

Software Assurance (SwA) Forum

Enabling Successful Development Efforts: Standards, People, and Culture: The Enterprise Perspective

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Cyber Capabilities at a Glance

- Weaponized Platforms
- Resilient Systems

- Weaponized Payloads
- Non-Kinetic Effects
- Secure Supply Chain
- Cyber Capability

- Training Programs
- Facility Staffing

- CND Operations (IC, DoD, Fed)
- Title 50 & Title 10 Operations
- Intelligence Fusion & Analysis
- NCC, Kinetic & Non-Kinetic C2
- Next Generation Networks

Aerospace Systems



Electronic Systems



Technical Services



Information Systems



Integrated Cyber Security Goals and Future Vision

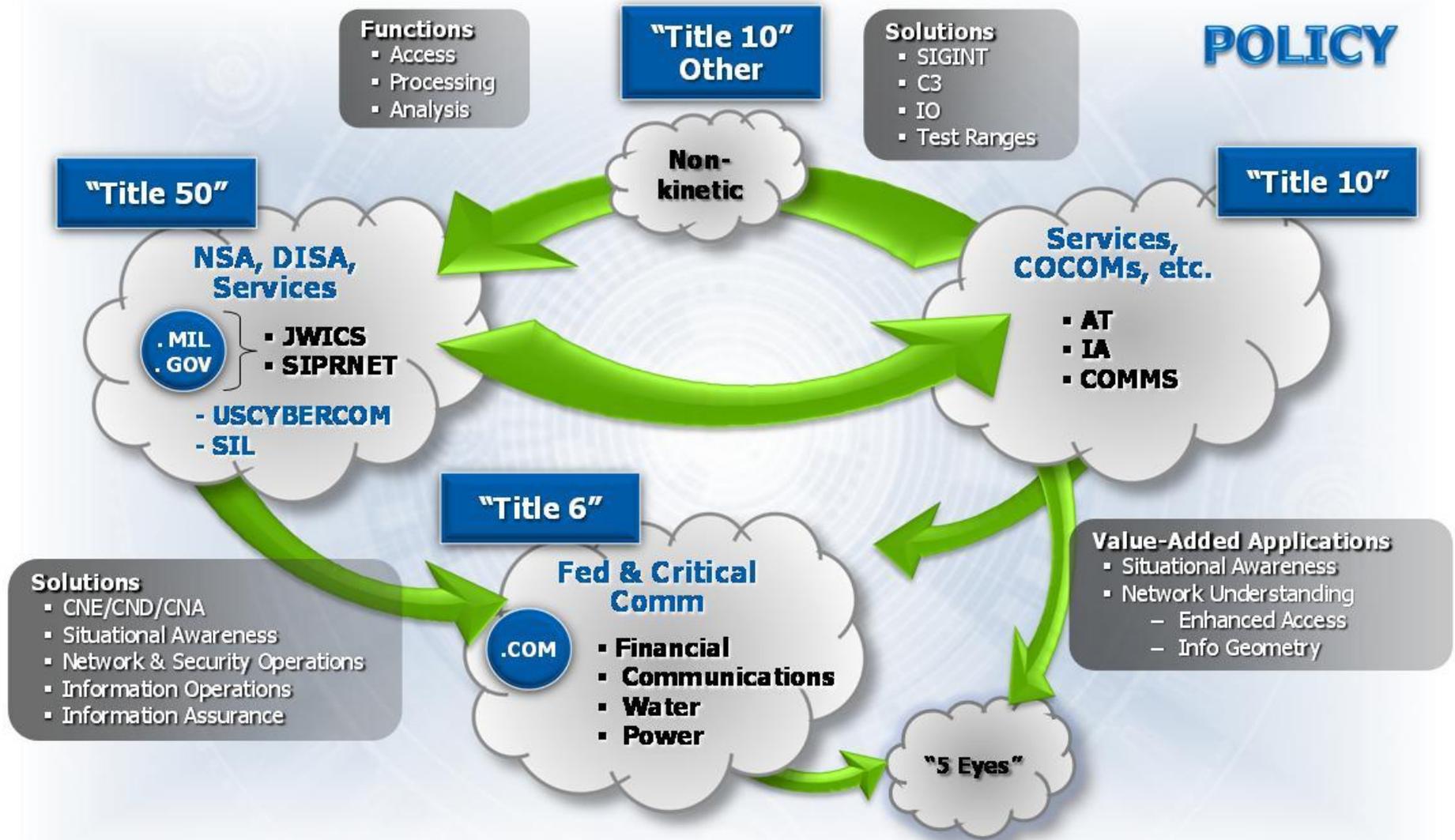
Corporate Cross Sector Initiatives

- Project Viceroy
- Project NKE

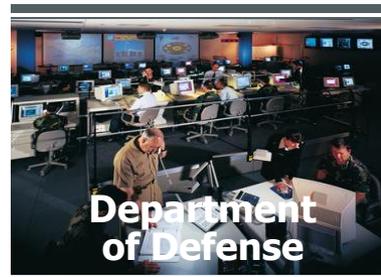
- Multi-Int, Multi-Sensor Mission Assurance
- Coordinated Non-Kinetic and Kinetic Mission Assurance

Committed to Addressing The Nation's Challenges

Capabilities Across Computer Network Attack (CNA) Computer Network Defense (CND) Computer Network Exploitation (CNE)



NGC's CyberSecurity Experience



Key Programs	Northrop Grumman Global Network (NGGN)	DHS/DOJ CISO Support DoS Enterprise NW/Security Treasury GSOC	USCYBERCOM, US ARMY I2WD, 1 st IO CMD, 5 th SIG, 7 th SIG, MCNOSC	Restricted Programs, Multiple Customers
Description	<ul style="list-style-type: none"> • Enterprise security and risk mgmt (120,000 users) • 24x7 CyberSecurity Operations (Protect, Detect, Respond, Recover) • APT defensive technologies • Smart Card/HSPD-12 	<ul style="list-style-type: none"> • SOCs/CSIRCs • TIC implementation • FISMA, PKI • Deep packet inspection • Continuous vulnerability assessment and risk mgmt • Forensics 	<ul style="list-style-type: none"> • Tier-1,2 & 3 Incident Handling and Response for DoD GIG, LANDWARNET, Marine Corps Enterprise Network • Security architecture, engineering & testing • Cyber Test & Exercises 	<ul style="list-style-type: none"> • Cyber sensors and system development, integration & test • System deployment, sustainment, training • Collaborative, agile software development
Relevant Expertise	<ul style="list-style-type: none"> • Integrated COTS and custom solutions • InfoShield™ framework • Legal/privacy issues • CyberSecurity info sharing across .mil, .gov, .com • R&D Investments to enhance capabilities 	<ul style="list-style-type: none"> • Collaboration tools to improve notification • Risk management and prioritization • Executive dashboard – vulnerability status • Enterprise Patch Mgmt • Visualization tools 	<ul style="list-style-type: none"> • Near real-time CND situational awareness • C2, coordination • CNO Mission & Exercise Planning • Vulnerability mgmt • Cyber Threat Analysis • Emulation, Modeling & Simulation 	<ul style="list-style-type: none"> • Interfaces to IC-based capabilities for response and threat tracking • Support transfer of IC capabilities/knowledge • Advanced threat detection and analytics

Northrop Grumman Cyber Academy
Research & Development

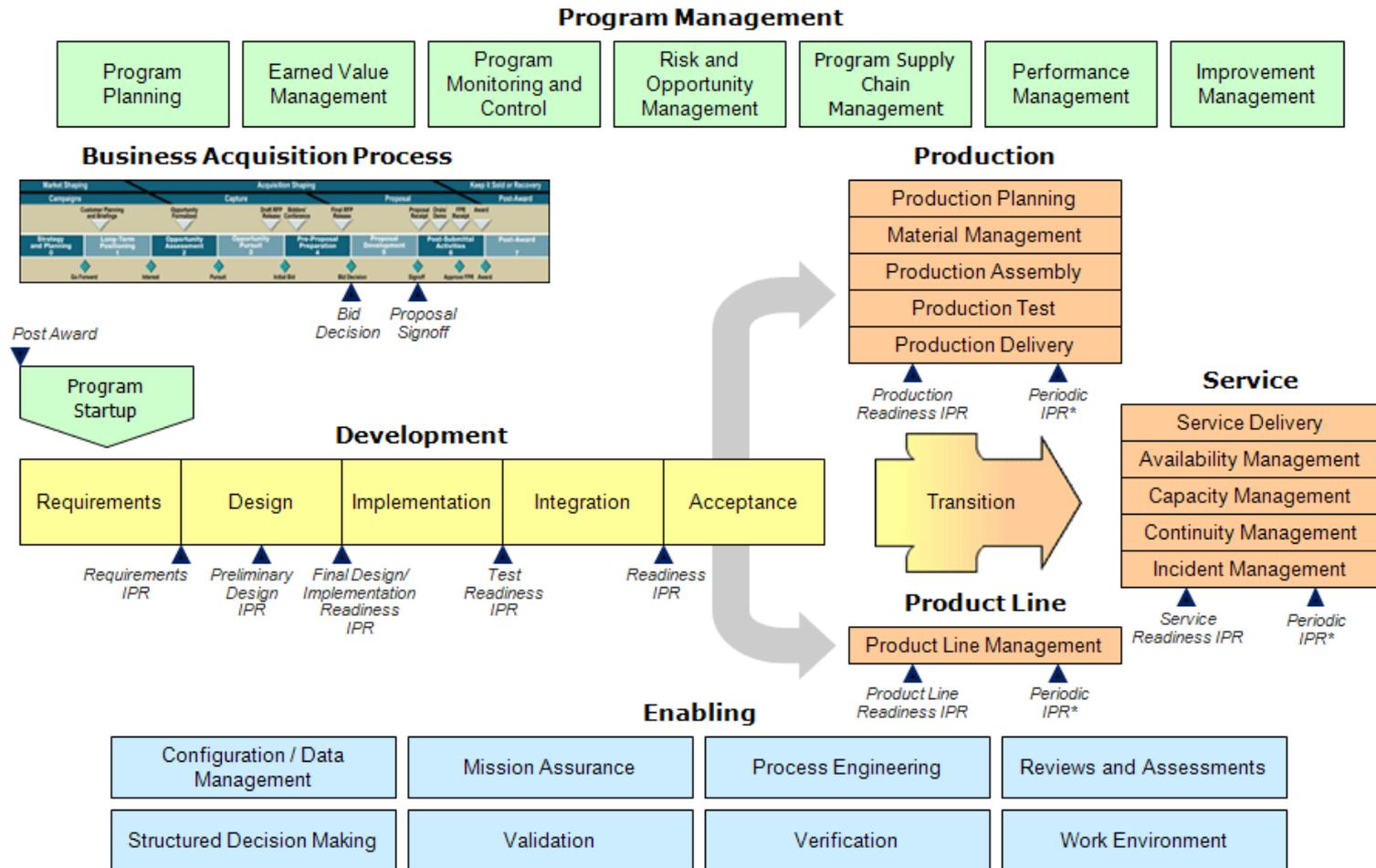
Cybersecurity Relationships & Partnerships

- Corporate Strategic Technology Partners
 - Lab investments, joint R&D
 - Small Businesses, Key Vendors
- Research University Relationships
 - 100+ university partnerships
 - Cybersecurity Research Consortium (Carnegie Mellon, MIT, Purdue Universities)
- Industry and research consortia, national level advisory boards, professional societies
- DoD Defense Industrial Base (DIB)



Resources to Accelerate the Pace of Cyber R&D

Standardization: The Program Execution Framework (PEF) Reference Model



Reference model shows all activities for all program types

PEF assets are stored on T3G landing pages

Links to policies and procedures

Integration with sector PM Handbook

Wiki to share and deliver data

E100: Requirements

System Requirements Analysis

Requirements define the desired capabilities of the product, service, and/or the program that produces the product or provides the service system. They form the basis for design, production, test, operations, and/or services. Each requirement has technical, schedule or cost implications. Therefore, it is essential to identify key requirements early so you can figure out "what to make before you make it." (read more)

Work Product Resources

WORK PRODUCT	TYPE	ASSET	TYPE	
Concept of Operations	Templates	Basic Outline	<input checked="" type="checkbox"/>	
		Concept of Operations	<input checked="" type="checkbox"/>	
		Concept of Operations DoD style	<input checked="" type="checkbox"/>	
		Concept of Operations Template with SSP characteristics.doc	<input checked="" type="checkbox"/>	
		Security	<input checked="" type="checkbox"/>	
		Simple Template for Concept of Operations	<input checked="" type="checkbox"/>	
	Tools	CONOPS checklist	<input checked="" type="checkbox"/>	
		Front Material could be reused for training materials	<input checked="" type="checkbox"/>	
	Training	Training SRA	<input checked="" type="checkbox"/>	
		Security CONOPS	<input checked="" type="checkbox"/>	
Guidance	IEEE Guidance for Creating a Concept of Operations	Security	<input checked="" type="checkbox"/>	
		Writing for Dummies DoD style	<input checked="" type="checkbox"/>	
	Customer Requirements Baseline	Templates	Requirements Specification	<input checked="" type="checkbox"/>
			Software Requirements Specification	<input checked="" type="checkbox"/>
Tools		Requirements Checklist	<input checked="" type="checkbox"/>	
		Requirements Management Tool Trade Study Report	<input checked="" type="checkbox"/>	
		Customer Requirements	<input checked="" type="checkbox"/>	
Functional Baseline	Tools	Interface Control Document Checklist	<input checked="" type="checkbox"/>	
		PCA-FCA Checklist	<input checked="" type="checkbox"/>	
	Training	Technical Performance Measurements	<input checked="" type="checkbox"/>	

T3G =
 Templates,
 Tools,
 Training, and
 Guidance

Managers use PMPro to tailor the PEF

- **PMPro** – an Access db tool used to help Programs plan the appropriate management controls to be implemented including applicable policies, procedures, work products & associated success criteria, and gate review points.
 - Single Program use (i.e., start new instance of tool for each program)

The screenshot displays the 'EMPTY DATABASE' window of the NG PM PRO tool. The interface is divided into several sections:

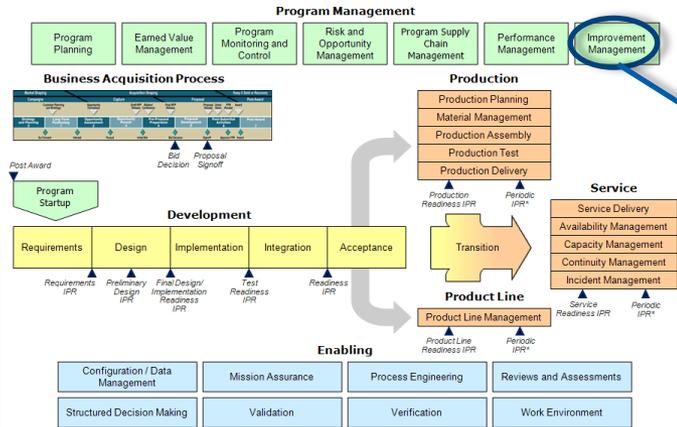
- PROGRAM INFO:** Fields for Program Acronym (EMPTY DATABASE), Sector (NGIS), Division, Business Unit, Operating Unit, Approver - MA, Approver - PRA, Program Manager, and Data Manager.
- Secondary Characteristics:** Checkboxes for EVM, Suppliers, and Transition (all checked), and CMMI is required (unchecked).
- Program Type Selection:** A table with columns 'Program Type' and 'Choose'. The 'Product Development' row is selected.
- Counts:** A summary table showing Base (159), Adds (0), NAs (0), and Total (159) for Work Products.
- Reports:** Buttons for Print, Tabular, and HTML reports for various categories: Applicable Policies & Procedures (P1, T1), Work Products & Descriptions (P2, T2), Work Product Action Status (P3, T3), Work Products & Gates (P4, T4), and Success Criteria & Gates (T5, H5).
- Select Gates:** A button labeled 'Apply Gate Filter' and the text 'all gates assigned'.
- Help/Notes:** Text explaining the 'Apply Gate Filter' function and a note about filtering work products.

The NG PM Pro tool assists in tailoring the NG quality standards to a program

PEF program types

1. **Product Development.** Activities involved in the transformation of customer needs to delivered products or service systems required to deliver services.
2. **Product Maintenance.** Activities involved in the adaptive, corrective, improvement, enhancement and sustainment of delivered products
3. **Production / Manufacturing.** Activities to repetitively produce products with no or slight variations on an approved core design.
4. **Staff Augmentation.** Activities related to providing consulting expertise with process ownership of program management only; delivering hours only. Management of the activities is done by the customer.
5. **Professional Services.** Activities related to providing services as specified, including ownership of essential processes. Unique program management of the activities is done by NG.
6. **IT Managed Services.** Activities related to providing Information Technology infrastructure services to organizations.
7. **Operations.** Operations, routine maintenance, and / or support to accepted, deployed, operational systems.
8. **Product Line.** Activities to build a set of systems or products sharing a common, managed set of features that satisfy the specific needs of a particular market segment or mission and that are developed from a common set of core assets in a prescribed way.

NGIS Program Execution Framework (PEF)



Reference Model defines:

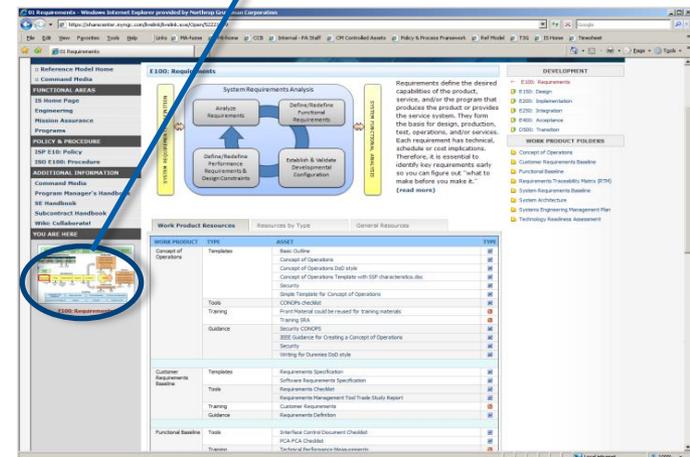
- Core activities for Programs, Engineering, Mission Assurance
 - Review gates
- Each activity defined by:
- Policy (Command Media ISP)
 - Procedure (Command Media ISO)
 - Work products and success criteria

NG PM Pro tool encapsulates:

- Program types
- Work products and success criteria
- Business rules to select applicable work product elements, success criteria, and gates

For each activity, T3G defines:

- Templates
- Tools
- Training
- Guidance



- NGIS is a strong partner in assuring our products and services exceed customer expectations
- The NG Program Execution Framework
 - codifies best practices
 - enables program execution success, and
 - ensures consistent execution through independent gate reviews and “in execution” process evaluations

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