EC and Systems Engineering

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How ECs Affect Acquisition and Logistics

- **Program cost and risk**
- **FMS and Economy of Scale**
- **Manufacturing flexibility**
- **Basing restrictions**
- **Costs to industrial base operations**
- **Future cleanup costs**
- **Future liability**

Phase I Assessment

- **An initial assessment of the likelihood that new regulations will be enacted, and the impacts those new regulations will have on DoD.**
- **What's required to conduct a Phase I Assessment**
  - An understanding of the reasons for regulatory change and their probability.
  - An understanding of where, why, how and how much of the materials subject to regulatory change; and the impacts the proposed regulations will have on our operations.
- **Working with the regulatory community to understand the reasons and risk of regulation is often easier than understanding the impacts proposed regulations will have on DOD.**
- **To make sound investment decisions, this situation must change.**
- **We need your help.**

Phase II Assessment

- **The same as a Phase I assessment, but much more detailed.**
- **Monetary estimates and operational assessments sufficiently detailed to support multi-million to billion+ dollar investment decisions in mitigation efforts.**
- **Mitigation efforts can include RDT&E, material substitution, process changes, protective equipment, new handling procedures, etc**
- **We need your help.**

The Challenge

- **Identify industrial materials that represent financial or operational risks**
- **Find technically and economically feasible mitigation options**
- **Deploy them as necessary**

A Systems Engineering Approach

The Players

- PMs
- OEMs
- SYSCOMs
- Research and Development
- Cognizant Authorities
- Industrial Facilities

Flagship Programs

- **Joint Strike Fighter**
  - Collecting regulatory requirements nationally and internationally
  - Incorporating into M&P decision processes
- **Future Combat System**
  - Enterprise logistics information initiatives
- **Virginia Class Submarine**
  - 2000 Closing the Circle Award
  - Hazardous Materials Map for tracking materials
  - Design/Build Environmental Analyses
  - Material Substitution

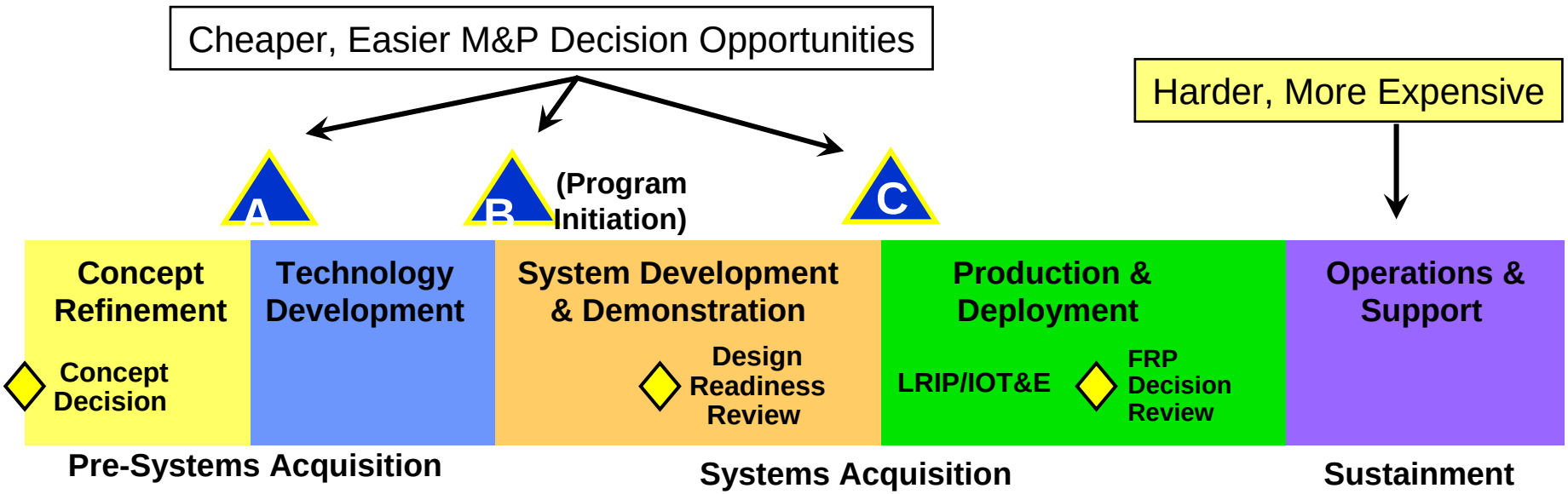
Potential Effects of Regulatory Change

- **No longer economical to continue using material**
- **Increase production time**
- **No longer operationally practical to continue using material**
- **Personal Protective Equipment**
- **Increase waste treatment costs**

Actions Subject to Regulation

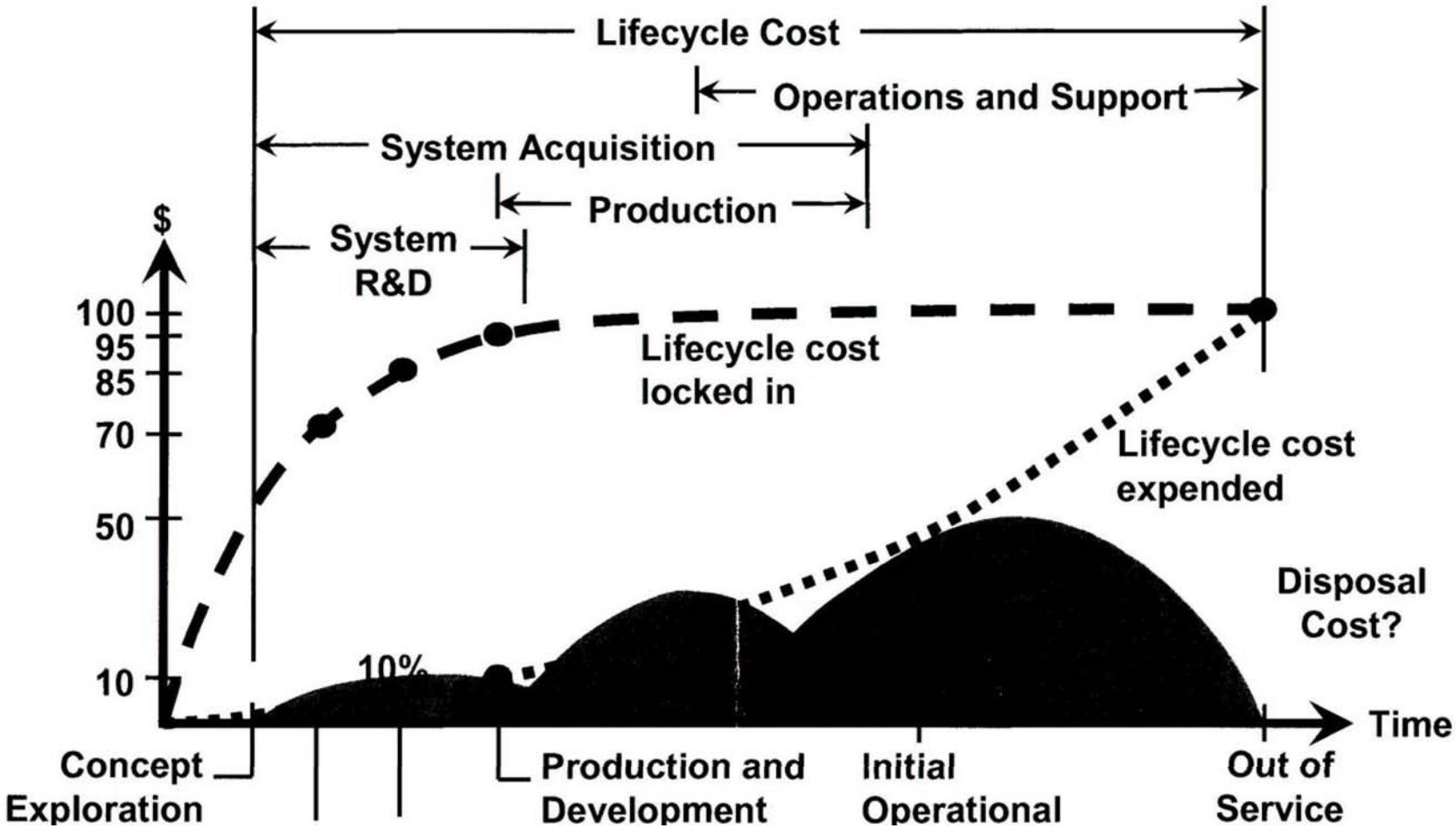
- **Human exposure**
  - Dermal
  - Inhalation
  - Ingestion
- **Air Emissions (VOCs, HAPs, Particulate)**
- **Effluent (permits, treatment)**
- **Accidents**

Life Phase M&P Changes



- **Early identification of potentially problematic materials and processes reduces life cycle costs, expands operational options**
- **$2B annually being spent to cleanup materials that were all once emerging contaminants chosen pre milestone C**

Percentage of Cost Locked In by Phase



Goal: Avoiding the Challenges of Changing Legacy Systems

- **Multiple sites**
- **Single production lines servicing multiple systems**
- **Multiple programs use same M&P**
- **Validation testing**
- **Independence of Cognizant Authorities**
- **Tech Orders / Tech Manuals / Specs / Standards / Drawings**
- **Getting new materials in supply (FEDLOG)**
- **Retrofit process equipment**

How: Earlier, proactive decisions that eliminate emerging contaminants

What's Good

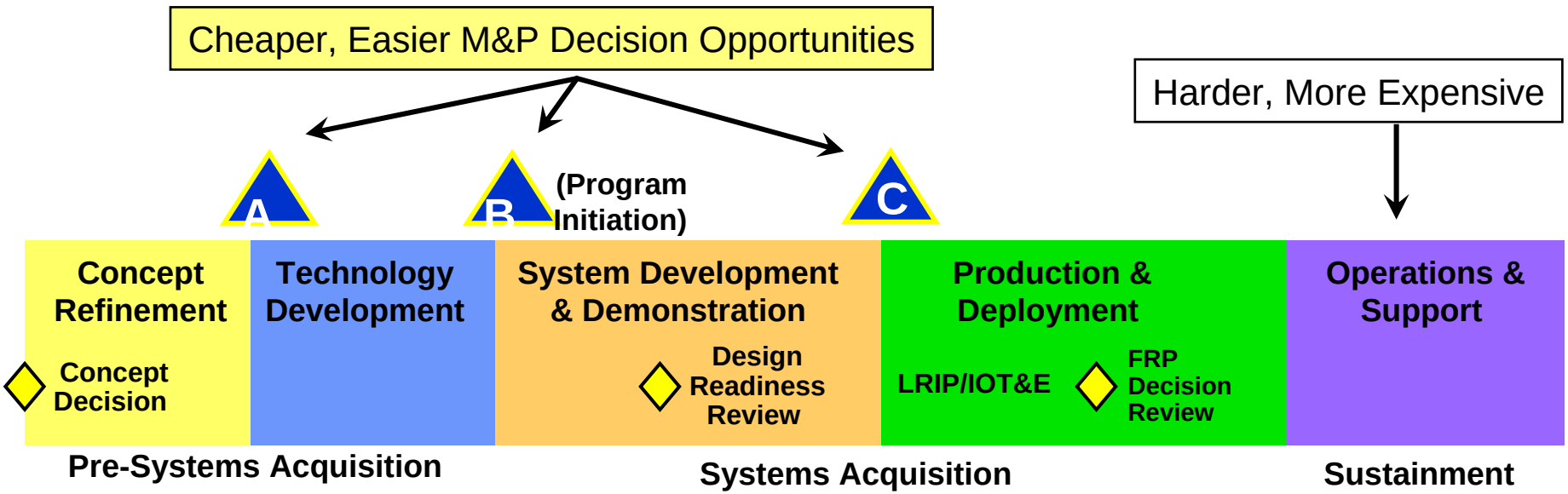
- **SERDP / ESTCP**
- **JGPP / JLC**
- **Single Process Initiative**

Why?

Each is doing the hard work of changing legacy systems.

Alternatives proven in legacy systems are adopted by new programs.

Life Phase M&P Changes



Programmatic Environment Safety & Health Evaluation (PESHE)

- **A strategy for integrating ESOH into the systems engineering process**
  - Identify ESOH responsibilities and risk management activities
  - Identify, determine status of ESOH risks
  - Acceptance of residual ESOH risks
  - Track progress managing and mitigating ESOH risks
  - Measure effectiveness of ESOH risk controls
  - Identify hazardous materials (HAZMAT) used in the system
  - Identify demilitarization/disposal plan

An Integrated Risk Management approach

Integrated Risk Management Plan

- **Engaging with regulators**
  - Improve transparency, reduce uncertainty
- **Mitigation Options**
  - Material substitution
  - Process changes
  - Stockpile material
  - Increase compliance monitoring
  - Additional training
  - Protective equipment
  - Benchmark with industry
- **Communications**
  - Clear consistent message from DoD
- **Decision – best path forward**
  - Invest in science to reduce regulatory uncertainty?
  - Invest in mitigation?
  - Combination of the two?

Enterprise Business Model Requirements

Have

- **Data on material purchase and use scattered across DoD and its suppliers**
- **Databases do not communicate with each other**
  - Formats differ
  - Information collected is not consistent
  - Single point access not possible
- **Manual data calls notoriously inaccurate and incomplete**

Need

- **Data on material purchase centrally accessible and easily aggregated**
- **Databases that communicate with each other**
  - Compatible formats
  - Identical subset of data to make enterprise business case
  - Single point access routine occurrence
- **Eliminate need for manual data calls**

Making it Better: EC Industrial Base Working Group

- **Potential Membership**
  - DoD industrial policy
  - Service acquisition commands
    - Systems Engineering
    - ESOH specialists
  - DoD industrial facilities
  - Defense Logistics Agency
  - Other DoD material database resources
  - Cognizant military authorities
  - OEMs
  - Providers of material management services
- **Task**
  - Collect and synthesize comprehensive information about material uses and alternatives to support informed decision making

Summary

- **EC is a resource for PMs, industrial base**
  - Early warning of problematic materials
  - Broadens manufacturing, basing options
  - Reduces manufacturing, sustainment costs
- **Current process needs work**
  - Lack of information hinders progress
  - Need for closer dialog

DoD Emerging Contaminant Website!

www.DENIX.osd.mil

Industrial Base Definition

The Defense Industrial Base (DIB) is the world-wide organic and private sector industrial complex with capabilities to perform research and development, design, produce, and maintain military weapon systems, subsystems, components, parts or provide other goods and services to meet military requirements.

Single Process Initiative

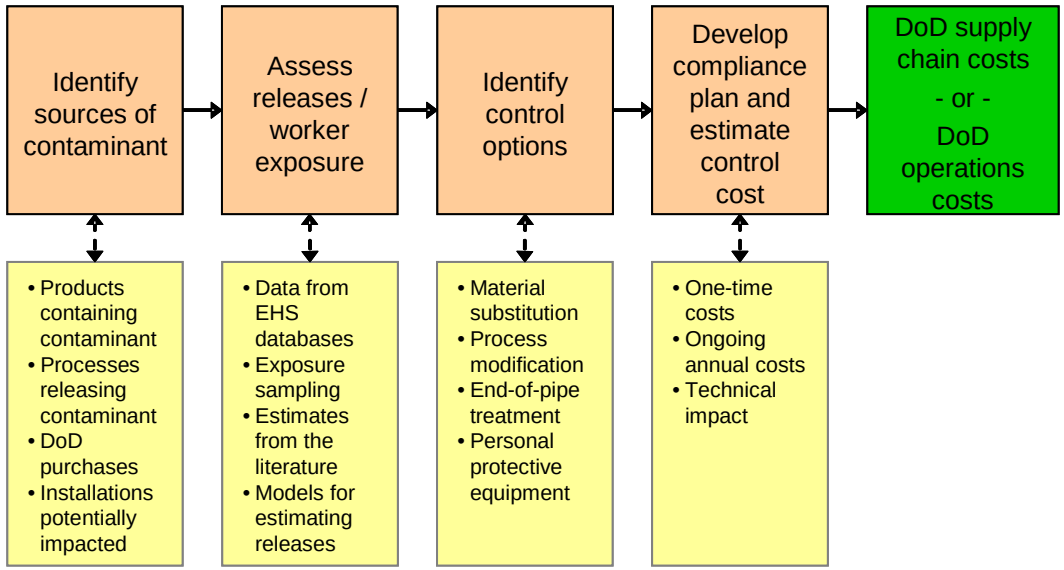
- **Purpose: The purpose of SPI is to remove highly-tailored or customer-unique requirements from contracts and adopt instead, a single process proposed by the contractor. For example, if a contractor is allowed to use a single soldering standard (proposed by the contractor) for all work at its facility, costs to all affected customers should be reduced, while maintaining or even increasing quality.**

- **Concerns: Because government agencies have their own unique set of requirements, a contractor can have several very similar systems or processes set up to accommodate each Agency. Maintaining many similar set-ups required by the government is inefficient and costly to the contractor and to the government.**

- **Goal: Enable contractors to propose single processes that would meet the needs of multiple customers, and eliminate unique processes/systems that are imposed on contractors, unless they are essential to ensure mission safety and reliability. SPI is expected to improve process efficiencies, improve product quality, reduce the contractors' operating costs, and, reduce Government acquisition costs. The target time frame is 120 days from receipt of a concept paper to issuance of a contract modification.**

- **Key Elements: All contractor systems and processes are candidates for this initiative if efficiencies can be gained. SPI would eliminate duplicative contractor systems and processes imposed by each customer's requirements.**

Finding Materials In Legacy Systems



And this is just to respond to a new reg!

Business Transformation Opportunity

- HMCS (Hazardous Material Control System)
- HMMS (Hazardous Material Management System)
- HMIRS (Hazardous Materials Information Resource System)
- ERLS (Environmental Reporting Logistics System)
- AF - / Environmental Management Information System
- Munitions Items Disposition Action System (MIDAS)
- FEDLOG
- Manual Data Calls

Not connected, different formats and owners