

Headquarters U. S. Air Force

Integrity - Service - Excellence

Joint Expeditionary Force Experiments (JEFX) Lessons Learned



U.S. AIR FORCE

**Mr. Bill Euker
AFC2ISRC/AFEO**

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Overview

- **JEFX Overview**
- **Concept Development**
- **Initiative Selection Process**
- **Evolutionary Acquisition**
- **Design and Planning**
- **Execution**
- **Assessment**
- **Reporting**
- **Pathway to JEFX 06**

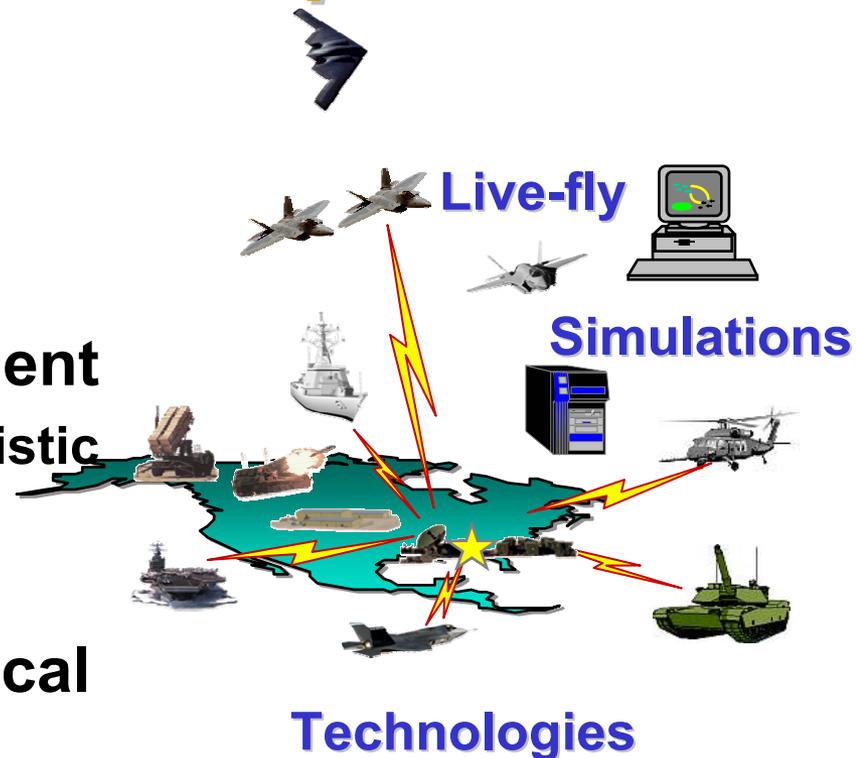


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What is JEFX ?

- **Multi-national, Multi-service**
 - Integration
- **Multi-functional exploration**
 - Spiral development
 - End-to-end process
 - Rigorous assessment
- **Multi-dimensional environment**
 - Controlled, operationally- realistic
 - Live, virtual and constructive simulation
- **A catalyst to accelerate critical warfighting capabilities**

Large-Scale C2 “Experiment”





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Air Force Experimentation Campaign Plan

Year	Past and Planned Experimentation Areas
EFX 98	Distributed Command and Control
JEFX 99	Integration of Air and Space and Coalition Warfare
JEFX 00	Agile Combat Support and TCT
APTX 2001	Alliance Information Sharing
JEFX 02	TCT, ISR Management, and Right-sizing the AOC (Global Strike)
2003	TCT using Paul Revere (an airborne C2 and ISR laboratory) (Global Strike)
JEFX 04	Network Centric Operations: Effects Based Operations, Predictive Battlespace Awareness, Network Centric Infrastructure (Space and C4ISR)
APTX 2005	Network Centric Operations for an Integrated/Responsive Mobility Capability: GDSS II; ACS processes for Base Opening; Tactical Collaboration (Global Mobility and Space and C4ISR)
JEFX 06	Network Centric Operations: Continuous Air Planning and Execution; ISR Fusion; ConstellationNet; HLS/HLD

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Concept Development

- **Senior leadership support is key**
 - Senior mentor involvement helpful
- **Some concepts require long-term campaign**
 - TCT...TST...
 - EBO
- **Collaborative process is required**
 - Doctrine Center, Air Staff, Industry, Battle Labs
 - Well developed concepts with documentation and communities of interest understanding needed
 - AF CONOPS provide experimentation foundation



CONOPS Construct

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Global Power



Global Reach



Global Vigilance



Integration CRRA

Global Strike
CONOPS

Homeland Security
CONOPS

Global Mobility
CONOPS

Global Persistent Attack
CONOPS

Nuclear Response
CONOPS

Space & C4ISR
CONOPS

Agile Combat Support
CONOPS

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Initiative Selection Process

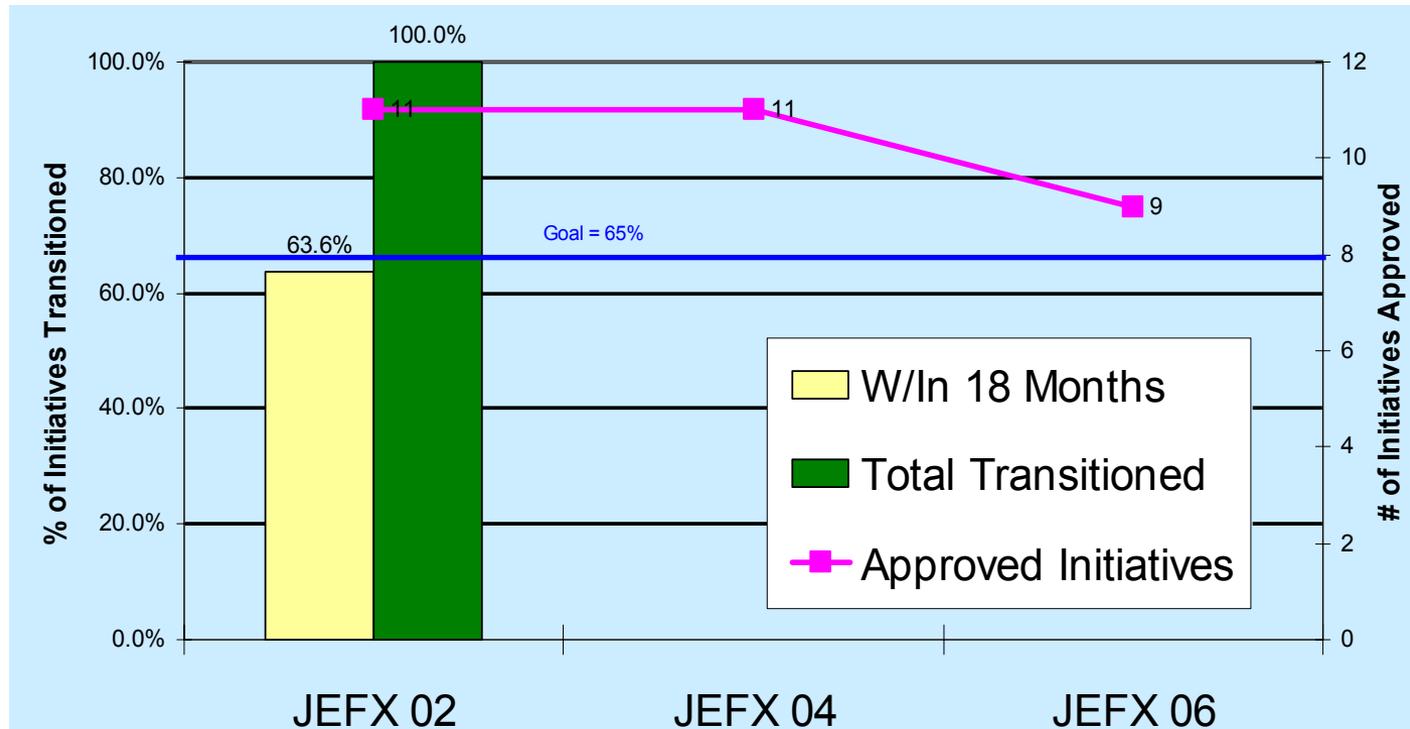
- **Step 1 – Define the Capability Gaps**
 - Capability Review and Risk Assessment (CRRRA) process
 - Functional needs analysis
- **Call for Initiatives**
 - Consider both processes and technology
 - Industry vs AF spiral development IPT portfolios
 - Pay-to-play has worked
- **Initiative Selection**
 - 85 percent able to transition within 6-18 months
 - Standardized Risk, Cost, and Performance criteria needed
 - Classified and Joint initiatives need to be part of process



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Evolutionary Acquisition

- Require initiative Transition Plans before EndEx
- Require sponsor commitment to POM for sustainment
- Involve the System Program Office early in the process
- Program funds to transition initiatives
- Staff to manage transition





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Experiment Enterprise

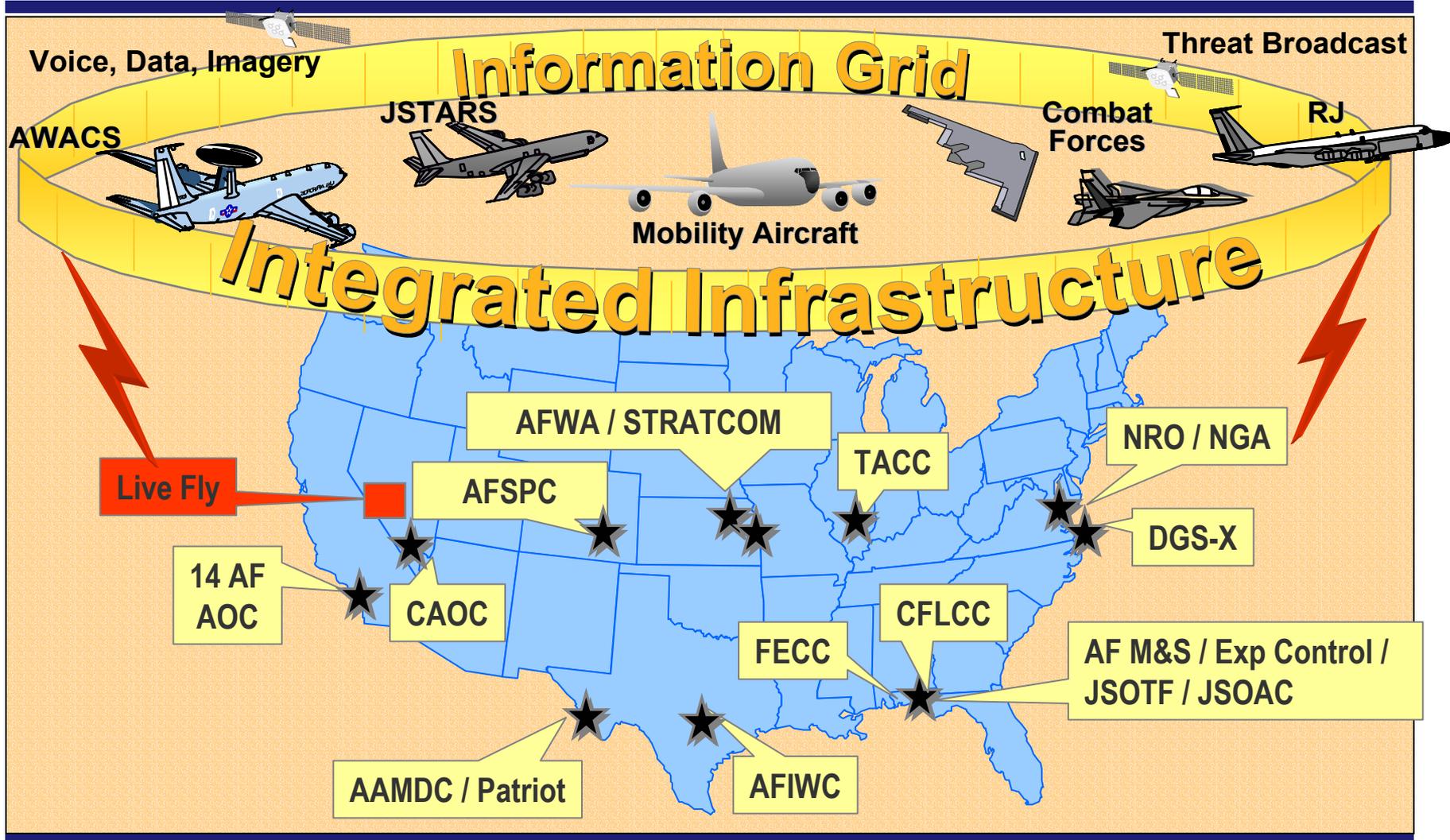
- **An established core team is key to success**
 - **“The Experiment Enterprise”**
 - **Engineers, professional control force, experiment management, assessment, communicators, operators**
- **Team embedded in existing organizations enables networking and management flexibility**
- **Senior mentors provide useful role in advising control, assessment and operators**
- **Team continuity crucial**

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JEFX 04 Distributed Sites

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Collaboration via a Portal *Jefxlink.langleley.af.mil*

Air Force Experimentation Office Discreet Portal - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Media Print

Address <https://jefxlink.langleley.af.mil/index.asp> Go Links 1stCmd JEFX Google AFLinK Deltex YCSD

JEFX 2006 PLANNING Home [Change] New Messages (10) | My Profile | Logout

EXPERIMENTS

[JEFX 06 Portal](#)
[APTX 05 Portal](#)
[JEFX 04 Portal](#)
[JEFX 02 Portal](#)

FINAL REPORTS

[JEFX 04](#)
[JEFX 02](#)
[APTX 01](#)
[JEFX 00](#)
[EFX 99](#)
[EFX 98](#)

[Lessons Learned](#)

PORTALS

[Branch Portals](#)

WEBTOOLS

[Registration](#)
[Assessments](#)
[Op Threads](#)
[Initiatives](#)
[Tasks](#)
[Surveys](#)
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Welcome, **MR. WILLIAM EUKER**

Joint Expeditionary Force eXperiment (JEFX) 2006 Portal

PLANNING

[What is JEFX2006](#) [\(Site Security/Contact Information\)](#)

<< What would you like to do? >>

Register For:

- [Conferences](#)
- [Events As A Working Participant](#)
- [Events As A Visitor](#)
- [Events As A Distinguished Visitor](#)

Request:

- [Non-Mil/Gov Portal Access](#)

Submit:

- [Problem Report](#)
- [General Observation](#)
- [View My General Observations](#)

JEFX2006 File Search

This search will locate JEFX2006 file that have been authorized for global release.

[Advanced Search](#)

Separate multiple words or phrases with a semicolon ";"

[Notify Me When New Files Are Published](#)

Global Surveys

!!! Screen Resolution And Monitor Size Survey !!!

If you, our user, we request that you answer a few questions. Thank you for taking the time to answer our survey in another experiment portal, please decline this one. - AFEO Webteam

[Take survey](#) | [Decline survey](#)

NOTE: This notification will disappear after taking or declining the survey.

File Collaboration Area

- [-] **Capability Development Teams**
 - [ConstellationNet \(CN\)](#)
 - [Continuous Theater Air Planning/Execution](#)
 - [Homeland Security](#)
 - [Intelligence Surveillance Reconnaissance \(ISR\) Fusion](#)
- [-] **Conferences and Events**
 - [Concept Development Conference \(CDC\)](#)
 - [Critical Design Review \(CDR\)](#)
 - [Initial Design Review \(IDR\)](#)

ALT WORKSPACE Address <http://> Go Use frame border to adjust frame size.



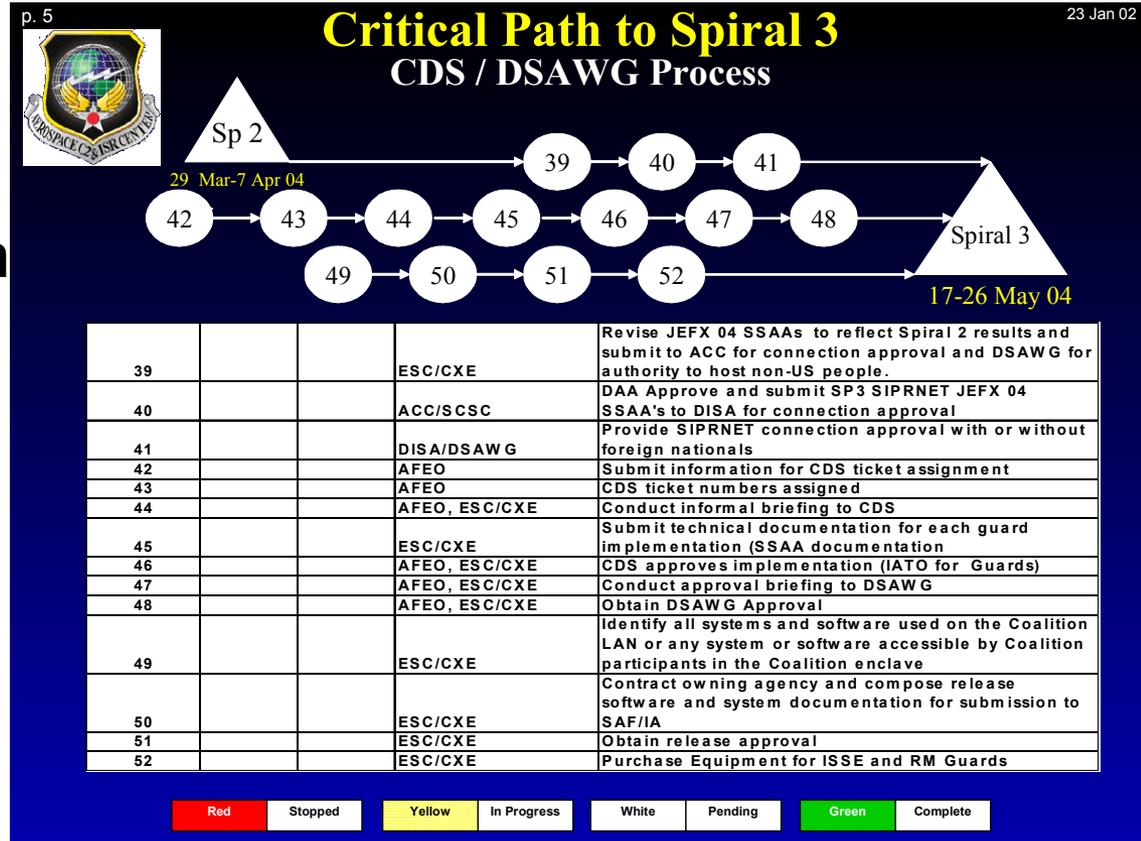
Web Tools



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Design and Planning

- Coalition involvement requires long-term effort, additional resources, and senior leadership commitment

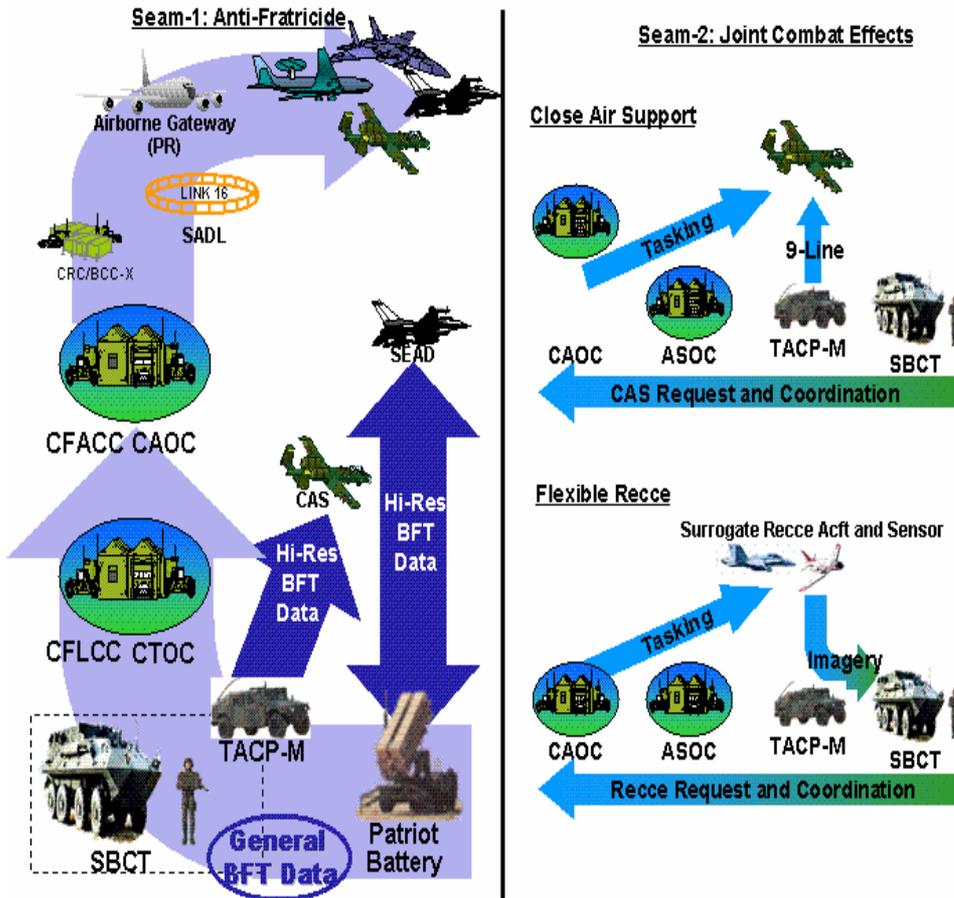


- Operational threads are a useful experiment design and assessment framework



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Army Close Air Support, Situational Awareness (ACASSA)



- Addressed CSAF guidance to close AF-Army seams in Blue Force Tracking (BFT), close air support, and flexible reconnaissance
- JFCOM/J8 used this initiative to partially satisfy Congressional requirement to do BFT experimentation
- Navy participated using their F/A-18 to receive BFT in the cockpit

PORTALS
 Branch Portals

WEBTOOLS
 Registration
 Assessments
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 Initiatives
 Tasks
 Surveys
 Forums
 Chatrooms
 Journal

Search Files
 Search Users
 File Workspace

Problem Reports Administration

COMMUNICATIONS
 New WEM Message

LIVE HELP OFFLINE

Admore S.
 Borden D.
 Church K.
 Euker W.
 Finch R.
 Green P.

Joint Expeditionary Force eXperiment (JEFX) 2006 Assessment Toolset

Operational Threads

[Assessments Main](#)

[Op Cap Deficiencies](#)
 [Initiative Core Capabilities](#)
 [Initiative Information](#)
 [Detailed Analysis](#)
 [Initiative Summary](#)

Operational Capability - The ability to execute a specified course of action (JP 1-02). Inherent to a capability are the organizations and people, processes and technical means used to accomplish a military task or mission. Standard capabilities are found in the Master Capability Library Version 5.5.

[View All Threads](#) | [Full OpCap Report \(Basic - XLS\)](#) / [\(Basic - HTML\)](#)

#	Deficiency Title	Description	Applicability	Node	Requirement
01	Level 0 Fusion of Real-time External AOC Data	There is currently a deficiency in our ability to receive real-time data from organizations external to the AOC and perform Level 0 fusion on that data. The A version of this operational thread describes the "As Is" or baseline process and tools.			

#	Control	Thread Title	Description	Baseline	CDT
Fusion 1.1	Hide Tasks/MOE Thread Report (Basic) Thread Report (Detail)	Fusion for Initial SA		False	PBA

Thread Measures Of Effectiveness

There are no Measures Of Effectiveness (MOE) for this thread.

Thread Tasks & Initiative Core Capabilities

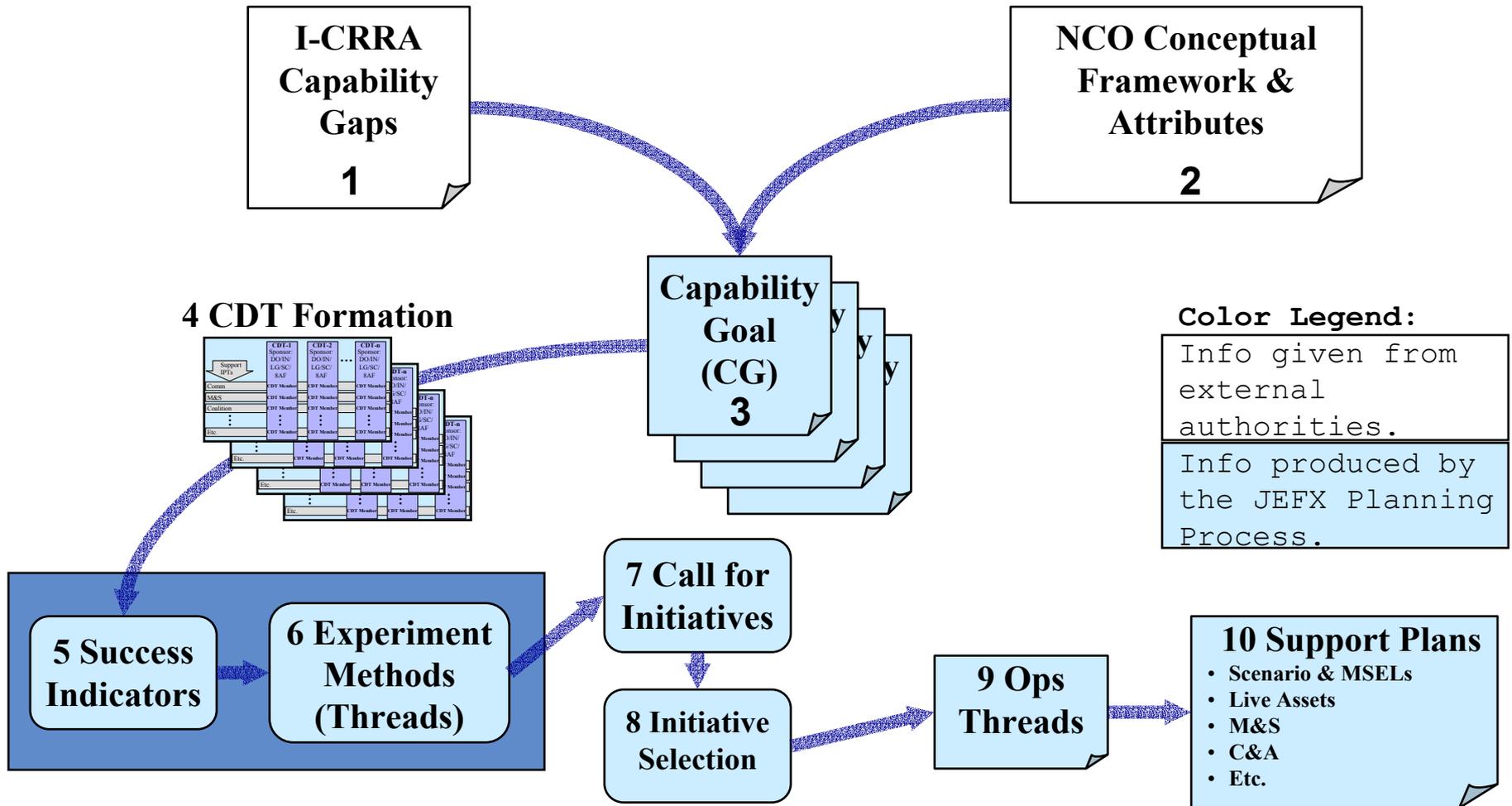
#	Task	MOP/THRESHOLD	Initiative	Location	Operators	Stimulus	Applications
8	Assess Task Fusion 1.1.1	Receive data from remote			NTISR, ...		

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Design Process Overview



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Planning

- Configuration control is a process that requires a tracking and collaboration tool – Operator, Position, System, Application, Training, Hardware (OPSATH)

CREW POSITION	PNum	ULN	Site	Bldg	Floor	Room	Seat	Computer	UserLogin	ID Assgnd	PC Scr	CPCC Assr
TOTAL JEFX ENTERPRISE			SUB TOTAL					636	0	0	695	54
TOTAL STRATEGIC SITES (NON-NELLIS)			SUB TOTAL					0	0	0	0	1
TOTAL NELLIS ENVIRONMENT			SUB TOTAL					636	0	0	695	53
NELLIS UPRANGE AND COMPOUND			SUB TOTAL					119	0	0	120	0
CAOC-N SUPPORT-ASSESSOR-CONTROL			SUB TOTAL					121	0	0	73	53
CAOC PARTICIPANT STAFF (P00-P11)			SUB TOTAL					396	0	0	502	0
CFACC & STAFF (P00)			SUB TOTAL					17	0	0	26	0
CFACC LEADERSHIP (P00)			SUB TOTAL					14	0	0	20	0
CFACC (Floor)	P00	001	KLSV	202	1	120	C4	1	cfacc		2	
CFACC (Office)	P00	001	KLSV	202	2	218	A1	2	cfacc		2	
Commanders Conference Room	CONF	001	KLSV	202	2	211	211	1	cfacccon		1	
ADVISOR TO CFACC 2	P00	002	KLSV	202	1	120	C3	1	acfacc2		2	
DEP CFACC RAF	P00	003	KLSV	202	1	120	C5	1	dcfacc		2	
DIRMOBFOR	P00	004	KLSV	202	1	120	C2	1	dirmob4		2	
ADVISOR TO CFACC	P00	007	KLSV	202	2	218	A2	1	acfacc1		2	
CFACC AIDE	P00	008	KLSV	202	2	218	A3	1	cfaccade		1	



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Execution

- **Spiral development process benefits from permanent infrastructure**
- **Professional control force is not a luxury**
- **Experimentation is harder than “real-world”**
- **Combined large-scale exercise and experiment is not ideal**
- **End-to-end validation requires live fly**



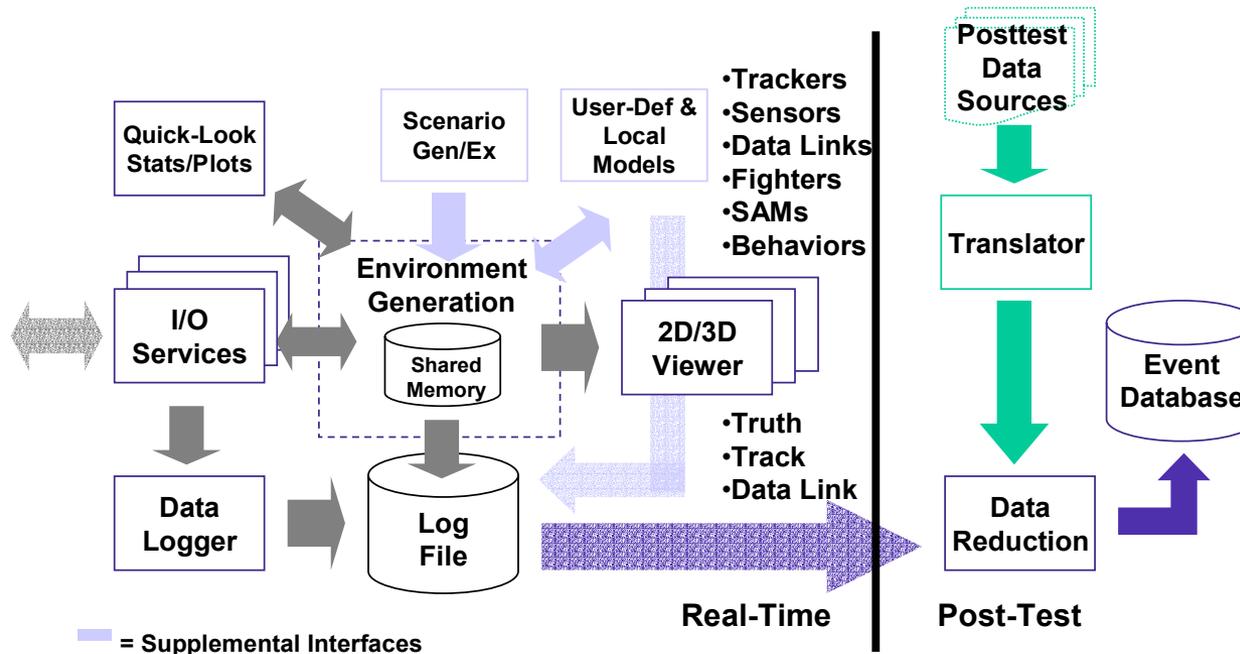
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Assessment

- Data Collection, Translation, & Visualization:
 - Real-time & Post-test Input
 - Translation into Common Format and Storage



- Ground-truth and timely C2 debrief is a challenge
- Automate data collection and analysis to meet timeline



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Reporting

- Web-based reports
- Use portal and document management tools for report writing
- Write reports on network that supports release
- Frame recommendations in DOTMLPF terms, validate with senior leadership, and track actions



JEFX 06 Way-ahead

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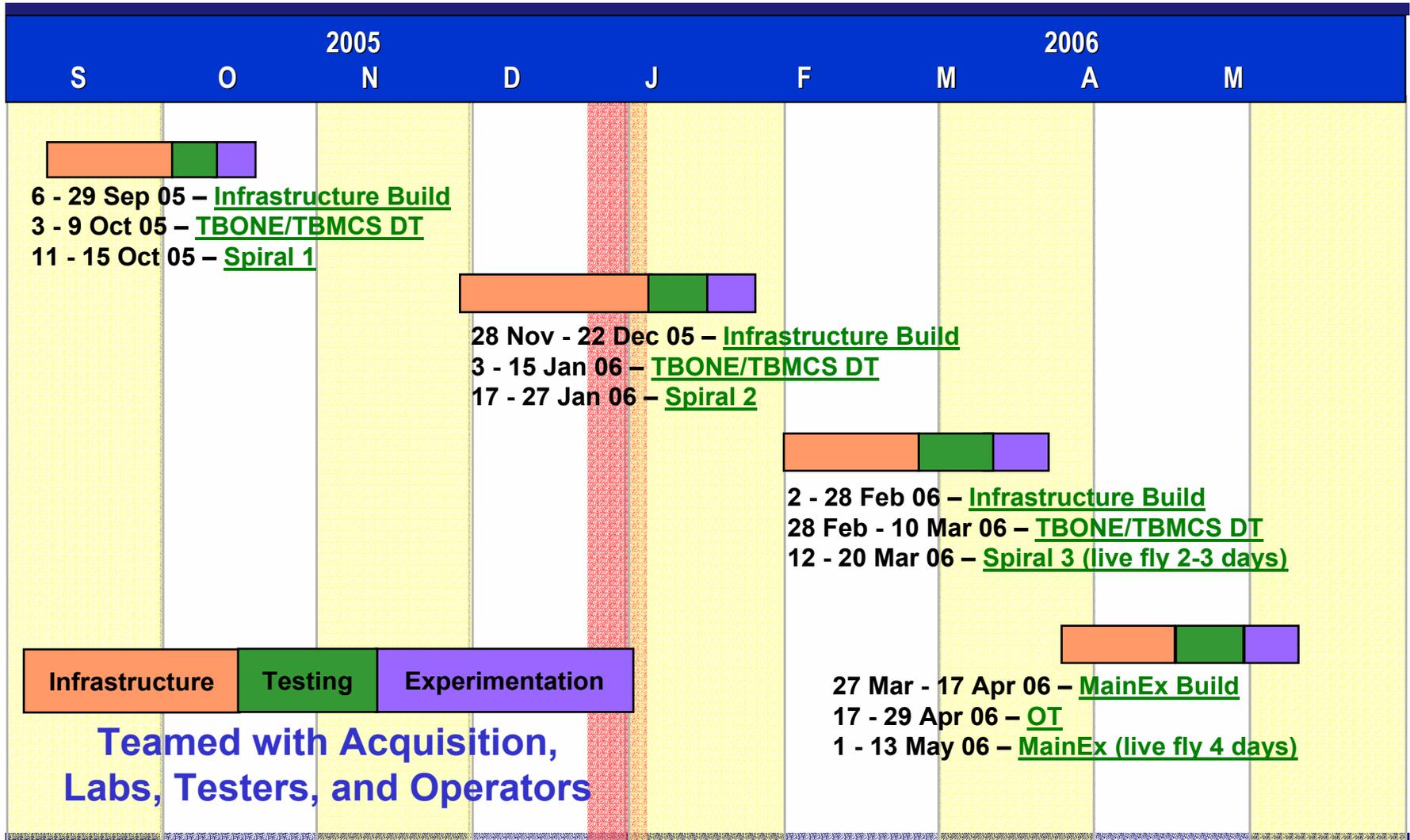
- **Achieve and field four capability goals with Joint and Coalition play (4-Eyes) using a JFCOM-approved, real-world scenario**
 - **Continuous Air Planning and Execution (CAPE)**
 - **ISR Fusion (ISR)**
 - **ConstellationNet (CN)**
 - **Homeland Security / Defense (HLS/HLD)**
- **Accomplish four overall effects**
 - **Tighten CAOC integration: reduce applications, H/W, and seats via TBONE**
 - **Prepare for fielding of TBONE by conducting DT/OT**
 - **Expand datalink use**
 - **Extend network to link Operational-to-Tactical**

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JEFX 06 Draft Major Event Schedule Spirals & MainEx



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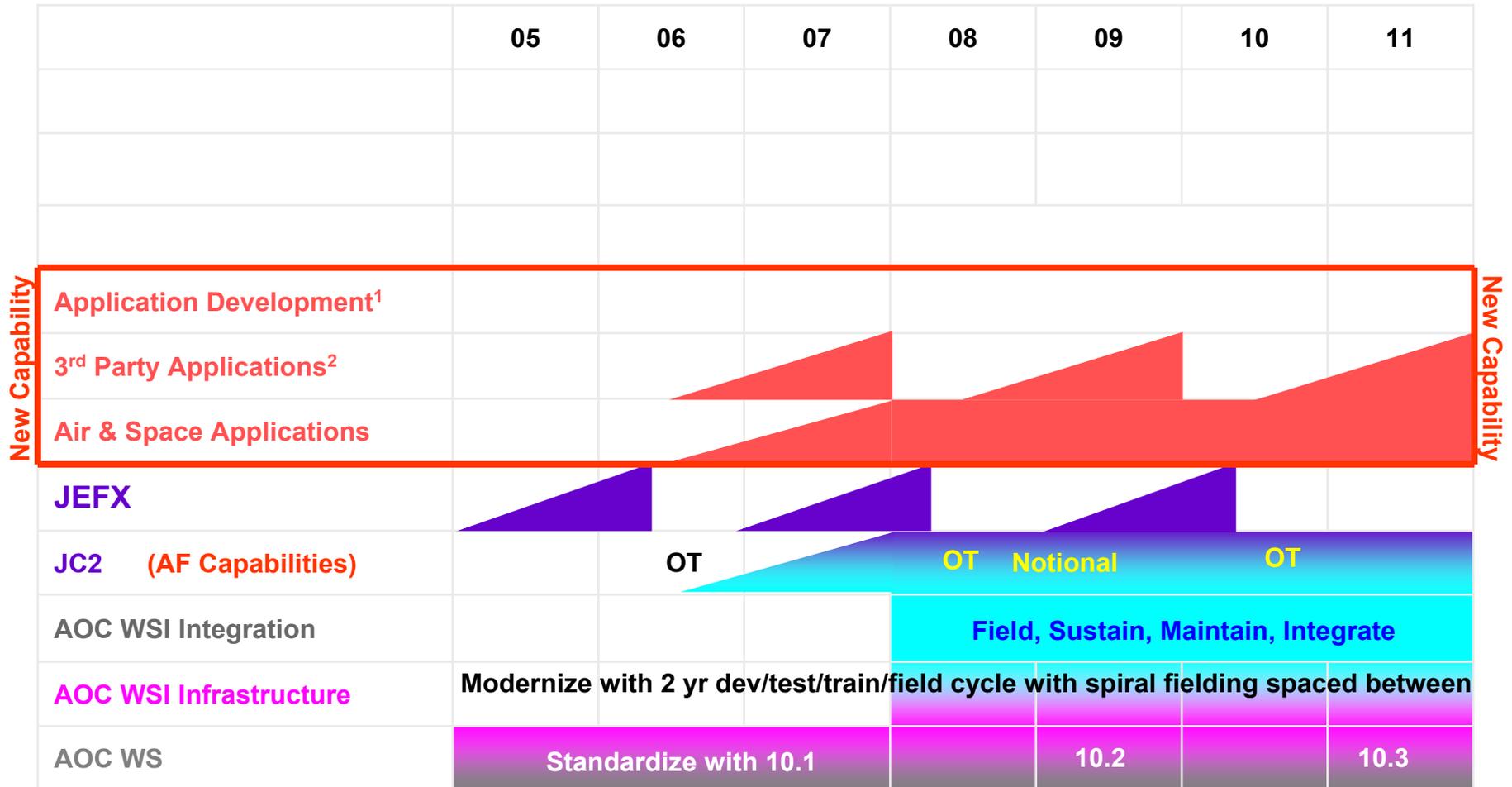
Summary

- **JEFX has captured Experimentation Management Lessons Learned since 1998**
- **Design, Planning, Execution, Assessment and Reporting of large-scale C2 experiments continues to evolve**
- **JEFX 06 will continue to explore innovative ways to speed the transition of capabilities to the warfighter by pushing the envelope and leveraging test and experimentation**



Operational Level Way Ahead

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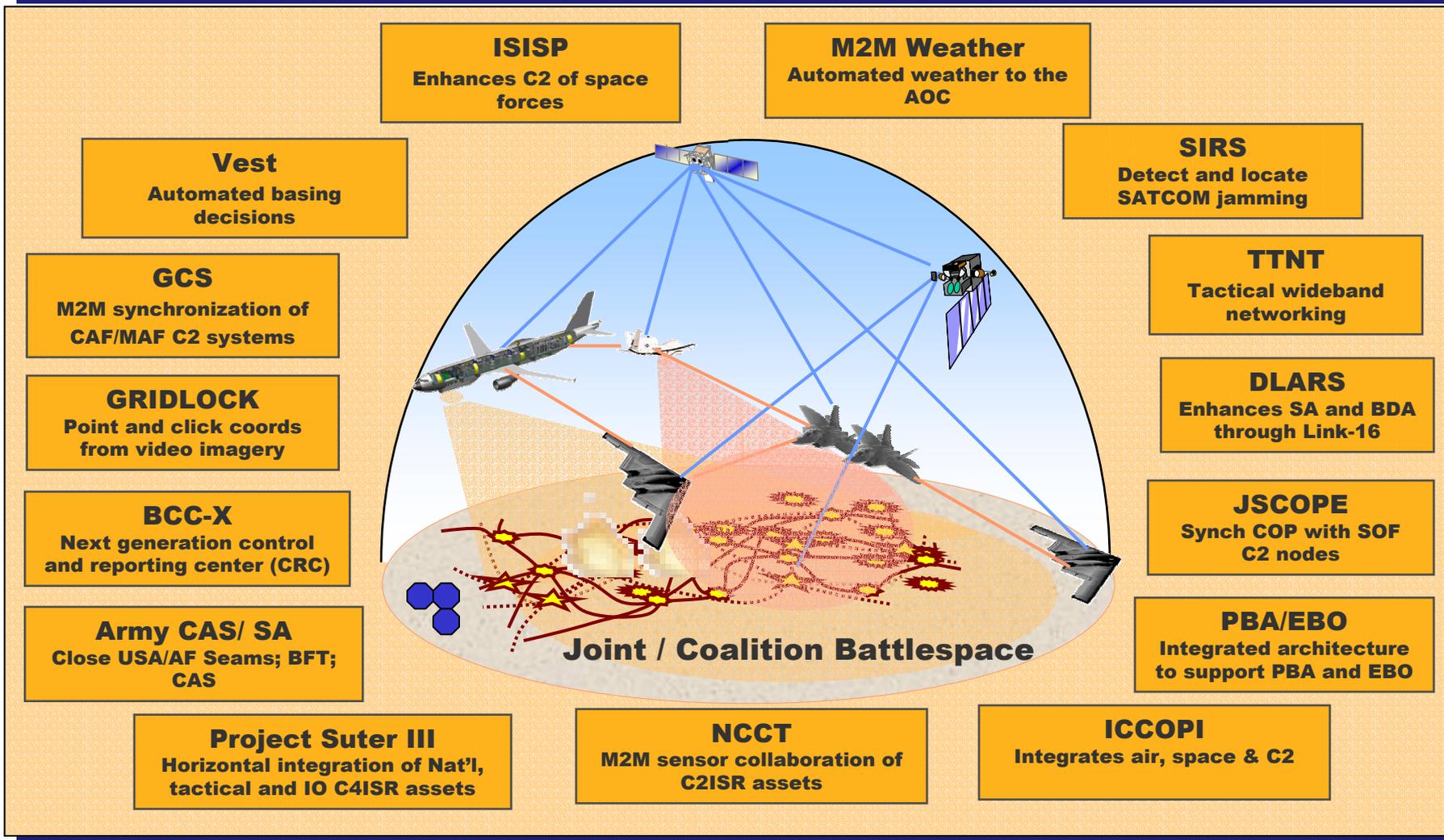
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JEFX 04 Initiatives

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JEFX... accelerating capabilities to the warfighter



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What's Come Out of JEFX?

Empirically validate capabilities

Processes

Developing and Refining Warfighter Processes



- Used Non-traditional sensors (2002)
- Reduced TPFDD from 2 days to 4 mins (1999)
- Integrated Space into AOC operations (1999)

- Developed Coal Warfighter IO Tools (2000)
- Improved Dynamic ISR Management (2002)

- Reduced the Combat Search and Rescue tasking timeline to < 1 hour (2002)

- Enhanced Distributed Ops (1999)
- Reduced MAAP by 30% (2002-2004)

- Decreased Time Critical Targeting from hours to minutes (2000-2004)

- Designed AOC IM Plan (1999-2004)

- Time Sensitive Targeting (2004)

- Agile Combat Support Processes (2004)



Evaluate emerging technology

Systems

Rapidly Transitioning Warfighting Systems



- Theater Battle Management/ Space Battle Management Core Systems (1999)
- Combat Track II (1998)
- ADOCS (2002)
- Project Suter III (2004)
- ACE Portal (2004)

- Broadsword (1999)
- B-2 C2 for Rapid Halt (1999)
- Global Air Mobility Operational Display (1999)
- B-1 Enroute Retargeting Capability (1998)
- Collaborative Tools (1998-2002)
- Agile Combat Support Logistics Tools (1999)
- Time Critical Targeting Functionality (2002)
- Moving Target Information Exploitation (2000)
- Machine to Machine Weather (2004)
- Multi-Asset Synchronizer (2004)
- SATCOM Interference Response System (2004)

Provide DOTMLPF Recommendations

Networks

Improving Warfighter Information

- Established baseline for AOC (2000)

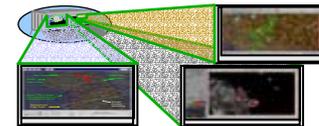
- Increased the TCT prosecution success by 90% using datalinks (2000)

- Implemented first-ever theater-wide Integrated Services Digital Network (2000)

- Slashed decision cycle with 600% increase in data/video throughput (1998)

- Used airborne platform to direct ISR sensors and strike platforms- a first (2002)

- Developed an affordable COTS solution for distributing Predator and other ISR video to multiple locations (1999)



- Reduced effects of satellite latency from 2 hrs to 11 mins (1998)

- Integrated AccessNet and Global Broadcast Service (1999)

- Validated and increased LAN speed 10X using GigE (2000)

- Tactical Targeting Network Technology (2004)

- Network Centric Collaborative Targeting (2004)





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MainEx – Exp 1st

17 Apr – 11 May 06

Sun	Mon	Tue	Wed	Thu	Fri	Sat
16 Apr 06 Easter – OFF	17 Apr 06 Players Arrive	18 Apr 06 In-Brief	19 Apr 06 MiniEx	20 Apr 06 LF Arrival	21 Apr 06 Aircrew Tng	22 Apr 06 Live-Fly
	Experimentation					
	Experiment Training					
23 Apr 06 Backup	24 Apr 06	25 Apr 06	26 Apr 06	27 Apr 06	28 Apr 06 LF Hotwash	29 Apr 06 MainEx H/W & RTB
	Live-Fly					
	Experimentation					Config Reset
30 Apr 06 Backup	01 May 06 Config Rst & OT Tng	02 May 06	03 May 06	04 May 06	05 May 06	06 May 06
	OTRR	Regression Testing			Operational Testing	
	Data Reduction/ Quick Look Prep				AIPT RTB	
07 May 06 Backup	08 May 06	09 May 06	10 May 06	11 May 06	12 May 06 Save Test Config	13 May 06 CAOC T/D
	Operational Testing					MF 39

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