NDIA 11th Annual Systems Engineering Conference

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Establishing a Systems Engineering Center of Excellence within PEO GCS

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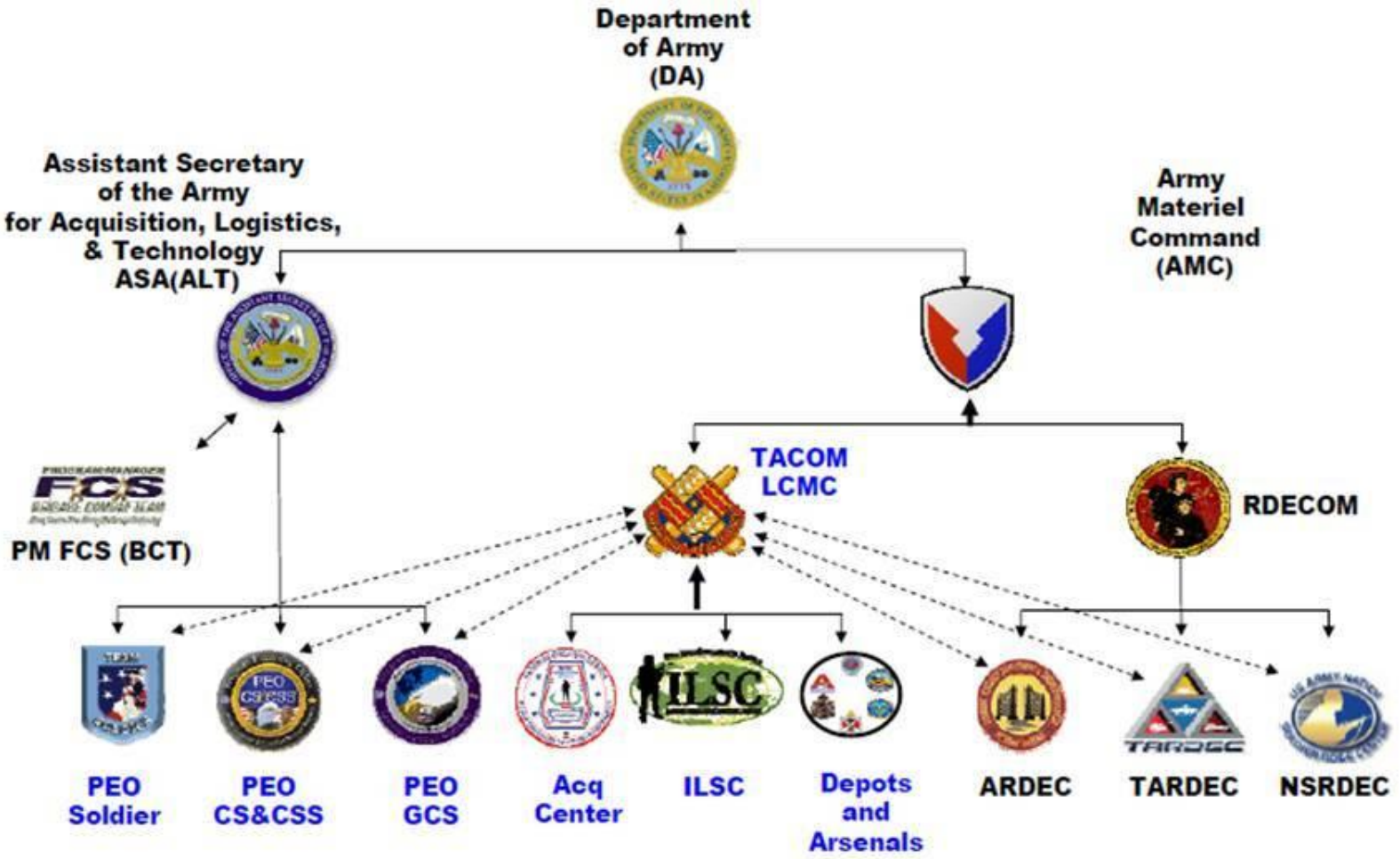
OPSEC Review conducted per AR 530-1 and HQ TACOM OPSEC SOP.

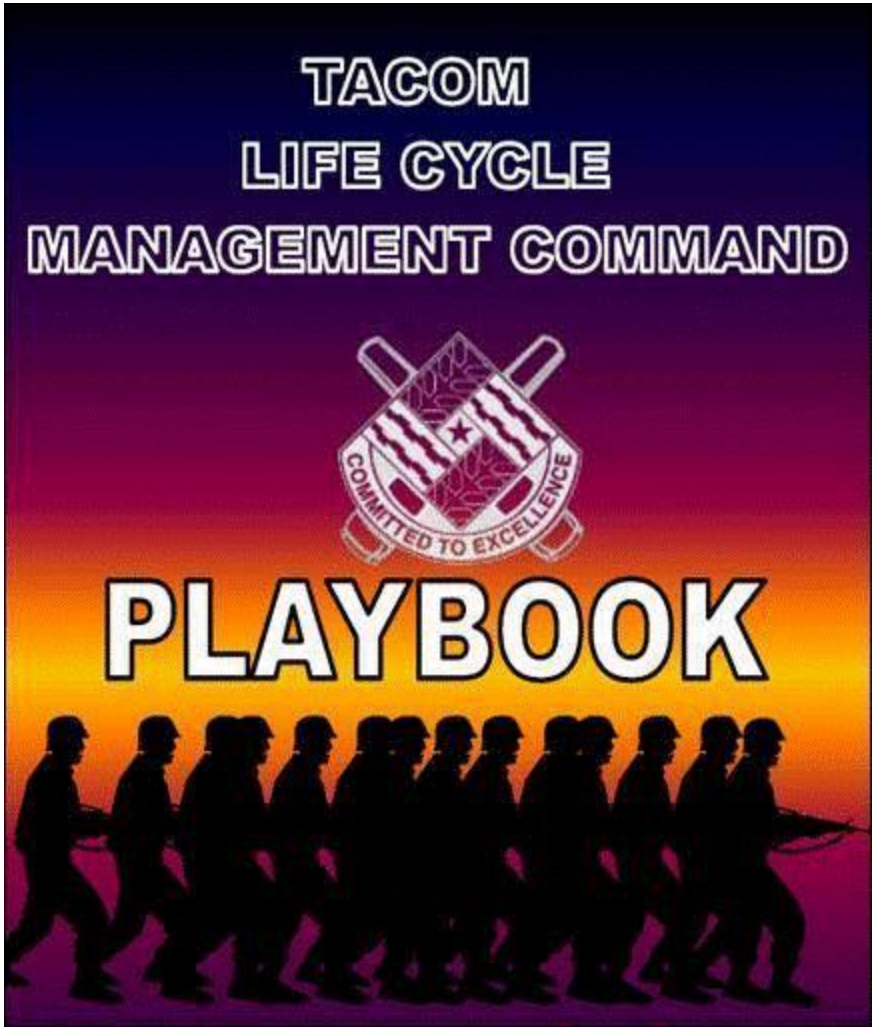
TACOM LCMC

TACOM Life Cycle Management Command



The TACOM LCMC unites all of the organizations that focus on Soldier and Ground Systems. The PEOs and PMs are able to work as an integral part of the Logistics and Technology efforts of the LCMC, while enterprise level partnerships are maintained with the Research, Development, and Engineering Centers (RDECs).

TACOM LCMC Playbook



PEO GCS

Program Executive Office Ground Combat Systems

Mr. Kevin Fahey

Heavy Brigade Combat Team	Stryker Brigade Combat Team	Joint Robotics Systems (Army & Marine)	Mine Resistant Ambush Protection	Joint LWH 155mm (Army & Marine)	Modular Brigade Enhancements
COL P. Lepine	*COL R. Schumitz*	*Col J. Braden (USMC)*	*COL K. Peterson*	*Mr. J. Shields*	*COL J. Wendel*

Vision

Exceed Warfighter expectations as the Army's Lifecycle Manager and systems integrator for current and future Ground Combat Systems.

Mission

Manage the development, systems integration, acquisition, testing, fielding, sustainment and Improvement of ground combat systems in accordance with the Army's initiatives to provide mission-capable systems to the Warfighter while meeting cost, schedule and Performance goals.

Supporting the Army Vision Requires Synchronized Modernization WHY?

WHAT WORKED BEFORE…

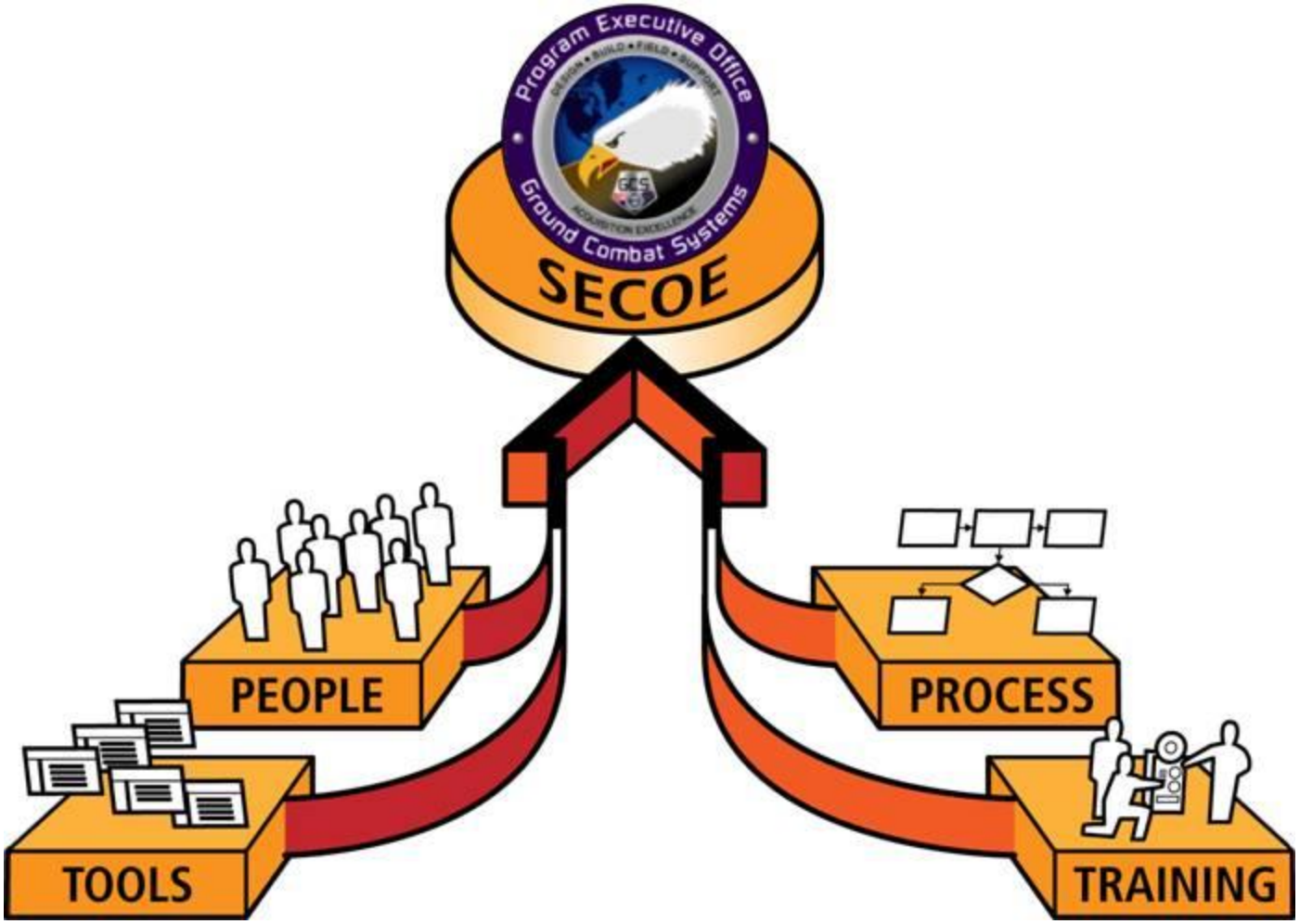
- GCS Platform infrastructure has remained relatively constant since the last development/improvement program
- Requirements are evolving and expanding which requires integration of new capabilities
  - New/Updated CDDs/CPDs under development
  - Integrating new capability to already strained power, space, and weight claims
- Integrating more in current vehicle configuration impacts crew and vehicle capability

…DOESN'T NECESSARILY WORK NOW!

We are at the degradation point

SECOE

Systems Engineering Center of Excellence



SECOE Description

Systems **E**ngineering **C**enter **O**f **E**xcellence is an operational organization infused with common SE processes and tools to optimize execution of acquisition programs

DEVELOPMENT TENETS:

- Comprehensive system-of-systems integration methodologies
- Support senior management fact-based decision making
- End-to-end processes that are tailorable, scalable, & portable
- Focus on PEO-wide problem sets
- Maximize common tools and processes

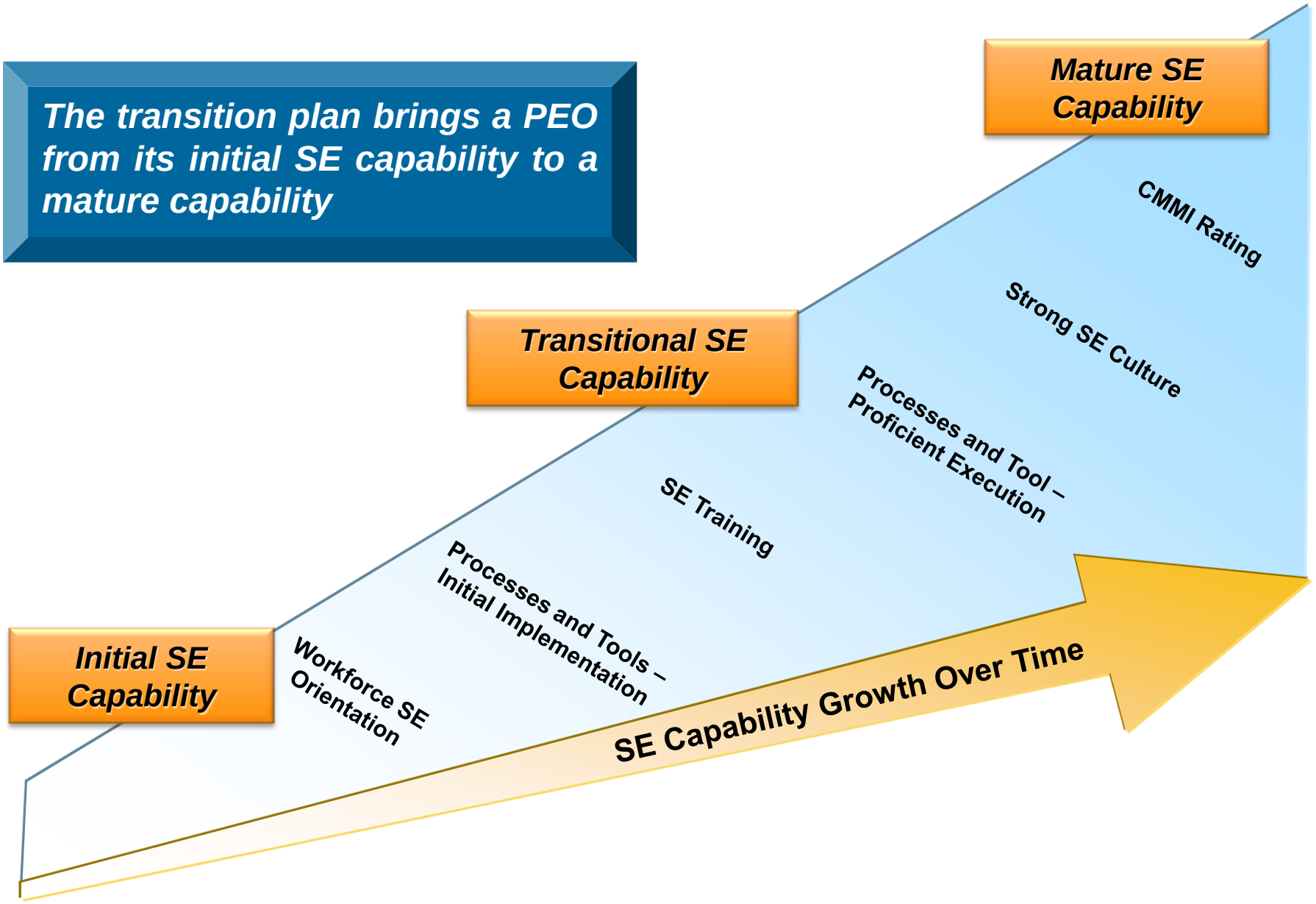
Systems Engineering

A branch of engineering whose responsibility is creating and executing an interdisciplinary process to ensure that customer and stakeholder's needs are satisfied in a high quality, trustworthy, cost efficient and schedule compliant manner throughout a system's entire life cycle, from development to operation to disposal.

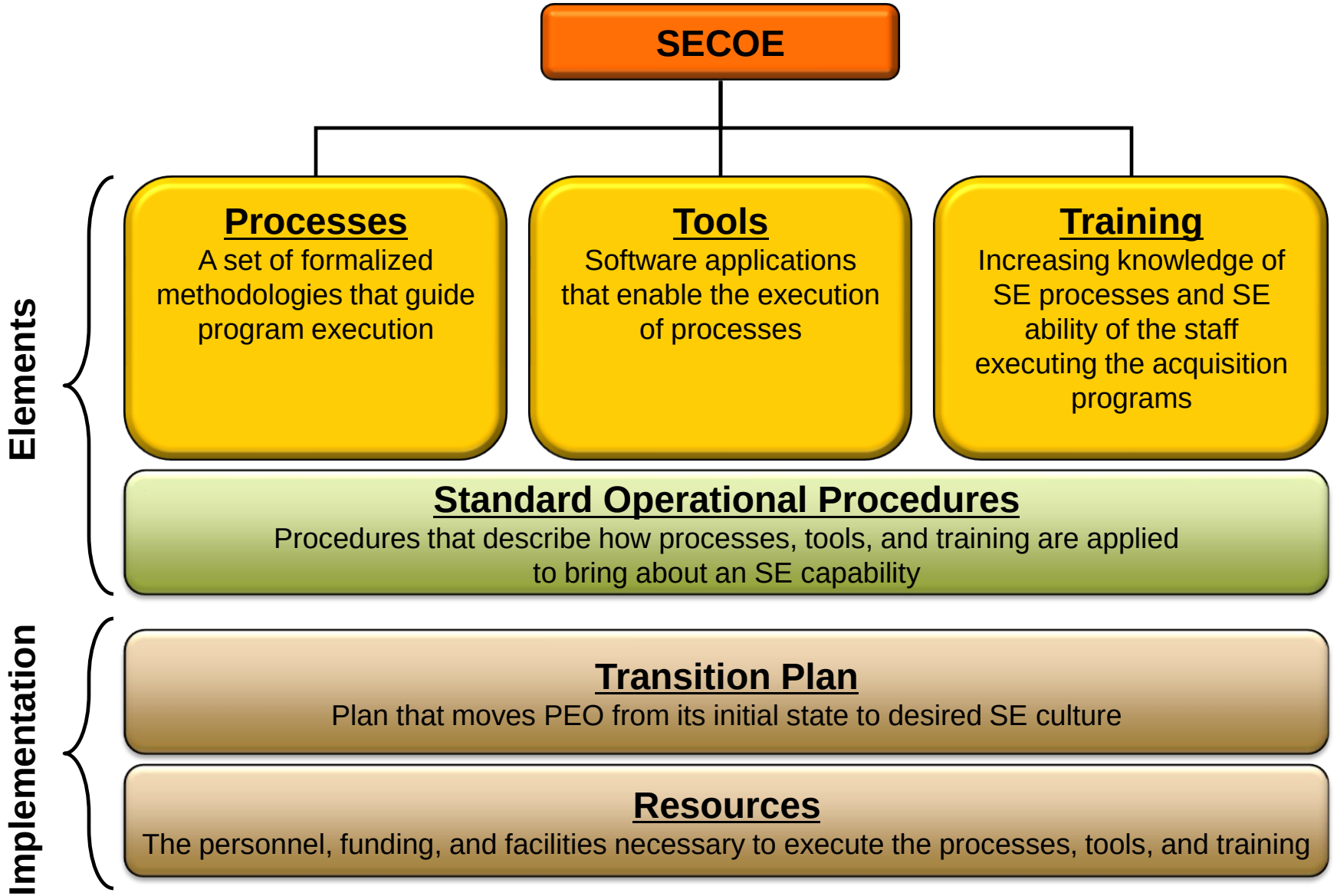
- International Council on Systems Engineering (INCOSE)

SE Capability Growth

The transition plan brings a PEO from its initial SE capability to a mature capability



SECOE COMPONENTS



Growing Core Capabilities

	PROCESSES	TOOLS	TRAINING
Current Efforts	• IMP/IMS Development • IMS Maintenance • Capability Alignment • SEP Development • Risk Management	• Tools Plan • Risk Management Tool • Requirements Mgmt • Integrated Scheduling	• Training Plan • SE Curriculum
Near Term Plans	• Technical Reviews • Requirements Mgmt • Unit Set Fielding • Tech Readiness Assmnt • Mfg Readiness Assmnt	• Fielding Management • Automated IMP Template • Configuration Mgmt • Data Management • Modeling and Simulation • Architecture Tools • Reliability Tools	• Workforce SE Orientation • Pilot Training Program • Professional Affiliations • SE Training Coordinator • Academic Partnerships • SE Library

STANDARD OPERATIONAL PROCEDURES

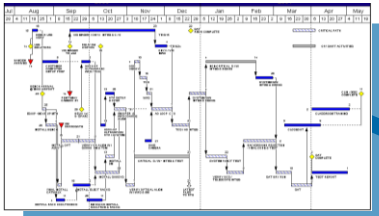
- Systems Engineering Integration Team Review and Approval SOP
- Risk Management Process/Tool Application SOP
- PEO IMP/IMS SOP

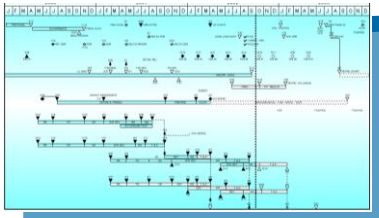
Integrated Scheduling

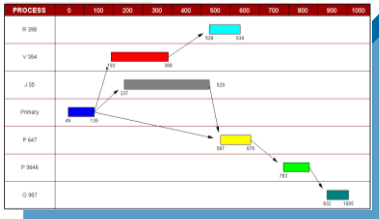
Aligning Across Platforms

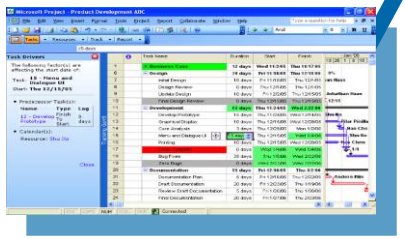
Individual Schedules

Differing formats
Differing detail
Differing software









Scheduling Tools

Built using off-the-shelf software SOPs being developed

Schedule Maintenance Tool

Enterprise Project Management (EPM)

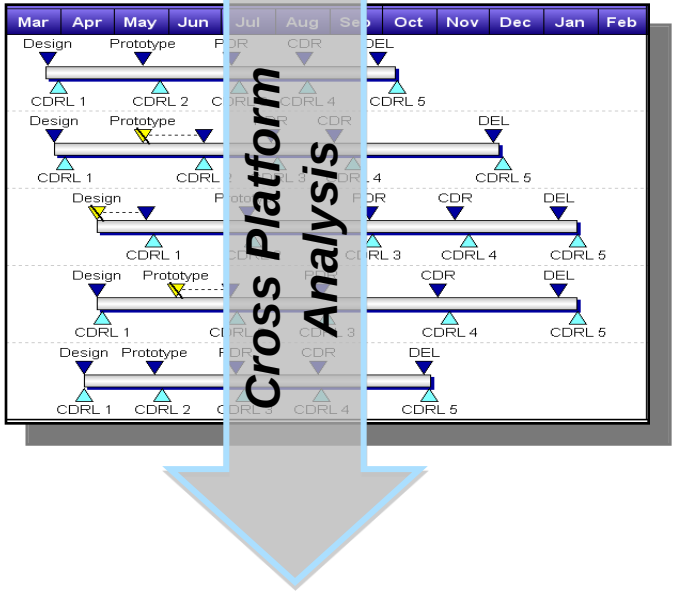
MS Project

PEO GCS Knowledge Center

PEO GCS

Integrated Master Schedule

HBCT
SBCT
MRAP
JLWH
RS JPO

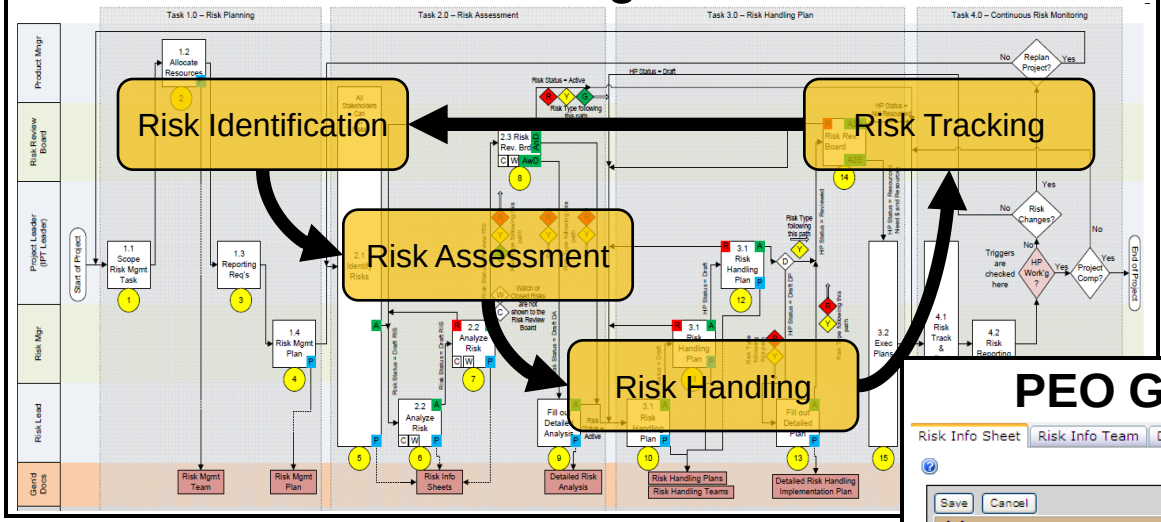


Scheduling Opportunities

- PEO and PMs gaining better insight across programs
- Focusing on sustainment & modernization
- Managing Schedule Risk
- Identifying Commonality Opportunities
- Supporting “What If Drills”
- Synchronizing/Standardizing schedules across PEO

Risk Management

PEO GCS Risk Management Process

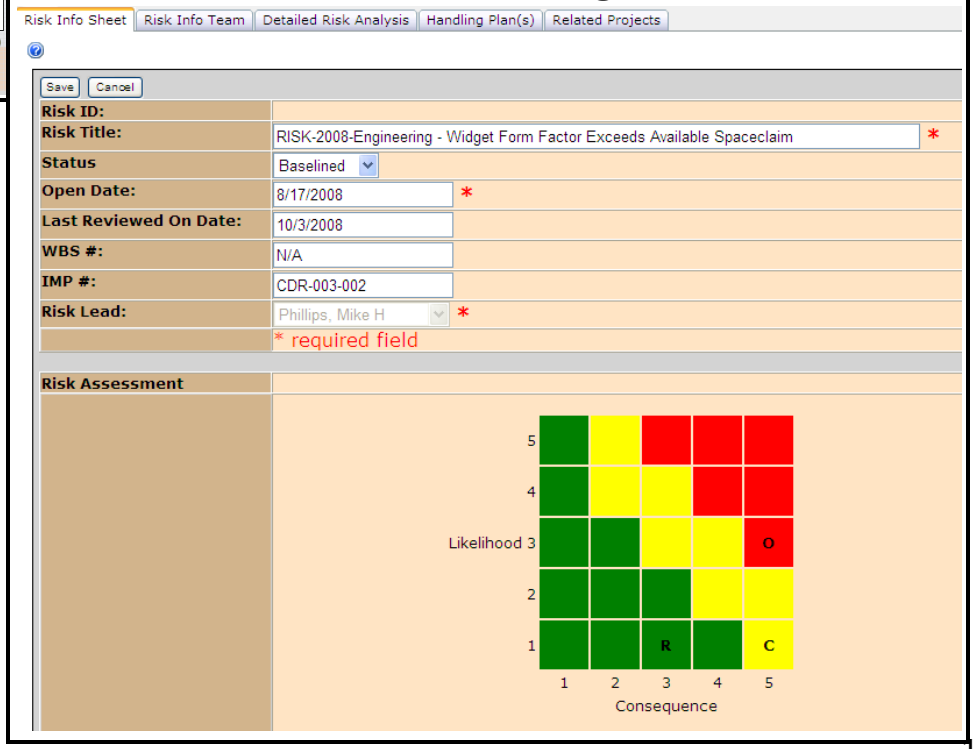


Improving Risk Management

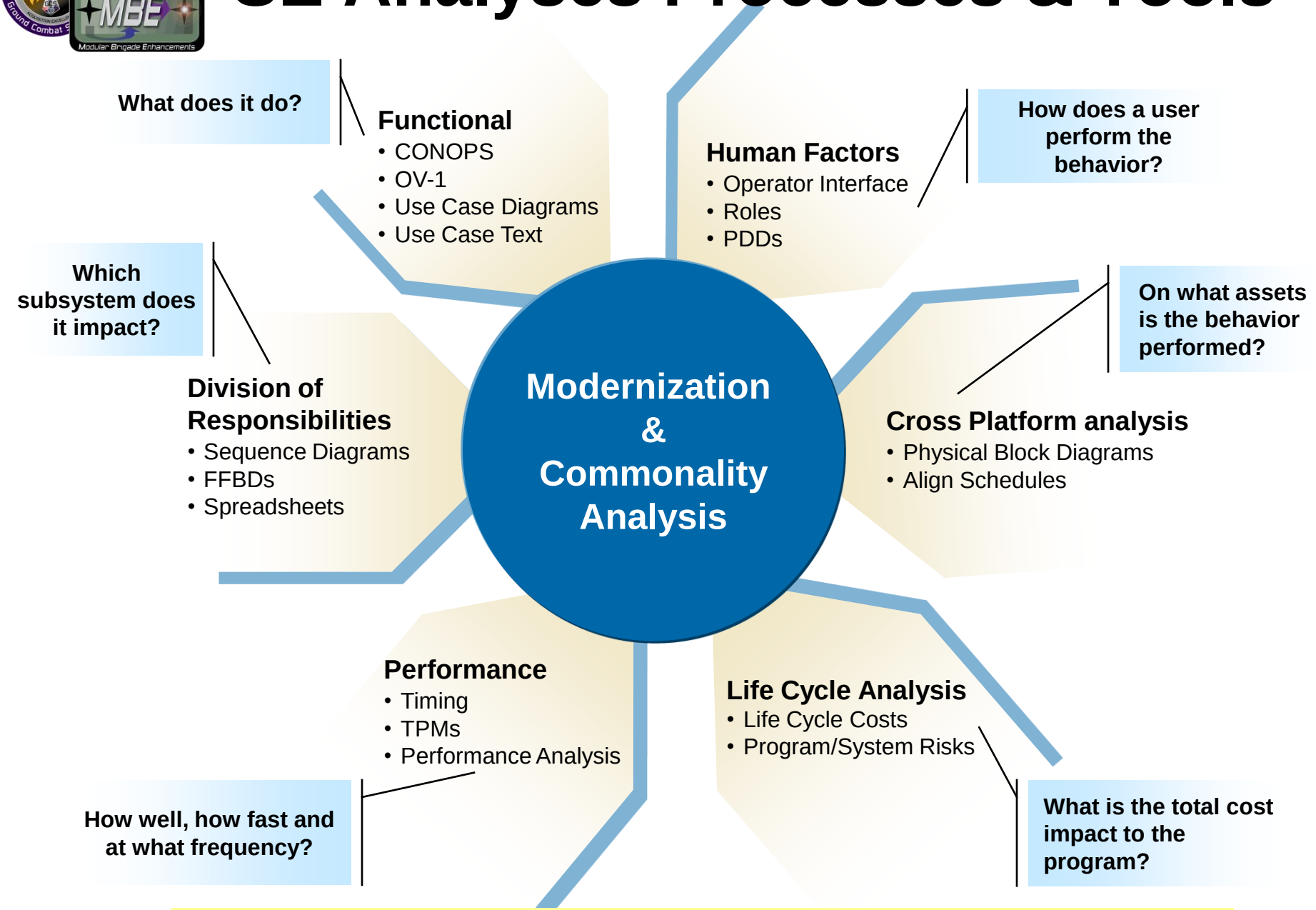
- Proactively Managing Risk
- PEO and PMs using a common understanding of program risk
- Supporting "What If Drills"

- PEO GCS risk management tool is being used to automate the risk management process
- Integrated in the PEO GCS Knowledge Center
- The process is based on and aligns with DOD risk guidance
- The tool is portable and tailorable to other PEOs

PEO GCS Risk Management Tool



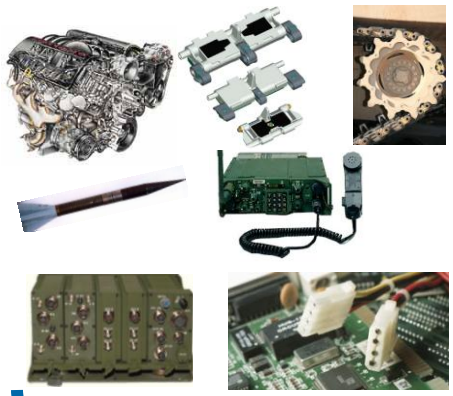
SE Analyses Processes & Tools



Systems Engineering-Based Analysis Processes Being Improved

Two-Level Platform Analysis

System Wide Analysis of Potential Components



Component

Performance/ Capability

Needed
Power
Space Claim
Thermal

Vehicle

Performance Needs

Available
Power
Space Claim
Thermal Limits

Needed Vehicle Infrastructure Improvements

Component Mods to support vehicle needs

Coordinated Vehicle Modernization Plans & Component Development Plans

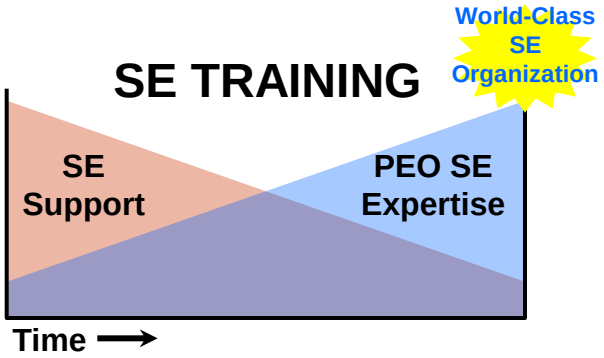
Commonality Analysis

Move	X		X	X
Shoot	X	X		
Comm	X	X	X	X
Survive	X			X

Commonality Optimization

SE Training

- SECOE Training Objectives:
  - Train a SE qualified workforce
    - Trained to understand systems engineering
    - Trained to manage systems engineering
  - Increase visibility into available SE training and certifications
  - Establish single training tracking tool for SE training & certifications
    - Working with DAU to customize & implement PEO GCS training
      - Available to PEO CS/CSS, TARDEC, and TACOM
      - Focusing on growing number of Level III certified SPRDE, Program Systems Engineers
    - Working with professional organizations, academia
      - Aligning and educating workforce on available SE certifications and degree programs for those interested
  - Utilize existing TACOM training databases (e.g., TEDS) to implement
- Near Term Timeline:
  - Sep 08: Draft Training Plan
  - Sep 08: Draft Training Curriculum
  - Nov 08: SE Workforce Briefing Complete
  - Nov 08: Pilot Training Delivery
  - Dec 08: SE Library Initiated
  - Jan 09: Professional Development Opportunities Identified
  - Feb 09: SE Training Process Approved



Evolving the Workforce Over Time

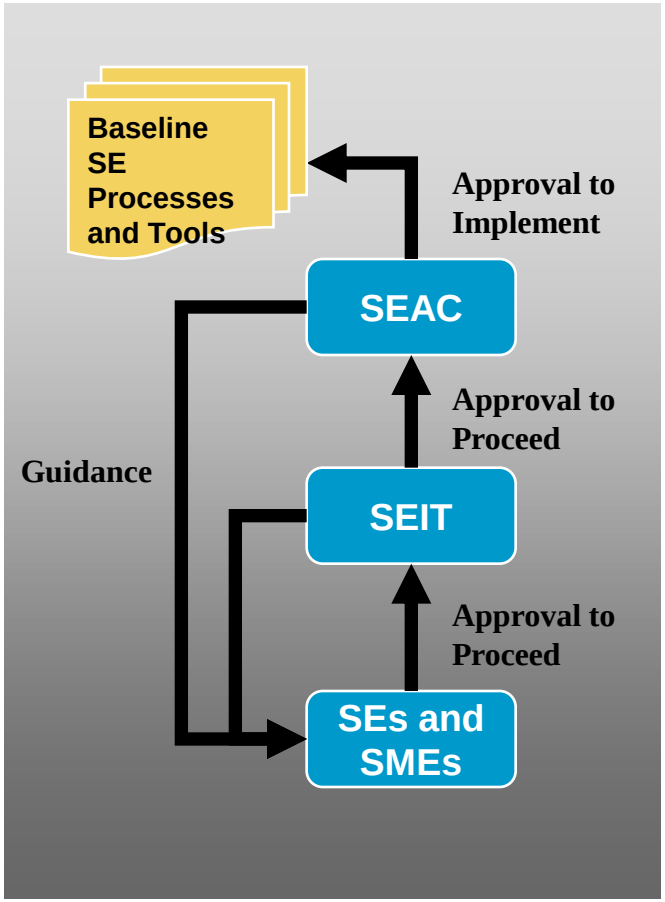
PEO GCS
System Engineering Curriculum
2008

SE ROLES
GREEN - New Engineer BROWN - SE Position BLUE - SE Task

Category	Course	Course #	Hrs	Type
Process				
	Cost Analysis	CLB 007	4	online
	Intro to Earned Value	CLB 016	1	online
	Performance Measurement Baseline	CLB 017	1	online
	Earned Value & Financial Reports	CLB 018	1	online
	Technical Reviews	CLE 003	3	online
	System Safety in SE	CLE 009	4	online
	Modeling & Simulation for SE	CLE 011	3	online
	Modular Open Sys Approach to Acquisition	CLE 013	4	online
	Technical Planning	CLE 017	3	online
	Technology Readiness Assessment	CLE 021	3	online
	Modeling & Simulation for Test & Evaluation	CLE 023	3	online
	Trade Studies	CLE 026	4	online
	Engineering Change Proposals for Engineers	CLE 036	5	online
	Reliability & Maintainability	CLE 301	4	online
	Scheduling	CLM 012	8	online
	Work Breakdown Structure	CLM 013	6	online
	IPT Mgmt & Leadership	CLM 014	8	online
	Risk Management	CLM 017	8	online
	Improved Statement of Work - Reqms Mgmt	CLM 031	4	online
	PEO GCS SE Overview	PEOGCS/SE		Instruct
	Cost As An Independent Variable	CAIV001	8	Instruct
	Logistics Support Training	ILS100	24	Instruct
	Reliability Engineering Overview	REL101	4	Instruct
	Production Reliability Engineering	REL102	8	Instruct
	Design Development Reliability Engineering	REL103	16	Instruct
	Decision Analysis and Resolution	NCSENG0035	1	Instruct
	Design to Cost	DTC100	8	Instruct
	Writing Good Requirements	S10003	8	Instruct
	Principles of System Engineering	SEPOSE100	40	Instruct
	Applied Statistics	STAT120	24	Instruct
	Design of Experiments	STAT210	24	Instruct
	Earned Value Management (EVMS) 100	FEVM100WB	6	online
	EVMS - Program Execution	FEVM200WB	6	online
	IMP/IMS			

Approval Process

Process Flow



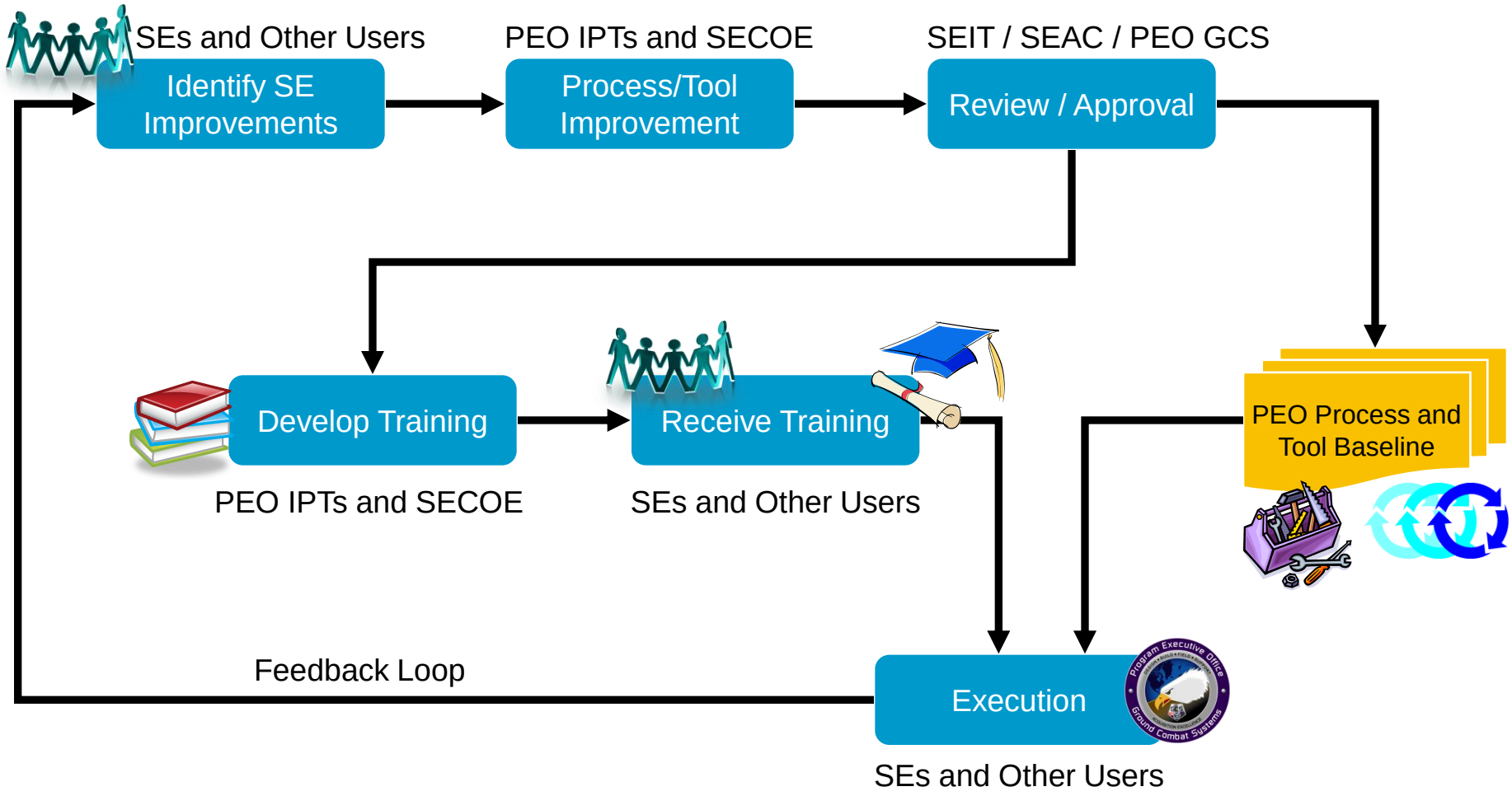
Process Steps

Phase 1: Need and Concept	Phase 2: Draft Development	Phase 3: Final Development	Phase 4: Implementation
1.1 Identify SE Product Need	2.1 Form IPT to Develop Product	3.1 Develop Final Product	4.1 Add Product to the PEO GCS Baseline
1.2 Define Scope and High-level Solution Concept	2.2 Develop Draft Product	3.2 Develop Associated Training	4.2 Deliver Training to the User
1.3 Present Draft SE Project Directive to SEIT for Approval	2.3 Present Draft Product to SEIT for Guidance	3.3 Present Final Product to SEIT for Approval	4.3 User Execution
1.4 Present Draft SE Project Directive to SEAC for Approval		3.4 Present Final Product to SEAC for Approval	4.4 Maintain and Continuously Improve Product
		3.5 Present Final Product to PEO GCS for Approval	

Systems Engineering & Integration (SEIT) Membership: *PEO Lead SE (chair), PM Lead SEs, CIO*

Systems Engineering Advisory Council (SEAC) Membership: *PEO Lead SE (chair), PMs, CIO*

SECOE Steady State



A Lifecycle of Continuous Improvement

SECOE Stakeholder Benefits

Army Benefits

PEOs executing acquisition programs with greater efficiency while reducing turbulence and disruption to the Unit

PEO

PEO/PM Benefits

Provides synchronized views across the PMs

APEO SEIO

PMs

TACOM Community

Benefits Growing systems engineering capabilities within the community and building for the future

PM Benefits

Suite of processes, tools, and training to enable more efficient program planning and execution in terms of cost, schedule, and performance

Other Orgs (PEO CS/CSS, TARDEC,…)

The Future

- Update on PEO GCS progress will be provided at NDIA 12th Annual Systems Engineering Conference
- In the meantime, contact me if you want to:

  - Contribute good ideas to our effort

  - Steal good ideas from our effort

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