

Horizontal Integration of ESOH Requirements for Future Combat Systems

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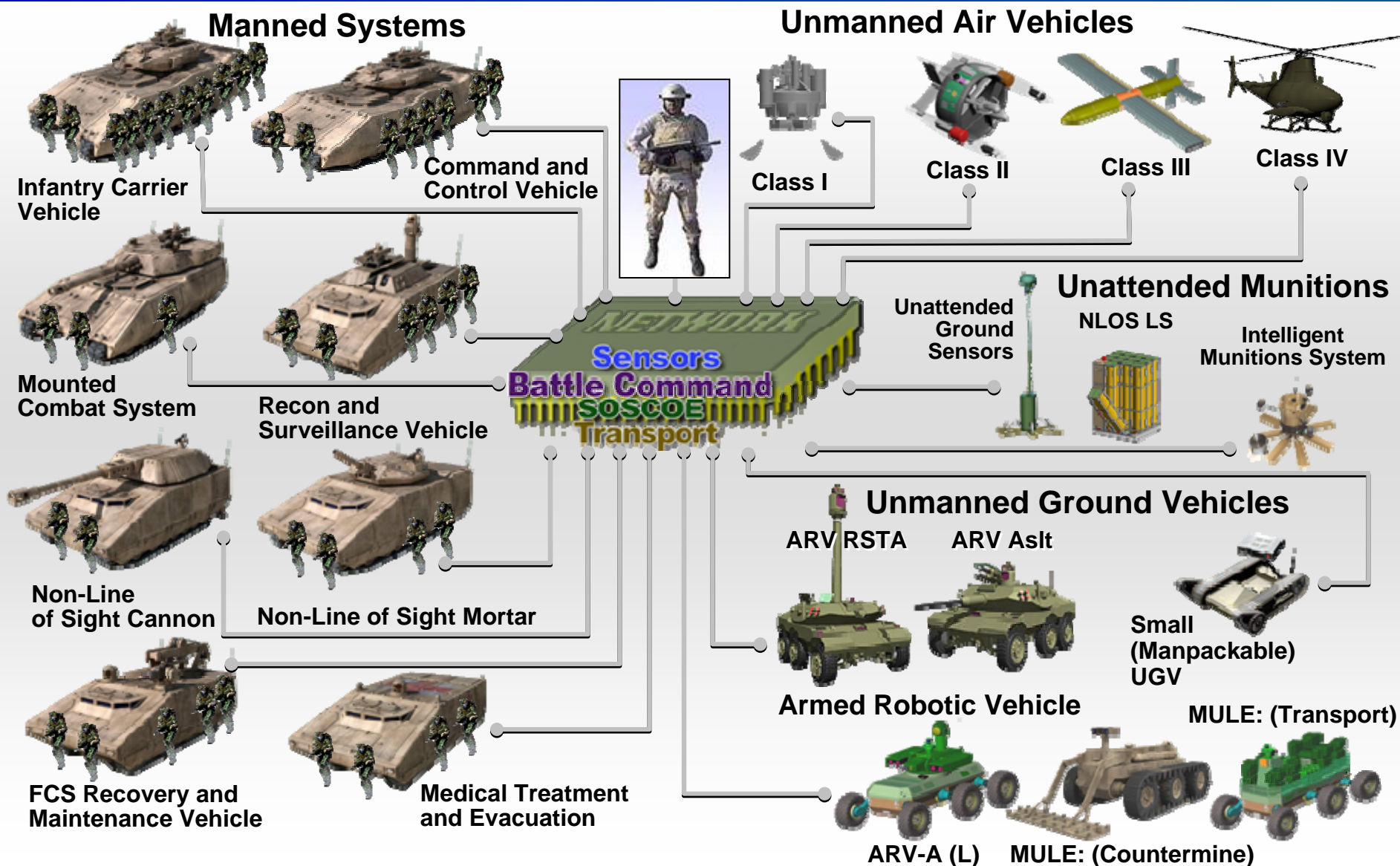
26 October 2006



Overview

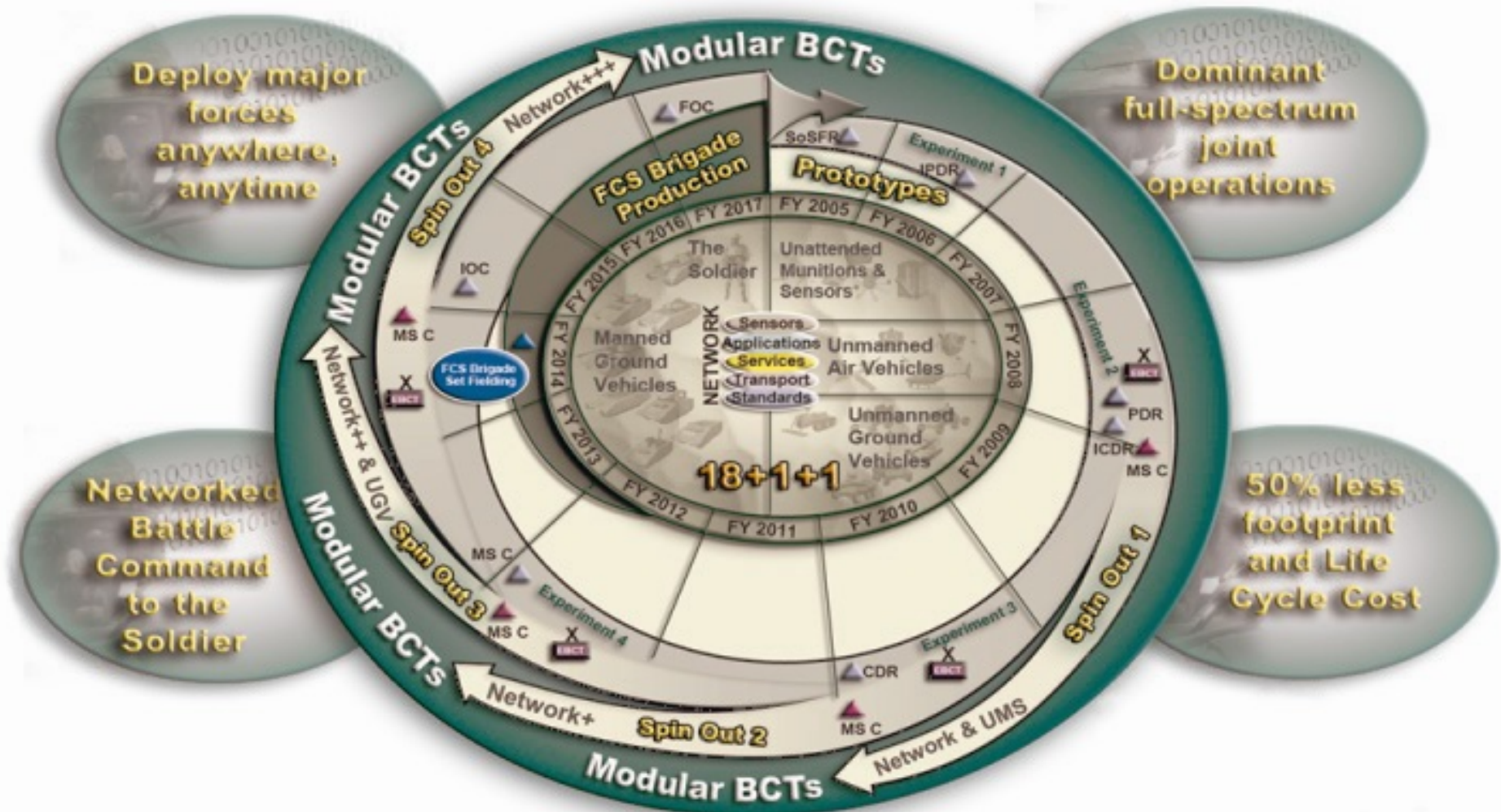
- Program Overview
- Design for Environment (DfE)
- Design for Safety (DfS)
- ESOH Requirement Allocation
- Programmatic Environment, Safety and Occupational Health Evaluation
- ESOH Hazard Risk Index
- ESOH Relationships & Responsibility
- ESOH Working Group
- ESOH Integration
- Hazard Tracking System
- System Hazard Analysis
- Spin Out 1 ESOH Activities
- National Environmental Policy Act
- Summary

FCS System-of-Systems (SoS) – 18+1+1





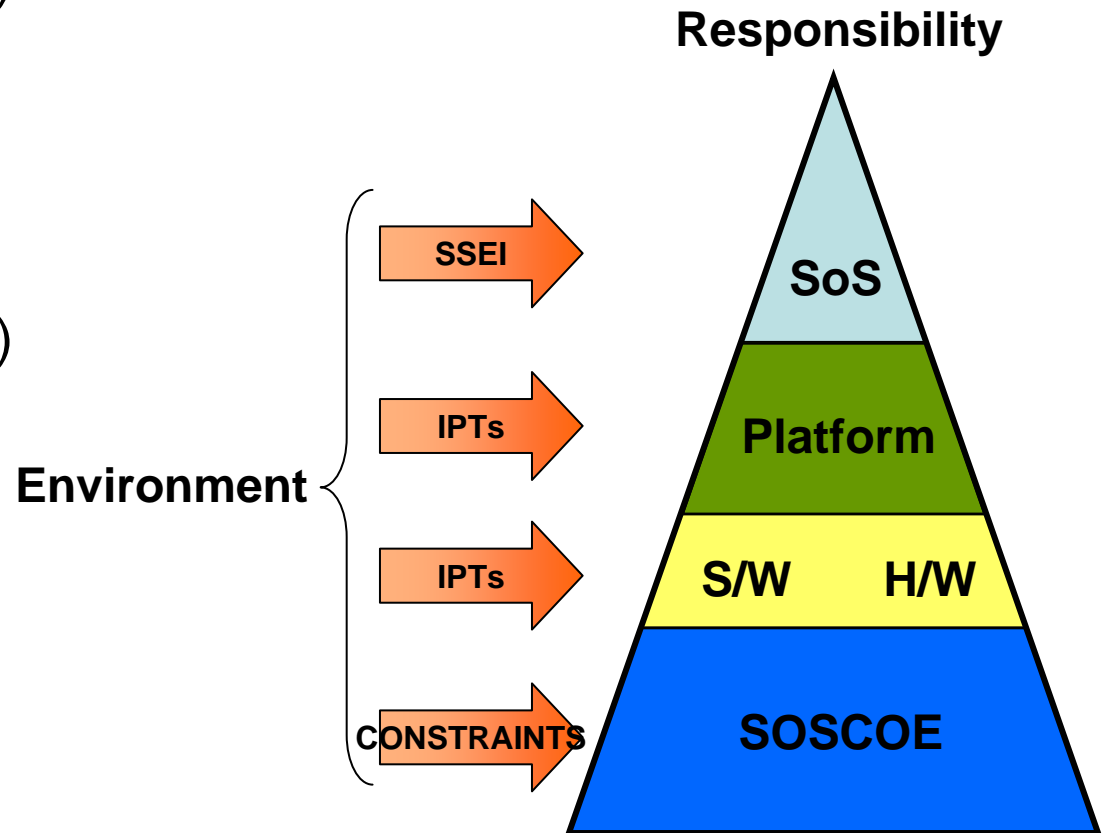
PM FCS (BCT) System of Systems Schedule



See First, Understand First, Act First, Finish Decisively

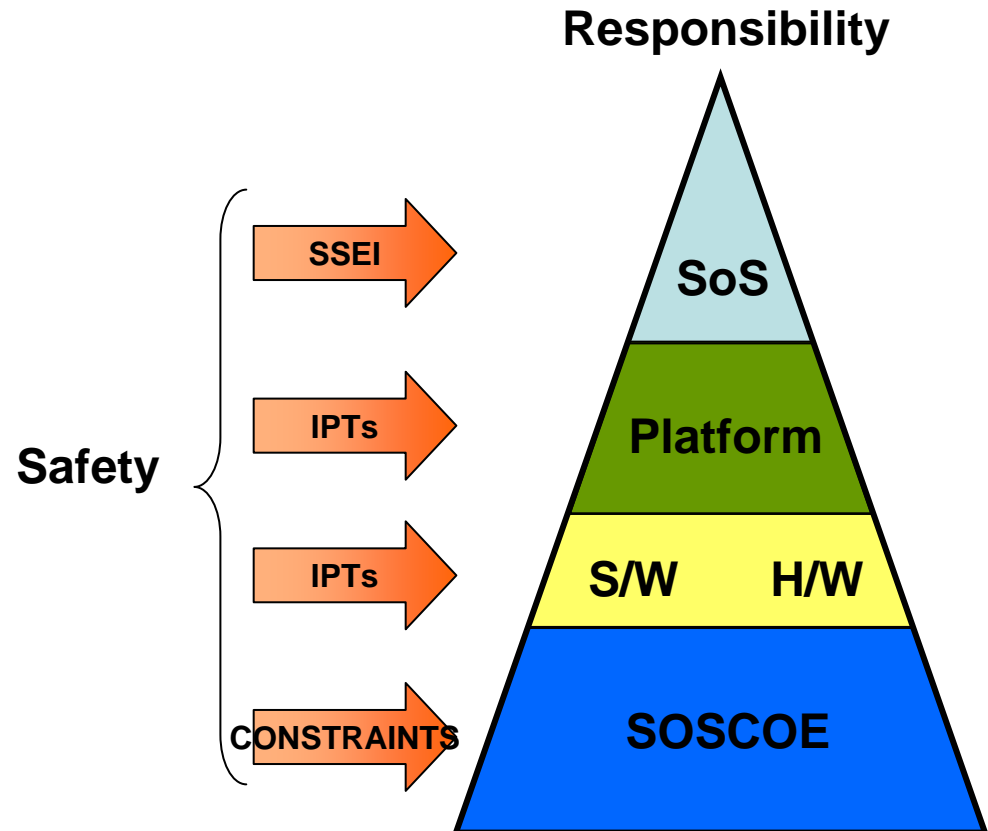
Design For Environment (DfE)

- Design for Environment (DfE) processes and policies are outlined in the Programmatic Environment, Safety and Occupational Health Evaluation (PESHE)
- Design for Environment (DfE) has been implemented through the requirements development process at the Systems of Systems and System Levels
- Utilization of Current Force hazard databases for new design feedback loop

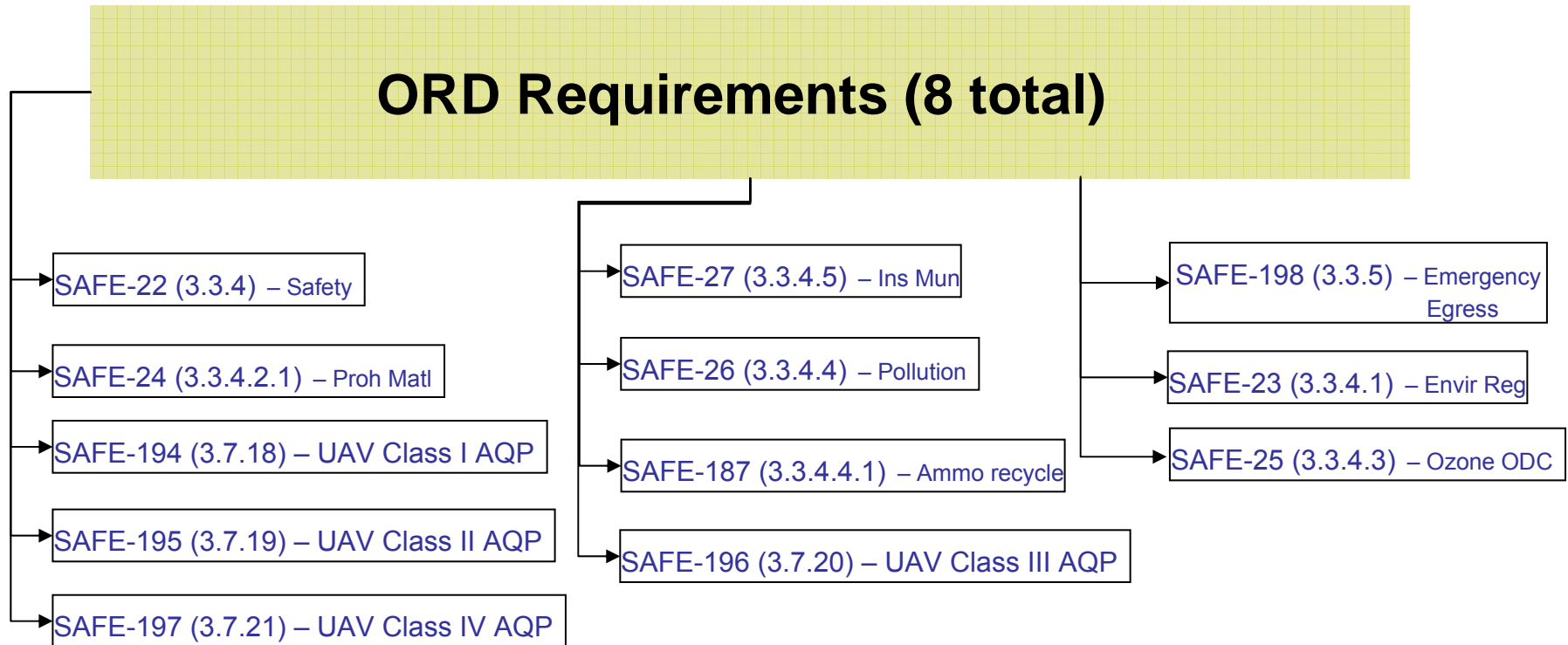


Design For Safety (DfS)

- Design for Safety (DfS) processes and policies are outlined in the Programmatic Environment, Safety and Occupational Health Evaluation (PESHE) Rev G dtd 20 Oct 05
- Design for Safety (DfS) has been implemented through the requirements development process at the System of Systems and System Levels
- Identified Gaps between PESHE and OTP Statement of Work (SOW)
 - Gap analysis correction currently underway and will be resolved and Change Request Approved by PDB on 2/2/06 to move forward
- System Safety Plan Progress Reports (SSPPR) along with SDRL deliverables will be the mechanism to ensure that OTP management plans are in place and being executed



ESOH Requirement Allocation



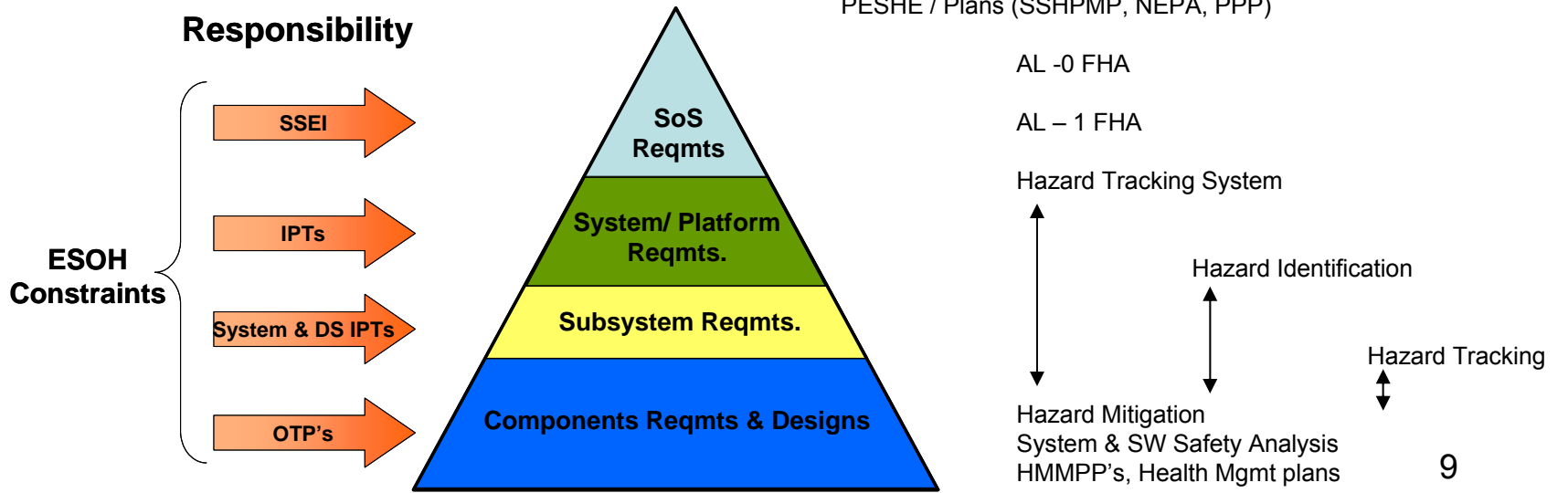
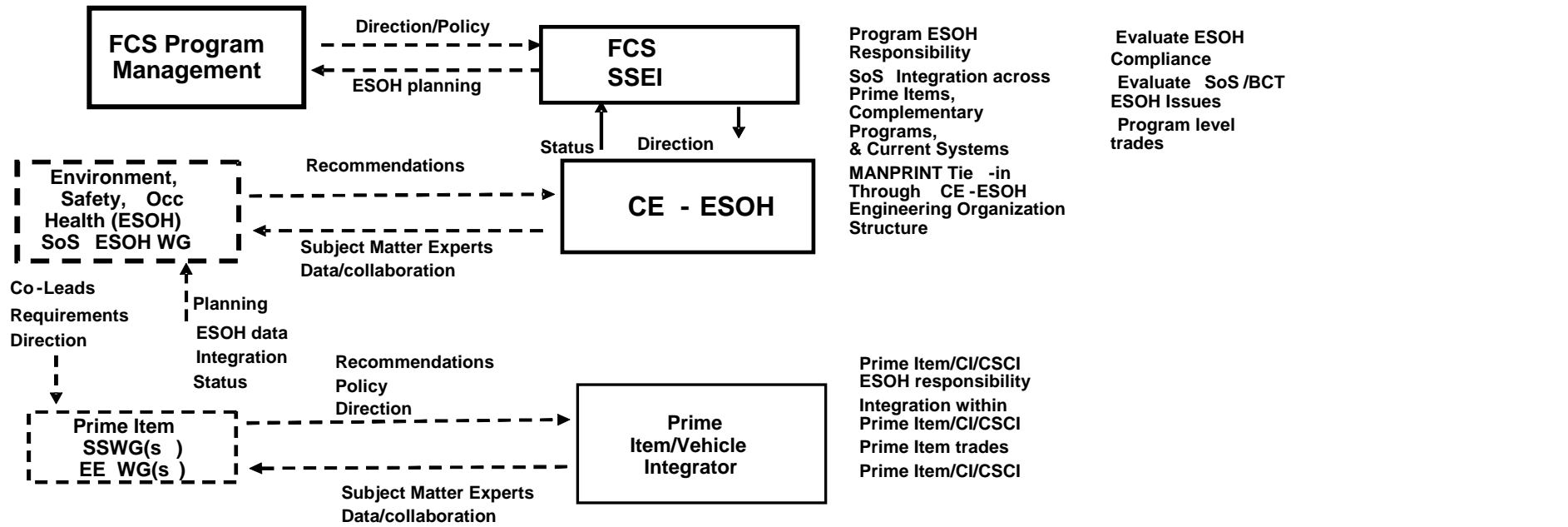
Complete ORD Coverage
12 Overarching SoS Requirements
149 Specific PIDS Requirements

Programmatic Environment, Safety & Occupational Health Evaluation (PESHE)



- Primary Contract Delivery for ESOH at Program level
 - Goes beyond traditional Government PESHE & Includes:
 - Incorporates and invokes ESOH plans and evaluation of performance on FCS.
 - Program Plans and/or Summary of Plans
 - Programmatic Status of Tasks and Activities related to ESOH
 - Invokes
 - National Environmental Policy Act (NEPA) and EO12114
 - System Safety and Health
 - Pollution Prevention
 - Hazardous Materials (HAZMAT) Management

ESOH Relationships & Responsibility



ESOH Working Group



- The purpose of the ESOH Working Group (WG) is to:
 - Facilitate environmental, safety and occupational health engineering and management coordination and agreement for the FCS Program.
 - Identify, track and Resolve ESOH issues
 - Review ESOH data, analyses and assessments
 - Evaluate ESOH changes in the ORD, O&O, and requirements, decisions, planning for prime items and documentation.
 - Clear all ESOH change activity for PDB
 - Monitor and guide overall Program compliance with applicable ESOH statutory, regulatory, treaty requirements. Develop and approve plans to resolve any issues.

ESOH Working Group



- All Integrated Process Teams (IPTs) have membership on the ESOH WG
- Actions Completed
 - Development of the FCS Programmatic Environment, Safety and Occupation Health evaluation (PESHE)
 - Prohibited Material Usage Approval Process
 - NEPA Approach, Schedule, and Initial Analysis
 - Safety Release Request Process
 - Usage of Lead-free Solder
- Current Issues being worked
 - Cross IPT hazard identification/analysis
 - Request for use of Prohibited Materials – list PMUARs
 - Spin Out 1 hazard analysis

ESOH Integration

- Lessons learned from the Current Force have been applied to the System of System Preliminary Hazard List and the ESOH requirements development
- System Safety Working Groups have been established at the IPT levels.
 - SSEI ESOH personnel attend these SSWG meetings and are part of the SSWG membership
 - SSEI and IPT ESOH personnel collaborate at the overarching weekly ESOH WG meetings
- Integration Improvements include:
 - Include TRADOC in the Working Groups and WIPT membership
 - Initiate quarterly safety execution reviews with the Program senior management
 - Develop and implement quarterly ESOH execution assessments across the program
 - PESHE flowdown to One Team Partners

Hazard Tracking System

- Success of ESOH integration is measured by identified hazards mitigated to the lowest level possible (low risk) in the Hazard Tracking System (HTS) located on the Program internal server
 - USG/LSI agree upon the level associated with the hazard
 - ESOH Working Group (WG) and IPT Safety and Environmental Working Groups (SSWG/EEWGs) monitor and execute the mitigation plans
 - The results from the NEPA analysis identifying environmental hazards will be loaded into the HTS
- The HTS provides the following:
 - Provides the Army and LSI with the results and status of hazard mitigation and risk management efforts at the subsystem, system and SoS levels.
 - Serves as a repository of hazardous materials usage information and ESOH Programmatic and Standards Compliance actions.
 - Contribute to the management of ESOH risk and engineering change environmental impacts.
 - Supports Systems of Systems Integrated Hazard Analysis, program compliance and major program milestone reviews.

System Safety Status

- MGV
 - Preliminary Hazard List (PHL) developed for all platforms
 - Preliminary Hazard Analysis (PHA) ongoing for all platforms
 - Work ongoing with Architecture to identify SCFs
 - Functional Hazard Analysis (FHA) ongoing for common systems
- UGV
 - PHL developed for ANS
 - PHA ongoing for MULE
- UAV
 - Class IV PHA previously conducted for Navy airframe
- UGS
 - PHA/Safety Assessment Report (SAR) completed
- C4ISR
 - PHA/SAR Air Sensor Integrator
 - PHA ongoing for Battle Command
 - PHA ongoing for C4ISR Components of Spin-Out 1
 - PHA performed for SOSCOE
- Complementary Programs
 - NLOS-LS PHA performed
 - IMS PHA performed

Spin Out 1 ESOH Activities



- Spin Out 1 (SO1) ESOH WG Sub Team to the FCS ESOH WG was founded in August 2005 to support the overall SO1 ESOH activity.
 - The purpose of this forum is to identify and establish a framework of key ESOH resources, responsibilities, interfaces, requirements, products and activities supporting the definition and development of the overall ESOH approach for SO1 ESOH processes.
 - SO1 ESOH WG Sub Team is a cross-organizational and cross-functional team of Army and LSI ESOH, IPT and Program personnel including DTC, Current Force, PM FCS BCT, and CHPPM (spell out).
- Current SO1 schedule identifies Safety Release required NLT October 2007 to support Technical Field Test (TFT) Test Preparation beginning in November 2007.
 - This safety release represents the Current Force use of integrated FCS SO1 vehicles.
 - SO1 SoS safety package includes NEPA, Hazardous Material Lists, Safety Assessment Reports, Health Hazard Assessments, ARMY FUZE Board Safety Certification, Interface Hazards Analysis and System Safety Releases.

Spin Out 1 ESOH Activities



- Environment, Safety and Occupational Health (ESOH) Safety and Health Hazard System and Integrated Hazard Analysis facilitated and conducted by the IPTs/OTPs are the foundation of the overall SO1 SoS Safety Assessment activity.
- The SO1 SoS safety assessment will consolidate and evaluate IPT/OTP safety related submittals and will document the top level safety assessment to support the Current Force Safety Release needs.

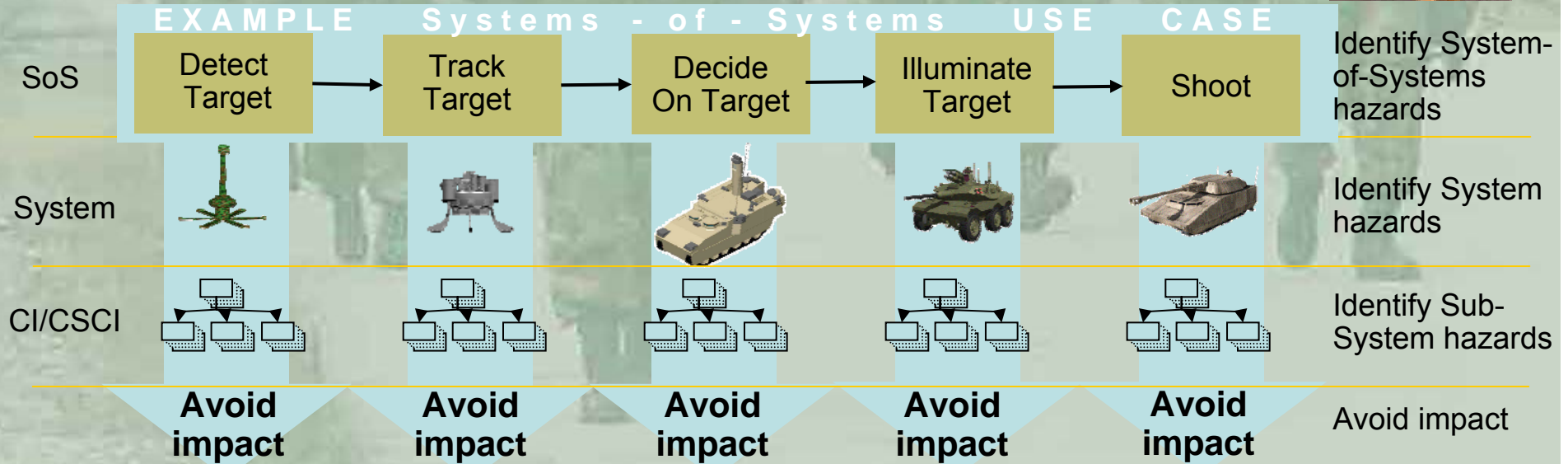
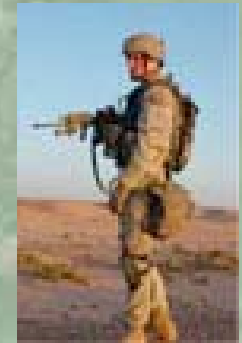
National Environmental Policy Act (NEPA)



- FCS BCT Programmatic Level SoS NEPA Document
 - Overarching Programmatic Environmental Assessment (PEA) Document Summarizes FCS SoS Environmental Impacts/Risks
 - System-level data Annexes - NEPA for Prime Items
 - Summarize NEPA Data from 68 Complementary Programs
 - Affected Environment Annex
 - Regulatory Annex
 - Cumulative Environmental Impacts Matrix
- Develop NEPA data for the FCS program will be provided to installations
- Analysis Status
 - √ Completed NEPA analysis for Experiment 1.1
 - √ PEA to be released first quarter CY 07
 - Will address Spin Out 1

Summary

- **Past systems were stove piped.** Platform ESOH impacts measured in the field
- **FCS System-of-Systems approach ensures platform interactions hazards are mitigated before fielding**
 - SoS level requirements bound system with comprehensive requirements
 - Establishes consistency across all platforms
 - Improved platform design through System-of-Systems approach



Opportunity to avoid ESOH impacts across platforms prior to fielding