

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



**May 2015**

**Under Secretary of Defense for Acquisition, Technology and Logistics**  
*Manufacturing & Industrial Base Policy*

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# Report Documentation Page

Form Approved  
OMB No. 0704-0188

Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

1. REPORT DATE <b>MAY 2015</b>		2. REPORT TYPE		3. DATES COVERED <b>00-00-2015 to 00-00-2015</b>	
4. TITLE AND SUBTITLE <b>Implementing Filters to Identify and Prioritize Industrial Base Risk: Rules of Thumb to Reduce Cognitive Overload</b>				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) <b>Under Secretary of Defense for Acquisition, Technology and Logistics, Manufacturing &amp; Industrial Base Policy, Washington, DC, 20301</b>				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT <b>Approved for public release; distribution unlimited</b>					
13. SUPPLEMENTARY NOTES <b>Presented at the 12th Annual Acquisition Research Symposium held May 13-14, 2015 in Monterey, CA.</b>					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT <b>Same as Report (SAR)</b>	18. NUMBER OF PAGES <b>16</b>	19a. NAME OF RESPONSIBLE PERSON
a. REPORT <b>unclassified</b>	b. ABSTRACT <b>unclassified</b>	c. THIS PAGE <b>unclassified</b>			

# *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**

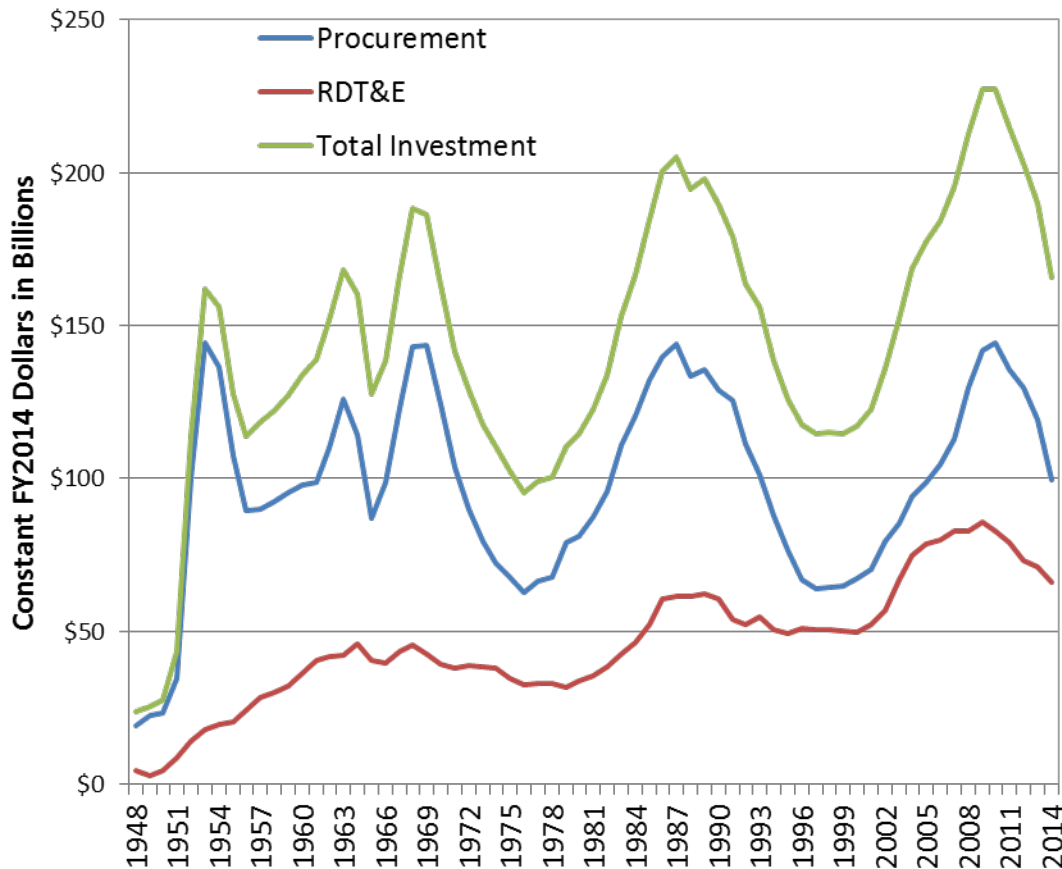
- Section 2521 of Title 10, Defense Manufacturing Technology Program

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

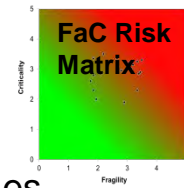
Examples of IB risks to:

- 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
<b>Select</b> Sector/SubSector 	Scope the problem (existing risk assessments; program shutdowns)	Preliminary Sector Taxonomy
<b>Search</b> 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
<b>Conduct</b> FaC Matrix Assessment 	Facilitated scoring, based on standardized criteria, by SMEs	FaC Risk Matrix
<b>Validate &amp; Mitigate</b> 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:

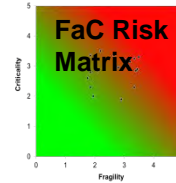
- Characteristics that make a specific *Capability* difficult to replace if disrupted

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

## Fragility:

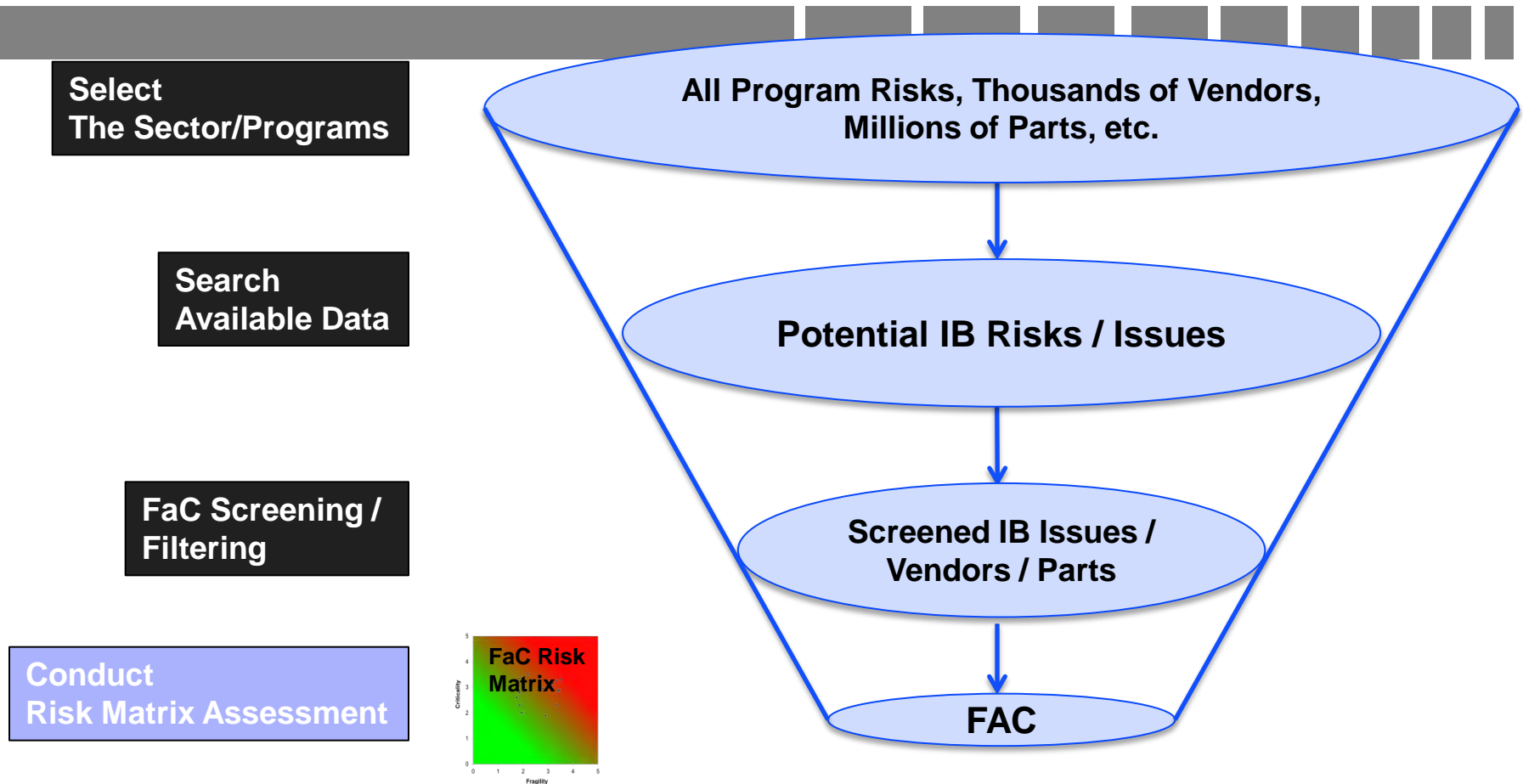
- Characteristics that make a specific *Capability* likely to be disrupted

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



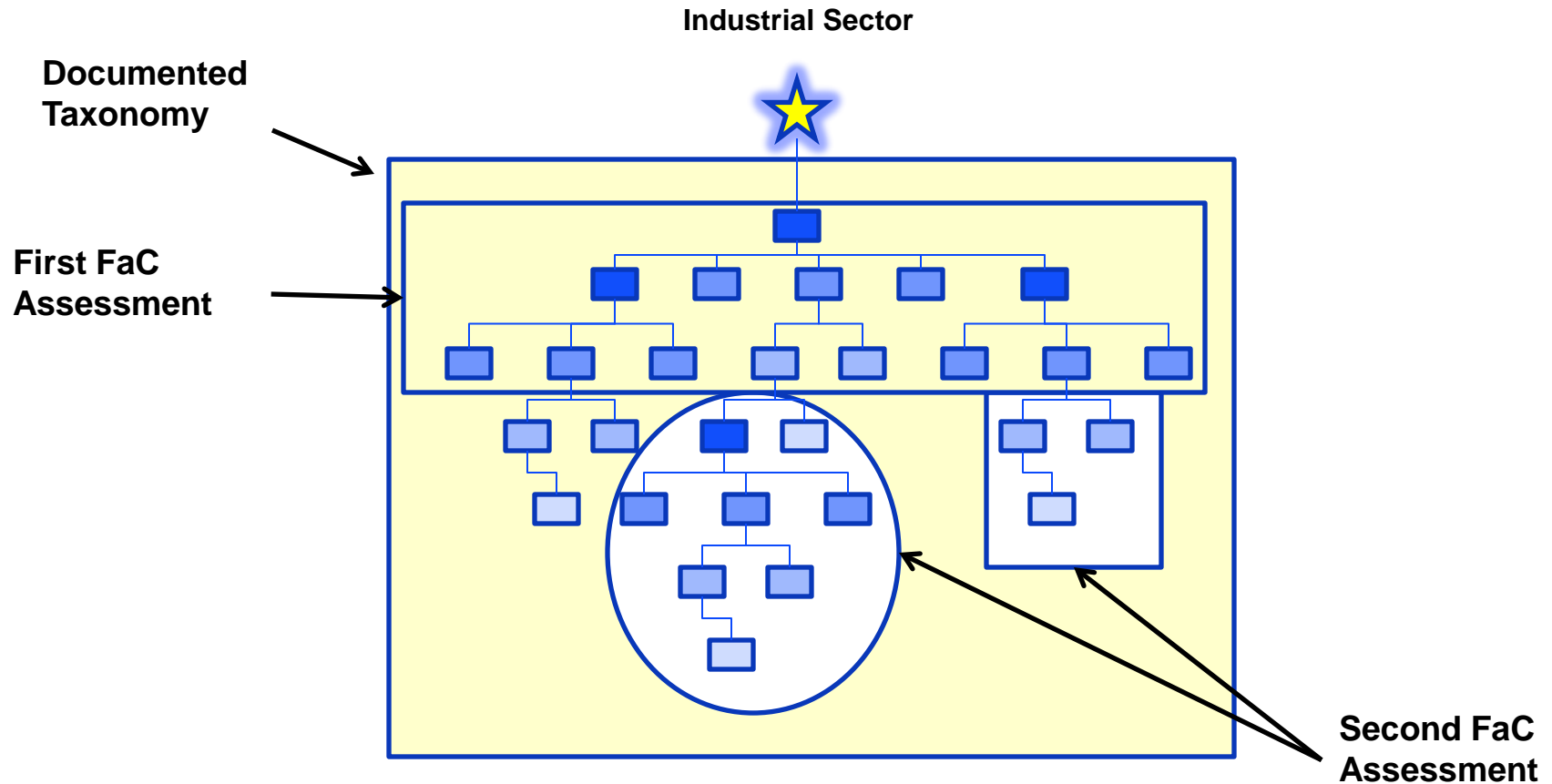
Final set of capabilities assessed in the risk matrix is pared down through filters

# Filtering Out Low-Risk Concerns Quickly is Essential

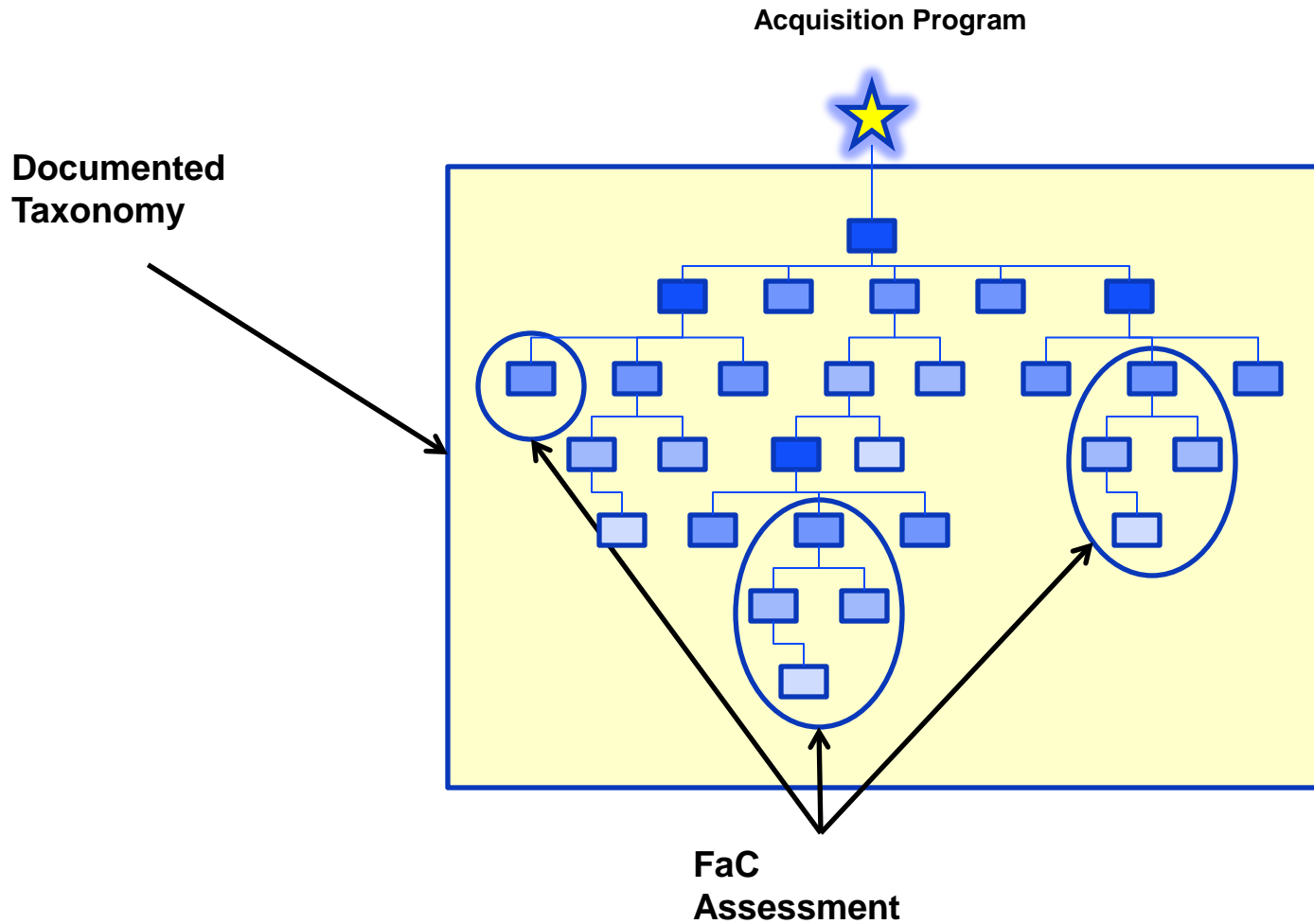


Appropriate filters – manual or automated – help focus attention on areas of highest risk and prioritize scarce resources

# Example: Scoping the Assessment Using a Taxonomy



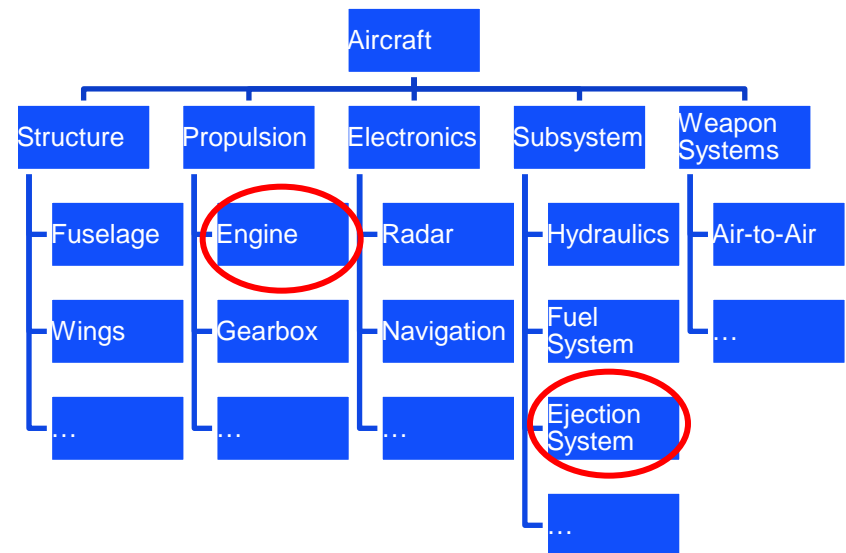
# *Refining the Scope of the Assessment*



# *Example: High-Level Filters to Identify Areas of Concern*

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

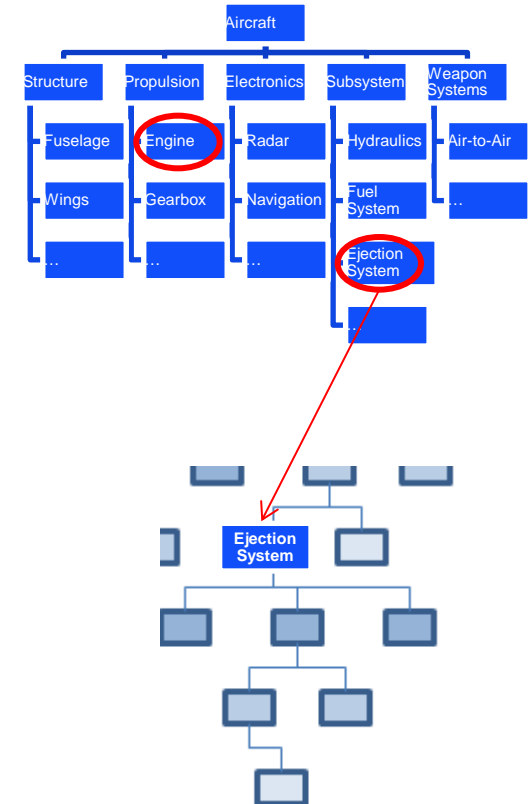
- Operational impact of capability (pervasiveness across the DoD or platforms)
- Low commercial market demand (few or limited applications)
- Change in DoD demand expected over the FYDP (up or down)
- Rapid rate of technical change expected (rapid advancement or obsolescence)
- Limited sources of supply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



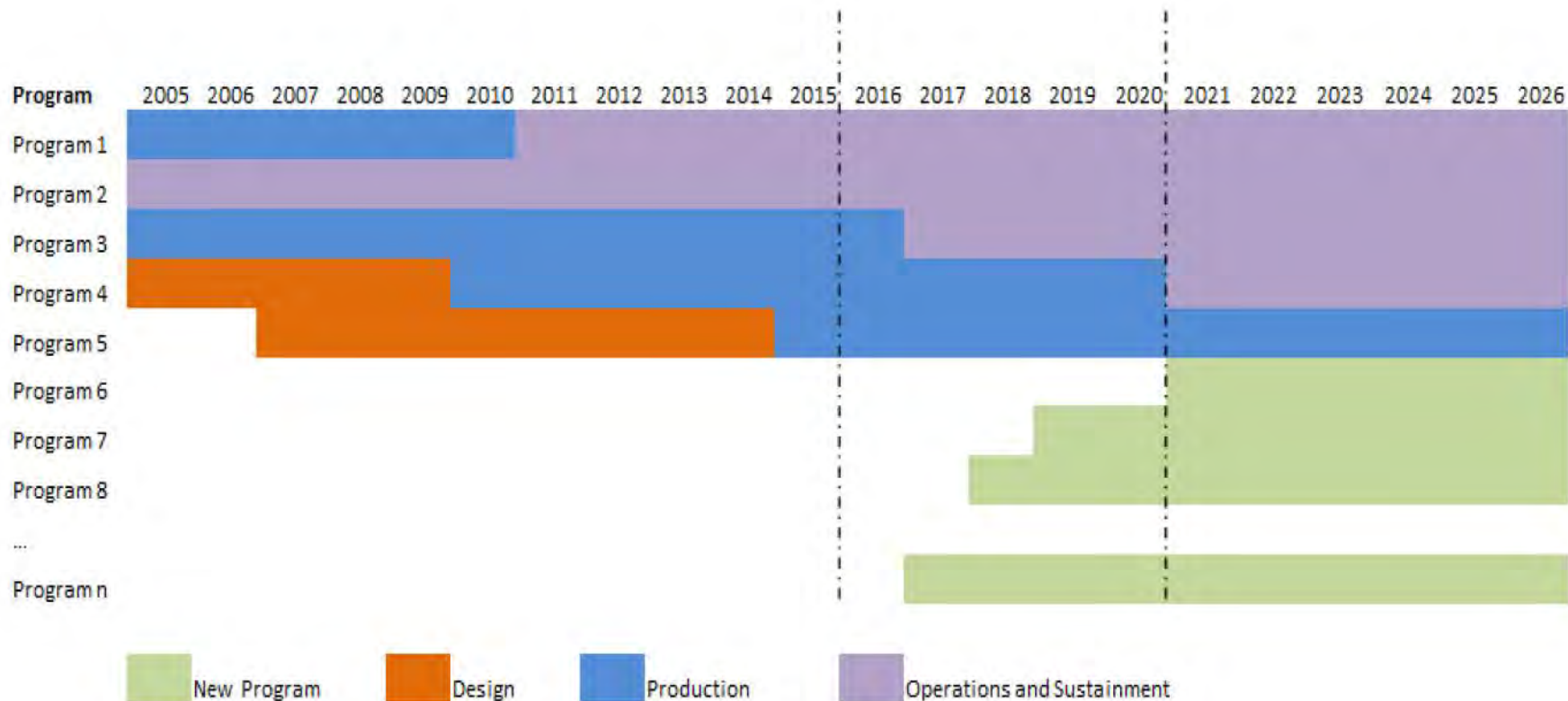
High-level filters are adaptable to the sector and focus on the types of risk to e.g., superiority, security of supply, suppliers

# Example of an Initial Screening Exercise (notional)

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

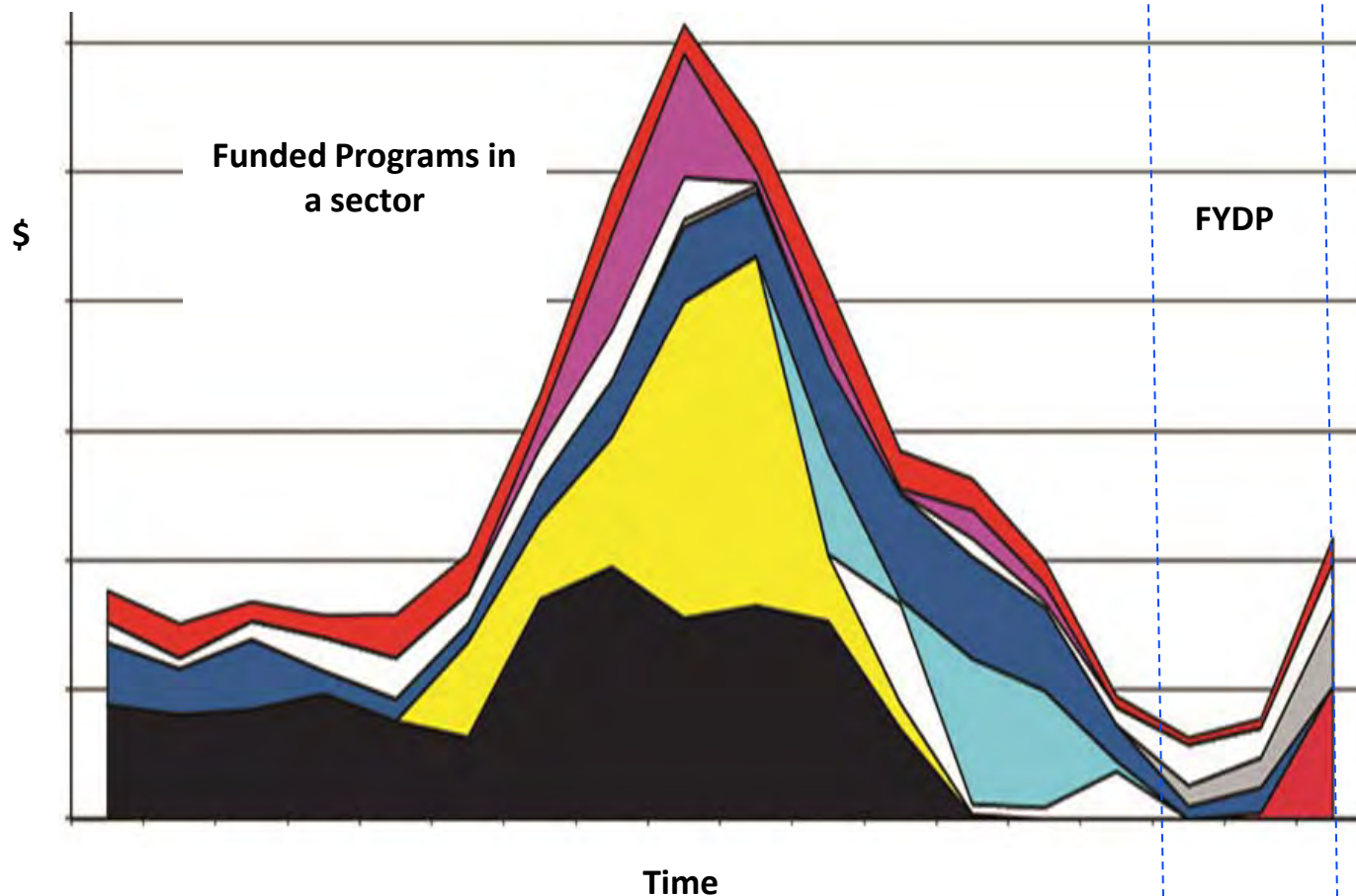


# Screens Based on DoD Trends Reveal Areas of Concern



**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**