ITEM NOMENCLATURE
17. IN PRODUCTION — YES NO
18. ALL LOWER LEVEL ITEMS AFFECTED
a. NOMENCLATURE
b. PART NO.
c. NSN
19. DESCRIPTION OF CHANGE
20. NEED FOR CHANGE
21. PRODUCTION EFFECTIVITY BY SERIAL NUMBER
22. EFFECT ON PRODUCTION DELIVERY SCHEDULE
23. RETROFIT
a. RECOMMENDED ITEM EFFECTIVITY
b. SHIP/VEHICLE CLASS AFFECTED
c. ESTIMATED KIT DELIVERY SCHEDULE
d. LOCATIONS OR SHIP/VEHICLE NUMBERS AFFECTED
24. ESTIMATED COSTS/SAVINGS UNDER CONTRACT
25. ESTIMATED NET TOTAL COSTS/SAVINGS
26. SUBMITTING ACTIVITY
a. AUTHORIZED SIGNATURE
b. TITLE
27. APPROVAL/DISAPPROVAL
a. CLASS I — APPROVAL RECOMMENDED — DISAPPROVAL RECOMMENDED
b. CLASS II — APPROVED — DISAPPROVED
c. CLASS II — CONCUR IN CLASSIFICATION OF CHANGE — DO NOT CONCUR IN CLASSIFICATION OF CHANGE
d. GOVERNMENT ACTIVITY
e. SIGNATURE
f. DATE SIGNED (YYYYMMDD)
g. APPROVAL — APPROVED — DISAPPROVED
h. GOVERNMENT ACTIVITY
i. SIGNATURE
j. DATE SIGNED (YYYYMMDD)

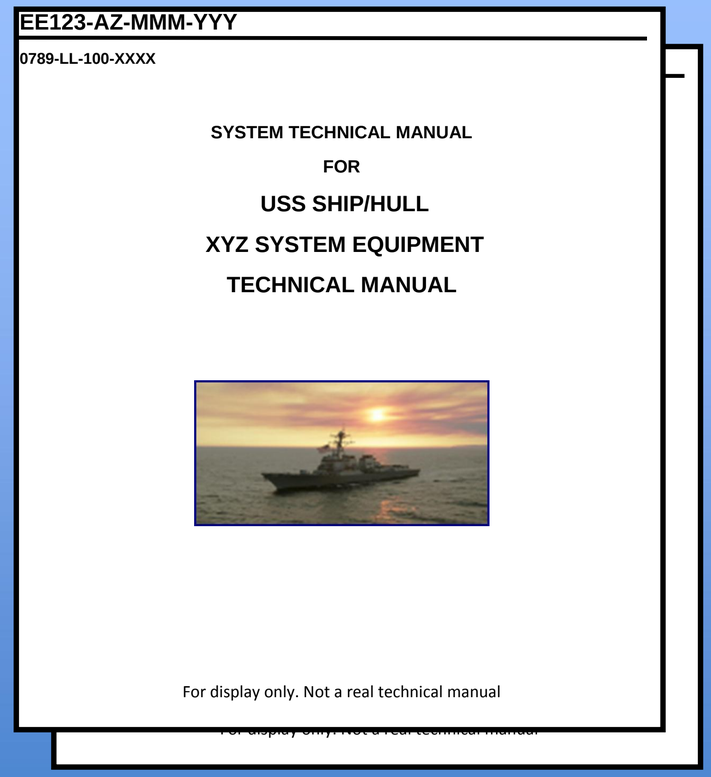
DD FORM 1692, AUG 96 (EG) — PREVIOUS EDITION MAY BE USED. — Designed using Perform Pro, WHS/DIOR, Aug 96 — Reset Form

Plan & manage Engineering Change Proposal (ECP) development

Technical Documentation



Develop/Update Engineering Drawings



Develop or update Technical Manuals

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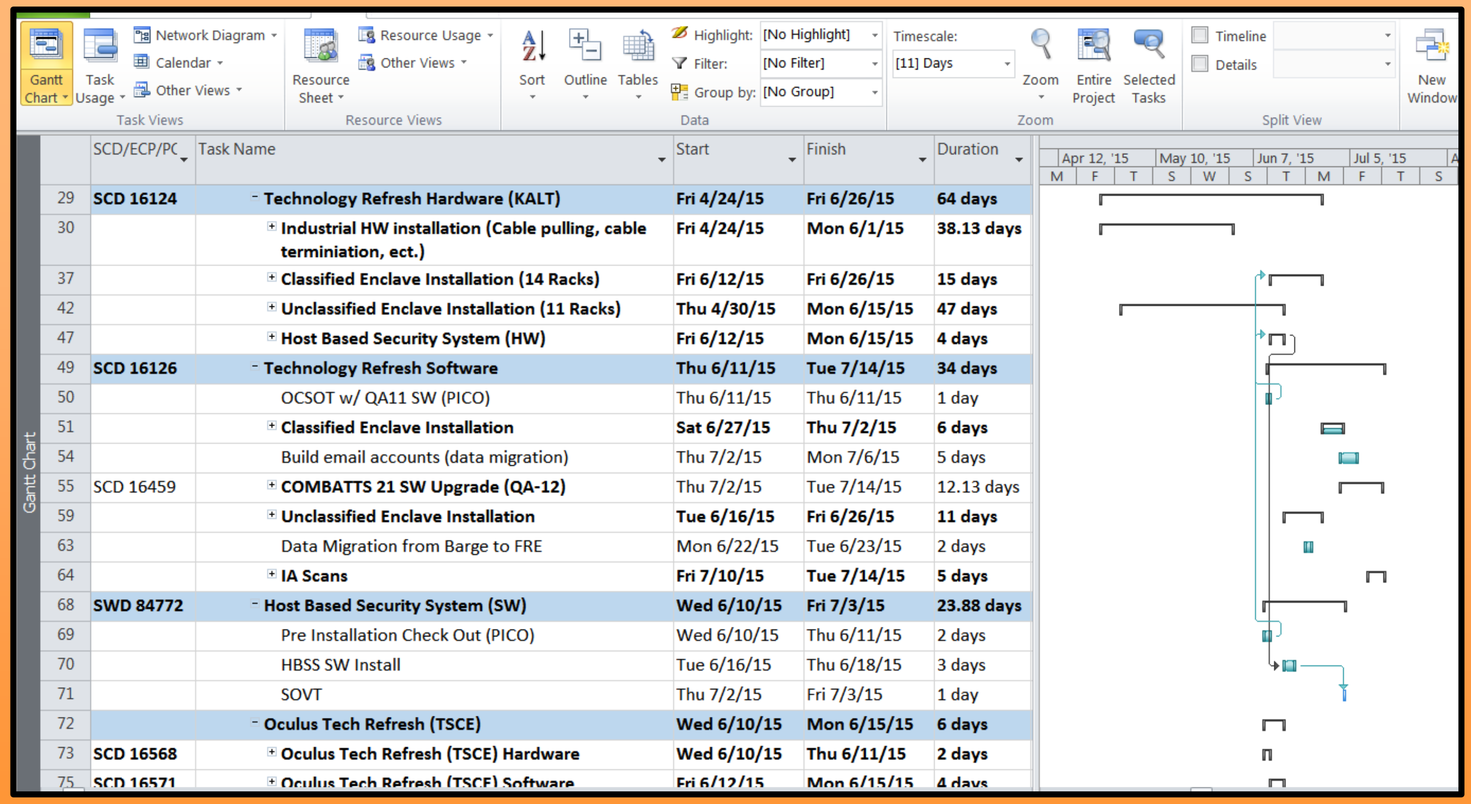
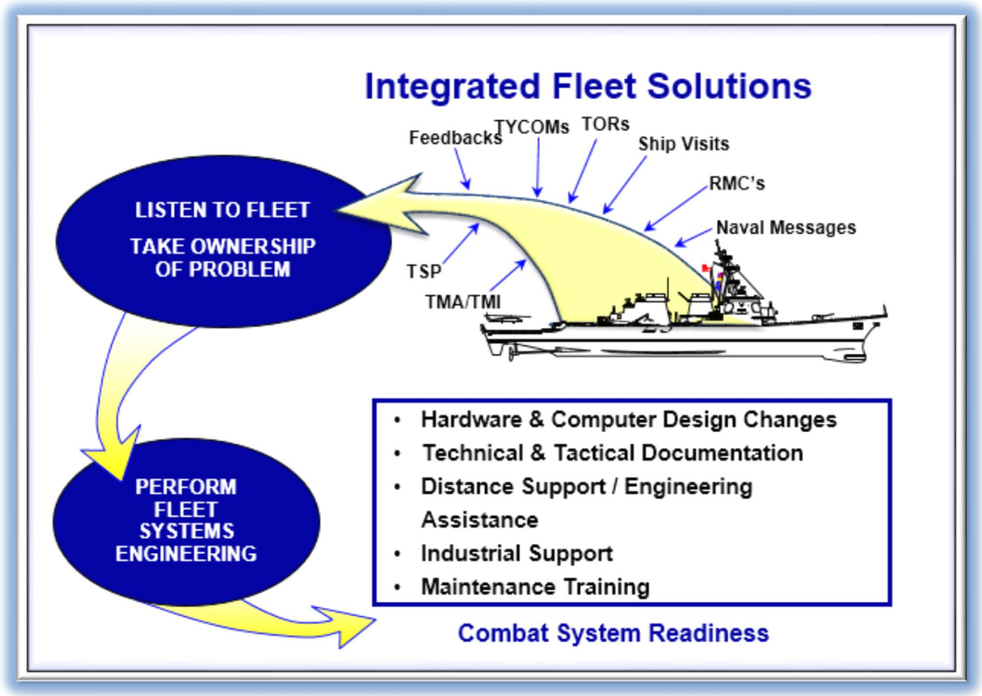
Hardware Upgrades



	SCD/ECP/PC	Task Name	Start	Finish	Duration
29	**SCD 16124**	**Technology Refresh Hardware (KALT)**	**Fri 4/24/15**	**Fri 6/26/15**	**64 days**
30		**Industrial HW installation (Cable pulling, cable terminiation, ect.)**	**Fri 4/24/15**	**Mon 6/1/15**	**38.13 days**
37		**Classified Enclave Installation (14 Racks)**	**Fri 6/12/15**	**Fri 6/26/15**	**15 days**
42		**Unclassified Enclave Installation (11 Racks)**	**Thu 4/30/15**	**Mon 6/15/15**	**47 days**
47		**Host Based Security System (HW)**	**Fri 6/12/15**	**Mon 6/15/15**	**4 days**
49	**SCD 16126**	**Technology Refresh Software**	**Thu 6/11/15**	**Tue 7/14/15**	**34 days**
50		OCSOT w/ QA11 SW (PICO)	Thu 6/11/15	Thu 6/11/15	1 day
51		**Classified Enclave Installation**	**Sat 6/27/15**	**Thu 7/2/15**	**6 days**
54		Build email accounts (data migration)	Thu 7/2/15	Mon 7/6/15	5 days
55	SCD 16459	**COMBATTS 21 SW Upgrade (QA-12)**	Thu 7/2/15	Tue 7/14/15	12.13 days
59		**Unclassified Enclave Installation**	**Tue 6/16/15**	**Fri 6/26/15**	**11 days**
63		Data Migration from Barge to FRE	Mon 6/22/15	Tue 6/23/15	2 days
64		**IA Scans**	**Fri 7/10/15**	**Tue 7/14/15**	**5 days**
68	**SWD 84772**	**Host Based Security System (SW)**	**Wed 6/10/15**	**Fri 7/3/15**	**23.88 days**
69		Pre Installation Check Out (PICO)	Wed 6/10/15	Thu 6/11/15	2 days
70		HBSS SW Install	Tue 6/16/15	Thu 6/18/15	3 days
71		SOVT	Thu 7/2/15	Fri 7/3/15	1 day
72		**Oculus Tech Refresh (TSCE)**	**Wed 6/10/15**	**Mon 6/15/15**	**6 days**
73	**SCD 16568**	**Oculus Tech Refresh (TSCE) Hardware**	**Wed 6/10/15**	**Thu 6/11/15**	**2 days**
75	**SCD 16571**	**Oculus Tech Refresh (TSCE) Software**	**Fri 6/12/15**	**Mon 6/15/15**	**4 days**

Manage installation, Integration, and Test Events aboard ship

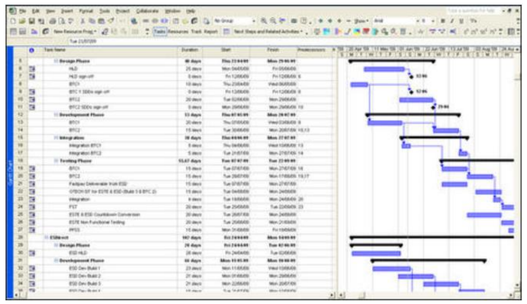
Navigating Regulations



Complex Processes

Upgrades Installed

Life Before Agile



Schedule

Lead
Systems Engineer

Stakeholders

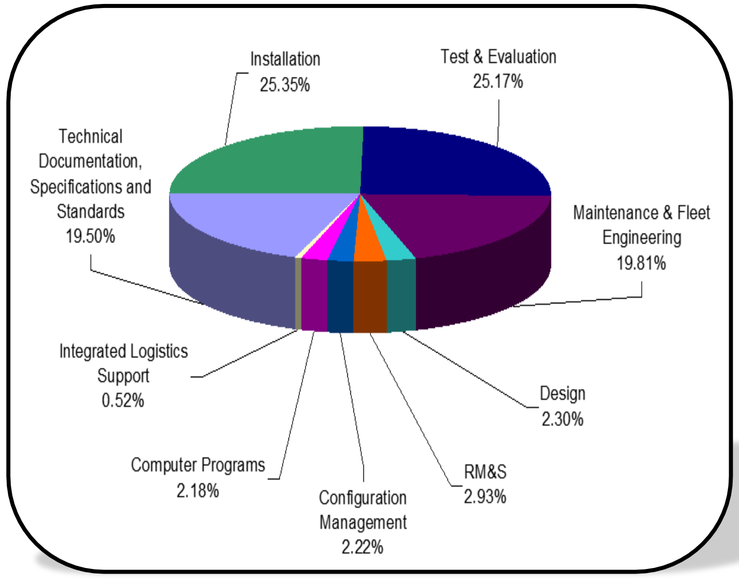
Mission Critical Events

Team

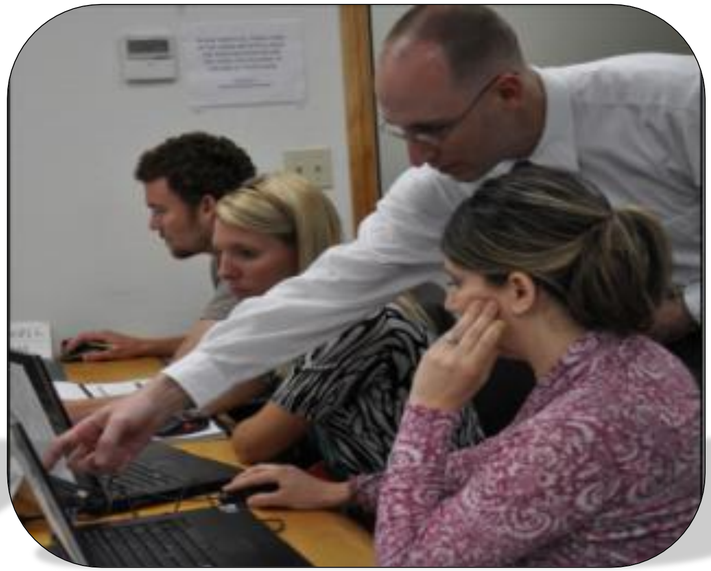
Deliverables

Heightened Awareness and Opportunities

Workload

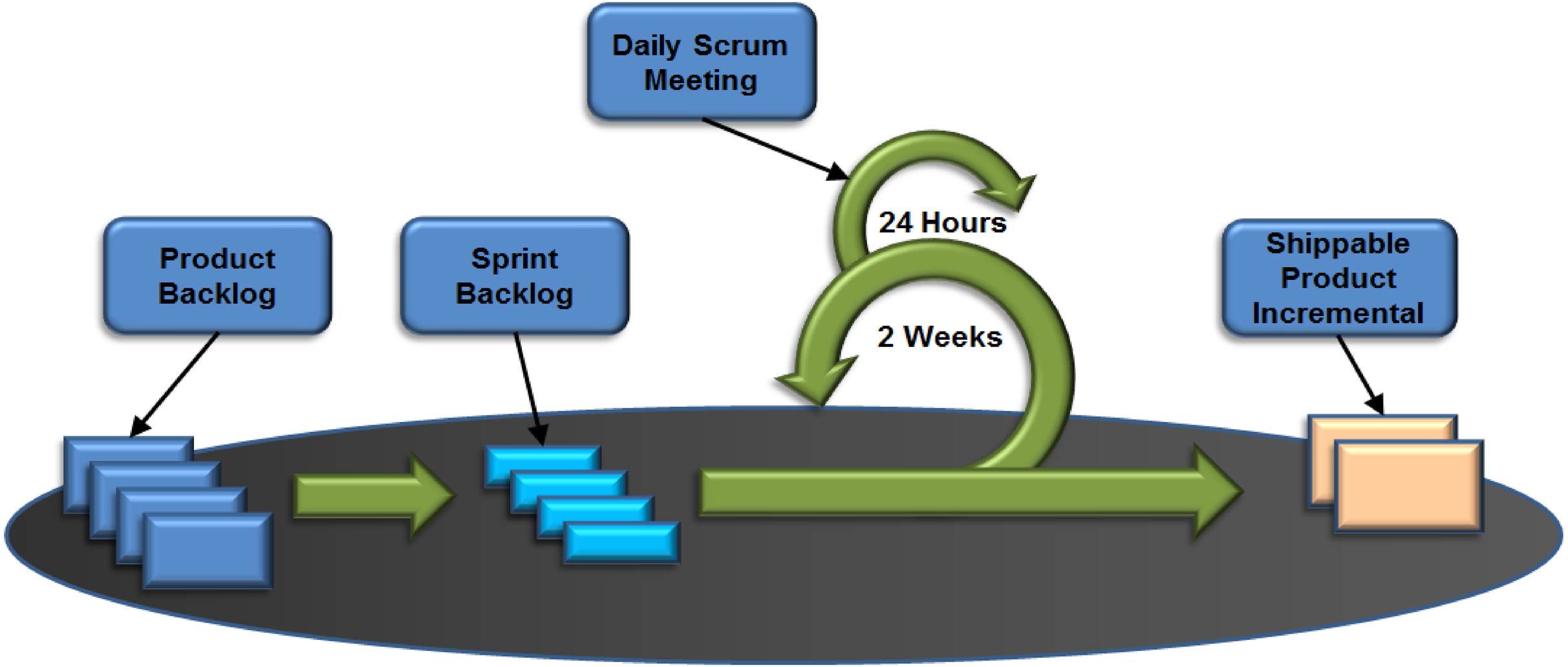


Knowledge



Collaboration

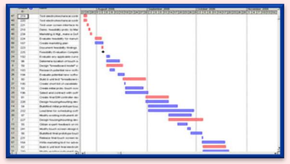
Components of Agile Scrum



Agile Helps Manage Workload

Mission Critical Events

Stakeholders

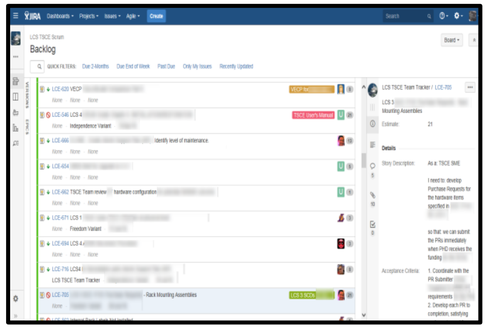


Schedule

Product Owner

Team

Scrum Master

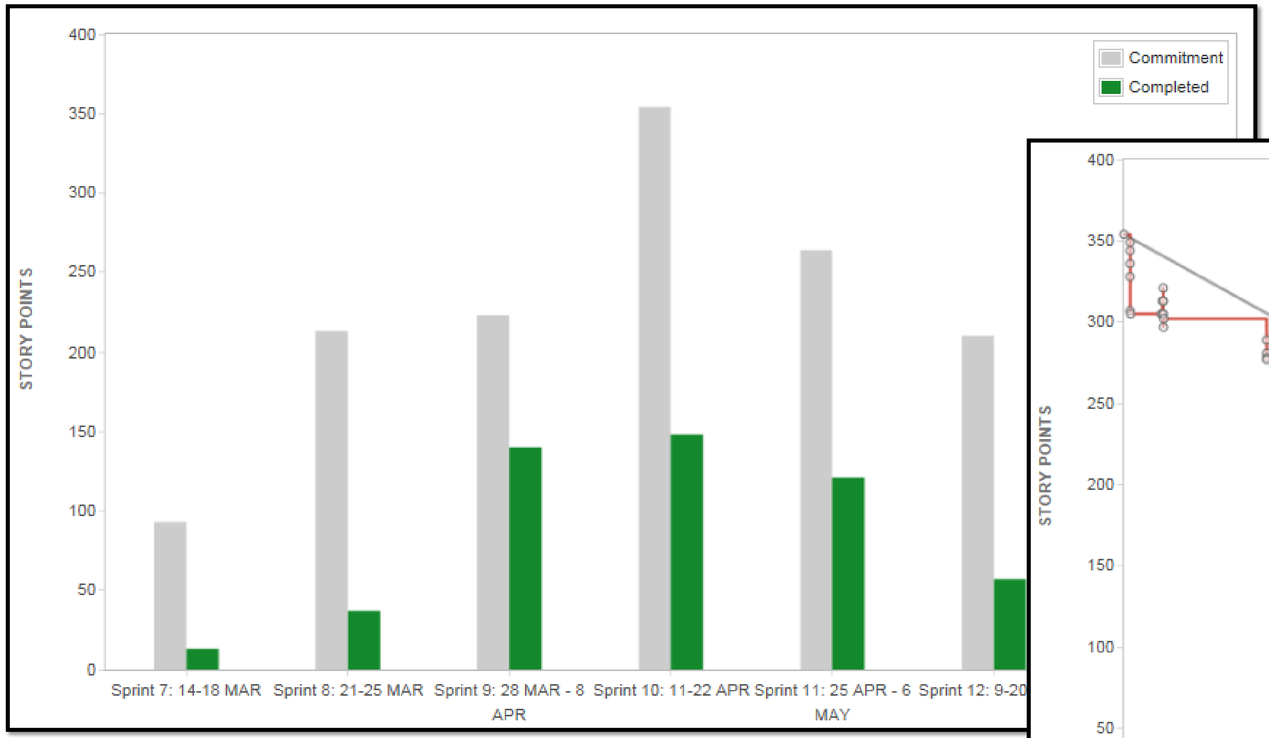


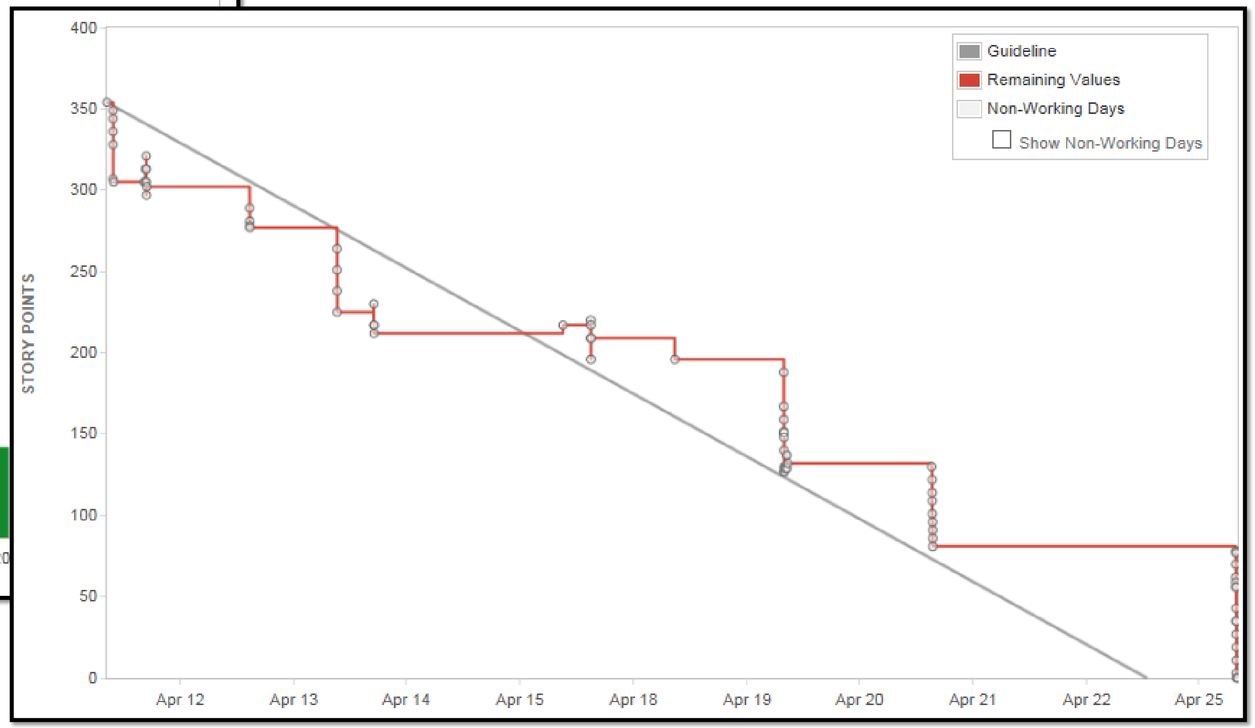
Task Backlog

Deliverables

Agile Process Control

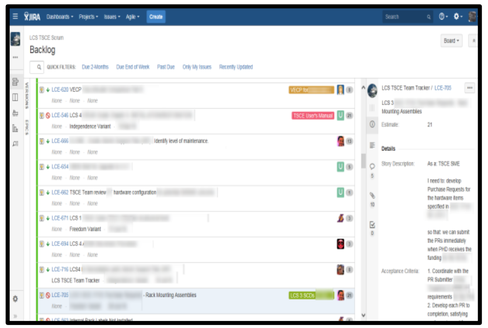
Forecast commitments and negotiate trade-offs



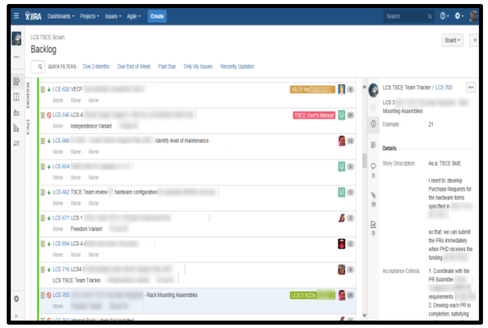


Agile Helps Manage Work Flow

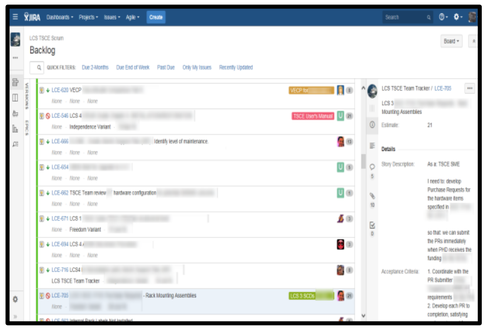
Lead Systems Engineer ⟷ **Lead Logistician** ⟷ **Lead Field Engineer**



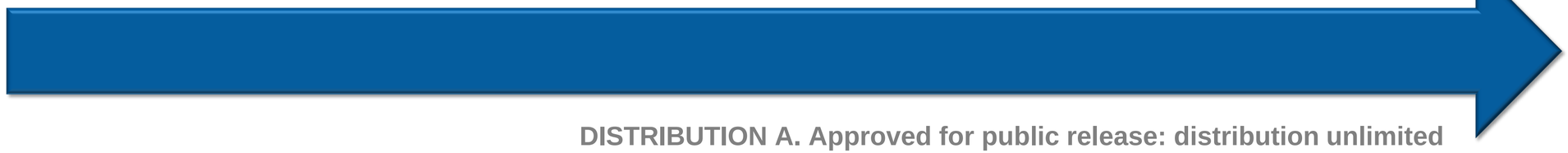
Engineering Backlog

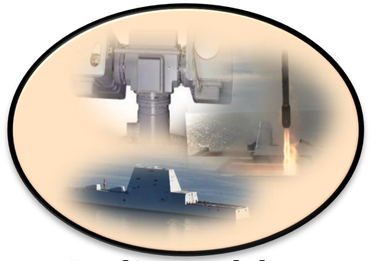


Logistics Backlog



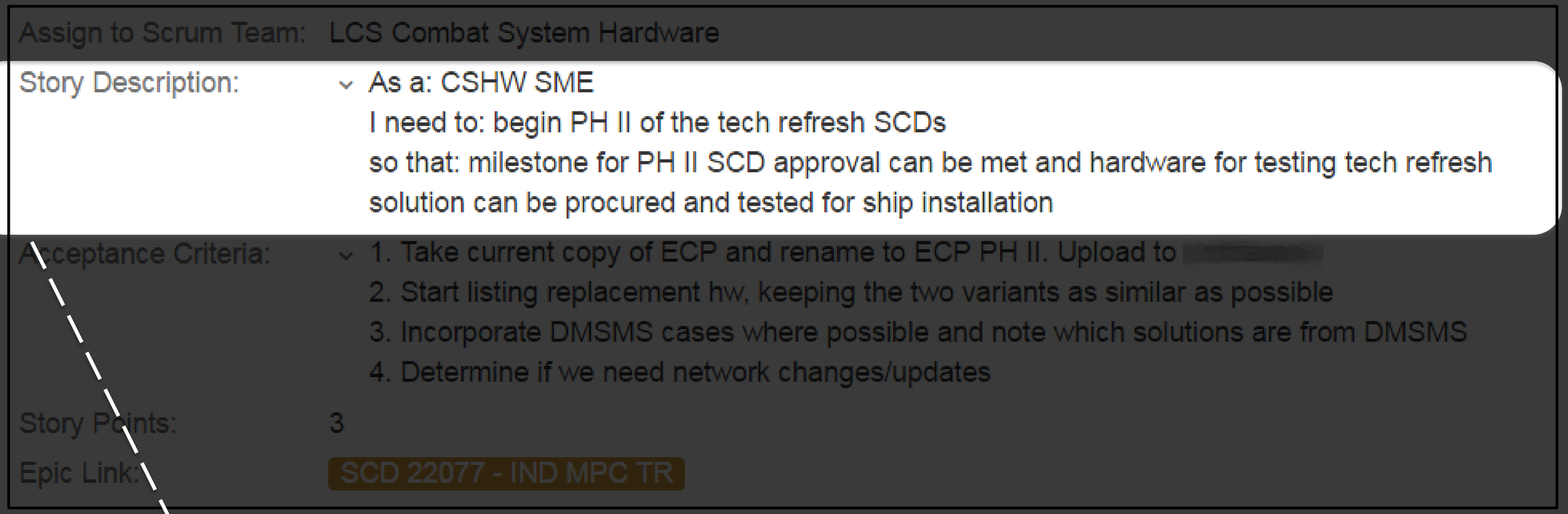
Install Backlog





Deliverables

Defining Tasks Through Stories

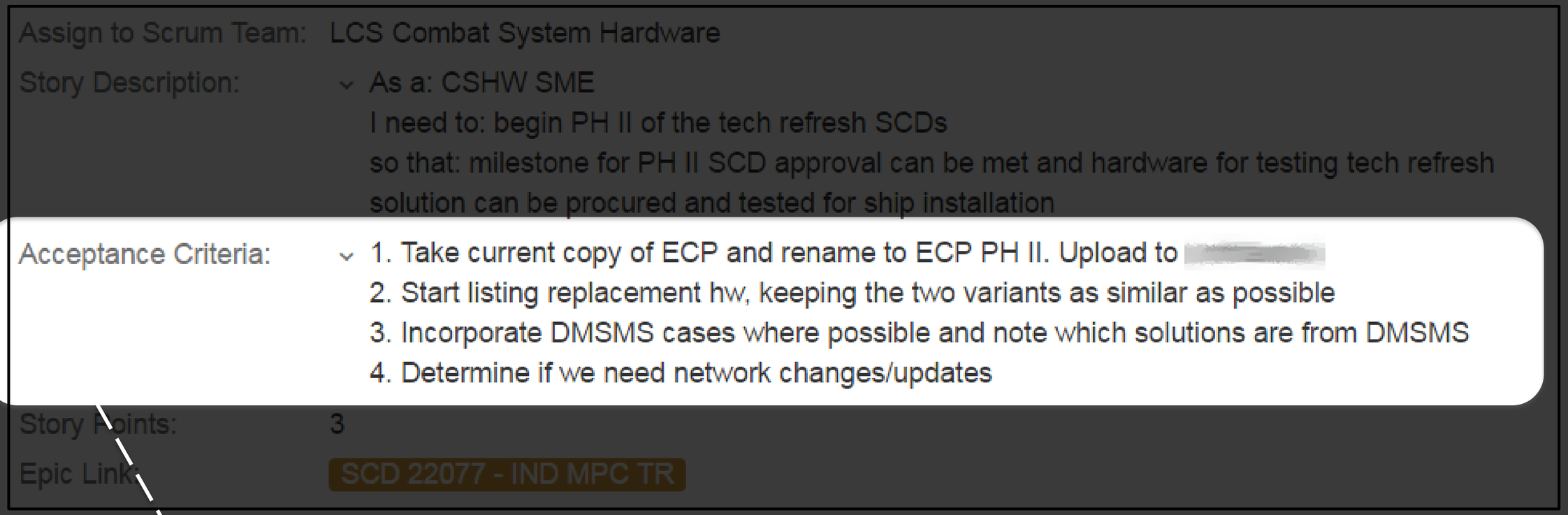


Provides “who, what and why” for a task

Provides context for team on task’s value

Used to help assess complexity of task

Define Completion Through Acceptance Criteria



Defines “done”

Provides details on what needs to be accomplished

May include references on complex process steps

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Case Study

MK-160 Gun Computer System (GCS) Obsolescence Management

Validate and upload GCS Data

Over 10,000 unique parts!

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SMART
Supportability Management Assessment Report Tool

My SMART | SCORE | Alerts | Cases | Reports

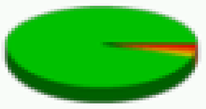
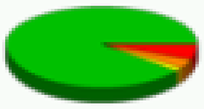
Summary | Supply | COTS | Obsolescence | Risk | End of Support | Overall

olutions

SCORE Status Overview

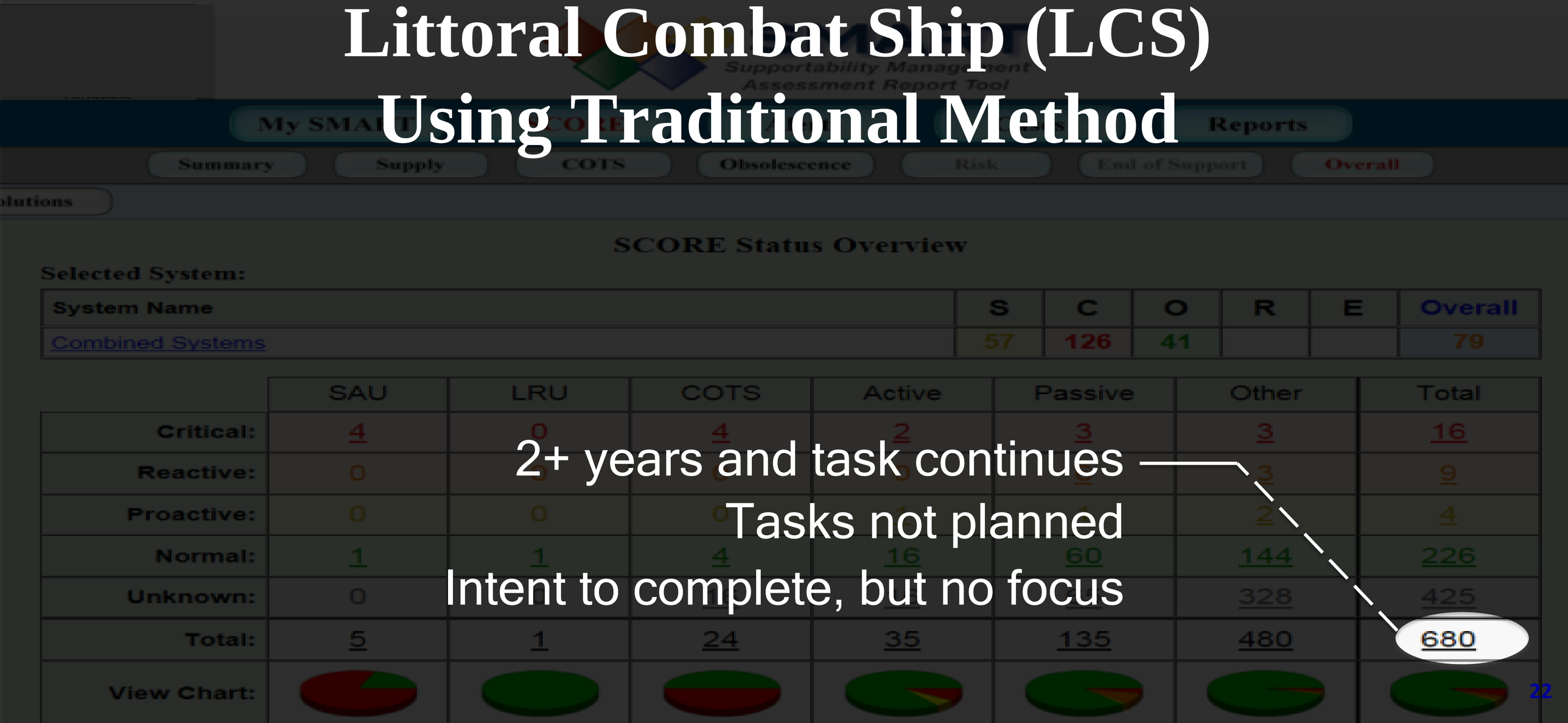
Selected System:

System Name	S	C	O	R	E	Overall
Combined Systems	57	126	41			79

	SAU	LRU	COTS	Active	Passive	Other	Total
Critical:	4	0	4	2	3	3	16
Reactive:	0	0	0	0	6	3	9
Proactive:	0	0	0	1	1	2	4
Normal:	1	1	4	16	60	144	226
Unknown:	0	0	16	16	65	328	425
Total:	5	1	24	35	135	480	680
View Chart:							

Case Study

Littoral Combat Ship (LCS) Using Traditional Method



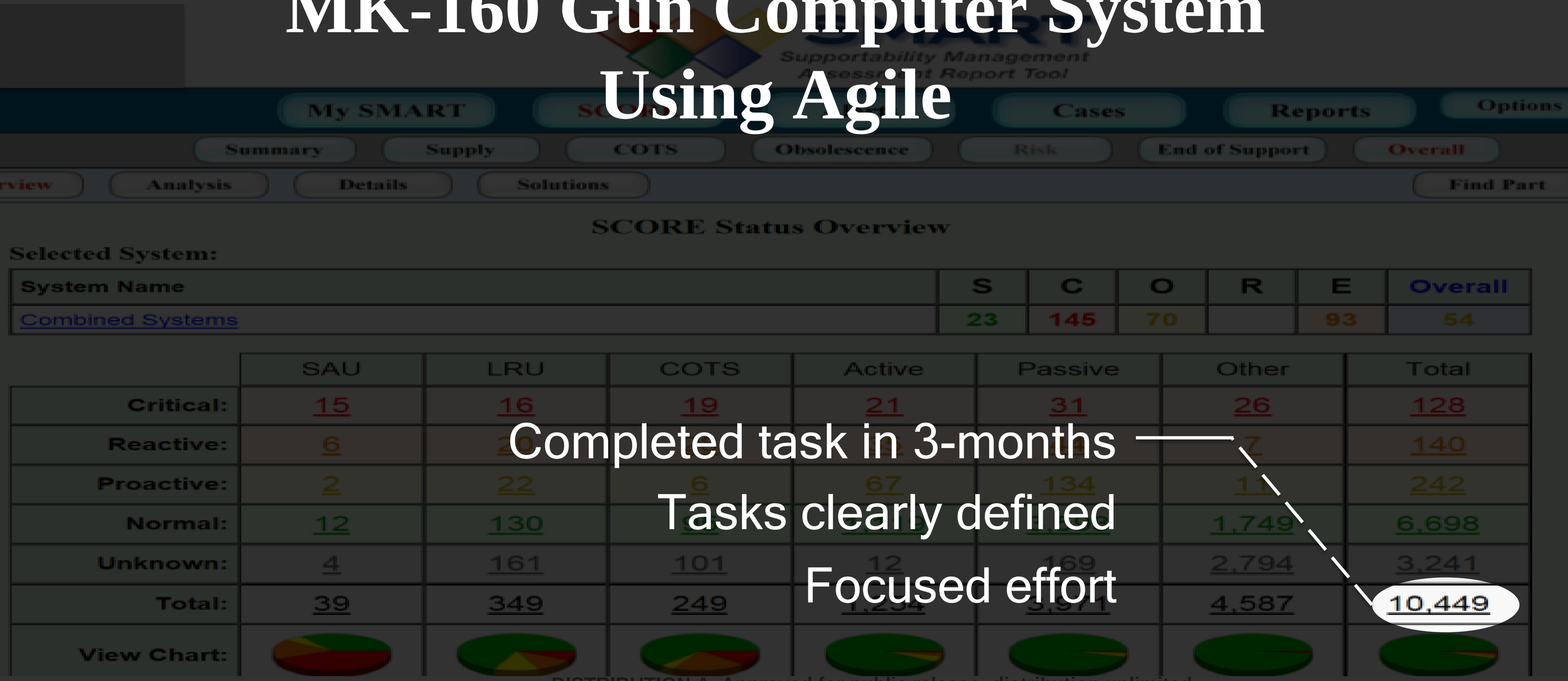
2+ years and task continues

Tasks not planned

Intent to complete, but no focus

Case Study

MK-160 Gun Computer System Using Agile



Completed task in 3-months

Tasks clearly defined

Focused effort

Agile: Why In-Service Engineering?

Navigate Regulation

Fleet Responsiveness

Manage Resources

In-Service Engineering Agent Successes with Agile

New team members are more productive earlier

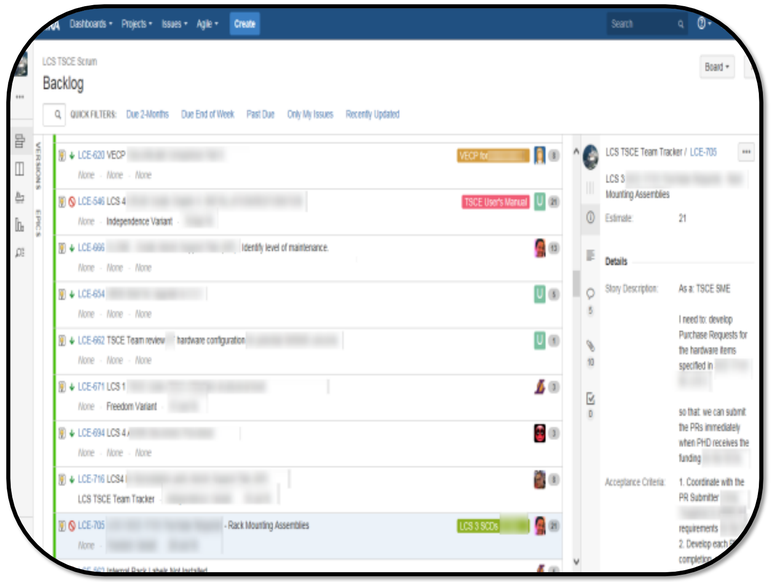
Teams now focus on strategic planning

Barriers are resolved sooner

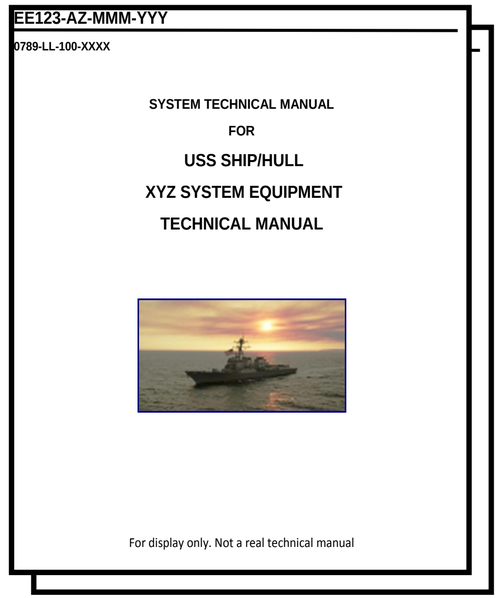
Agile Best Practices

Daily Stand-Ups

Central Backlog



Common Repository



Key Takeaways

Agile is essential where:

Highly regulated

Requirement changes

Resource constrained

Time critical

Questions?