



RAH-66 Comanche

Comanche Process Improvement Vision and Initiatives

26 JAN 04

Mr. Richard Tyler

Dr. Sam Cooke

Ms. Kathleen Leonard

Mr. Scott Reed

Contents

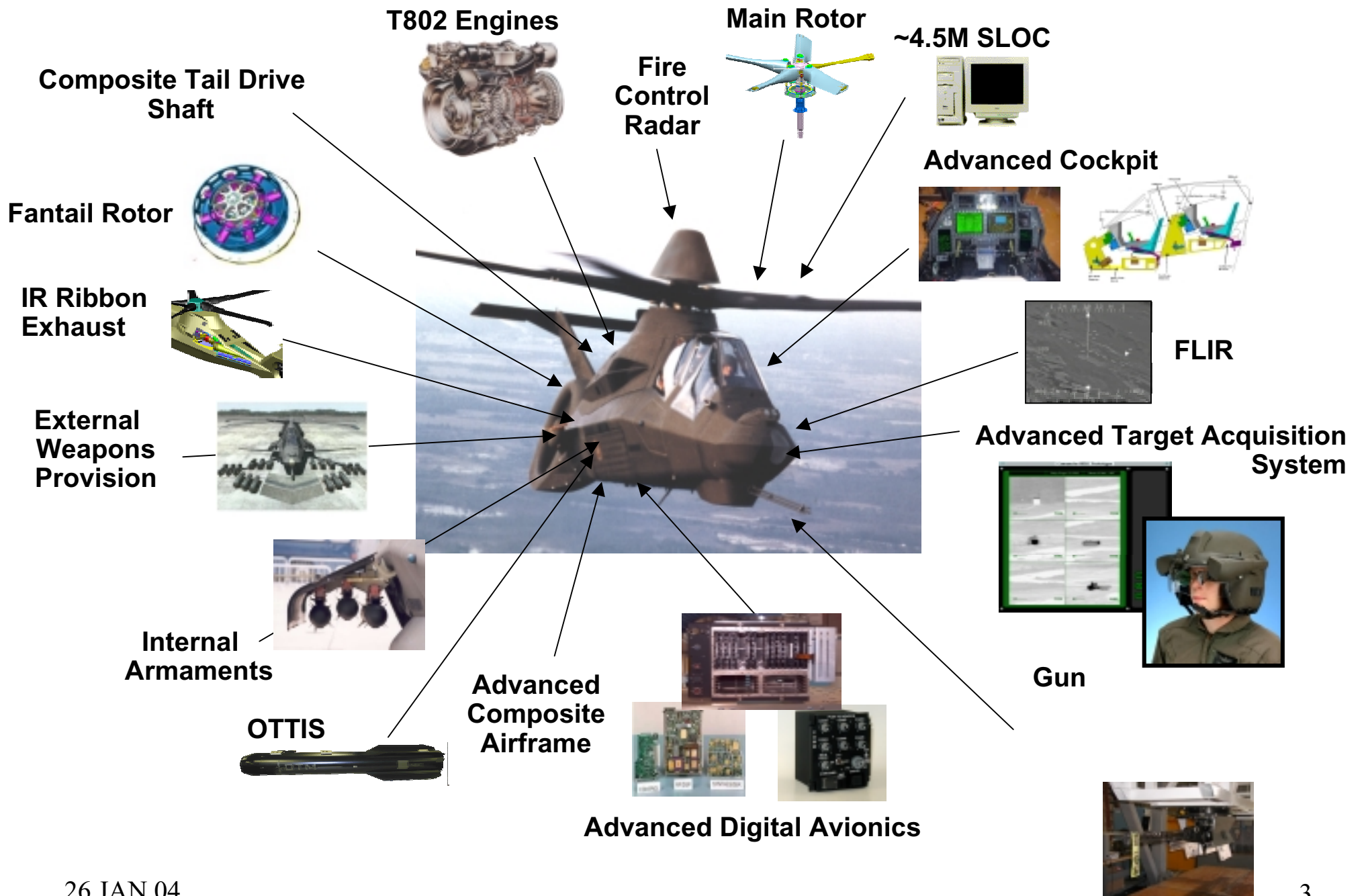
- **Purpose**

- To describe the Comanche Process Improvement (PI) vision, activities and status

- **Outline**

- Comanche Program Overview
- Process Improvement Approach & Schedule
- Process Improvement Status and Path Ahead
- Summary

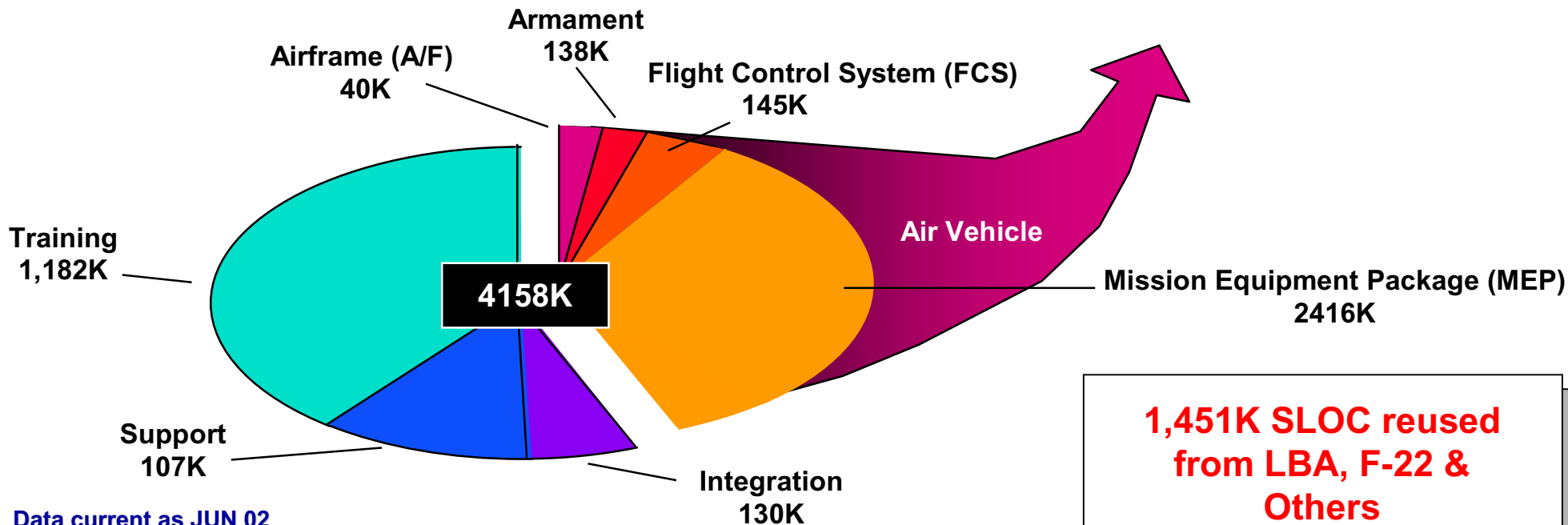
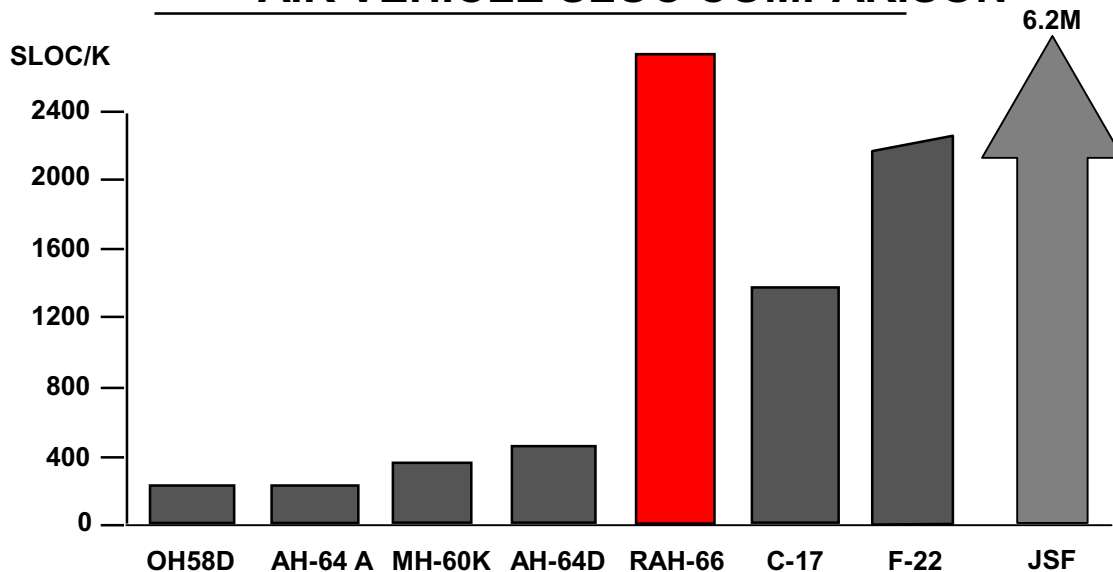
System Description



Comanche Software Source Lines of Code (SLOCs)

Category	SLOC (K)
Air Vehicle	2739
Training	1182
Support	107
Integration	130
TOTAL	4158

AIR VEHICLE SLOC COMPARISON

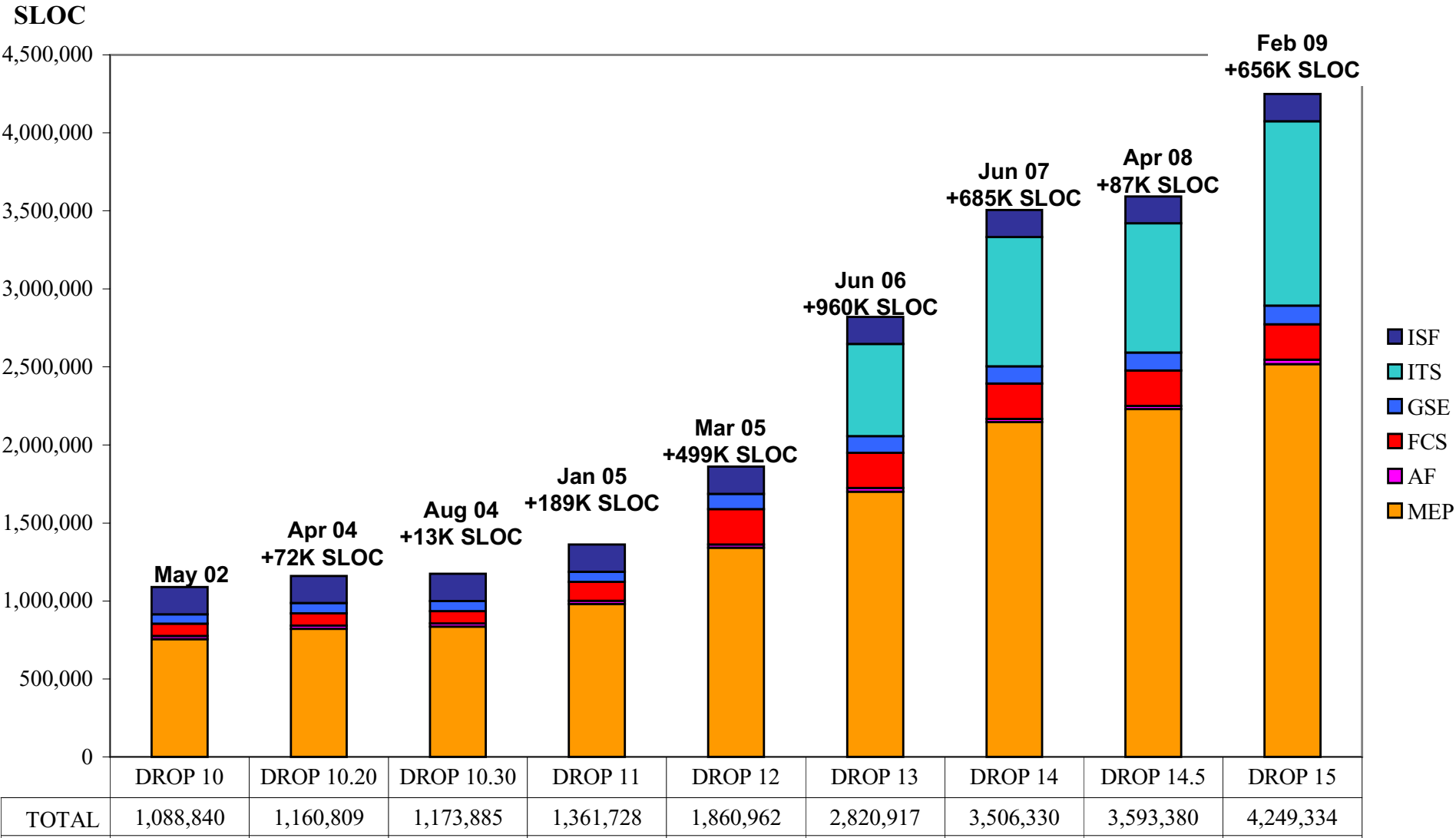


1,451K SLOC reused from LBA, F-22 & Others

Data current as JUN 02
Data from CARD

26 JAN 04

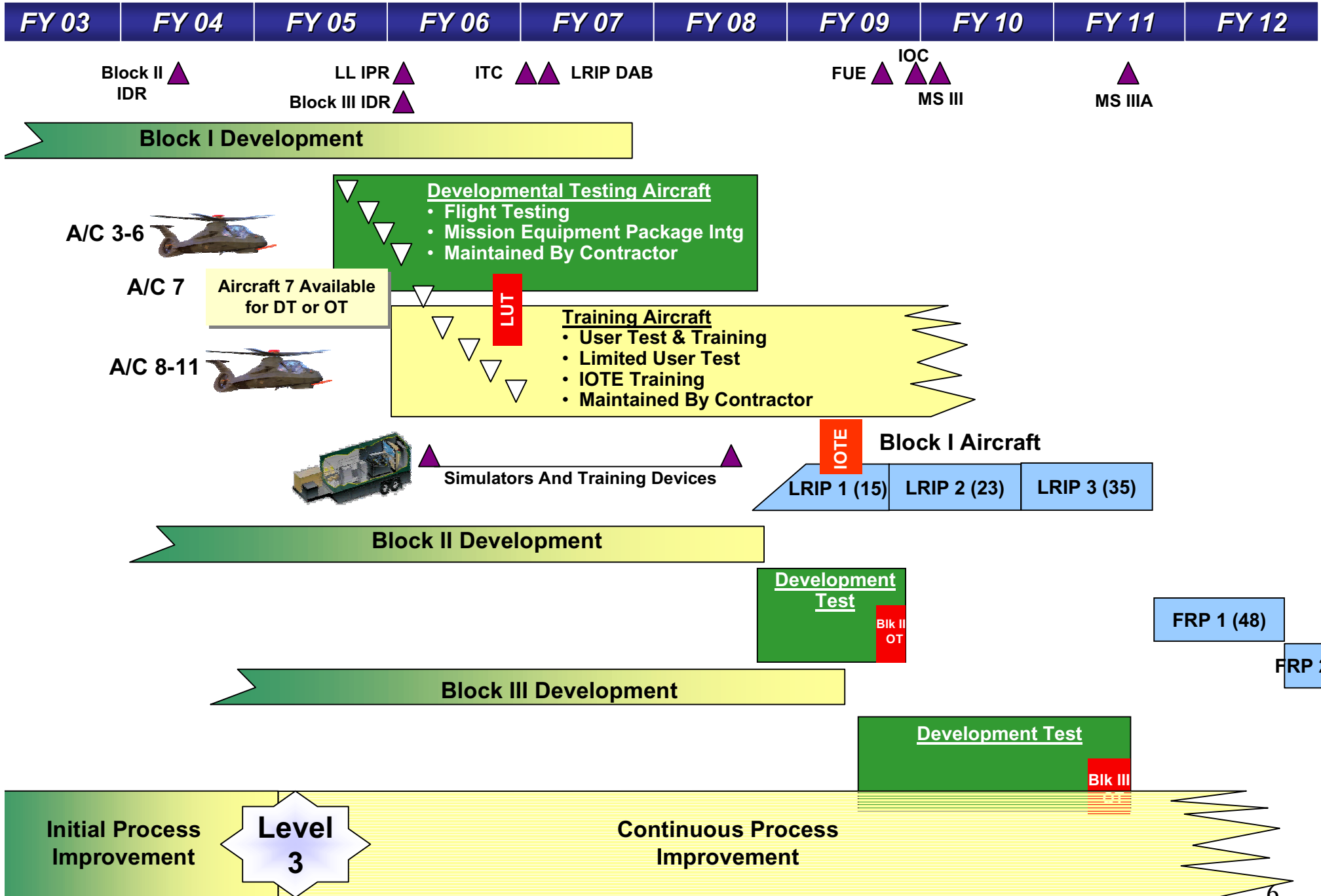
Comanche Software Growth Cumulative Software



Data current as JUN 02
Data from CARD

26 JAN 04

Comanche Program Schedule



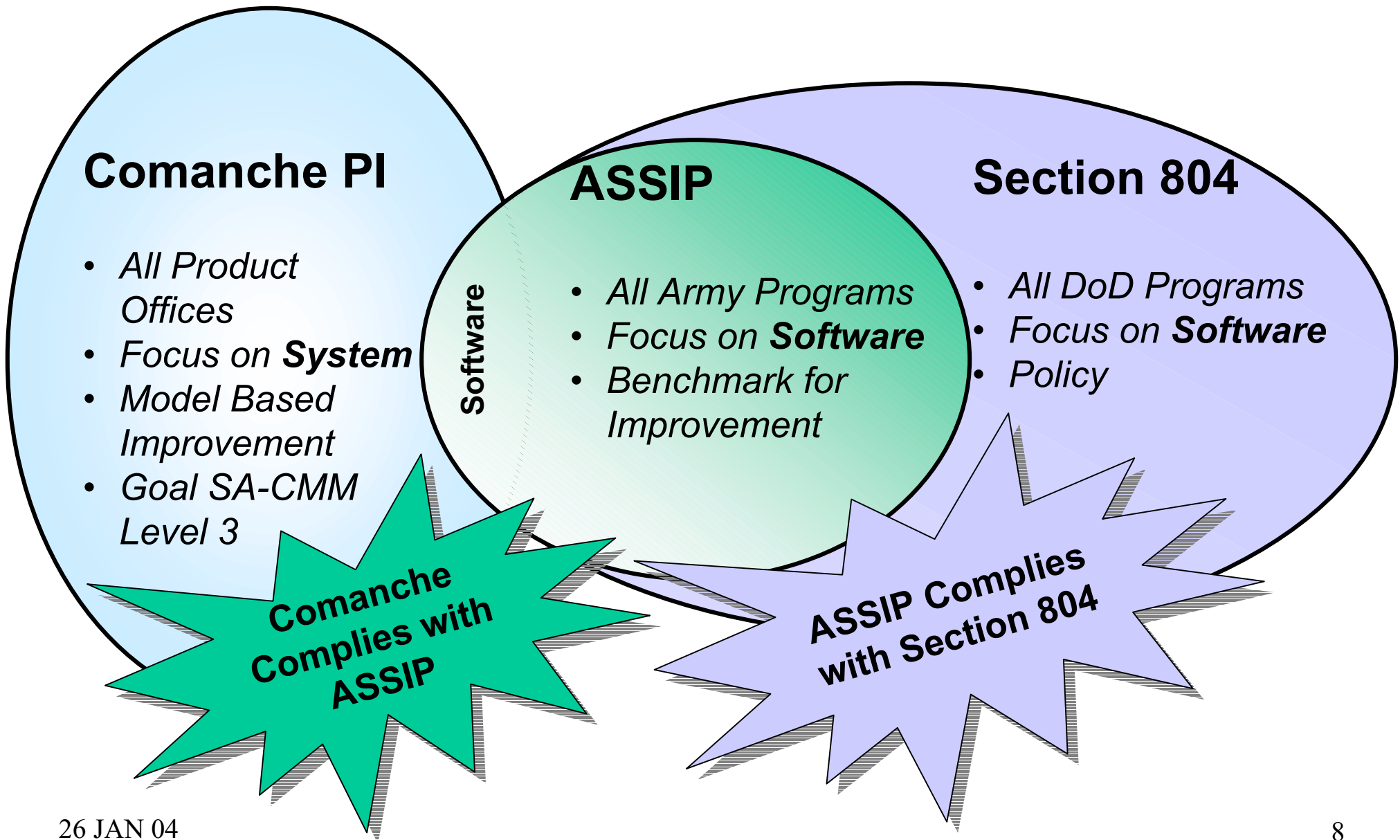
Process Improvement History

- **2002: In response to various independent program assessments, Comanche PM launches a process improvement initiative focusing on acquisition processes**
 - Independent Assessments
 - Identified lack of Systems Engineering as a program weakness
 - Identified acquisition process as a target for improvement
 - Recommended review of contractor processes by Software Engineering Institute (SEI)
- **2003: ASA (ALT) launches the Army Strategic Software Improvement Program**
- **2003: OSD improvement initiatives mandated by the Bob Stump National Defense Authorization Act for Fiscal Year 2003, Sec. 804. for Improvement of Software Acquisition Processes**

Our challenge:

Find a way to to improve acquisition processes, meet requirements and minimize impact to the Comanche PMs while answering the mail at Army, OSD and Comanche (internal) levels

How Comanche PI Fits into the Process Improvement Environment



Why Are We Doing This?

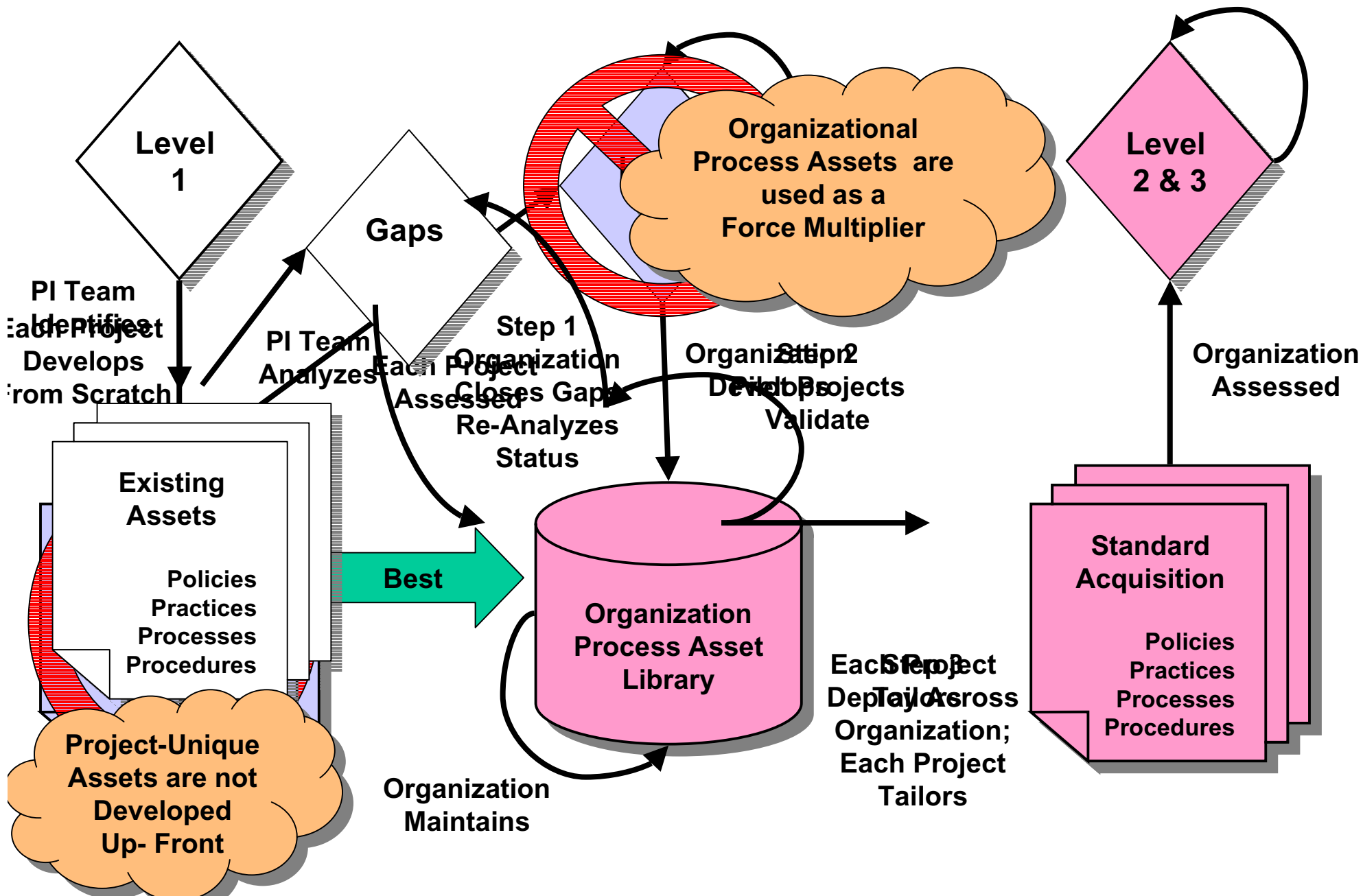
Improving Comanche Acquisition Processes will:

- **Instill Discipline Into Acquisition Processes**
- **Capture Comanche Best Practice Expertise Before It's Gone**
- **Enhance Internal And External Communication**
- **Maximize Efficient Use Of Constrained Resources**
- **Expand The Scope Of Risk Management Efforts**
- **Achieve Predictable Project Cost And Schedules**
- **Reduce Project Cost And Schedule Variances**
- **Comply With Section 804**



***Bottom Line
Process Improvement Makes
Good Business Sense***

Comanche Removes Steps from the Traditional Strategy



Comanche Process Improvement Strategy Details

- **The Systems Engineering Division owns process improvement**
- **SEI Capability Maturity Models (CMM) provide framework for Process Improvement**
 - Software Acquisition CMM (SA-CMM) Level 2 & 3 key process areas provide organizational framework
 - Relevant Systems Engineering CMM (SE-CMM) practices and existing Comanche practices are mapped into SA-CMM framework key process areas
- **Comanche Process Improvement is a “Do-It-Yourself” Effort**
 - Comanche Personnel are involved in every step
 - Software Engineering Institute (SEI) and AMRDEC Software Engineering Directorate (SED) provide consulting services
 - ASSIP benchmark data/recommendations are integrated into the Comanche process improvement effort

Comanche PI Vision and Authority



DEPARTMENT OF THE ARMY
PROJECT MANAGER, COMANCHE
BLDG. 5681, REDSTONE ARSENAL, AL 35894-5000

REF ID: A70507

SFAE-AV-RAH

02 MAY 2003

MEMORANDUM THRU Major General Joseph L. Bergantz, PEO Aviation, Building 5681, Redstone Arsenal, AL 35894-5000

FOR Honorable Claude M. Bolton, Jr., ASA (ALT), 101 Army Pentagon, Washington, DC 20310-0103

SUBJECT: Comanche Project Management Office (PMO) Process Improvement Initiative

1. References:

a. Memorandum, Army Acquisition Executive, 11 April 2002, subject: Software Engineering Institute (SEI) Reviews of Comanche, Crusader, Manover Control System (MCS), and Force XXI Battle Command Brigade and Below (FBCB2).

b. The 2003 Bob Stump National Defense Authorization Act, Section 804, Acquisition of Software Intensive Systems.

2. Following receipt of the memorandum identified in reference 1a, the Comanche PMO reviewed the current status of their contractors and concluded that further assessment was unnecessary given that both primes were already working to achieve a Capability Maturity Model (CMM) Level IV certification in 2003. It was also decided at that time to establish a plan to implement a similar process improvement effort within the PMO.

3. Comanche initiated an effort in January to improve systems engineering and acquisition processes within the project office. The Comanche PMO will base their acquisition and systems engineering process improvement effort on the Capability Maturity Model Integration (CMMI - Systems Engineering) and the Software Acquisition (SA-CMM) process improvement frameworks developed for Department of Defense (DoD) by the SEI. These process improvement frameworks will be tailored to be applicable to the project office's mission and operation.

SFAE-AV-RAH

SUBJECT: Comanche Project Management Office (PMO) Process Improvement Initiative

5. The path Comanche has started down is consistent with the guidance received in March per reference 1b. We are working with the Army Strategic Software Improvement Program to ensure our internal efforts are performed in conjunction with the activities of this Office of Secretary of Defense chartered team.

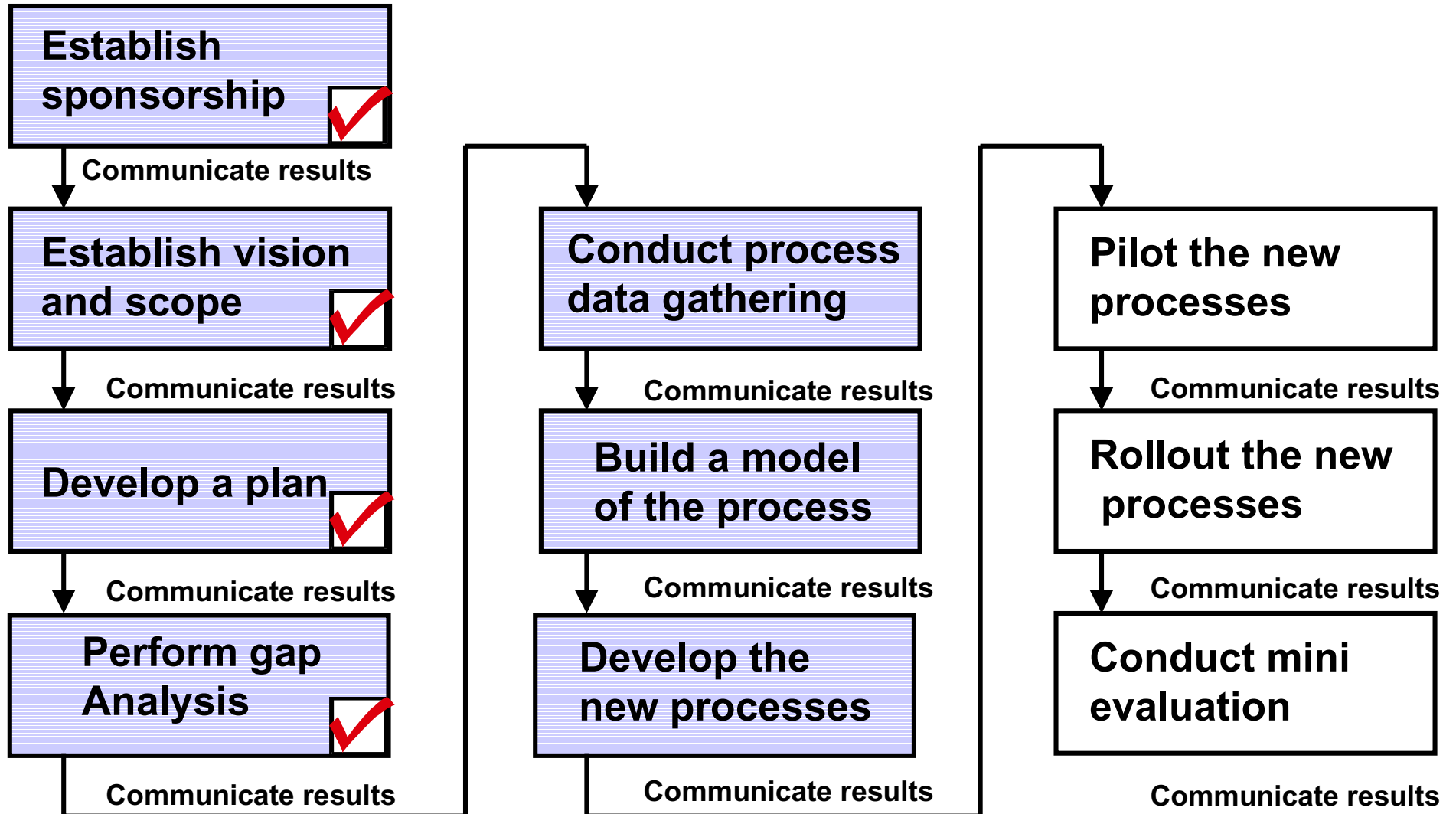
6. Based on the recommendation from the SEI representatives regarding the PMO, we are going to shoot for a Level III assessment by December 2004. If successful, we will be the first project office within DoD to achieve this rating.


ROBERT P. BIRMINGHAM
Colonel, Aviation
Comanche Project Manager

The Comanche PMO will base their ... process improvement effort on the Capability Maturity Model Integration (CMMI -Systems Engineering) and the Software Acquisition (SA-CMM) process improvement frameworks ... we are going to shoot for a Level III assessment by December 2004.

**Strategic Acquisition Process Improvement Plan
Signed by COL Michael Cantor PM Comanche
28 AUG 03**

Comanche Operational Approach to Acquisition Improvement



Shaded Tasks with a Check Mark are Complete, and without are In-Progress
Clear Tasks are not begun

Fact-Finding Methodology

- **Context Analysis (Quick Look)**

- Interviewed selected managers
- Identified Level 2 & 3 KPAs that are
 - Likely to rate as Satisfied
 - May rate as Satisfied
 - Likely to rate as Unsatisfied



- **Gap Analysis (Deeper Look)**

- Each Level 2 and Level 3 KPA briefed to Acquisition Improvement Group (AIG) over 3 full days
- Open Discussions of each KPA leading to a real-time rating by AIG for each commitment, ability, activity, and measurement
- Data review to estimate rating that would be received during an assessment
 - Satisfied (Green) - effective implementation of one or more practices
 - Partially Satisfied (Yellow) - a partial implementation of one or more practices
 - Not Satisfied (Red) - an ineffective implementation of an applicable practice or failure to implement an acceptable alternative.

SA-CMM Gap Analysis Stop Light

as of 18 DEC 03

Documented Organizational Policies

Adherence to Documented PROJECT Plans

Measurement and Verification of PROJECT

Level	KPA	C1	C2	C3	C4	AB1	AB2	AB3	AB4	AB5	AB6	AC1	AC2	AC3	AC4	AC5	AC6	AC7	AC8	AC9	AC10	M1	M2	V1	V2
2																									
	CTO	Red	Yellow	Green	Gray	Yellow	Green	Green	Gray	Gray	Gray	Red	Yellow	Yellow	Yellow	Yellow	Red	Yellow	Gray	Gray	Gray	Red	Gray	Red	Red
	EVAL	Red	Yellow	Gray	Gray	Yellow	Green	Green	Gray	Gray	Gray	Red	Green	Yellow	Yellow	Yellow	Gray	Gray	Gray	Gray	Gray	Red	Gray	Red	Red
	PM	Red	Yellow	Gray	Gray	Yellow	Green	Green	Gray	Gray	Gray	Red	Yellow	Yellow	Yellow	Yellow	Red	Gray	Gray	Gray	Gray	Red	Gray	Red	Red
	RDM	Red	Yellow	Gray	Gray	Yellow	Green	Green	Gray	Gray	Gray	Red	Green	Green	Green	Green	Green	Gray	Gray	Gray	Gray	Red	Gray	Red	Red
	SOL	Red	Yellow	Yellow	Yellow	Yellow	Green	Green	Yellow	Gray	Gray	Red	Yellow	Green	Yellow	Yellow	Yellow	Green	Gray	Gray	Gray	Red	Gray	Red	Red
	T2S	Red	Yellow	Yellow	Gray	Yellow	Green	Yellow	Red	Yellow	Yellow	Red	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Red	Gray	Red	Red
	AP	Red	Yellow	Gray	Gray	Yellow	Green	Green	Gray	Gray	Gray	Yellow	Yellow	Yellow	Yellow	Yellow	Green	Green	Gray	Gray	Gray	Red	Gray	Red	Red
3																									
	PDM	Red	Yellow	Yellow	Gray	Yellow	Gray	Yellow	Red	Gray	Gray	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
	CPM	Red	Gray	Gray	Gray	Yellow	Gray	Gray	Gray	Gray	Gray	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
	PPM	Red	Gray	Gray	Gray	Yellow	Gray	Gray	Gray	Gray	Gray	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
	TRNG	Red	Yellow	Gray	Gray	Yellow	Yellow	Yellow	Yellow	Gray	Gray	Green	Green	Green	Green	Green	Green	Gray	Gray	Gray	Gray	Red	Gray	Red	Red
	USER	Red	Yellow	Gray	Gray	Yellow	Yellow	Yellow	Gray	Gray	Gray	Red	Green	Yellow	Yellow	Green	Yellow	Gray	Gray	Gray	Gray	Red	Gray	Red	Red
	ARM	Red	Yellow	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Gray	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red

Documentation and Artifacts are needed across the board

Gray boxes do not appear in model

Measurement is an integral part of moving to Level 3

Gap Analysis Summary

Recommendations/Next Steps

- **Organizational Policy**

- Continue to maintain senior level commitment and sponsorship of process improvement down to project level (e.g., senior verification)
- Develop and promulgate policies ASAP

- **Project Planning and Documentation**

- Develop and Improve artifacts Directives, Process Descriptions, Procedures to be applicable to model
- Develop and implement repository and start collecting data ASAP
- Provide reviews of all projects for quality, consistency, adherence to procedures/templates (to include IPTs), and “can they be used to manage the project”

- **Measurement & Verification**

- Measure PI progress and operational improvement
- Measure and verify management of projects – critical to PI success

- **Paradigm Shift**

- Improve the culture to one that understands the concepts of internal management for all projects as opposed to contractor management

Comanche PI Schedule

**Our goal is to reach
CMM Level 3 by
DEC '04**

Level 3

1QFY05

Work the plan!



- 26 MAR 04: Policies, Processes & Procedures
- 26 MAR 04: Roles & Responsibilities
- 21 MAY 04: Assessment Plan
- 09 JUN 04: Pre-Assessment
- 23 JUN 04: Corrective Action Plan

1QFY04

**How do we get there?
(develop a plan)**



- 23 FEB 03: Initial Schedule*
- 18 JUN 03: Strategic Plan*
- 30 JUN 03: Update Schedule*
- 09 JUL 03: Process Improvement Plan*
- 11 JUL 03: Stand Up MSG/AIG*
- 14 NOV 03: SAISE Tailored CMM Framework*

3QFY0

3

**Where are we?
(survey the facts; perform a benchmark)**



- 23 MAR 03: Executive Kick-Off*
- 02 MAY 03: PEO Letter*
- 06 MAY 03: Climate Survey*
- 22 MAY 03: Executive Interviews*
- Late JUL 03: ASSIP Bench Mark*
- 12 DEC 03: CMM Gap Analysis*

26 JAN 04

Blue, Bold & Italic Font Indicates Completed Milestones

Summary

Comanche is:

- **Developing the most SW intensive Army Aviation System**

The Comanche Process Improvement Effort is:

- **Using proven SEI capability maturity models**
- **Ongoing according to plan and schedule**
- **Complying with Section 804 and ASSIP**