ASN (RDA)
Chief Systems Engineer

Naval System Engineering Technical Review Process

NDIA Oct 2010

Paul T Dube
NUWC Newport
(401) 832-1648
Paul.Dube@navy.mil

Agenda

- System Engineering Technical Review (SETR) Policy / Background
- SETR Relationship to PoPs and Gate Reviews
- Development of Engineering Functional Area SETR Criteria
- Worksheet for Critical Design Review (CDR) SETR Gate Review

Systems Engineering Technical Review

- The Naval SYSCOM Systems Engineering Policy of 19 Jan 2010, establishes a common SETR process within the DON
  - A technical assessment to evaluate maturity
  - A framework for structured systems engineering management
  - Tailored according to the SEP approved by the MDA or the delegated authority
  - Chaired by technical authorities independent of the program, with participation by the PM
  - Engagement of stakeholders, peers, technical authorities, subject matter experts, and senior leaders

Programs are assessed continuously and results presented at SETRs

Naval SETR Handbook Update

- 10-months following approval of Naval SYSCOM SE Policy Instruction
- Update System-Specific Enclosures
  - Facilities and Infrastructure – NAVFAC
    - ★ Completed
- Ensure alignment with the latest references, such as
  - DOD Instruction 5000.2, 2 Dec 08
  - Gate Reviews; Alignment with 5000.2 expected Oct 09
- Include Information in support of Engineering Functional Areas (EFAs)
  - EFA's represent engineering domains common among all SYSCOMS
  - Established through existing SYSCOMS technical working groups
    - ★ Technical Warrant Holders
    - ★ SYSCOM Engineering Experts

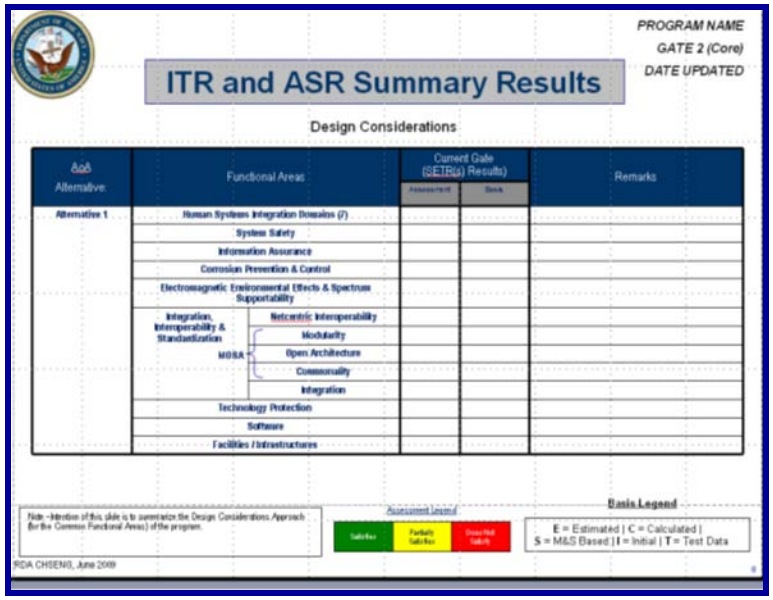
System Specific	POC	Lead
Platforms (NAVSEA) Ships Subs Carriers	Chris Paquette	Gail Goodman
Air (NAVAIR)	Mike Persson	
C4I (SPAWAR)	Dave Murray	
Land (MARCOR)	James Smerchansky	Bud Sawyer
IWS (NAVSEA) Surface IWS LMW IWS Subs IWS	Chris Paquette	Gail Goodman

Engineering Functional Areas
Open Architecture Enterprise Team (OAET)
Human Systems Integration Working Group (HSIWG)
Information Assurance Workforce Improvement Program (IA WIPT)
Software Engineering Working Group (SWWG)
Corrosion Prevention & Control
Safety Working Group, System Safety Advisory Board, Naval Executive Safety Board
Technology Protection
Interoperability and Integration Working Group
SE and PM Tasks

Linkage to PoPs/Gate Review

- Flag level issues highlighted in SETR Technical Review Board Recommendation
  - Program Technical Health, Readiness to enter next phase of development, Technical Risks, TRLs of CTEs
- Gate Backup Slide captures health of the Engineering Functional Areas (EFA's)
  - Drives need to have a mechanism to gauge success
- PM responsible for program execution BUT informed by SETR results

DoN Core Brief


PROGRAM NAME
GATE 2 (Core)
DATE UPDATED

ITR and ASR Summary Results

Design Considerations

Alternative	Functional Areas	Current Gate (SETR(s) Results)		Remarks
Alternative 1	Human Systems Integration Domains (7)			
	System Safety			
	Information Assurance			
	Corrosion Prevention & Control			
	Electromagnetic Environmental Effects & Spectrum Supportability			
	Integration, Interoperability & Standardization			
	MOSA: Netcentric Interoperability			
	MOSA: Modularity			
	MOSA: Open Architecture			
	MOSA: Commonality			
	MOSA: Integration			
	Technology Protection			
	Software			
	Facilities / Infrastructures			

Note - Intention of this slide is to summarize the Design Considerations Approach (for the Common Functional Areas) of the program.

Assessment Legend

Basis Legend

E = Estimated | C = Calculated | S = M&S Based | I = Initial | T = Test Data

RDA CHSENG, June 2009

Focus should be on developing SETR Criteria Questions and Goodness Metrics

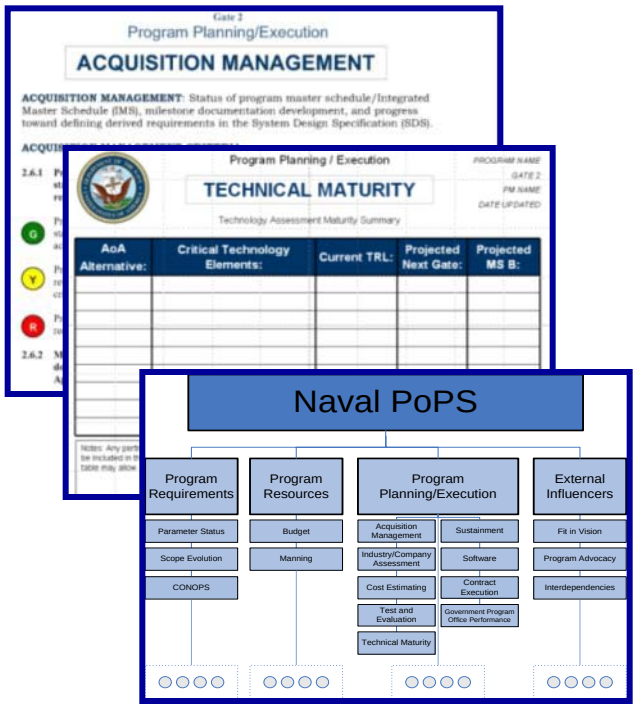
Inter-relationship of SETR, PoPS, and Gate Reviews

Systems Engineering Technical Review (SETR)

- Etc.
- HSI
- SW
- Safety
- Baseline

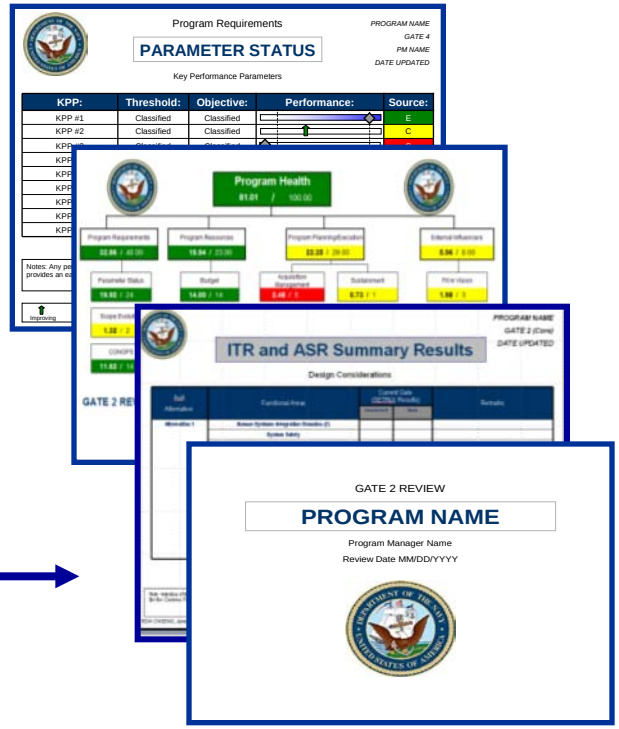
Technical maturity Assessment

Probability of Program Success (PoPS)



Holistic view of overall program health and readiness to proceed

DoN Gate Reviews



Detailed information germane to the Gate Decision

FY 10 Focus - Develop SETR Criteria

- Engineering Functional Area (EFA) teams defined mandatory / statutory and best practice products
  - Products were aligned to DOD 5000.2 milestones
- EFA's, developed SETR criteria specific to their Engineering domain which:
  - Establishes product maturity and health indicators
  - Includes requirements common among SYSCOM's
    - ★ Programs can tailor SYSCOM specific needs
    - ★ Programs can address additional elements to measure program performance and maturity
  - Guides in the preparation of SETR events
  - Guides reviewers in assessing SETR objectives
- Products and criteria organized into SETR Worksheets

Establish criteria to measure health and maturity of the program

FY 10 Focus - Develop SETR Criteria

- Total number of Criteria Statements Established
- April 19 – 20, 2010:
  - Two day Face to Face meeting among the SYSCOMS
  - Represented by Four review teams
  - Reviewed all statements and SETR Events and made recommendations

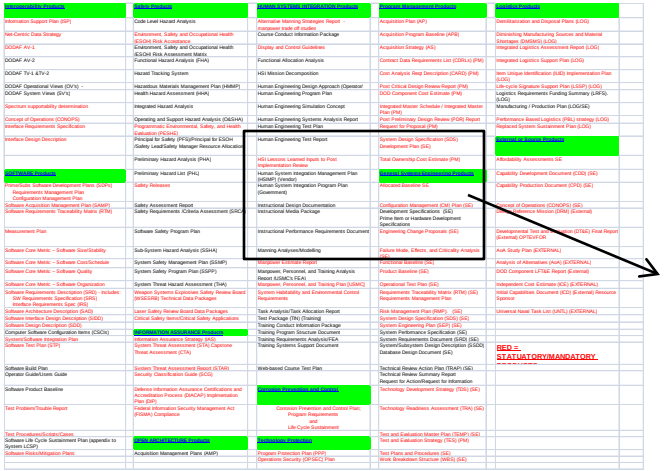
							Pre	Post									
CFA	ITR	ASR	SRR1	SRR2	SFR	SSR	PDR	PDR	CDR	IRR	TRR	FRR	SVR	OTRR	PRR	PCA	ISR	Total
I&I	14	24	45	15	23	24	27	19	25	4	12	3	8	12	4	1	3	271
Soft	5	11	14	21	28		31	101	108		30		31		29	15		424
Safety	10	18	13	3	26			39	32	3	18		11		14		10	197
IA	15	18	30		25		35		33		18							174
H. S. I.	2	5	5	2	10	2	23	4	20	5	12			10		2	1	103
CPC	4	2	4	5	3		7	7	7		5	1	5	2	3	1	3	59
Total	50	78	111	46	115	26	124	170	225	12	95	4	55	24	50	19	17	2458

Purpose of CDR Worksheet

- Tool to be used by Programs to develop a set of SETR entrance and evaluation criteria based on DOD requirements and DON accepted standards
  - The tool provides a Red, Yellow, Green assessment that the program can use to assess readiness to proceed
- Provides the anticipated health and maturity of engineering functional areas common among SYSCOMS
- Worksheets will be maintained on Naval Systems Engineering Resource Center (NSERC) as an interactive tool for program use (https://nserc.navy.mil)
- Maintenance anticipated by Systems Engineering Stakeholder Group on an as needed basis
  - Includes (H.S.I, Software, Safety, Open Architecture, Information Assurance, Corrosion Prevention and Controls, Integration and Interoperability, Technology Protection)

CDR Worksheet (Product List)

- Sample Section of Product List
  - Red - Mandated by Policy
  - Black - Best Practice/Common Engineering Products



Product List

	Human Engineering Test Report	System Design Specification (SDS) Development Plan (SE)
	HSI Lessons Learned Inputs to Post Implementation Review	Total Ownership Cost Estimate (PM)
	Human System Integration Management Plan (HSIMP) (Vendor)	General Systems Engineering Products
	Human System Integration Program Plan (Government)	Allocated Baseline SE
	Instructional Design Documentation	Configuration Management (CM) Plan (SE)
	Instructional Media Package	Development Specifications (SE) Prime Item or Hardware Development Specifications
	Instructional Performance Requirements Document	Engineering Change Proposals (SE)
	Manning Analyses/Modelling	Failure Mode, Effects, and Criticality Analysis (SE)
	Manpower Estimate Report	Functional Baseline (SE)

CDR Worksheet (Product Table)

- Comprehensive list of mandated and best practice products associated with each Engineering Functional Area
- Identifies the Policy, Guidance and Standards associated with each product
- Provides stakeholder involvement recommendations
- Identifies the expected maturity of the product (Draft, Final, Updates) for each SETR event
  - Aligned to DOD 5000.2 and DON Gate Reviews

Product Description Cross Reference Table

I - Provides Input
L - Leads
R- Reviews
A - Approves
C - Concures

D- draft
F- Final
U- update

PROGRAM INITIATION AT MS B

TITLE	Description	Policy	Guidance	Standards	Stakeholders		SETR Review(s)-->	ITR	ASR	SRR1	SRR2	SFR	SSR	Pre PDR	IBR	Post PDR	CDR	IRR	TRR	FRR	SVR	OTRR	PRR	PCA	ISR
								1	A 2			3		B 4-5		6		6			C 6			6	
Interoperability Products																									
Information Support Plan (ISP)	The identification and documentation of information needs, infrastructure support, IT and NSS interface requirements and dependencies focusing on net centric, interoperability, supportability and sufficiency concerns. It should include force-level information exchange and processing, including TDLs.	DODI 4630.8			Interoperability Software Safety Information Assurance Open Architecture H. S. I. Corrosion Prevention & Control Technology Protection	L, A					D			F			D				U		U	U	U

CDR Worksheet (Criteria Table)

- Organized and Categorized by SETR focus areas
- Worksheet contains more than 500 criteria elements

Note: Click on upper left Boxes [1] and [2] to expand and contract spreadsheet or use the [+] and [-] to expand sections individually

Priority	CRITICAL DESIGN REVIEW (CDR)	Common Functional Area	R	Y	G	U	NA	Program Comments	Independent Assessment Team Comments
	Tier 1 / Tier 2 / Tier 3 / Tier 4								
	SYSTEM REQUIREMENTS AND CAPABILITIES		0	0	0	0	0		
	DESIGN MATURITY								
	REQUIREMENTS ANALYSIS								
	REQUIREMENTS ALLOCATION								
	REQUIREMENTS MANAGEMENT								
	TEST EVALUATION AND CERTIFICATION OF PRODUCT		0	0	0	0	0		
	TEST PLANNING								
	SOFTWARE ENGINEERING								
	HUMAN SYSTEMS INTEGRATION								
	ENGINEERING PROCESSES, CONTROL AND ANALYSIS		0	0	0	0	0		
	SETR PLANNING/TECHNICAL REVIEW ACTION PLAN (TRAP)/Entry/Exit								
	INFORMATION ASSURANCE								
	PROCESS REVIEW								
	CONFIGURATION MANAGEMENT								
	RISK MANAGEMENT								
	TEST & EVALUATION								
	ARCHITECTURE								
	SOFTWARE ENGINEERING								
	MEASUREMENT & ANALYSIS								
	LOGISTICS								
	HUMAN SYSTEMS INTEGRATION								
	CORROSION PREVENTION AND CONTROL								
	PROGRAM MASTER SCHEDULE, EARNED VALUE AND COST		0	0	0	0	0		
	CRITCAL PATH								
	COST/SCHEDULE/PERFORMANCE/KEY PERFORMANCE PARAMETERS								
	COST ESTIMATE								
	SOFTWARE CORE METRICS								
	PROGRAM RISK PLANNING AND RISK ASSESSMENT		0	0	0	0	0		
	RISK PLANNING								
	RISK ASSESSMENT								

Sample Section of Criteria Table

- Provides evaluation criteria for expected health and maturity of the product
  - Directly tied to the Products List
  - Critical Information that goes into a product
  - Maturity expectations of important engineering studies
  - Tied to Policy, Guidance and Best Practices
- Contains an assessment tool and comments section

CRITICAL DESIGN REVIEW (CDR)				Common Functional Area						Program Comments	Independent Assessment Team Comments
Tier 1	Tier 2	Tier 3	Tier 4		R	Y	G	U	NA		
SYSTEM REQUIREMENTS AND CAPABILITIES					0	0	0	0	0		
	DESIGN MATURITY										
		System Engineering Plan (SEP)									
			Critical Technology Elements (CTEs) required to support the parameters in the ICD/CDD/CPD are at Technology Readiness Level (TRL) XX or above (based on mandatory levels from OSD); or if any CTE is below that mandatory TRL, a substitute mature technology is available that meets the user's needs.	Interoperability							
		Design Specifications									
			Are subsystem design specifications for each configuration item (H/W and S/W) complete?	Systems Engineering							

Contact Information

Paul T. Dube

ASN(RD&A) Systems Engineering Support

Naval Undersea Warfare Center

Division Newport

1176 Howell Street

Newport RI 02841

401 832 1648