



Parts Standardization & Management Committee (PSMC)

SMC Systems Engineering/PM&P Standardization Initiatives

USAF SMC/EN

4 - 6 November 2014

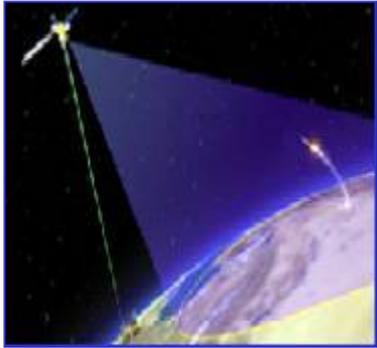
Track 3
briefing 17103



SMC Space Mission Portfolio

U.S. AIR FORCE

*WE DEVELOP, ACQUIRE, FIELD
AND SUSTAIN SYSTEMS IN
FOUR MAJOR MISSION AREAS*



Space Superiority

Space Situation Awareness
- SBSS
- Space Fence
Defensive Counter Space
Offensive Counter Space



Space Support

Launch Systems
Spacelift Range
Sat Control & Network



Force Application

Conventional Missiles
Prompt Global Strike



Space Force Enhancement

Milstar/AEHF/EPS
DSCS/GBS/WGS
GPS
DSP/SBIRS
DMSP/DWSS
NUDET (Nuclear Detection)

**Developing, Delivering, and Supporting Military Space and Missile
Capabilities to Preserve Peace and Win Conflicts**



U.S. AIR FORCE

Space System Development



Titan IV-A A-20

- Launch is a “one-strike-and-you’re-out” business
- Spacecraft must work by remote control for 15 years
 - Hostile environment
 - “Small” failures can cripple or end mission



Delta III

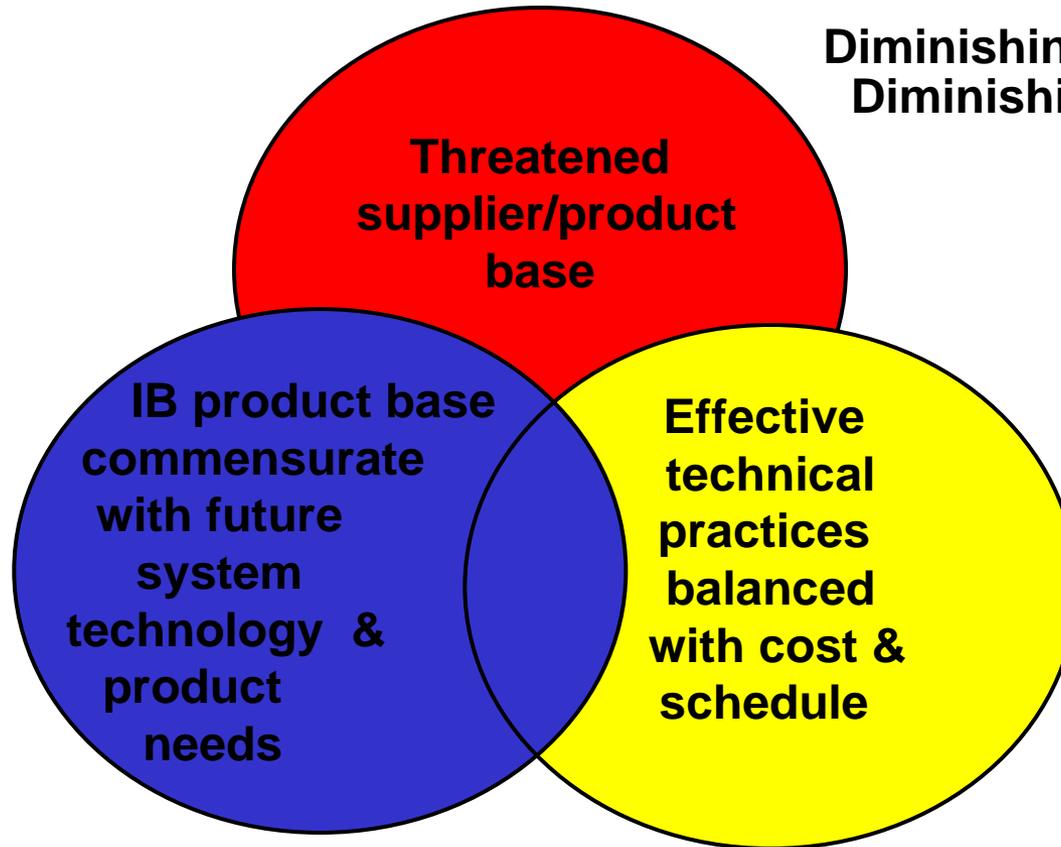
*No “flight Testing” and No Service Calls in Space
Mandates Unique, High-Confidence Mission Assurance Culture*



Industrial Base Scope

U.S. AIR FORCE

**Diminishing Sources
Diminishing Sources**



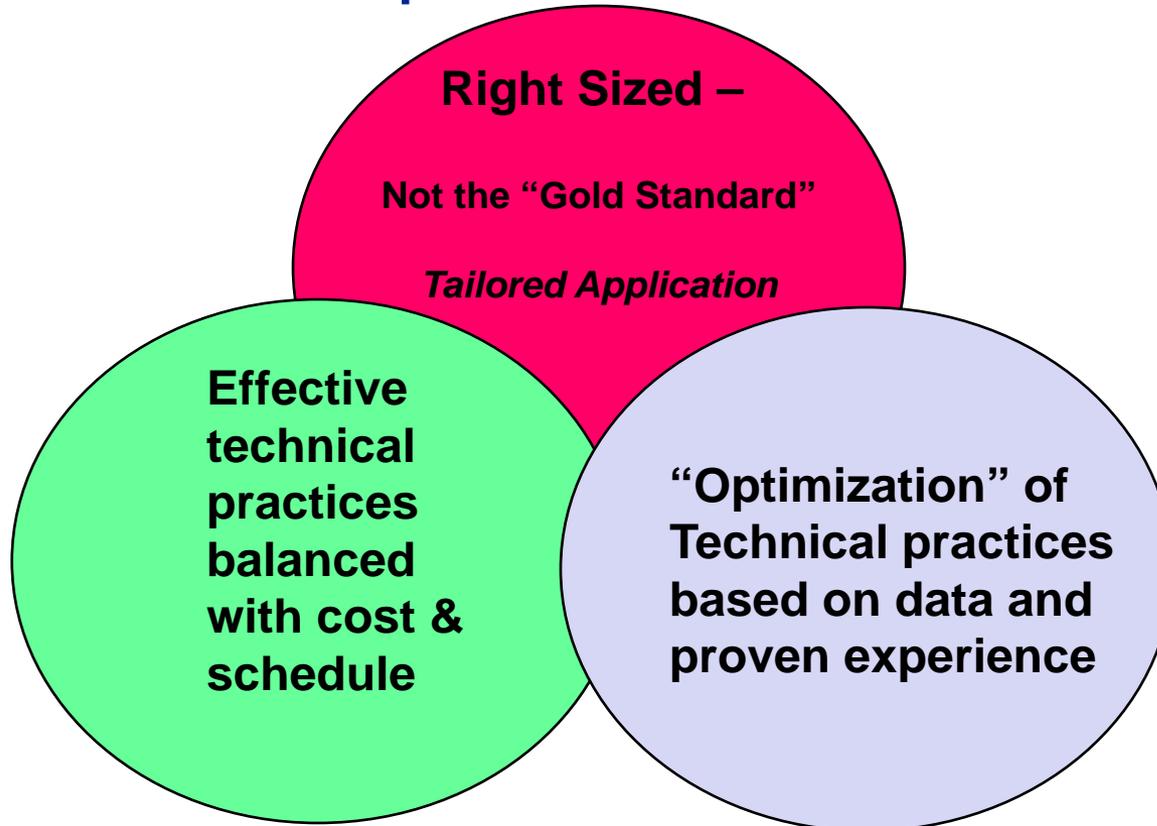
**Product
Technology**

**Technical
Practices**



Balanced Technical Practices

Specs & Standards



Reliable Products & Supply Base

Decision Analysis/Risk Mgmt

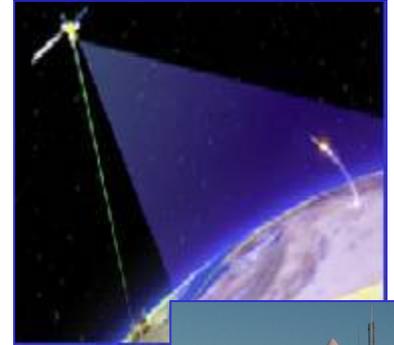
Include commercial data/practices where available and applicable



U.S. AIR FORCE

AFPEO for Space Mandates

- Deliver warfighting capability by maintaining momentum on improving and executing programs
- Focus on making today's space systems more affordable
- Develop and evolve new architectures that are affordable and resilient





Resiliency and Disaggregated Space Architectures

U.S. AIR FORCE

“Our satellites provide a strategic advantage for the U.S., and as such, we must consider the vulnerabilities and resilience of our constellations. My staff at Headquarters Air Force Space Command, alongside the team at the Space and Missile Systems Center, is leading efforts at **balancing resilience with affordability**. They are **examining disaggregated concepts** and evaluating options associated with **separating tactical and strategic** capability in the missile warning and protected communications mission areas. We are also evaluating constructs **to utilize hosted payload and commercial services**, as well as methods to on-ramp essential technology improvements to our existing architectures. Beyond the necessity of finding efficiencies and cost savings, we may very well find that **disaggregated or dispersed constellations of satellites will yield greater survivability, robustness and resilience in light of environmental and adversarial threats.**”

Statement to the Senate Armed Services Committee, 24 April 2013



Resiliency and Disaggregated Space Architectures

U.S. AIR FORCE

Large, complex systems that require many years of sustained investment to design, develop, field and operate may no longer be affordable. Moreover, given the growing threat environment, they may place a significant amount of national treasure at increased risk.

While astute mission assurance measures have decreased launch failures to record lows, there is always the risk that a single launch failure, early-orbit anomaly, environmental event or hostile act could result in the loss of hundreds of millions, or even billions, of dollars.



Better Buying Power 3.0 DRAFT

Achieving Dominant Capabilities through Technical Excellence and Innovation

Achieve Affordable Programs

- Continue to set and enforce affordability caps

Achieve Dominant Capabilities While Controlling Lifecycle Costs

- Strengthen and expand “should cost” based cost management
- Build stronger partnerships between the acquisition, requirements, and intelligence communities
- Anticipate and plan for responsive and emerging threats
- Institutionalize stronger DoD level Long Range R&D Planning

Incentivize Productivity in Industry and Government

- Align profitability more tightly with Department goals
- Employ appropriate contract types, but increase the use of incentive type contracts
- Expand the superior supplier incentive program across DoD
- Increase effective use of Performance-Based Logistics
- Remove barriers to commercial technology utilization
- Improve the return on investment in DoD laboratories
- Increase the productivity of IRAD and CR&D

Incentivize Innovation in Industry and Government

- Increase the use of prototyping and experimentation
- Emphasize technology insertion and refresh in program planning
- Use Modular Open Systems Architecture to stimulate innovation
- Increase the return on Small Business Innovation Research (SBIR)
- Provide draft technical requirements to industry early and involve industry in funded concept definition to support requirements definition
- Provide clear “best value” definitions so industry can propose and DoD can choose wisely

Eliminate Unproductive Processes and Bureaucracy

- Emphasize Acquisition Executive, Program Executive Officer and Program Manager responsibility, authority, and accountability
- Reduce cycle times while ensuring sound investments
- Streamline documentation requirements and staff reviews

Promote Effective Competition

- Create and maintain competitive environments
- Improve technology search and outreach in global markets

Improve Tradecraft in Acquisition of Services

- Increase small business participation, including more effective use of market research
- Strengthen contract management outside the normal acquisition chain
- Improve requirements definition
- Improve the effectiveness and productivity of contracted engineering and technical services

Improve the Professionalism of the Total Acquisition Workforce

- Establish higher standards for key leadership positions
- Establish stronger professional qualification requirements for all acquisition specialties
- Strengthen organic engineering capabilities
- Ensure the DOD leadership for development programs is technically qualified to manage R&D activities
- Improve our leaders’ ability to understand and mitigate technical risk
- Increase DoD support for Science, Technology, Engineering and Mathematics (STEM) education

**Continue Strengthening Our Culture of:
Cost Consciousness, Professionalism, and Technical Excellence**



Functional Areas of SMC Standards

U.S. AIR FORCE

STANDARD PRACTICES

- Program/Subcontract Management
- Systems Engineering
- Architecture Development
- Design Reviews
- Configuration Management
- Quality Assurance
- Logistics
- Manufacturing /Production Management
- Parts Management (non-space)
- Parts Management (space)
- Risk Management
- System Safety
- Occupational Safety and Health
- Reliability/Availability

Subsystem/Component Standards

- Electrical Power, Batteries
- Electrical Power, Solar Cells/Panels
- Electromagnetic Interference & Control
- Environmental Engineering; Cleanliness
- Human Systems Integration
- Interoperability
- Maintainability
- Mass Properties
- Moving Mechanical Assemblies
- Ordnance
- Pressurized Systems & Components
- Information Assurance/Program Protection
- Software Development
- Structures
- Survivability
- Test, Space & Ground

➤ *Industry consensus standards developed or adopted for use on SMC contracts*



Why Standards are Important



“Technical standards provide the ***corporate process memory*** needed for a disciplined systems engineering approach and help ensure that the government and its contractors ***understand the critical processes and practices*** necessary to take a system from design to production, and through sustainment.”



United States Deputy Assistant Secretary of Defense for Systems Engineering
(Modeling & Simulation Journal, Spring 2013)



SE & TR&A Standards Background

U.S. AIR FORCE

- **OSD formed Gap Analysis Working Groups (summer 2011) to evaluate standardization gaps and potential solutions in several functional areas, including Systems Engineering and Tech Reviews and Audits**
- **Recommendation for SE and TR&A standards was briefed in November 2011 to Defense Standardization Council (DSC)**
 - **Need based on WG findings**
- **DSC agreed with recommendations**
 - **OSD clarified direction in March 2012: All teams are to develop commercial standards**
- **OSD issued direction to establish a Se and TR&A Working Group (Dec 2012)**
- **In Jun 2013, OSD selected IEEE to develop the SE and TR&A standards (each standard was individually evaluated and selected)**
- **DSC and DSE Direction:**
 - **Concurred with findings and recommendations**
 - **Non-government standards (NGS) are preferred approach**
 - **AF will lead multi-service working groups**
 - **Develop standards that apply to contractors**



U.S. AIR FORCE

IEEE Joint Systems Engineering WG

- **DoD-IEEE Standards Working Group established**
 - Kickoff meetings 15 & 22 Aug 2013
 - Leadership Team
 - WG Chair, Lockheed Martin
 - WG Vice-chair, USAF SMC
 - WG Secretary, The Aerospace Corp.
 - Technical Editors
 - SE Standard, Los Alamos National Labs
 - TR&A Standard, L-3 Com
 - DoD & Industry broadly represented (next chart)
 - Same WG members for SE and TR&A teams
 - **Two IEEE projects**
 - 15288.1 Defense Systems Engineering: DoD addendum to 15288
 - Leverage 15288 process language; specify work products and attributes
 - 15288.2 TR&A Standard: stand-alone document
 - No equivalent industry standard)
 - Hook reviews/audits to 15288 process
-



U.S. AIR FORCE

IEEE Joint Systems Engineering WG

Industry

- BAE Systems
- Ball Aerospace
- Boeing
- General Dynamics
- Harris
- Lockheed Martin
- Northrop Grumman
- Raytheon
- SAIC/Leidos
- United Technologies
- Ingalls Shipbuilding

Associations

- AIA
- IEEE-CS/SA
- INCOSE
- ISO/IEC
- NDIA
- SAE Intl

Leadership Team

Chair, Lockheed Martin
Vice-chair, USAF SMC
Secretary, The Aerospace Corp.
Technical Editor, Los Alamos Nat. Lab.

Defense

- Air Force
- Army
- Navy
- OSD – DASD (SE)
- DAU
- DSPO
- DOD SERC Universities –
Systems Engineering
Research Center

* Although any individual was welcome to participate in the working group, individuals from the organizations above were requested to ensure a good cross section of the industry stakeholders. Names and affiliations of *individuals* rather than organizations will be used for identification of working group membership as individuals sign up for the group.

IEEE Standard for Application of SE on Defense Programs

- Summary of Project Authorization Request for Systems Engineering
 - Identifier of Standard – IEEE Std 15288.1
 - Title: Standard for Application of Systems Engineering on Defense Programs
 - Scope:
 - System life cycle processes, activities, and tasks of ISO/IEC/IEEE 15288 for use on any defense system across the life cycle
 - Purpose:
 - This standard implements ISO/IEC/IEEE 15288 for use by United States Department of Defense (DoD) organizations and other defense agencies in acquiring systems or systems engineering support.
 - Need:
 - Provide the defense specific language and terminology for the standard to ensure the correct application of acquirer-supplier requirements for a defense prgm.
 - Technical Approach:
 - Addendum to ISO/IEC/IEEE 15288 and will:
 - Not repeat processes and information in 15288
 - Include defense specific language and terminology
 - Include necessary tailoring or changes to existing elements
 - Include any additional explanation or guidance

IEEE Standard for Application of Technical Reviews & Audits

- Summary of Project Authorization Request for Technical Reviews & Audits
 - Identifier of Standard – IEEE Std 15288.2
 - Title: Standard for Application of Technical Reviews and Audits on Defense Programs
 - Scope:
 - Establishes the requirements for technical reviews and audits to be performed throughout the acquisition lifecycle for the U.S. Department of Defense (DoD) and other defense agencies.
 - Purpose:
 - Amplify ISO/IEC/IEEE 15288 Clause 6.3.2.3.a for selection, negotiation, agreement, and performance of the necessary technical reviews and audits, while allowing tailoring flexibility for the variety of acquisition situations/ environments when the technical reviews or audits are conducted.
 - Need:
 - Provide the defense specific language and terminology for the standard to ensure the correct application of acquirer-supplier requirements for a defense program.
 - Technical Approach:
 - Standard will be in the form of a full standard that has links to ISO/IEC/IEEE 15288 and will:
 - Elaborate on the activities and tasks related to TR&A
 - Include defense specific language and terminology needed for the standard
 - Include the criteria for reviews & audits
 - Include the expected/required outcomes/ products of reviews & audits
 - Include any additional explanation or guidance



IEEE 15288.1 and 15288.2 Schedule

U.S. AIR FORCE

- Bi-weekly meetings and document development is on-schedule
 - Working draft review by organizations: May 10, 2014
 - Formal ballot period: June 12 to July 17, 2014; recirculation as required
 - Completed with 100% approval by ballot committee
 - Publication: January 2015

Progress:

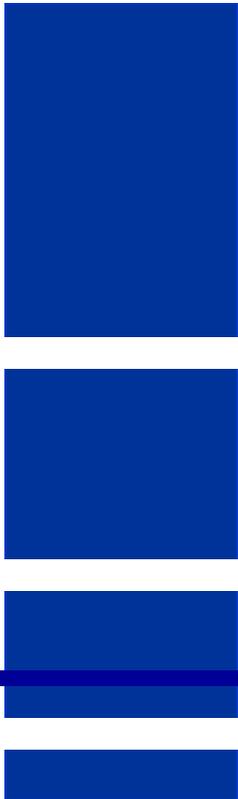
15288.1 Systems Engineering
15288.2 Technical Reviews And Audits

Item No	1/1/2011	3/1/2011	5/1/2011	7/1/2011	9/1/2011	11/1/2011	1/1/2012	3/1/2012	5/1/2012	7/1/2012	9/1/2012	11/1/2012	1/1/2013	3/1/2013	5/1/2013	7/1/2013	9/1/2013	11/1/2013	1/1/2014	3/1/2014	5/1/2014	7/1/2014	9/1/2014	11/1/2014	1/1/2015	3/1/2015	5/1/2015	7/1/2015	9/1/2015	11/1/2015			
IEEE Std 15288.1-11																																	
IEEE Std 15288.2-11																																	
IEEE Std 15288.1-12																																	
IEEE Std 15288.2-12																																	
IEEE Std 15288.1-13																																	
IEEE Std 15288.2-13																																	
IEEE Std 15288.1-14																																	
IEEE Std 15288.2-14																																	
IEEE Std 15288.1-15																																	
IEEE Std 15288.2-15																																	
IEEE Std 15288.1-16																																	
IEEE Std 15288.2-16																																	
IEEE Std 15288.1-17																																	
IEEE Std 15288.2-17																																	
IEEE Std 15288.1-18																																	
IEEE Std 15288.2-18																																	
IEEE Std 15288.1-19																																	
IEEE Std 15288.2-19																																	
IEEE Std 15288.1-20																																	
IEEE Std 15288.2-20																																	
IEEE Std 15288.1-21																																	
IEEE Std 15288.2-21																																	
IEEE Std 15288.1-22																																	
IEEE Std 15288.2-22																																	
IEEE Std 15288.1-23																																	
IEEE Std 15288.2-23																																	
IEEE Std 15288.1-24																																	
IEEE Std 15288.2-24																																	
IEEE Std 15288.1-25																																	
IEEE Std 15288.2-25																																	
IEEE Std 15288.1-26																																	
IEEE Std 15288.2-26																																	
IEEE Std 15288.1-27																																	
IEEE Std 15288.2-27																																	
IEEE Std 15288.1-28																																	
IEEE Std 15288.2-28																																	
IEEE Std 15288.1-29																																	
IEEE Std 15288.2-29																																	
IEEE Std 15288.1-30																																	
IEEE Std 15288.2-30																																	
IEEE Std 15288.1-31																																	
IEEE Std 15288.2-31																																	
IEEE Std 15288.1-32																																	
IEEE Std 15288.2-32																																	
IEEE Std 15288.1-33																																	
IEEE Std 15288.2-33																																	
IEEE Std 15288.1-34																																	
IEEE Std 15288.2-34																																	
IEEE Std 15288.1-35																																	
IEEE Std 15288.2-35																																	
IEEE Std 15288.1-36																																	
IEEE Std 15288.2-36																																	
IEEE Std 15288.1-37																																	
IEEE Std 15288.2-37																																	
IEEE Std 15288.1-38																																	
IEEE Std 15288.2-38																																	
IEEE Std 15288.1-39																																	
IEEE Std 15288.2-39																																	
IEEE Std 15288.1-40																																	
IEEE Std 15288.2-40																																	
IEEE Std 15288.1-41																																	



SAE G-23 Manufacturing Management Committee

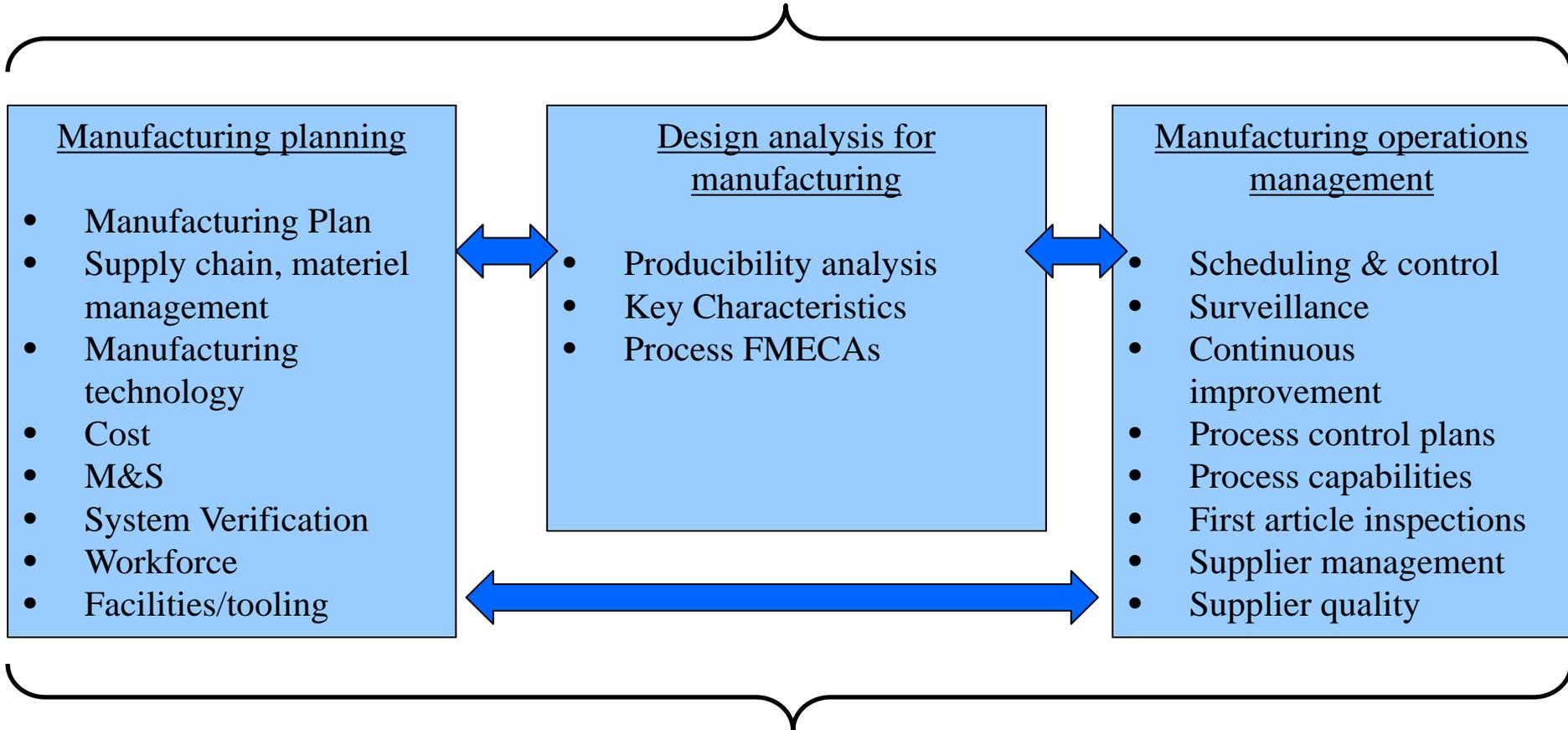
AS6500 Manufacturing Management Standard





SAE AS6500 Overview of Content

Manufacturing Management System: *Program, Policies, Objectives*

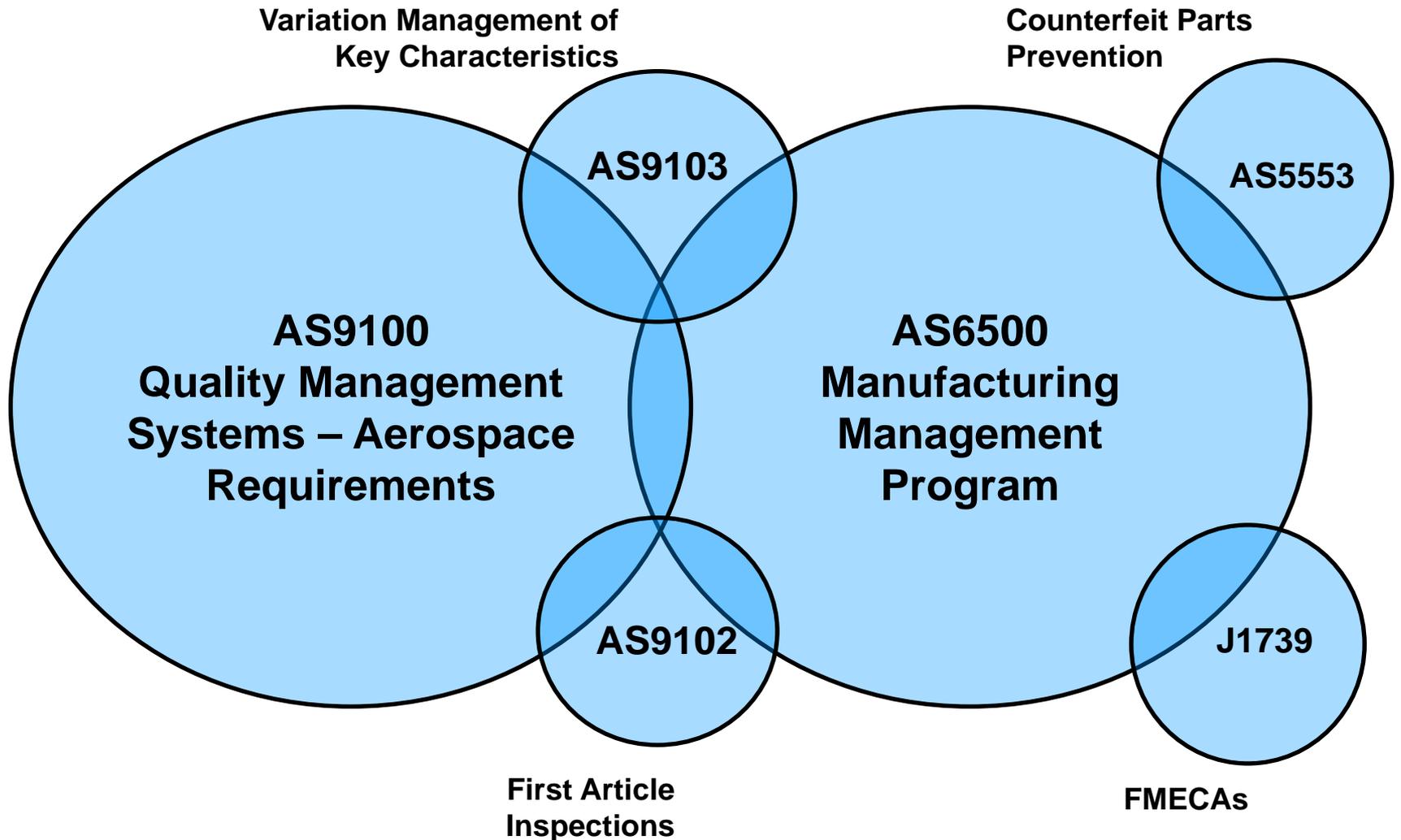


Manufacturing Risk Identification and Resolution:

- Feasibility assessments, MRLs, PRRs



AS6500 Integration with Other SAE Standards





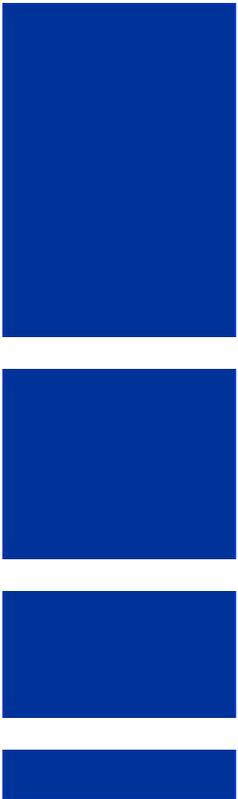
AS6500 Manufacturing Standard Status

- **Committee ballot resulted in nearly unanimous approval**
 - **93% approval**
 - **Dissenting vote related to implementation of the standard as opposed to the content of the standard**
- **Draft AS6500 standard forwarded to SAE's Aerospace Council**
 - **SAE's tech editor “clean-up” process**
- **Aerospace Council voting expected to commence NLT end of October for a 28 day ballot process**
- **Committee intent to develop guidance and training on implementation of the standard**



SMC Parts, Materials & Processes (PM&P) Program

**SMC Chief Systems Engineer
SMC/EN**





PM&P Related Specs & Standards *(Prime/subcontract Requirements)*

- **MIL-STD 1546 - Parts, Materials, & Processes Control Program for Space & Launch Vehicles**
- **MIL-STD 1547 - Electronic Parts, Materials, & Processes for Space & Launch Vehicles**
- **MIL-STD 1543 - Reliability Program Requirements for Space and Launch Vehicles**
- **MIL-STD 1580 - Destructive Physical Analysis for EEE Parts**



PM&P Related Mil Specs & Standards *(Example Detailed Piece-Part Specs/Std)*

- **MIL-M 38510 Microcircuit General Specification (Qualified Product Line (QPL) Class B & S Requirements)**
- **MIL-S 19500 Semiconductor General Specification (QPL Class T/TX/TXV/S Requirements for Diodes and Transistors)**
- **MIL-I 38535 Integrated Circuit General Specification (Qualified Manufacturer's Line (QML) Class Q/V Requirements)**
- **MIL-I 38534 Hybrid General Specification (QML Class H/K Requirements)**
- **MIL-STD 883 & MIL-STD 750 - Test Method Documents for Electronic Devices**
- **MIL-C 123A - Ceramic Capacitor General Specification (QPL Requirements for Space Quality Capacitors)**



SMC PM&P Standards



SMC Standard SMC-S-009
12 April 2013

Supersedes:
SMC-S-009 (2009)

Air Force Space Command

SPACE AND MISSILE SYSTEMS CENTER STANDARD

PARTS, MATERIALS, AND PROCESSES CONTROL PROGRAM FOR SPACE VEHICLES

APPROVED FOR PUBLIC RELEASE; DISTRIBUTION IS UNLIMITED



SMC Standard SMC-S-010
12 April 2013

Supersedes:
SMC-S-010 (2009)

Air Force Space Command

SPACE AND MISSILE SYSTEMS CENTER STANDARD

TECHNICAL REQUIREMENTS FOR ELECTRONIC PARTS, MATERIALS, AND PROCESSES USED IN SPACE VEHICLES

APPROVED FOR PUBLIC RELEASE; DISTRIBUTION IS UNLIMITED



SMC Space Vehicle PM&P Standards Revision

Chronology

- **Initiated complete rewrite in 2004 timeframe**
 - **Published initial TOR versions in 2006 timeframe**
- **Initiated TOR Rev A update with focus on remaining areas of disagreement**
 - **Published TOR Rev A in 2008 timeframe (SMC-S-010 and SMC-S-009)**
- **Initiated TOR Rev B update with focus on remaining areas of disagreement**
 - **TOR Rev B's (SMC-S-010 and SMC-S-009) published 6 Mar 2013**
- **Extensive Govt/Industry Collaboration**
 - **Solid technical foundation**

What Issues/Differing Views Are Out There?

**Are there Opportunities to Facilitate cost savings initiatives like
Common Parts Procurement/Stores?**



SMC/NRO/MDA/NASA COLLABORATION



PMP Tech Interchange Forums

- **JEDEC/G12**
- **NEPAG Telecons**
- **DLA QPL/QML Audits**
- **DLA Specs/Standards Activities**
- **NSS PM&P Engr Forum (PMPEF)**
- **Aerospace Technical Forums (SPWG)**
- **HIREV**
- **Trusted Foundry**
- **Rad Hard Electronics**



NSS Forums

- **SMC/NRO/Aerospace PM&P Engineering Forum (PMPEF)**
- **Monthly PMP Community Information Sharing forum conducted by Aerospace and SMC/EN to facilitate identification of PM&P issues for purpose of Cross Program Information Exchange and assessment of potential enterprise level applicability/collaborative mitigation strategies. Participants: Aerospace reps from ETG and individual SMC and NRO programs; SMC/EN**
- **NRO SE PM&P FORUM**
- **Monthly internal NRO PMP Community Information Sharing forum conducted by Aerospace ETG and NRO to facilitate identification of PM&P issues for purpose of Cross Program Information Exchange and assessment of potential enterprise level applicability/collaborative mitigation strategies. Participants: Aerospace reps from ETG and individual NRO programs.**



NASA Electronics Parts Advisory Group (NEPAG)

- **NASA Electronics Parts Advisory Group (NEPAG) Domestic Telecon (weekly/~2hrs) International Telecon (monthly)**
- **Weekly PM& P Community Information Sharing forum hosted by NASA to facilitate identification of PM&P issues for purpose of Cross Program Information Exchange and assessment of potential enterprise level applicability/collaborative mitigation strategies across many government agencies using high reliability PM&P. Teleconferences held since 2000.**
- **Participants (Org)**
 - **NASA HQ; Ames Research Center; Glenn Research Center; Goddard Space Flight Center; Jet Propulsion Laboratory; Johnson Space Center; Kennedy Space Center; Langley Research Center; Marshall Space Flight Center; U.S. Air Force / SMC; The Aerospace Corporation; DLA Land and Maritime; Def. Stand. Prog. Off. (DSPO) / GIDEP; Johns Hopkins University-APL; Missile Defense Agency (MDA); National Reconnaissance Office (NRO); Northrop Grumman ICBM Support; U. S. Air Force / NWC ICBM Sys Div; U. S. Army / AMRDEC; U. S. Navy / NAVSEA**
 - **DLA Land and Maritime**
 - **Audit Schedule; DLA-VQ Audits Projection for FY14; DLA News - Major issues being worked (DLA-VA, DLA-VQ) VQ)**



- **JEDEC Committee:**
 - **Government Liaison JC-13** is responsible for standardizing quality and reliability methodologies for solid state products used in military, space, and other environments requiring special-use condition capabilities beyond standard commercial practices. This includes long-term reliability and/or special screening requirements.
 - **JC-13: Government Liaison**
 - **JC-13.1 Subcommittee: Discrete Devices**
 - **JC-13.2 Subcommittee: Microelectronic Devices**
 - **JC-13.4 Subcommittee: Radiation Hardness: Assurance and Characterization**
 - **JC-13.5 Subcommittee: Hybrid, RF/Microwave, and MCM Technology**
- **G12 Solid State Devices Committee**
 - The G-12 Solid State Devices Committee develops solutions to technical problems in the application, standardization, and reliability of solid state devices. This is implemented by evaluation and preparation of recommendations for specifications, standards, and other documents, both government and industry, to assure that solid state devices are suitable for their intended purposes.



DLA QPL/QML Audits

30-Jan-14		Upcoming Supplier Audits		Changes since last update in color							
Commodity	Date	Supplier	Change	Audited	Location	Audit Type	DLA Contact	Aerospace	NRO	NASA Audit	NASA SAS
2	2	1	1	1	1	1	2	1	1	1	1
Hybrid	10/21/2013	Teledyne Microelectronics Tec		YES	Lewisburg, TN	38534 H&K Re-audit	R.Barker	J. Sokol		J.Gray	YES
Discrete Semi	10/21/2013	Solid State Devices, Inc.			La Mirada, CA	19500 JANS Re-audit	A. Barone	T. Gibson		B.,Damron	
Passive	10/28/2013	Environ Labs Inc.			Minneapolis, MN	202 Lab Suitability Audit	C. Rida				
Connector	10/28/2013	AbelConn, LLC			New Hope, MN	55302 Re-audit	C. Rida				
PWB	11/4/2013	Multicircuits, Inc			Oshkosh, WI	55110 Re-audit	R. Puckett				
Hybrid	11/4/2013	Teledyne Microwave Solutions		YES	Sunnyvale, CA	38534 H&K Re-audit	N. Raybould	J. Sokol		Majewicz,G	YES
Hybrid	11/4/2013	Avago Technologies		YES	San Jose, CA	38534 H&K Re-audit	D.Miller	J. Sokol			
IC	11/4/2013	Engineering and Solutions Technol			Sunnyvale, CA	Lab Suitability Re-audit	S. McNulty				
IC	11/7/2013	Infiniti Solutions Test Lab			Santa Clara, CA	Lab Suitability Re-audit	P.Patterson				
Connector	11/10/2013	TE Connectivity-Deutsch			Oceanside, CA	26483,38999,83723 Re-aud	A. Baillieul			R. Billig	REC
IC	11/12/2013	National Semiconductor			Greenock, UK	38535Q/V Initial-audit	S.Thomas				
IC	11/12/2013	Minco Technology Labs		YES	Austin, TX	38535Q Re-audit	S. McNulty				
IC	11/12/2013	XTREME Semiconductor			Austin, TX	38535Q Re-audit	A.Thacker				
IC	11/16/2013	Analog Devices, Inc.			Limerick, IE	38535Q/V Initial-audit	P.Granchi			S.Agarwal	YES
PWB	11/18/2013	Viasystems North Jackson, Inc.			North Jackson, OH	31032,50884,55110 Re-aud	L. Sherman				
Passive	11/18/2013	Teledyne Relays			Hawthorne, CA	39016 Re-Audit	B. Bates	M. Garcia			
Discrete Semi	11/18/2013	Semicoa Corporation		YES	Costa Mesa, CA	19500 JANS Re-audit	Z.Karadsheh	T. Gibson		Brusse/Damron	
Hybrid	11/18/2013	Micross Components		YES	Orlando, FL	38534 H Re-audit	J. Buben	B. Evans			
IC	11/20/2013	Micross Components			Norwich, UK	38535Q Initial-audit	P.Granchi				
IC	12/2/2013	Cypress Semiconductor			San Jose, CA	38535Q Re-audit	MGrammen			S.Agarwal	YES
Passive	12/2/2013	Vanguard Electronics Company			Huntington Beach,	15305,27,83446 Re-Audit	A. Chase				
Connector	12/2/2013	Delsen Testing Lab			Glendale, CA	202 Lab Suitability Audit	D. Oglesby				
Connector	12/2/2013	Amphenol Otimize			Nogales, MX	39012,55339 Re-audit	A. Baillieul	S			
Connector	12/2/2013	ITT Canon			Nogales, MX	,38999,83513 Re-audit	S.Taylor	S			
Connector	12/2/2013	Winchester Electronics			Sonora, MX	28748 Re-audit	A. Baillieul	S			
Connector	12/2/2013	Cooper Interconnect			Nogales, MX	22992,38999,55116,55181	A. Baillieul	S			
Passive	12/2/2013	Datatronics Inc.			Romoland, CA	21038 Re-Audit	D. Oglesby	S			
Wire & Cable	12/2/2013	Carlisle			Nogales, MX	17,25038 Re-Audit	S.Taylor	S			
PWB	12/9/2013	Murrietta Circuits			Anaheim, CA	31032,55110 Initial-audit	L. Sherman				
Discrete Semi	12/9/2013	Optek Technology, Inc.			Carrollton, TX	19500 Re-audit	Z.Karadsheh				



DLA QPL/QML Audits

30-Jan-14											
Upcoming Supplier Audits											
Commodity	Date	Supplier	Change	Audited	Location	Audit Type	DLA Contact	Aerospace	NRO	NASA Audit	NASA SAS
IC	12/9/2013	IBM BAE Systems			Fishkill, NY	NON QML-Program Audit				S.Agarwal	YES
IC	1/6/2014	Micross Components			Orlando, FL	38535Q Re-audit	M.Grammen				
Hybrid	1/6/2014	BI Technologies			Fullerton, CA	38534 H Re-audit	C.Hancock				
Discrete Semi	1/8/2014	Episil Technology, Inc.			Hsinchu, Taiwan	19500 Re-audit	G. Nash				
IC	1/9/2014	SemPac			Dasmarrinas, PHIL	883 Lab Suitability Audit	M.Grammen				
IC	1/10/2014	Trio Tech Bangkok			Bangkok, Thailand	883 Lab Suitability Audit	A.Thacker				
Discrete Semi	1/11/2014	Trio Tech Bangkok			Bangkok, Thailand	750 Lab Suitability Audit	B.Deslich				
Hybrid	1/27/2014	Data Device Corporation		YES	Bohemia, NY	38534 H&K Re-audit	J. Buben	J. Sokol		J.Gray	
PWB	1/28/2014	Sanmina - SCI			Costa Mesa, CA	31032.55110 Re-audit	K.Powell			T.Gutierrez	
PWB	2/3/2014	Viasystems North America, Inc.			Anaheim, CA	31032.50884.55110 Re-audit	L. Sherman			T.Gutierrez	
IC	2/3/2014	TI SVA			Santa Clara, CA	38535Q/V Re-audit	S. Yu	D.Peters			
IC	2/3/2014	DPA Components, Int'l			Simi Valley, CA	38535Q Re-audit	J.Puhalsky	T. Gibson			
Passive	2/3/2014	Hi-Rel Microelectronics			Milpitas, CA	202 Lab Suitability Re-Audit	K.Rudd				
Passive	2/3/2014	Pacific Aerospace & Electronics			Wenatchee, WA	28861 Re-Audit	D.Ogleby				
PWB	2/3/2014	USA MicroCraft Inc.			Brea, CA	31032.50884.55110 Re-audit	L. Sherman				
Relay	2/3/2014	Jennings Technology			San Jose, CA	83726 Re-audit	K.Rudd				
PWB	2/3/2014	Speedy Circuits Inc.	-4		CA	audit	R. Puckett				
IC	2/4/2014	Peregrine Semiconductor			San Diego, CA	38535Q/V Initial-audit	M.Grammen	L.Harzstark		S.Agarwal	
IC	2/8/2014	Silanna			Sydney, AU	38535Q/V Initial-audit	S	L.Harzstark		S.Agarwal	
Hybrid	2/10/2014	Cobham Environmental Services			San Diego, CA	38534H,883 Lab Suit. Re-audit	R. Barker				
Hybrid	2/10/2014	Cobham Sensor Systems			San Diego, CA	38534H Re-audit	R. Barker				
IC	2/10/2014	Aeroflex RAD			Colorado Springs, CO	Lab Suitability Re-audit	J.Schneider	T.Turflinger			
Passive	2/10/2014	MET Laboratories			Baltimore, MD	202 Lab Suitability Re-Audit	C. Rida				
Passive	2/10/2014	Pacific Resistor Co.	-1		Tarzana, CA	26,18546 Re-Audit	A. Chase				
Connector	2/10/2014	G&H Technology, Inc.	-2		Camarillo, CA	38999 Re-audit	A. Baillieul				
Passive	2/18/2014	Pulse Specialty Compo	-1		Bristol, PA	83531,2 Re-audit	K.Rudd				
Wire & Cable	2/19/2014	Therm-O-Link	-1		Garrettsville, OH	13486 Re-Audit	S.Taylor				



Space Parts Working Group

Space Parts Working Group (SPWG) is a joint government-industry working group sponsored by The Aerospace Corporation and the Space and Missile Systems Center. In its 44th year, SPWG is an unclassified, international forum for disseminating information to the aerospace industry and for resolving problems with high-reliability electronic piece parts for space applications.

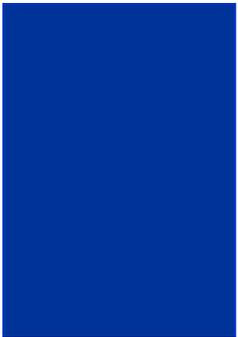
The meeting will include presentations from suppliers, prime system manufacturers, and government agencies, including the Air Force, NASA, Defense Threat Reduction Agency, and Air Force Research Laboratory. Suppliers will be presenting their latest roadmaps and product introductions, in addition to the current status of technologies and problems. There will also be presentations on today's hot topics, such as Non-hermetic packaging technologies, Hermeticity testing, Lead-Free Initiatives, and Specs and Standards.

April 2015

Doubletree Hotel Torrance/South Bay, Torrance, Calif.



Trusted Foundry



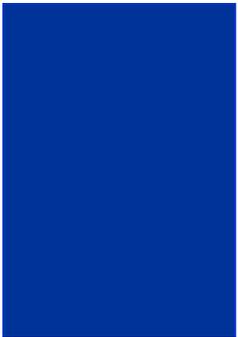


SMC Observations/Experiences

- **Trusted Foundry Incentive**
 - **Often unclear how serious a requirement on government programs**
 - Looks like a policy, but.....
 - **Unclear to companies the true impact on business base**
 - Investment vs added (or loss of) customer base
 - **Difficult for many companies to justify**
 - DoD often not major portion of business
 - Resources; impacts to company/factory flow
 - Conflicts with commercial practices
- **Difficulties to attain**
 - 2-3 year process
 - **Uses DSS facility clearance process**
 - Rigid – often not compatible with commercial business practices
 - Do not always need “classified” capability
- **In past, not a “User friendly” process (recently much improved)**
 - Multiple agencies involved in process
 - Difficult to coordinate and/or get feedback/status (recently much improved)
 - Can be discouraging to companies



Supply Chain Risk Management (SCRM)





SCRM Policy

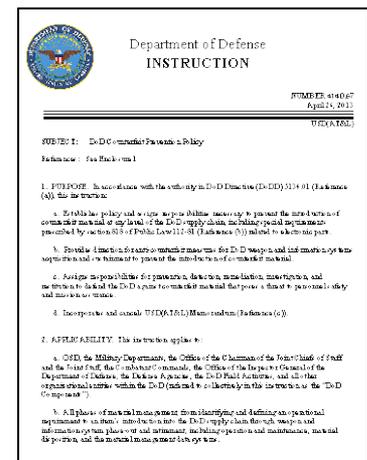
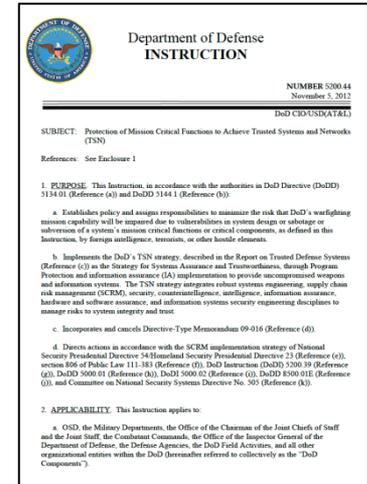
Trusted Systems and Networks (TSN)

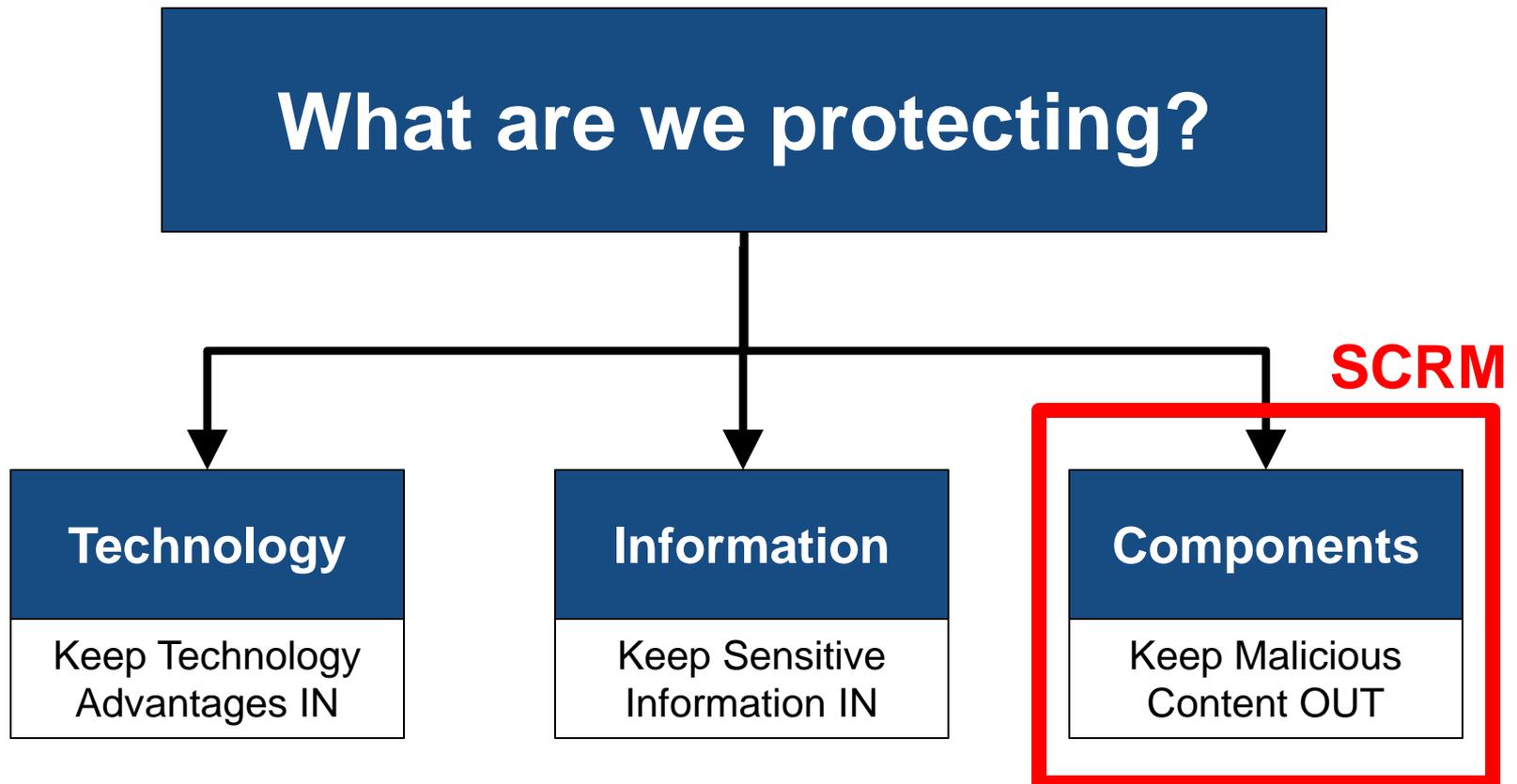
- **DoDI 5200.44, November 5, 2012**
Protection of Mission Critical Systems and Networks to Achieve Trusted Systems and Networks

“Establishes policy and assigns responsibilities to minimize the risk that DoD’s warfighting mission capability will be impaired due to vulnerabilities in system design or sabotage or subversion of a system’s mission critical functions or critical components by foreign intelligence, terrorists, or other hostile elements.”

Counterfeit Prevention

- **DoDI 4140.67, April 26, 2013**
DoD Counterfeit Prevention Policy
- “Establishes policy and assigns responsibilities necessary to prevent the introduction of counterfeit materiel at any level of the DoD supply chain”**







Supply Chain Risk Management (SCRM)

Conventional Counterfeit

- Covered in Parts, Materials, and Processes (PMP):
 - Integrate management
 - Improve reliability
 - Improve small quantity procurement and test
 - Reduce failures
 - Reduce costs
 - Enhance performance
- Focuses on **Quality & Performance**

Supply Chain Risk Management

- Mitigation of **Malicious Logic** in counterfeit components
 - Threat triggers vulnerability when desired
 - Component provides Quality & Performance, but may also include Malicious Logic





Supply Chain Threat Assessment

- **DIA Threat Analysis Center (TAC)**
 - All-source intelligence on supplier threats
 - Staffed by each DoD Component
 - No cost to each program
- **Programs submit TAC Request for Information (RFI) on Critical Component suppliers**
 - TAC provides threat report (e.g. Foreign Intelligence Entity threat)





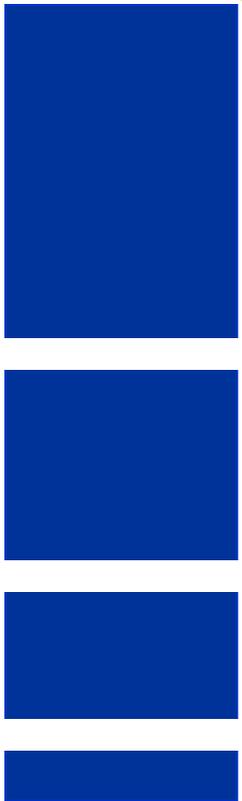
SCRM Countermeasures

- **Defense MicroElectronics Activity (DMEA) Trusted Suppliers**
 - **Accredited for Integrated Circuit integrity and confidentiality**
- **Program Protection Software Assurance**
 - **Software update strategy, Free Open Source Software analysis, secure design, etc.**
- **Counterfeit Prevention**
 - **Parts, Materials, & Processes methods**
- **Modify system design or acquisition procedures**





COUNTERFEIT PARTS





SMC/NSS Assessment

- **Counterfeit Parts Assessment**
- **SPO Interviews**
- **Contractor Interviews**
- **Subcontractor Interviews**
- **Supplier Interviews**
- **Distributor Interviews**
- **Counterfeit Parts JEDEC Task Group Status**



Part Manufacturers

- **How do you control your product to prevent counterfeit activity? Domestically and Internationally?**
- **Do you audit your distributors? To what criteria?**
- **What is your policy for scrap of product? Do you sell your scrap product?**
- **What is your policy for down-graded material and how is it controlled?**
- **How do you control any off-load of your product for fab, assembly or tests? Domestically and Internationally?**
- **How do you prevent or validate that no unwanted functions or viruses are implemented in your product?**
- **How do you assure that returned inventory is authentic?**



Distributors

- **How do you procure your material?**
- **What documentation do you request or require with the product?**
- **Do you procure from other than the original manufacturer?**
- **Do you ever perform any Destructive Physical Analysis to validate the product is genuine?**
- **How do you control your product to prevent counterfeit activity? Domestically and Internationally?**
- **Are you audited by your prime manufacturers on how you handle and control their product to prevent counterfeit?**
- **What is your policy for scrap of product? Do you sell your scrap product? Do you provide product deemed “bad” back to the manufacturer? Do you test or do you send product out for test? How do you control the outside facility to prevent counterfeit product?**
- **How do you prevent or validate that no unwanted functions or viruses are implemented in your product?**



Parts, Materials & Processes Document History Mil-STD-1546 & 1547 Technical Operating Reports (TOR)s

- **Existing comprehensive PM&P management/technical program**
 - Historically, effective at assuring quality parts, but “silent” on subject of counterfeit parts
- **SMC sponsored the update/revision of two PMP Standards (Aerospace TORs) for Space and Launch Vehicles**
 - **Requires all PMP to be procured from the original qualified parts/materials equipment manufacture (OEM), or it’s franchised/authorized distributor**
 - **Requires all parts be delivered with a certificate of compliance to military specification or space-level-equivalent source control drawing**
 - **Requires contractor to approve subcontractor PMP**
 - **Requires contractor to establish date/batch number control and two-way tractability for PMP used in flight hardware**
 - **Requires contractor to perform Destructive Physical Analysis (DPA) consistent with program technical requirements and MIL-STD-1580**



PMPCB / PMP Selection List

- **PMPCB**

- **Requires establishment of a Parts, Materials and Processes Control Board (PMPCB) with the following responsibilities:**
 - Review and approve all PMP
 - Establish and maintain all PMP lists
 - Review results of DPAs, Material Review Board (MRB) actions, and failure analysis.
 - Ensure laboratories and facilities used for screening and/or evaluation of PMP are adequate.
 - Establish and maintain a prohibited PMP list
 - Review all GIDEP, NASA, DOD, contractor, subcontractor and other agency PMP alerts, advisories, and reports for relevance to items used in the system.

- **PMP Selection List**

- parts and materials are technically justified with **approved and qualified sources of supply**, approved procurement specifications, and defined application conditions

- **Parts Procurement**

- All parts shall be procured from the part original equipment manufacturer (OEM) or its franchised, fully authorized distributor, and shall come with an OEM certificate of compliance.



SMC Actions

- **Although SMC has a very robust process for avoiding counterfeits for space programs through the use of the SMC PMP Standards, there is a need to address the non-space segments**
 - **DoD Standard Practice Parts Management**
 - **MIL-STD-3018 w/CHANGE 1; 27 October 2011**
 - **Update SMC list to include MIL-STD-3018**
- **Assess/establish guiding principles and practices for programs (incl contractors and suppliers) to align to and be compliant to 2012 NDAA, §818 and DFARS rule, 48 CFR 246.870**
- **Monitor supply chain procurement processes of primes and subcontractors to assure procurement requirements are being flowed down to the lowest level**



Summary

- **Standards - Teaming with industry essential!**
 - For both technical and political reasons
 - Selection of industry partners critical
 - Willingness to publish standard consistent with government needs
 - Basis for military standard if no cooperative agreement with industry org established
- **Experience – *Industry collaboration can be done provided ground rules and working relationships are forged***
 - SE, TR&A, Manufacturing Standards examples of excellent participation and support from industry
- **Parts Management**
 - Critical element for Mission Assurance
 - Commonality/consistency of practices "across our community"
 - Govt NSS; Primes; subs; sub-tier supply base
 - Counterfeit Parts practices consistent with DFAR
- **SCRM**
 - Understand policies and mitigation expectations for SCRM and establish practices across the community to implement