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Business Value and Customer Benefits Derived from High Maturity

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Information Technology Discussion Purpose and Agenda

• Purpose:

- Communicate business value and customer benefits derived from an application of "high maturity" system/software engineering processes, and
- How an integrated process framework helps

Discussion Agenda

- Business Value/Customer Benefits & Process Highlights
 - Quality and Process Goals
 - Quality and Process Performance
 - Process Highlights
- Integrated Process Improvement (CMMI)
- Limit 40 minutes including questions

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DES Business Objectives

DES management selects quality and process goals & measurements

Projects select related goals & measurements for each life cycle phase.

> Projects track process performance over time.

DES management checks org and project data against DES goals (process capability baseline).

 Projects check performance against project goals and business objectives.

 Projects improve performance
by removing root causes for out-of-bound conditions. 6

NORTHROP GRUMMAN Information Technology **DES Process and Quality Measures**

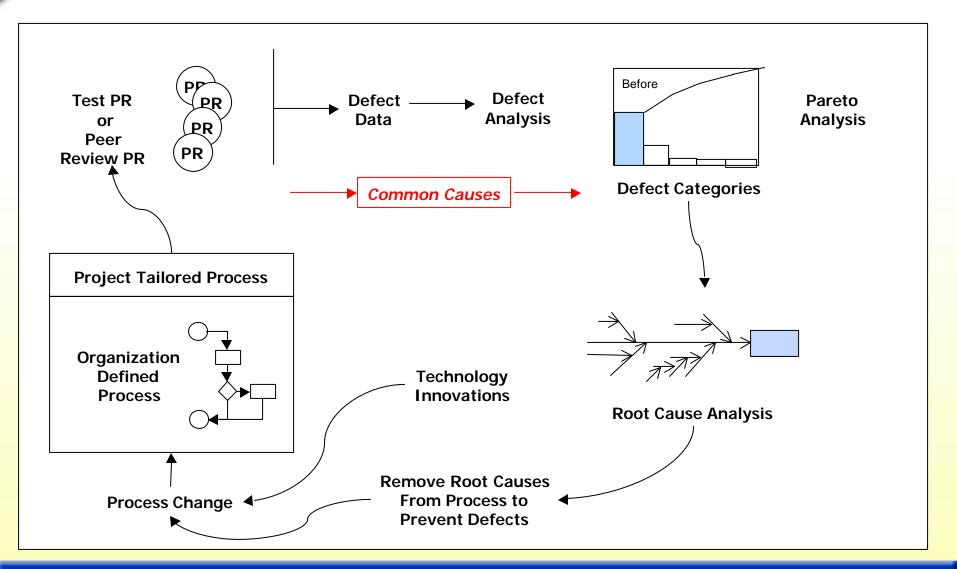
Acronym	Measurement	Process
CPIm	Cost Performance Index monthly	Earned Value System
SPIm	Schedule Performance Index monthly	Earned Value System
EPVPm	ETC Performance Variance Percentage monthly	Earned Value System
		or other financial process
DDr	Defect Density from Peer Review	Peer Review (all Life Cycle
		Stages)
DDt	Defect Density from Test & Operations	Test

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Process/Quality Improvements support Organizational Business Objectives

DES Business Objectives	DES Process & Quality Performance Goals
Annual Operating Plan	Collective across participating projects
Achieve revenue and margin	1. Achieve Cost Perf. Index = $1 \pm 5\%$
objectives	2. Achieve Schedule Perf. Index = $1 \pm 5\%$
	3. Achieve Est-To-Complete-Var = $0 \pm 5\%$.
	4. Achieve 5% improvement in Defect Density for each life cycle phase.
Improve customer	1. Achieve Cost Perf. Index = $1 \pm 5\%$.
satisfaction rating	2. Achieve Schedule Perf. Index = $1 \pm 5\%$.
	3. Achieve Est-To-Complete-Var = $0 \pm 5\%$.
	4. Achieve 5% improvement in Defect Density
	for each life cycle phase.

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SATS/SIGS Program and QM Indicators

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Defect Density at Review (all defects)

S Technical

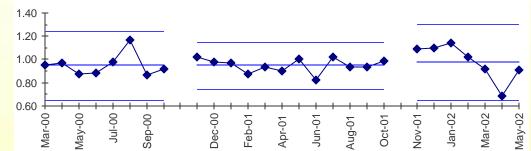
- Goal: 20 +/- 5 defects/KLoC
- Actual: 22.9 defects/KLoC 20
- Action: Implementing DDt
- Technical Highlights: Only 2% of all defects are found in the fielded system

80

60

S Financial

- Goal: 1.0 +/- 0.1
- Actual: 0.98



Cost Performance Index (Monthly)

- Action: DP cycle for SCoV in April; Countermeasures improve estimation; change EV tracking
- Technical Highlights: CPI is still on target

SATS/SIGS Program and QM Indicators

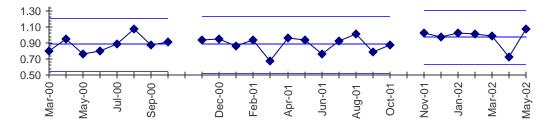
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Schedule Performance Index (Monthly)

M Schedule

RT - /ROP

- Goal: 1.0 +/- 0.1
- Actual: 0.975



Award Fee Scores

- Action: Watching closely, DP cycle for SCoV in April; Countermeasures – improve estimation; change EV tracking
- Technical Highlights: will be Satisfactory by 7/02

E Customer Satisfaction

- Goal: >= 95%
- Actual: 98.8%
- Action: Continue to deliver^{30%}
- Action: Continue to deliver a service of the service J-02 record

110%

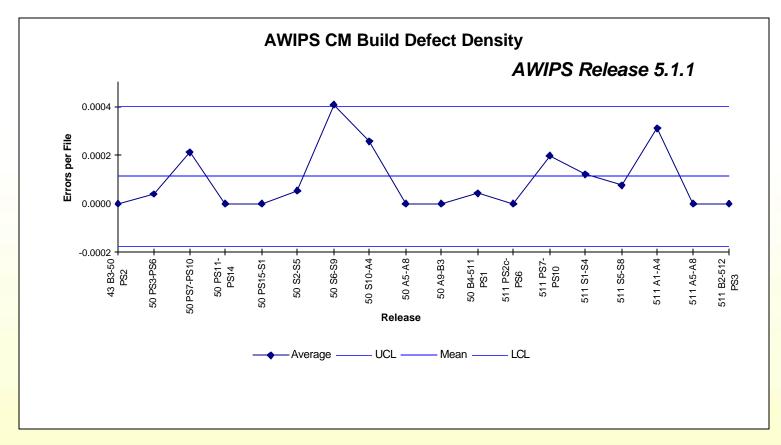
105% 100%

95%

Controlling Quality Performance — Build

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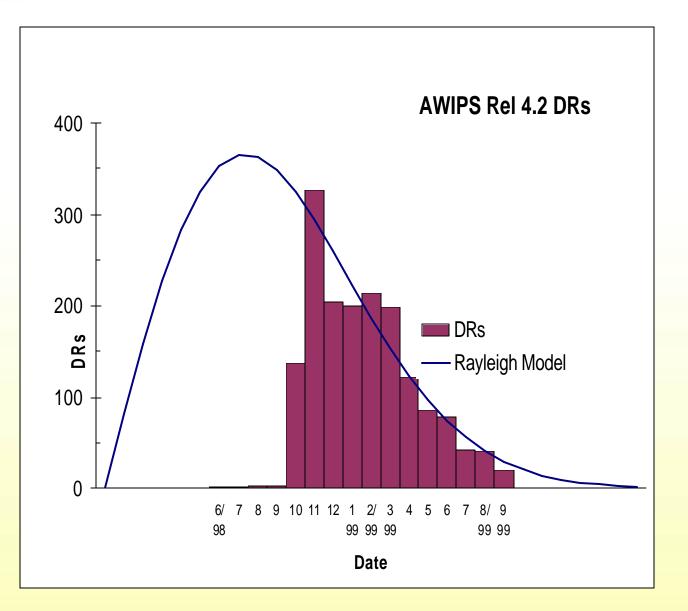
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Statistical process control identifies build issues that can impact the development schedule.

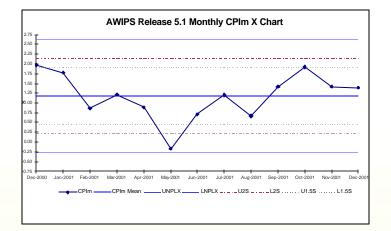
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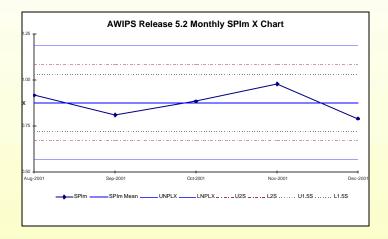
Predicting Quality - Example



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Controlling Process Performance

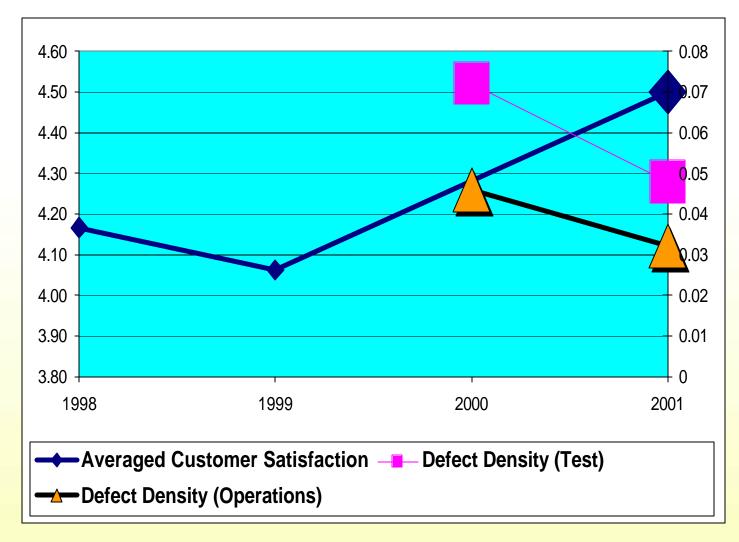




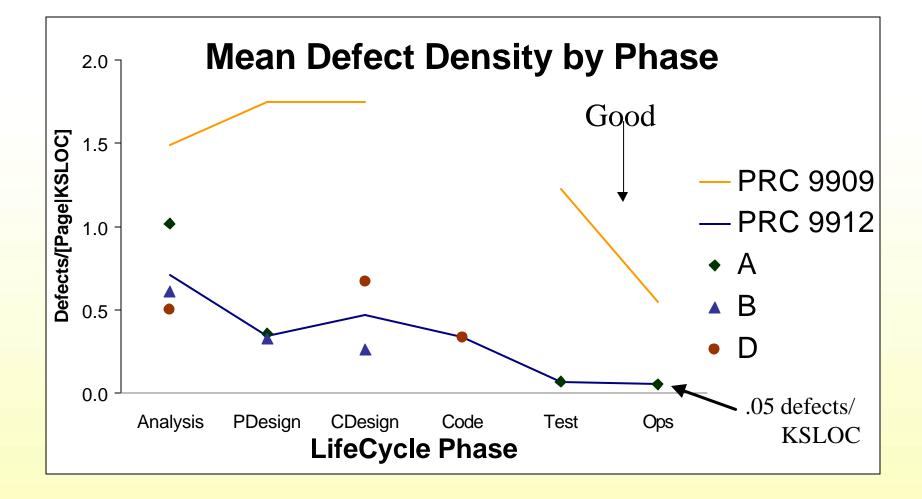
- Cost and schedule can be managed with statistical process control
- Improves predictions of future performance
- Results:
 - Build 4, 2% underrun
 - <u>R5.0, 4% underrun</u>
 - <u>R5.1, 5% underrun</u>
 - Build 5 variance in last 12 months, 10%

Statistical process control improves cost & schedule performance.

JEDMICS Defect Density & Customer Satisfaction Survey

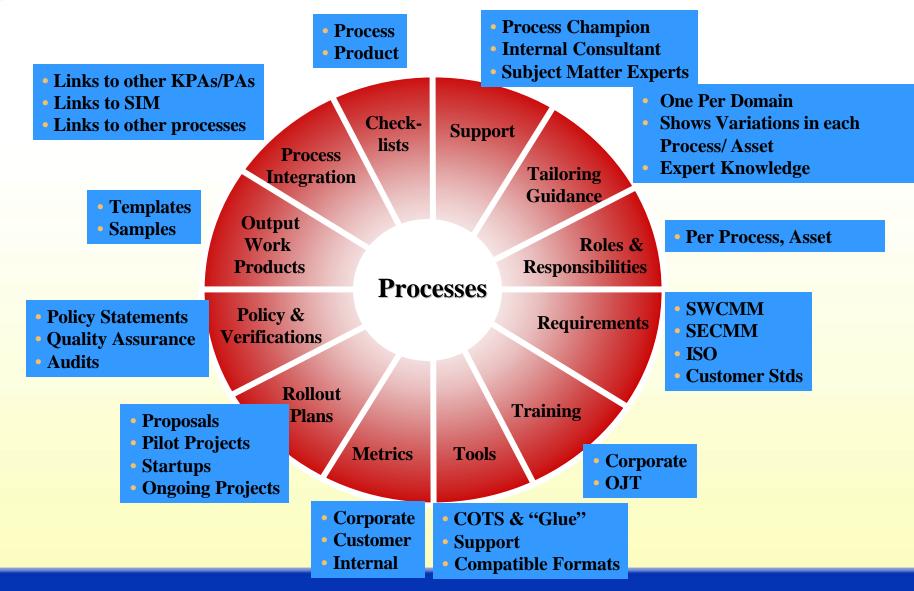


NORTHROP GRUMMAN Information Technology **Quality Improvement Realized**



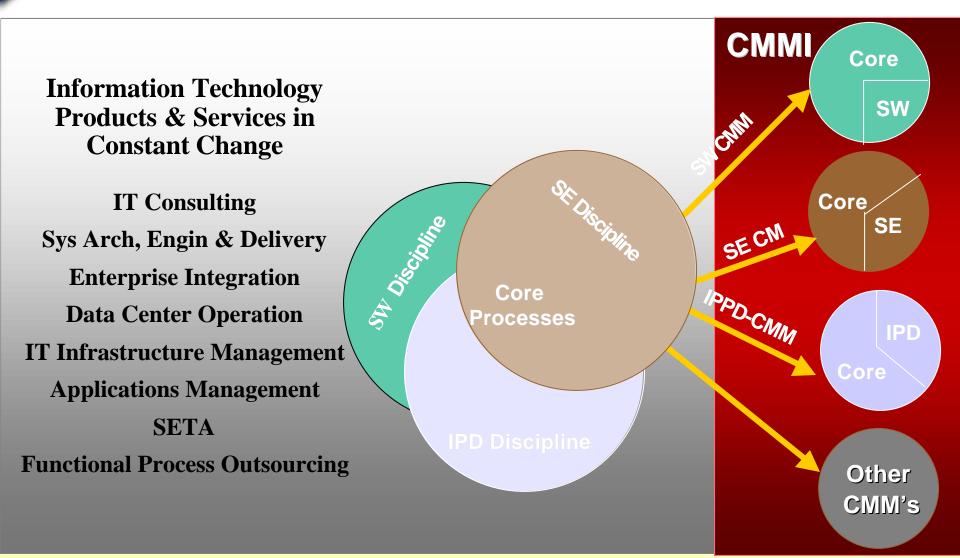
Process Implementation Support – Best Practice

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Core Processes Common to Multiple Disciplines

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Context: Acquisition/Development Space

increasing

Acquirei

Matched Team Mismatch •Mature buyer must •Match of maturity mentor low maturity •Team risk approach Execution to Plan developer •Outcome not Measurable predictable performance •Predictable results Disaster Mismatch •No discipline •"Customer is always No process right"

•Adhoc •Crisis Management "shorts cuts" Outcome not

predictable

Customer encourages

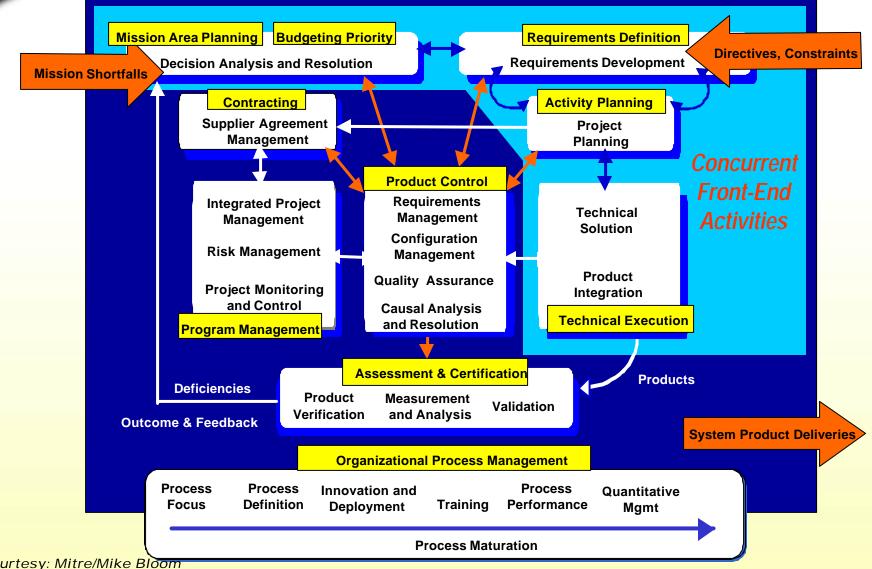
Process Maturity

increasing

Developer

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Why the CMMI fit's



Courtesy: Mitre/Mike Bloom