



Air Force Research Laboratory



Integrity ★ Service ★ Excellence

Systems Engineering Principles in Air Force IR&D Process

Date: 26 Oct 2011

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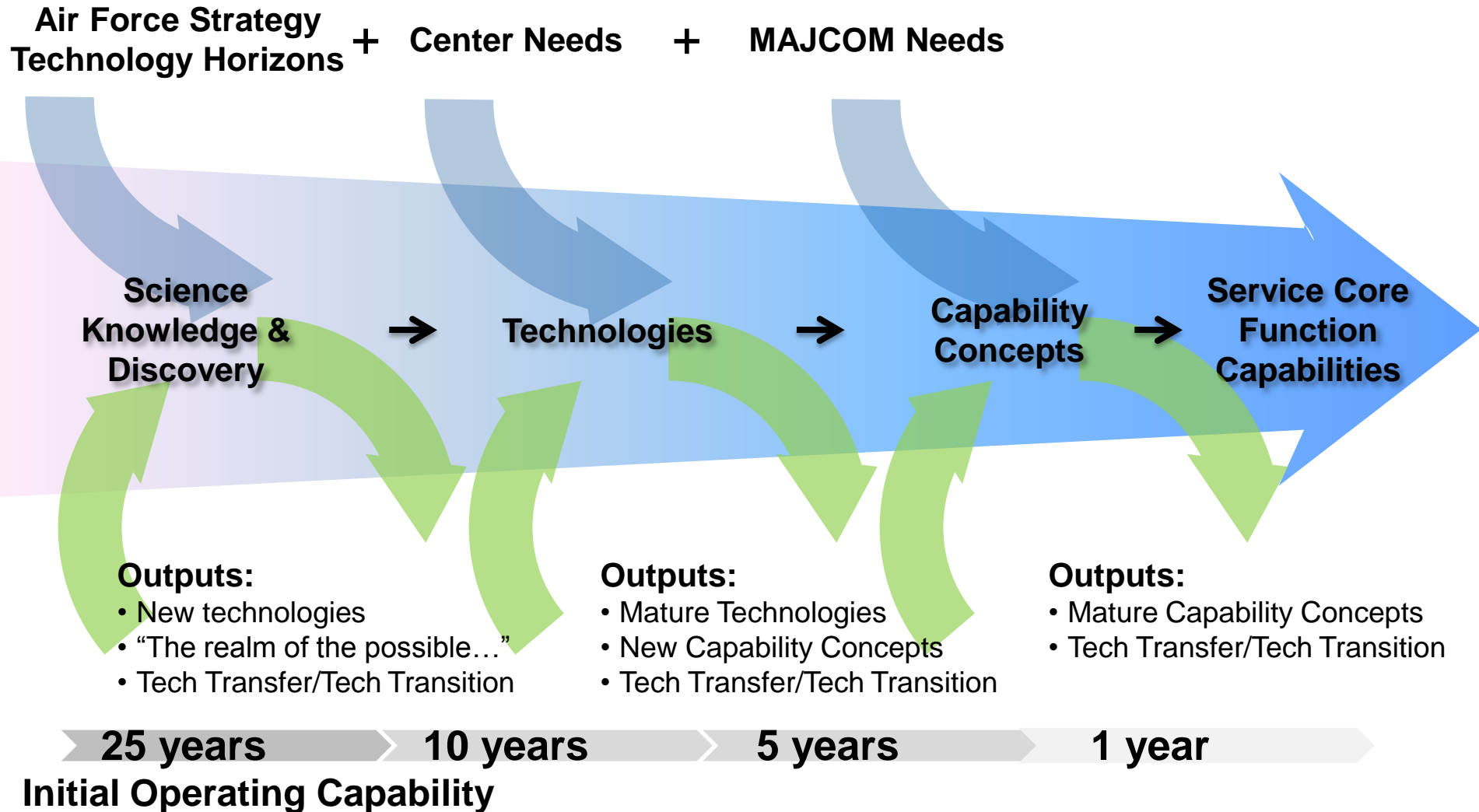
Overview



- **Alignment of Air Force S&T Program**
- **AF S&T customer engagement**
- **IR&D is worth our attention**
- **Air Force IR&D engagements**
- **3 Step workshop approach**
- **Adapting process toward Service Core Functions**



Turning Science Into Capability





Customer Engagement SCF Ties – MAJCOM, PCs, AFRL

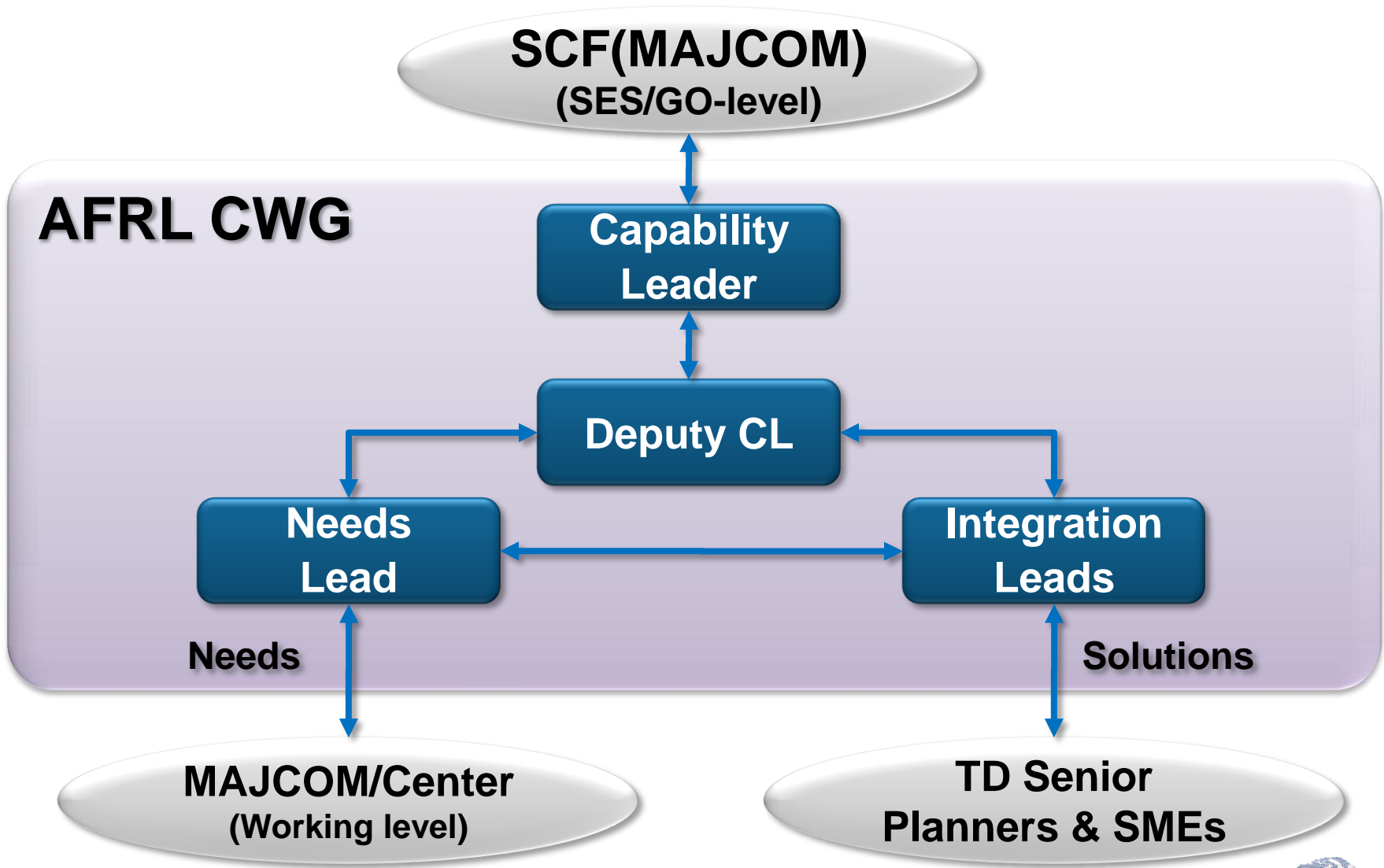


Service Core Functions	MAJCOMs/ Capability Working Groups	Product Centers
Rapid Global Mobility	AMC	ASC/ESC
Air Superiority	ACC	ASC/AAC/ESC
Global Precision Attack		
Global Integrated ISR		
Command and Control		
Personnel Recovery		
Global Integrated ISR	AFISR/A2	ESC/ASC
Agile Combat Support	AFMC	ALCs/ASC/NWC
Building Partnerships	AETC	As Required
Nuclear Deterrence Operations	GSC	NWC/ASC/SMC
Special Operations	AFSOC	ASC/ESC/AAC
Space Superiority	AFSPC - Space	SMC
Cyberspace Superiority	AFSPC - Cyber	ESC



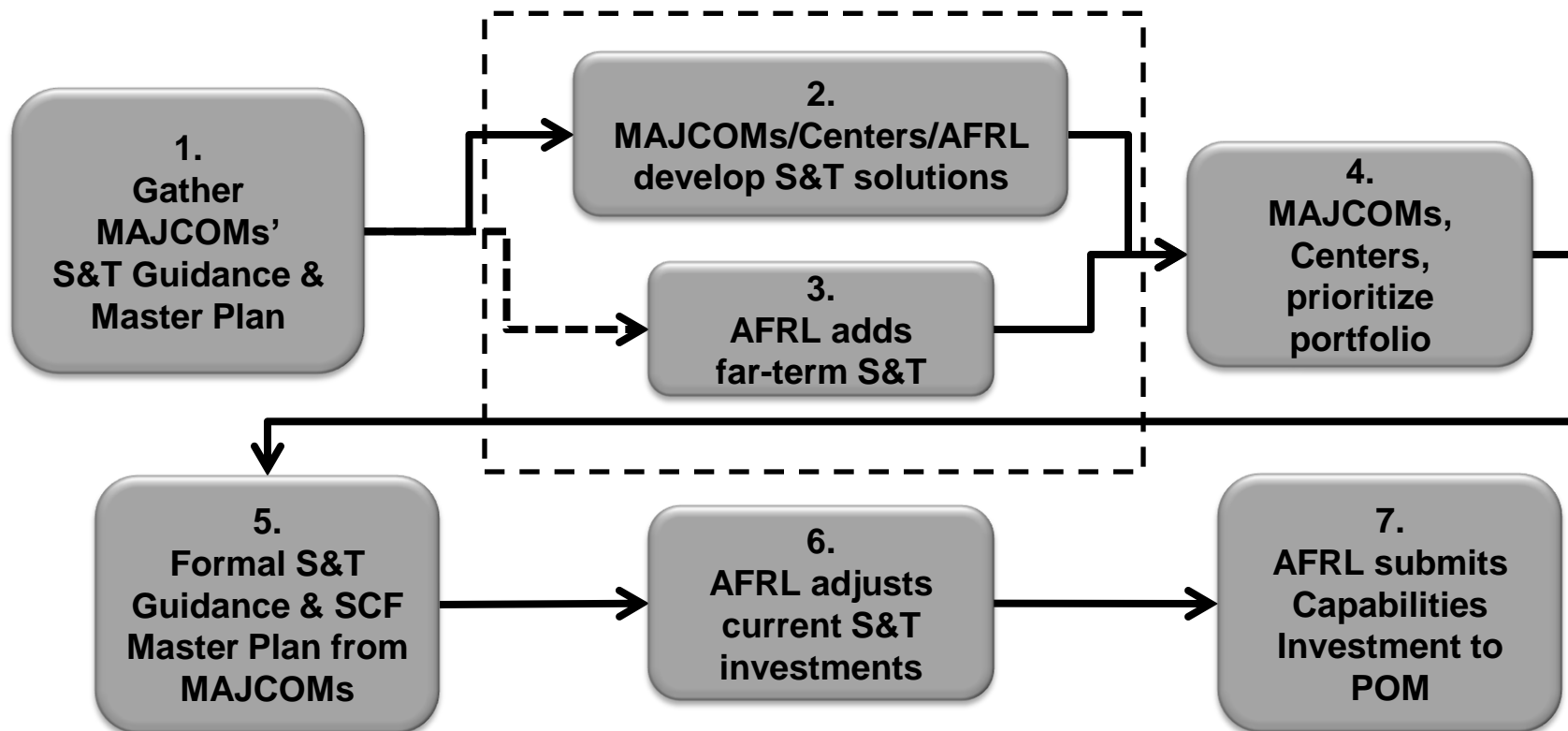


Capability Working Group





Customer Engagement Strategy

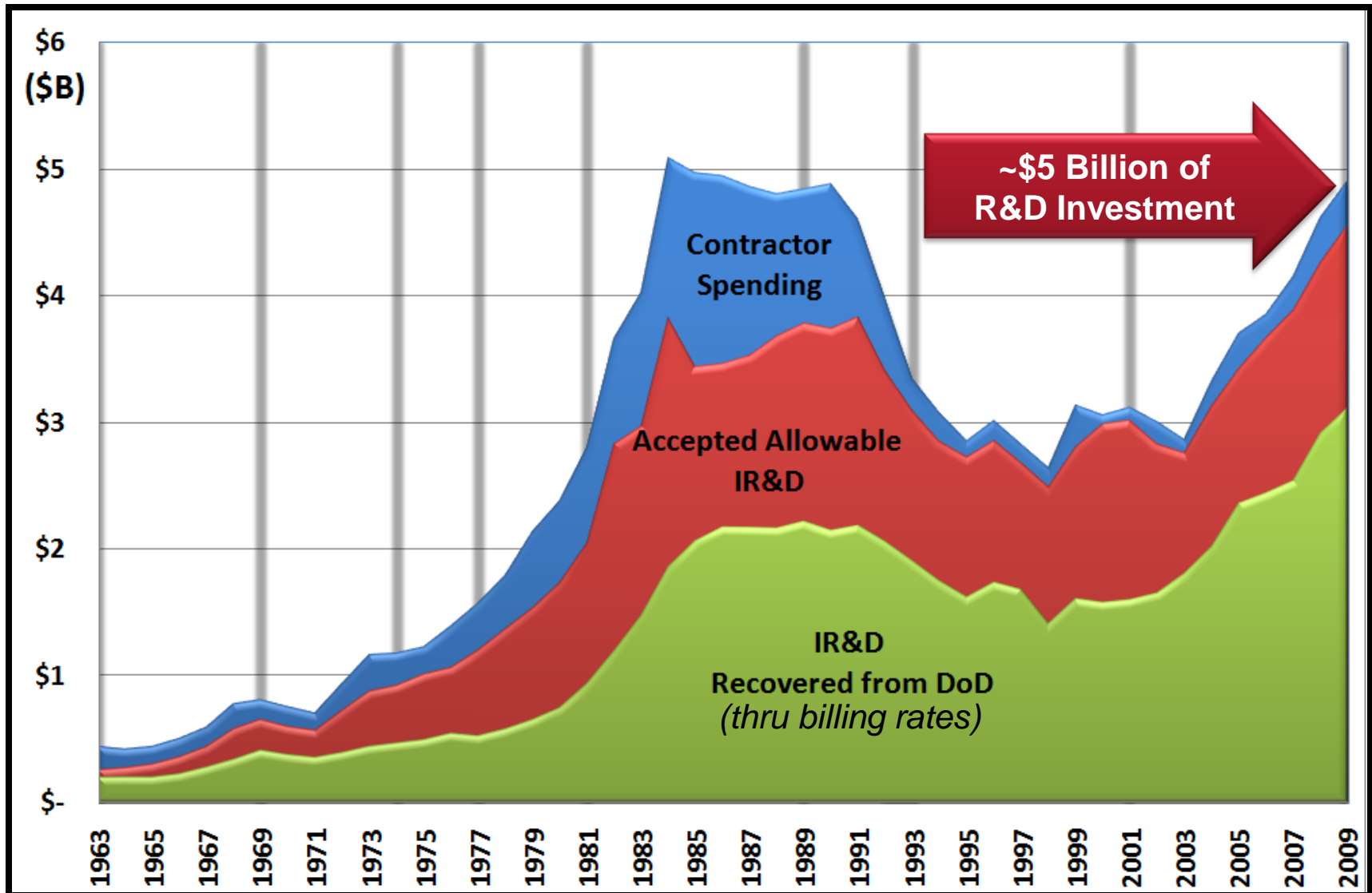


IR&D Informs the S&T Needs and Solutions Process





IR&D is Worth our Attention





AF/Industry IR&D Workshop



2 Year Cycle

AF Transmits
Tech Needs/Gaps
To Industry

Gov → Ind

Understanding
Industry's
IR&D

Ind → Gov

Partnering
Opportunities

**Ind & Gov
Assess/Align
Investment Strategies**

- AF S&T POM
- Industry IR&D

Coordinated with Major AF & Industry Events

Step 1

Step 2

Step 3



Step 1: Topic Selection



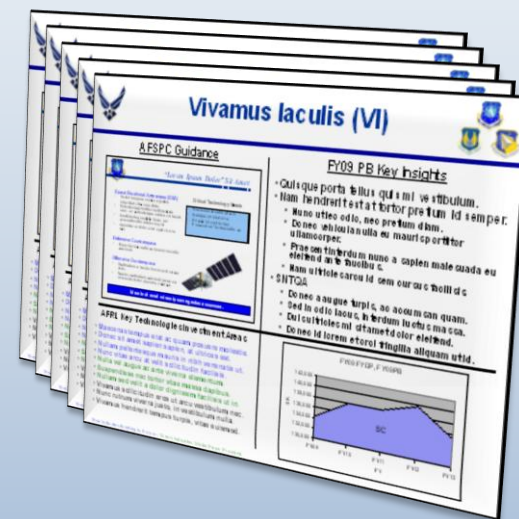
Workshop
Planning
Team



Needs



Solutions & Gaps





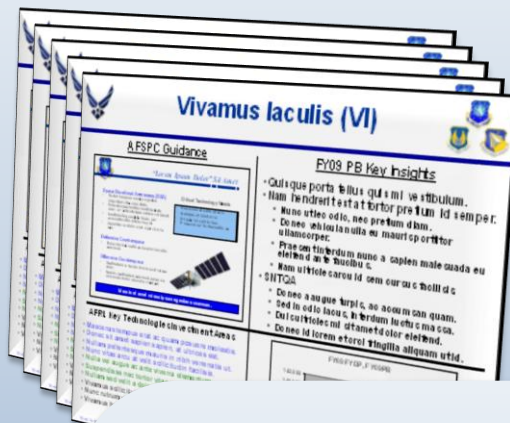
Step 2: Focused Industry Response



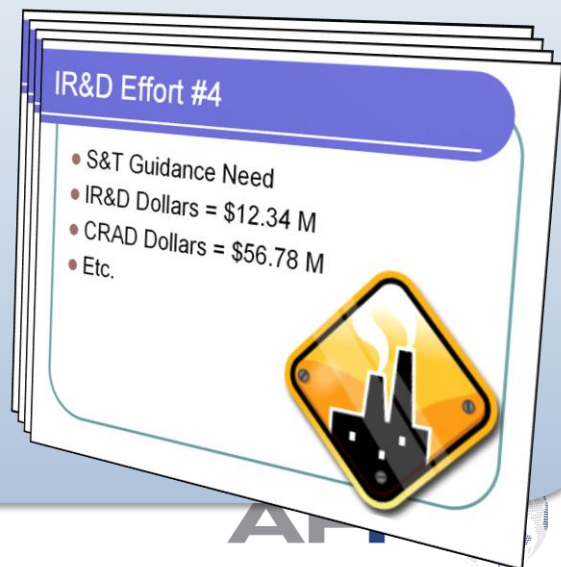
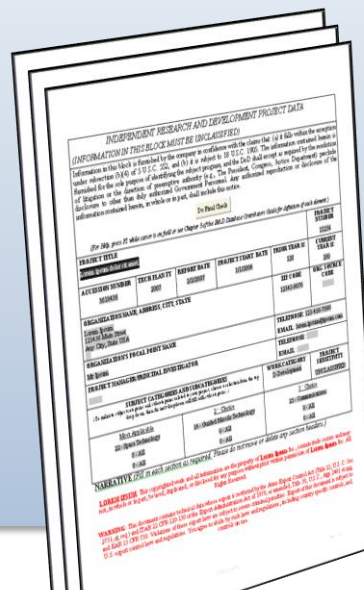
Needs



Solutions & Gaps



Candidate Topics & Presentations





Step 3: Low Hanging Fruit



Solutions

Tweaked 4 contract bids based on Step 1 info & won all 4.

Cand

Presentations

“These workshops help us focus our IR&D projects to our customer.”

“I’m lead in this tech area and was not aware your company was doing that!”

IR&D Effort #4

Guidance Need

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Space Technology Interchange Workshop



- **Key Technology Areas Covered**

- Launch Detection
- MILSATCOM
- Operationally Responsive Space
- Spacecraft Power
- Space Situational Awareness/Command & Control
- Routine Launch: Pathfinder Demo
- Spacecraft Propulsion
- Pervasive Tech - Rad Hard Electronics

- **9 Major Defense Contractors Participated**

- **102 IR&D abstracts submitted**

- **68 industry IR&D projects briefed**

- 25% of Space IR&D investments (\$281M) apply to Step 1 needs
- “Well aligned with SMC needs ... real potential to add value to SMC acquisition.”



Space Technology Interchange Workshop



- **Topic areas pursued**
 - **Standardized SSA modeling & simulation**
 - 5 KTRs interested
 - Drafting CRADA template
 - **Communications (RF, SAT)**
 - Discussion with KTR on collaboration



IR&D Schedule FYs 11-12



Product Center	AF Tech Needs Briefings	Industry IR&D Briefings
Space	6-7 Apr 2010	6-8 Oct 2010
Electronic Systems	22-24 Jun 2010	7-9 Dec 2010
Nuclear Weapons	2-3 Aug 2011	Dec 2011
Air and Sustainment	1-3 Nov 2011	Apr 2012
Air Armament	Mar 2012	Jul 2012
Space	May 2012	Sep 2012
Electronic Systems	Jun 2012	Oct 2012



IR&D Schedule FYs 11-12



MAJCOM: Service Core Function(s)	AF Tech Needs Briefings	Industry IR&D Briefings
	6-7 Apr 2010	6-8 Oct 2010
	22-24 Jun 2010	7-9 Dec 2010
GSC: Nuclear Deterrence	2-3 Aug 2011	Dec 2011
AMC: Rapid Global Mobility ACC: Air Superiority / Global Prec Attack/ ISR AFMC: Agile Combat Support AFSOC: Special Ops	1-3 Nov 2011	Apr 2012
ACC: Global Precision Attack	Mar 2012	Jul 2012
AFSPC: Space Superiority	May 2012	Sep 2012
ACC: C2 / ISR AFSPC: CyberSpace Superiority AFISR/A2: ISR	Jun 2012	Oct 2012



Summary

- **Industry is a key partner in meeting Air Force S&T needs . . . IR&D is essential**
- **IR&D Workshop approach is proven to be an effective interchange forum**
 - **Single Air Force voice on vetted needs**
 - **Focused industry response**
 - **Closer coordination and/or collaboration is win-win**
- **Challenges of aligning IR&D engagements toward SCFs**
 - **Complexity of product center, MAJCOM, and SCF relationship**
 - **Classified information**

Linking IR&D to Air Force Service Core Functions helps achieve strategic priorities for National Defense



Questions?



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