

Implementing Filters to Identify and Prioritize Industrial Base Risk: Rules of Thumb to Reduce Cognitive Overload



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Manufacturing & Industrial Base Policy

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Outline



- **Background**

- Risk in the industrial base
- Risk assessment process
- Continuous improvement

- **Filters and screens**

- Purpose and application to industrial base assessment
- Examples

Acquisition, Technology and Logistics Manufacturing and Industrial Base Policy

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MIBP supports the Office of the Secretary of Defense and Service Acquisition Executives by providing:

- Detailed analyses and in-depth understanding of the increasingly global, commercial, and financially complex industrial supply chain essential to our national defense
- Recommendations or taking appropriate actions to maintain the health, integrity and technical superiority of that supply chain

MIBP is DoD's lead in all matters relating to mergers, acquisitions, and dissolutions of national security-related business.

Programs

Defense Production Act

- Title I: Defense Priorities and Allocations System (DPAS)
- Security of Supply
- Title III: Expanding Production Capability and Supply
- Title VII: Committee on Foreign Investment in the United States

U.S. Code Title 10 – Armed Forces

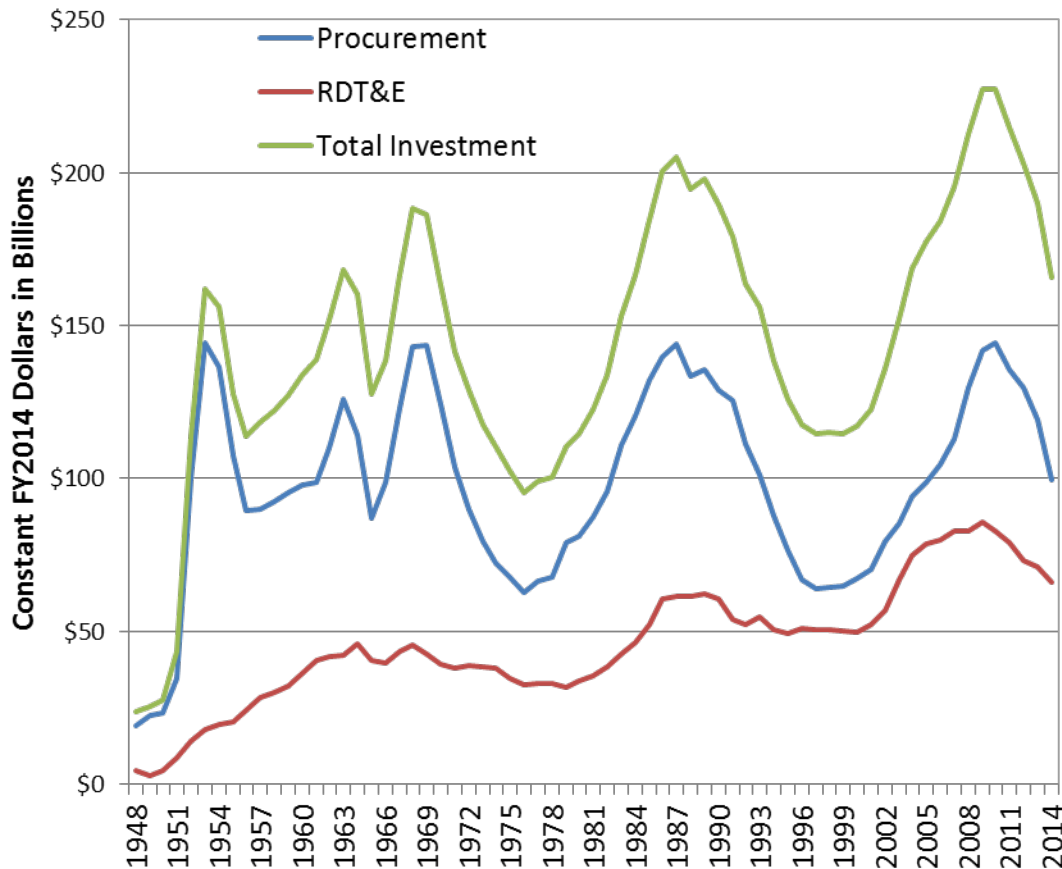
- Section 2521 of Title 10, Defense Manufacturing Technology Program

North American Technology and Industrial Base Organization (NATIBO)

MIBP Mission: Support access to robust, secure and innovative industrial capabilities to fulfill short- and long-term National Security requirements

Budget Swings Have Significant Consequences for the Industrial Base

DoD Investment Outlays



Contractors & their vendors during **Upswings:**

- Acquire resources to address their schedule and performance requirements
- Resources may be limited due to demand

Downswings:

- Decide how much of that capability they can afford to maintain or
- Decide to exit the defense market

Will Warfighter Get Support When Needed?

- **Capitalism: Markets will right-size based on demand**
 - Companies enter when it is profitable, and exit otherwise
- **Many capabilities used by defense exist during upswings and downswings**
 - Capabilities “easy” to reproduce; low barriers to entry
 - Market has alternatives or substitutes
- ***But some capabilities are sensitive to defense procurement swings***
 - Small or no market without defense
 - Little slack available during upswings
 - Difficult to balance capital investments, specialized labor with large budget changes

Defense-specific or unique capabilities are especially sensitive to budget changes

What are Risks in the Industrial Base?

Risk in the industrial base can be:





- Involuntary – from external influences
 - Defense procurement budget
 - Congressional mandates
 - Emerging National Security threats
- Voluntary – from Defense decision making
 - Decisions about use of market forces to shape, create, and sustain industrial technologies and capabilities
 - Decisions about when and how to intervene

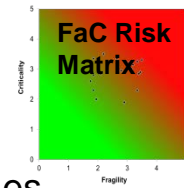
Examples of IB risks to:

- Technical superiority
 - Loss of design teams
 - Lack of next-gen technology
 - Barriers to unique technologies
- Affordable products
 - Lack of capacity to meet requirements
 - Absence of production capability
- Supplier
 - Sole sources
 - Financial fragility
 - Lack of interest in DoD
- Security of supply
 - Foreign dependencies
 - External investments
- Investment and transaction
 - Reduced competition
 - Loss of domestic IP

Industry provides nearly all of the capabilities required by the warfighter

Process for Assessing IB Risk

Process Activity	Action	Outcome
Select Sector/SubSector 	Scope the problem (existing risk assessments; program shutdowns)	Preliminary Sector Taxonomy
Search Available Data 	Identify IB-related risks & related capabilities/products Identify suppliers and market	Expanded Taxonomy and Product Supplier Pairs
FaC Screening/Filtering 	Focused set of IB-related risks for further assessment	Screened IB/Issues Capability-Supplier Pairs
Conduct FaC Matrix Assessment 	Facilitated scoring, based on standardized criteria, by SMEs	FaC Risk Matrix
Validate & Mitigate High Risk Issues; Develop Mitigation Strategy(ies)	SME “deep dive” into IB risk areas; facility visits	High Risk IB Issues



Statistical tests confirm the process well-suited to assessing a portfolio of suppliers supporting similar capabilities, and deriving cross-cutting solutions

Final Risk Matrix is Scored Using Standard Definitions

Capability = technology, part, component, product

Criticality:

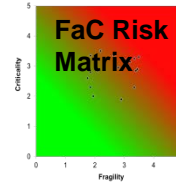
- Characteristics that make a specific *Capability* difficult to replace if disrupted

Defense unique capability
Skilled labor requirements
Defense Design requirements
Facility & Equipment requirements
Reconstitution time
Availability of Alternatives

Fragility:

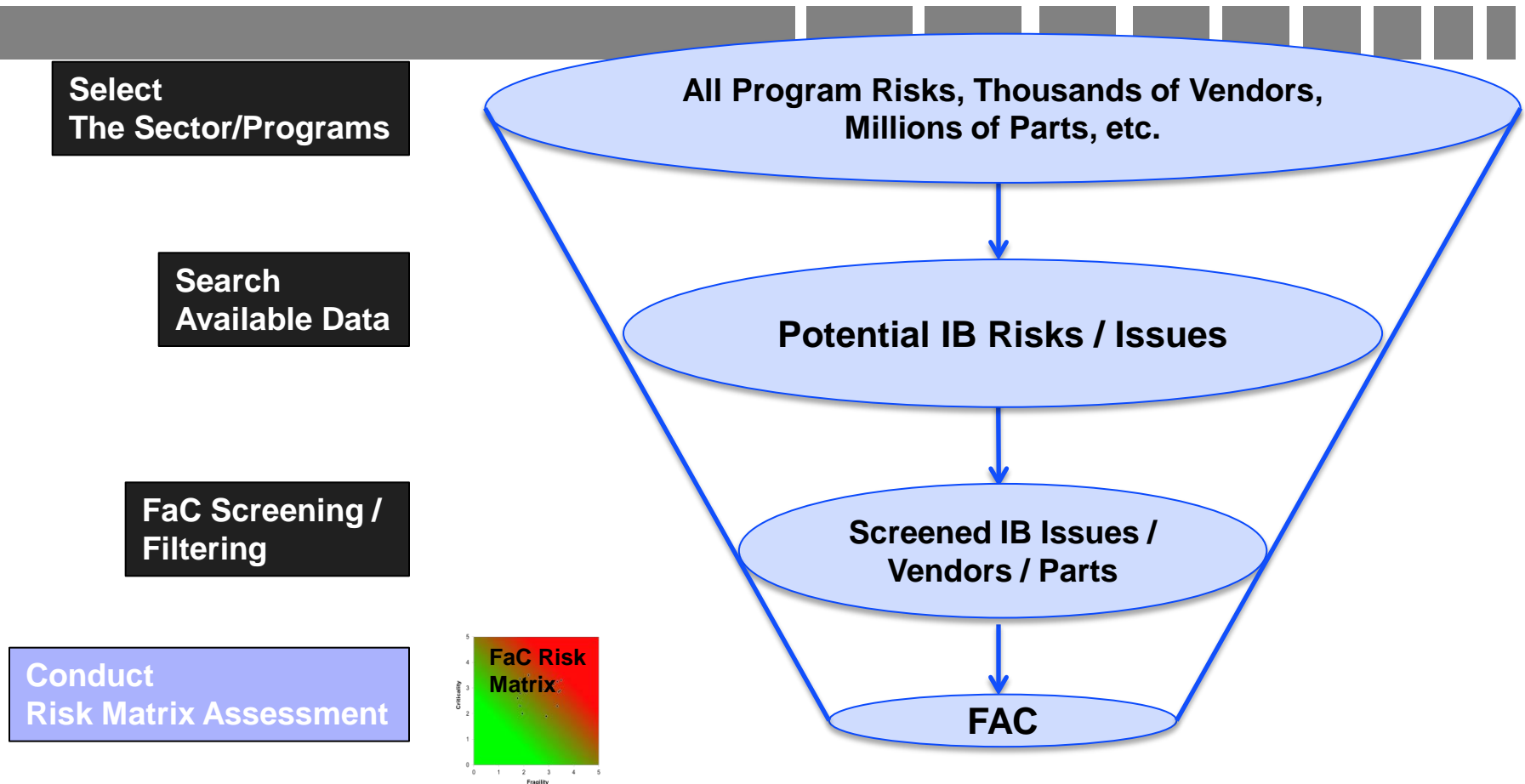
- Characteristics that make a specific *Capability* likely to be disrupted

Financial Outlook (Current provider)
DoD Sales (Current provider)
Firms in Sector (Existing market)
Foreign Dependency (Existing market)



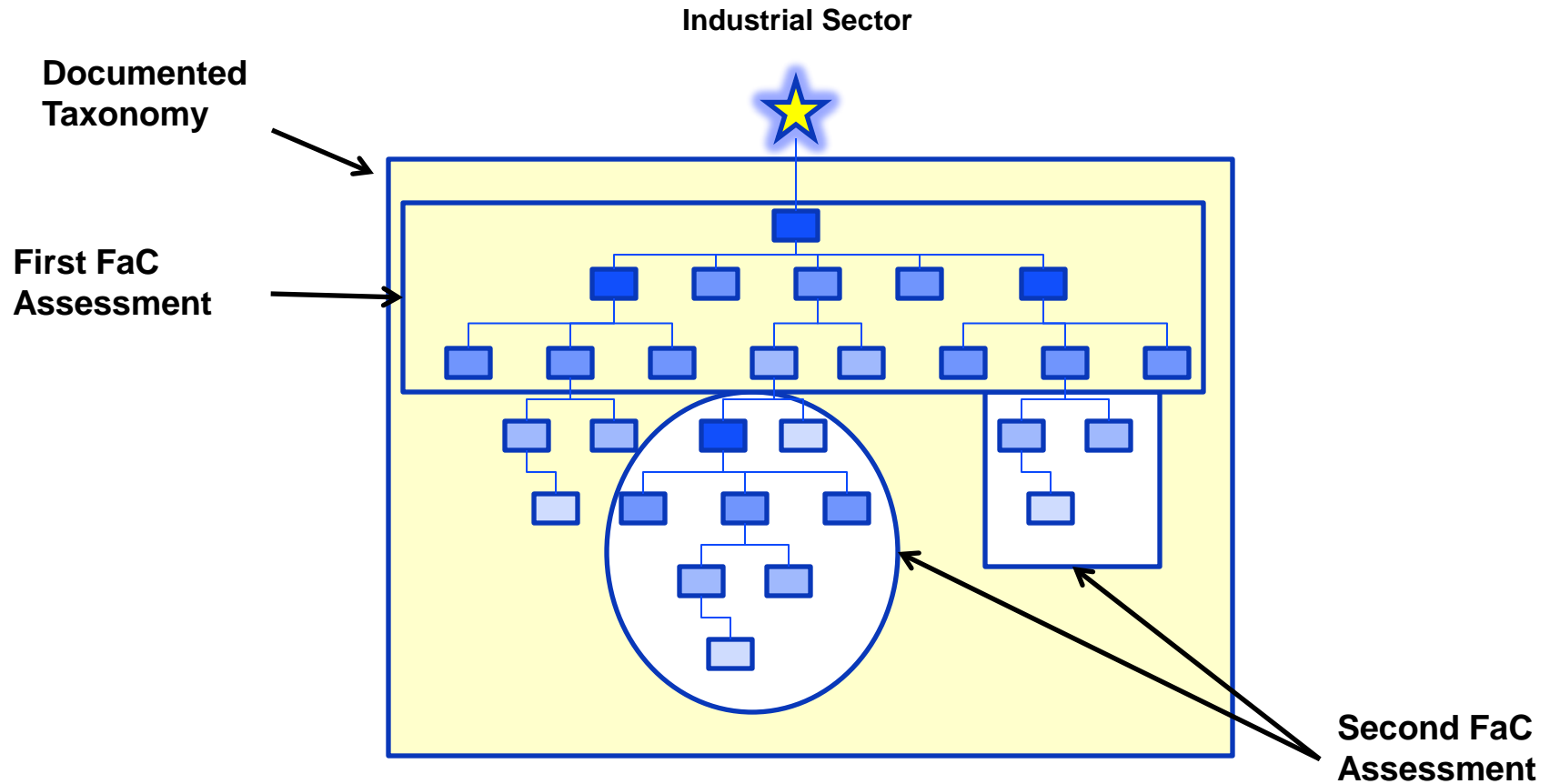
Final set of capabilities assessed in the risk matrix
is pared down through filters

Filtering Out Low-Risk Concerns Quickly is Essential

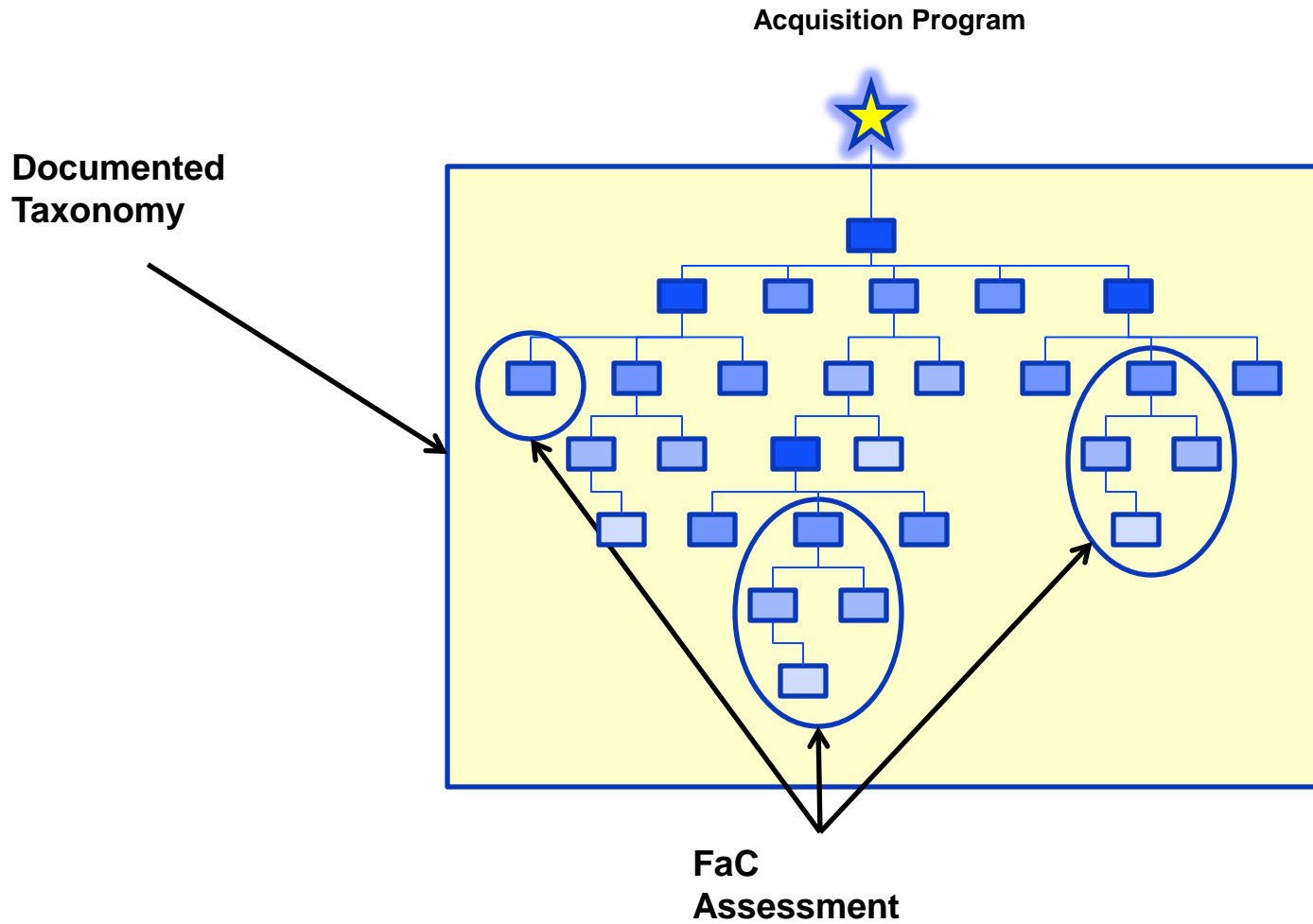


Appropriate filters – manual or automated – help focus attention on areas of highest risk and prioritize scarce resources

Example: Scoping the Assessment Using a Taxonomy



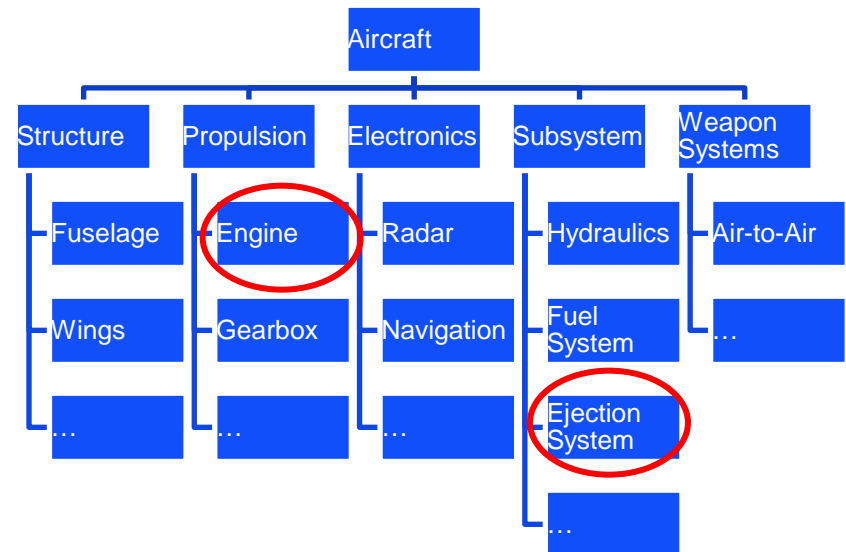
Refining the Scope of the Assessment



Example: High-Level Filters to Identify Areas of Concern

Typical Screens for DoD IB areas of risk applied to sector taxonomy:

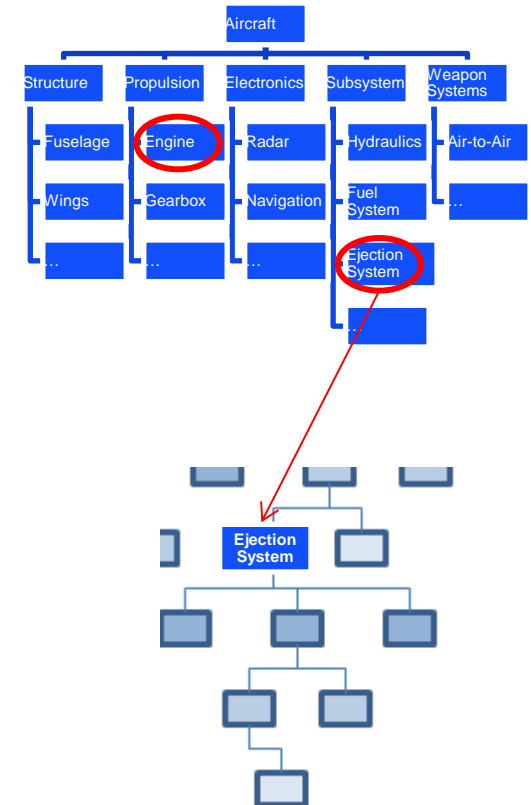
- Operational impact of capability (pervasiveness across the DoD or platforms)
- Low commercial market demand (few or limited applications)
- Change in DoD demand expected over the FYDP (up or down)
- Rapid rate of technical change expected (rapid advancement or obsolescence)
- Limited sources of supply (domestic, foreign)
- Anticipated future generation system requirements (next-gen)



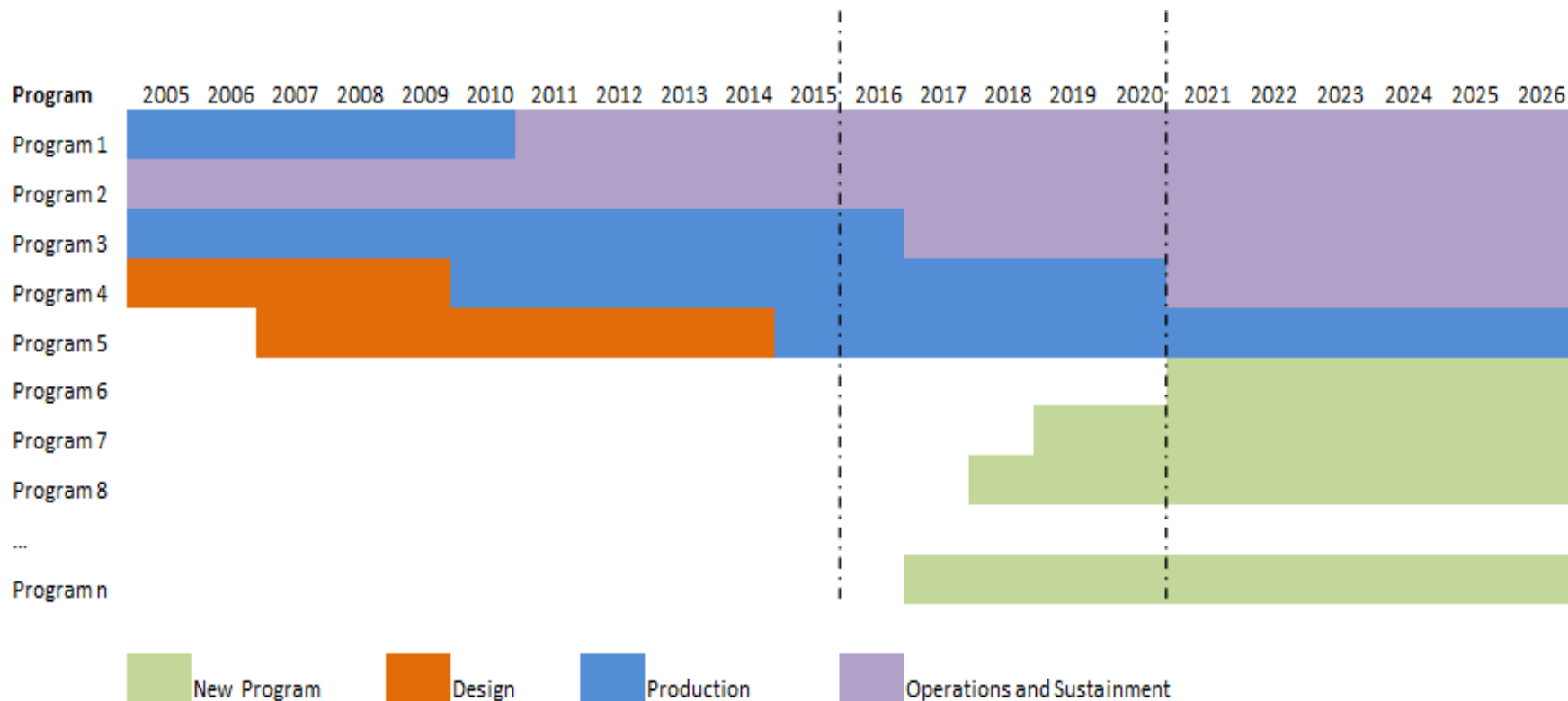
High-level filters are adaptable to the sector and focus on the types of risk to e.g., superiority, security of supply, suppliers

Example of an Initial Screening Exercise (notional)

High-Level Screen	Subsystem: Ejection System	Propulsion: Engine
Operational impact of capability	Yes: multi-Service requirement - Operational impact of capability cross-DoD	Yes: multi-Service requirement - Operational impact of capability cross-DoD
Low commercial market demand	Yes: primarily defense market	No: commercial market for aircraft engine; Yes: tactical aircraft have specialized requirements
Change in DoD demand expected over the FYDP	Yes: overall procurement decrease; no requirement for UAV	Yes: overall procurement decrease
Rapid rate of technical change expected	Unknown: technology evolves to improve survivability – neither rapid nor slow	No: next generation requirements will drive change; not commercial or current DoD demand
Limited sources of supply	Yes: decreasing DoD demand and limited commercial demand may limit sources	No: commercial market for aircraft engine; Yes: tactical aircraft have specialized requirements
Anticipated future generation system requirements	Unknown/yes: next-gen aircraft likely to require advanced systems	Yes: next-gen tactical aircraft likely to require advanced systems

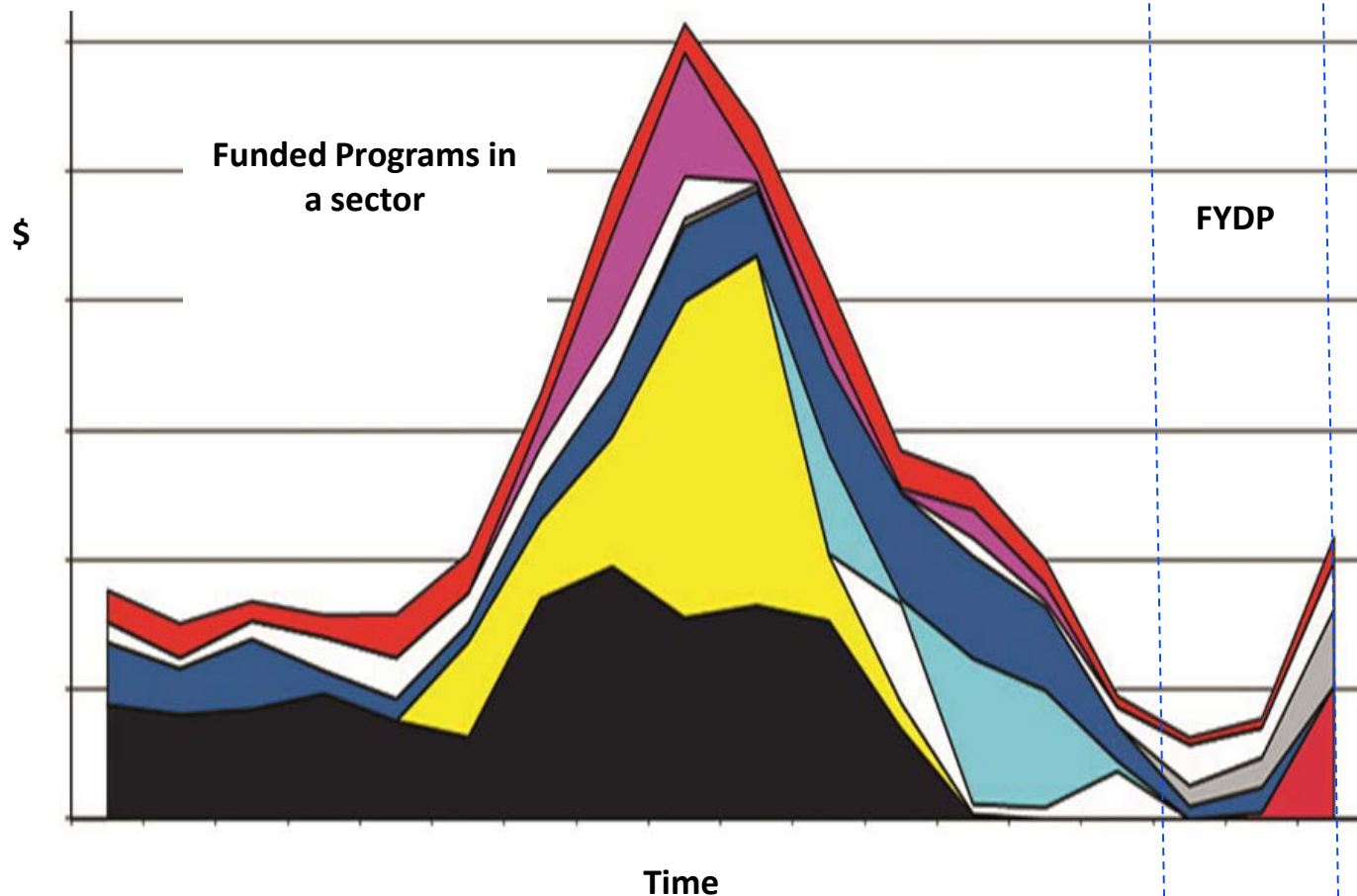


Screens Based on DoD Trends Reveal Areas of Concern



Unit-independent filter for risk to production, R&D facilities and skills

Screens Based on DoD Trends Reveal Areas of Concern



Unit-dependent filter for cross-cutting risk

Filters Enable Manageable Assessment, with Caveats



- **Pros:**
 - **Adaptable**
 - **Fast**
 - **Prioritize resources**
- **Cons:**
 - **Will miss areas of concern, by design**
 - **Rely on SME interpretation**
- **Next steps:**
 - **Continue to refine existing filters**
 - **Develop new ones to respond to environmental and strategic thrusts of the Department**