



PR Conference

COMBAT SURVIVOR EVADER LOCATOR (CSEL) DEVELOPMENT

**Personnel Recovery Conference
Washington, DC
January 22-24, 2001**



Combat Search and Rescue

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- **VIETNAM**

- AF--Lost 1 SAR Crewman for every 9.2 rescues
- Navy--Lost 1 for every 1.8

- **DESERT STORM**

- 5 of 10 Air Crew Captured
- US Army UH-60 Lost (5 Killed, 3 Captured)

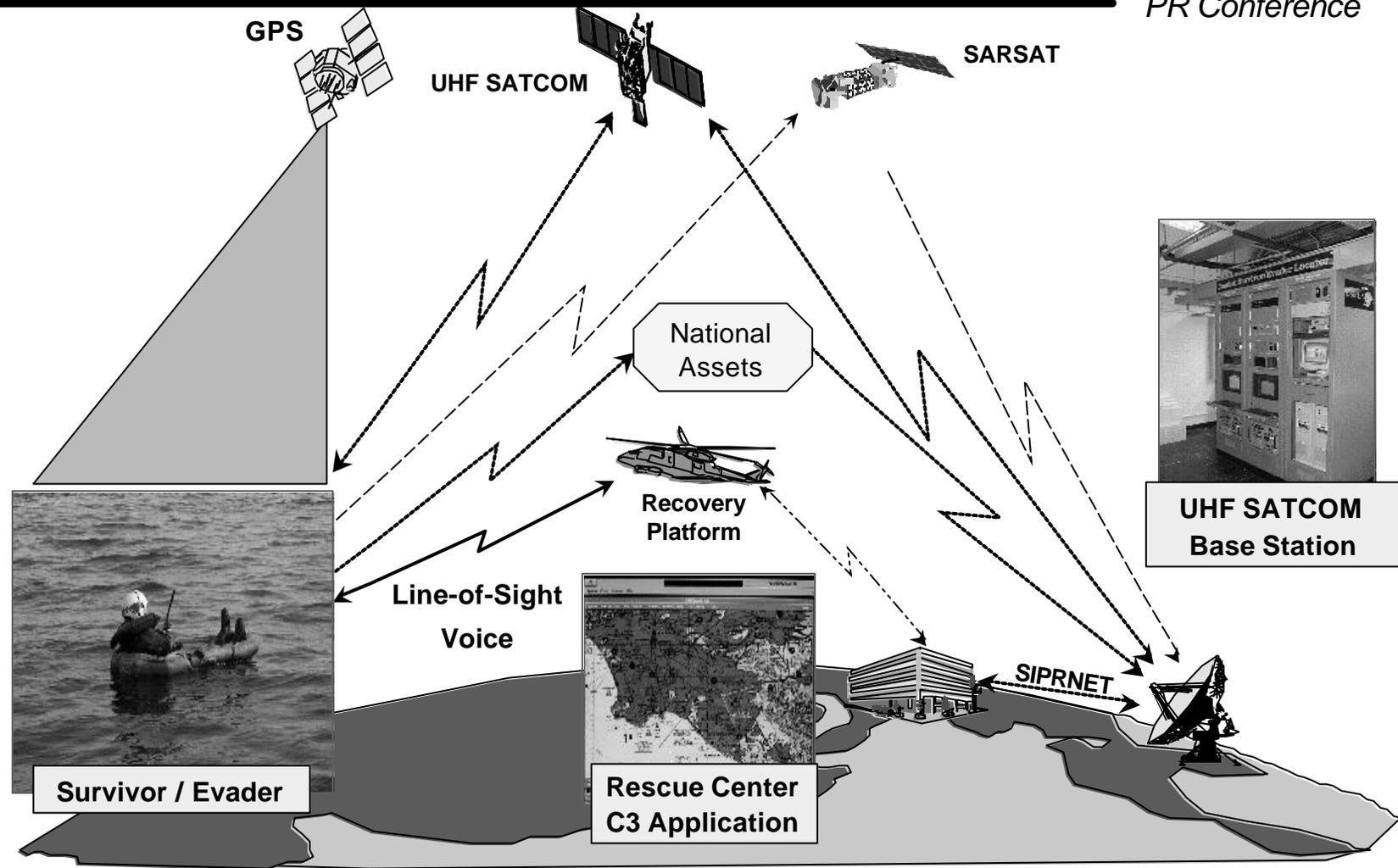
- **BOSNIA**

- Capt O'Grady's Location Unknown For 6 Days
- Evader and Rescue Forces Spent Much of Their Time "Listening"

***Current Survival Radios Put Survivor
and Rescue Forces At Risk***

CSEL System Architecture

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CSEL SYSTEM DEVELOPMENT

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- **Development challenges**
 - Requirements growth
 - Technological hurdles
 - Funding instability
- **Successes**
 - Evolutionary Acquisition
 - Spiral Testing
 - IPT Structure

REQUIREMENTS GROWTH

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- UHFSATCOM Requirements Growth
 - Demand Assigned Multiple Access-Compatible (DAMA-C) – no other user until 2004
- Radio Encryption – Upgrade from commercial to NSA
- Defense Information Infrastructure – Common Operating Environment (DII COE) Level 7
 - Significant effort on a moving target
- GPS SAASM module – CSEL is a pathfinder
 - New technology
 - Security Coating

TECHNOLOGICAL HURDLES

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- Development of multi-mode multi-band Worldwide communications capability within hand-held radio form factor/power constraints
 - UHFSATCOM two-way encrypted data
 - Low Probability of Exploitation (LPE) waveform
 - Search and Rescue Satellite (SARSAT) for Polar coverage
 - Next generation GPS security features
 - High pulse power, long life & low weight battery chemistry
 - Software reprogrammable for future growth

CAPABILITIES CHALLENGE

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*CSEL - 287.2 Ounces of Capability
in a 32 Ounce Package*

406 SARSAT
Beacon
35.2 Oz

P(Y) GPS
Receiver
48 Oz

LST-5
SATCOM
Transceiver
176 Oz

PRC-112
LOS SAR
Radio
28 Oz

**CSEL
32 Oz**

FUNDING INSTABILITY

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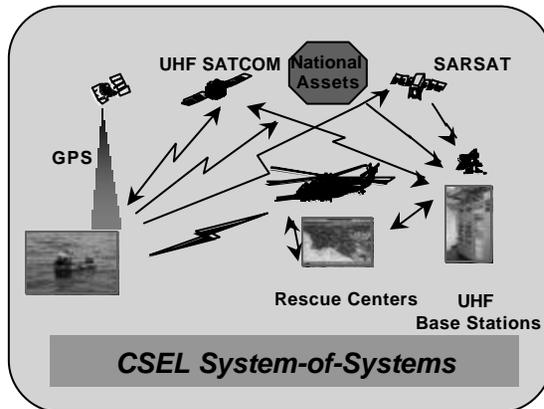
- Original program funding not balanced with the eventual requirements set
 - Short duration, top-down, development plan
 - 18 month medium/high risk development effort
 - 1-year delay shifting production \$ to development \$
- Economic production requires FYDP increase
- No sustainment funding – still needs to be addressed

CSEL ACQUISITION STRATEGY

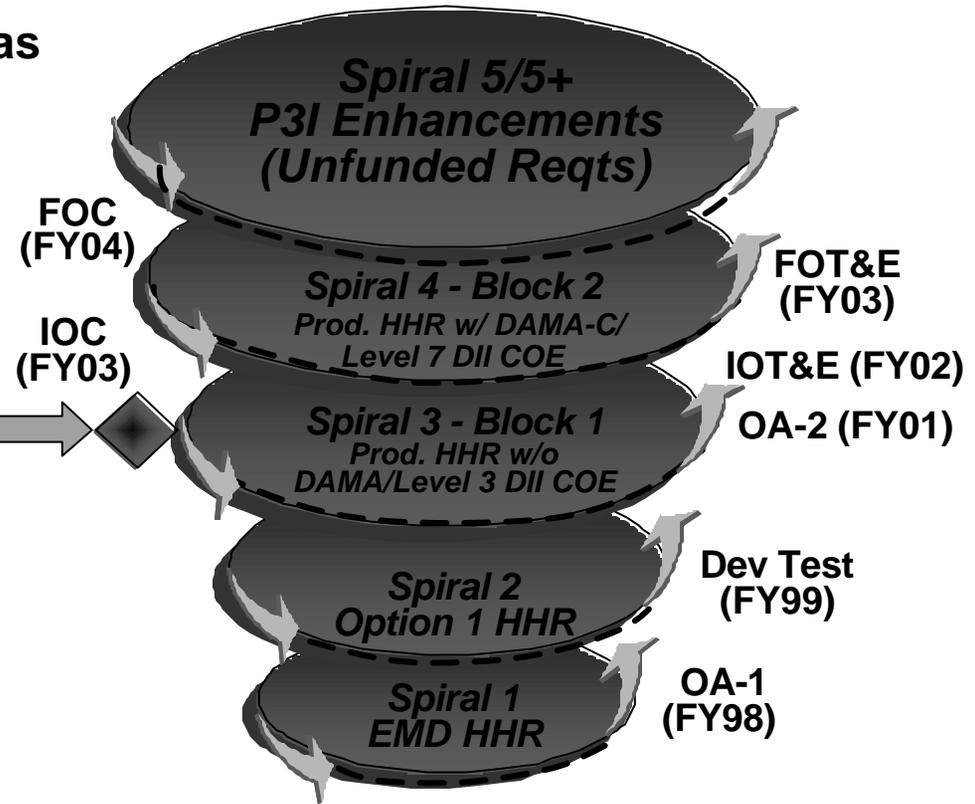
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- Block 1/Block 2 approach validated by JROC in FY00 ORD:

- Fields capability as soon as possible
- Reduces technical and schedule risks
- Provides opportunity for user feedback



Evolutionary Acquisition

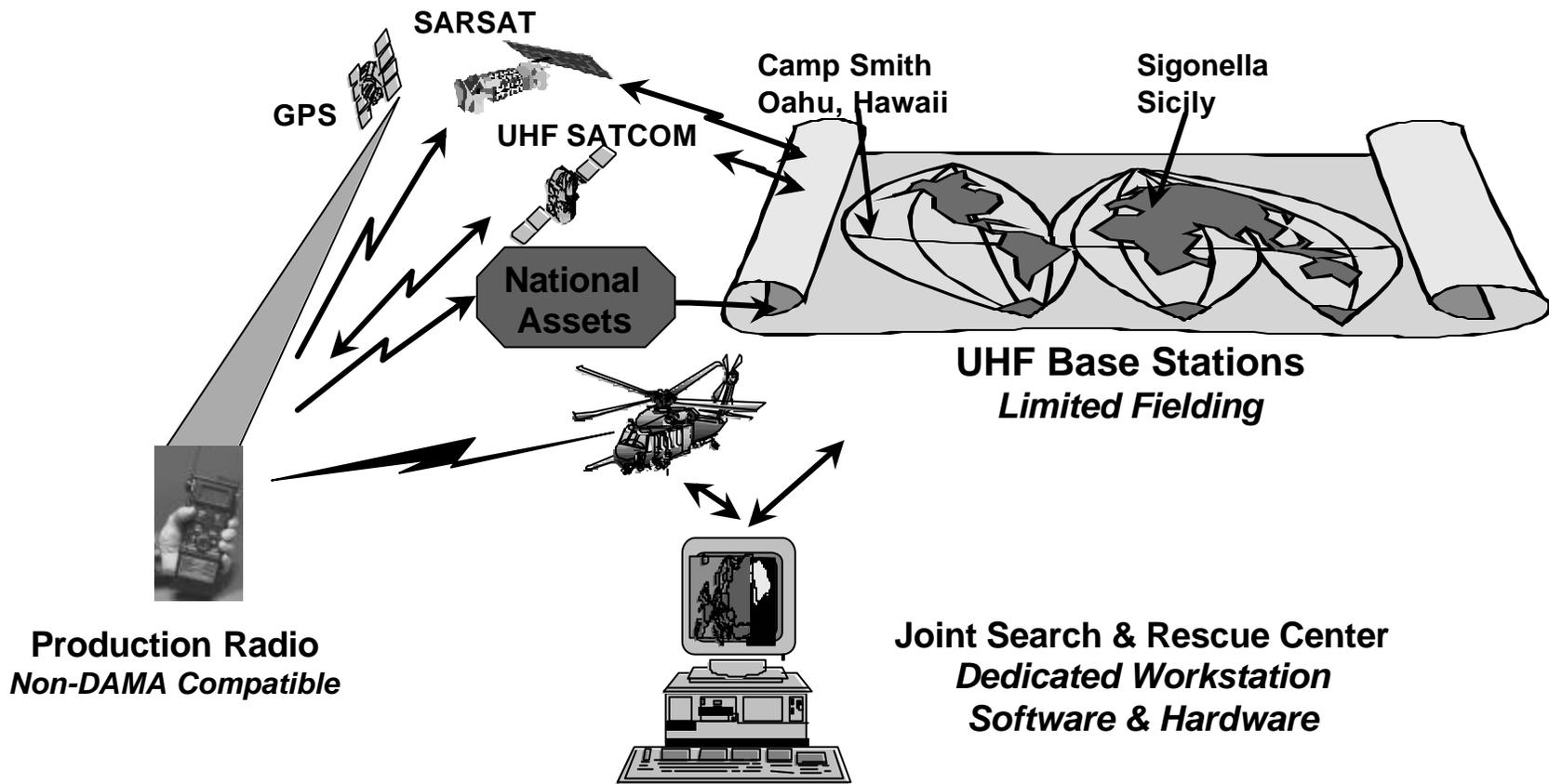


Contract Award (Feb 96)

CSEL ACQUISITION STRATEGY

Block I Configuration

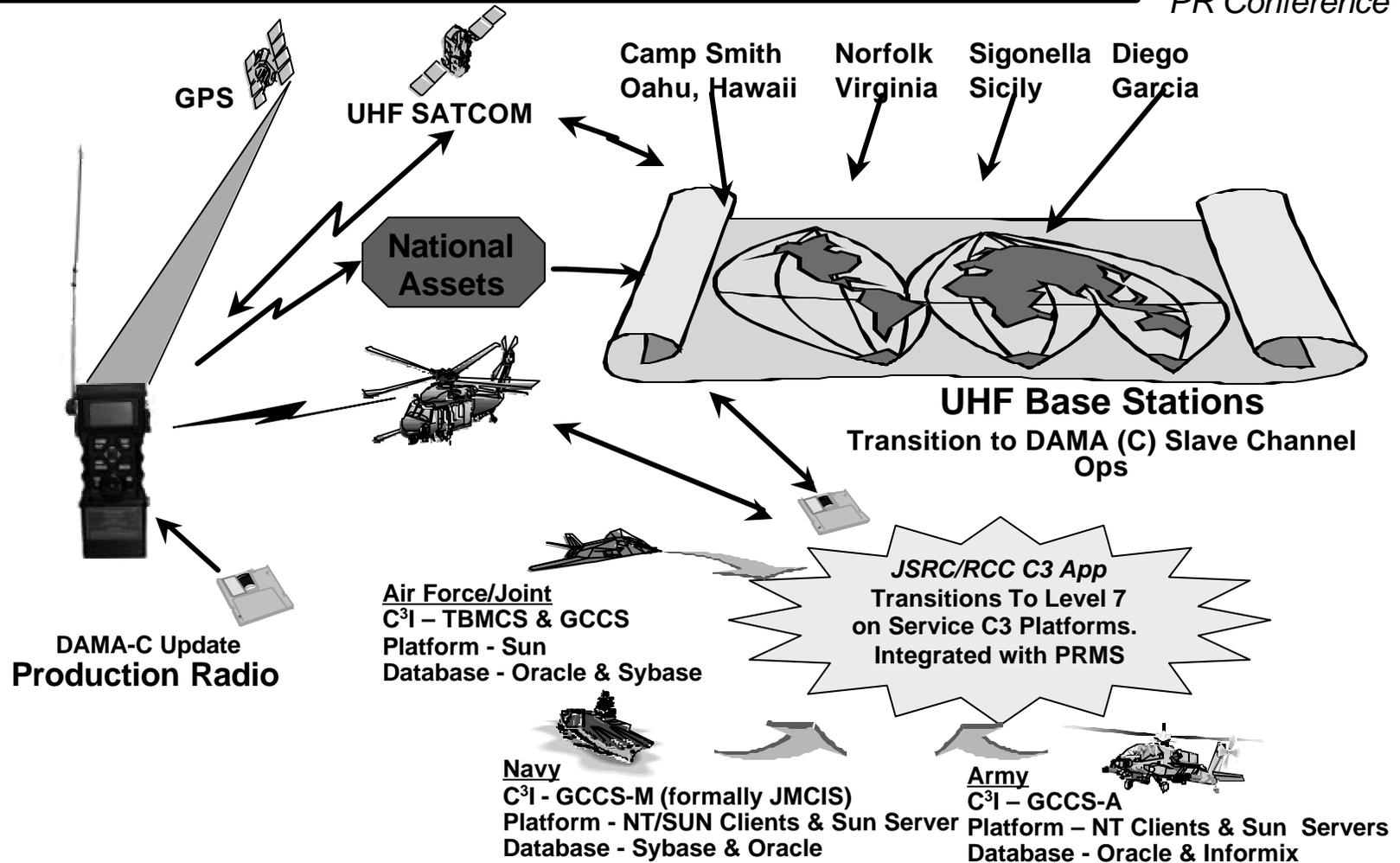
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CSEL ACQUISITION STRATEGY

Block II Configuration

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Lessons Learned

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- Requirements growth contributes to
 - Technical Complexity
 - Concurrency Risk
 - Funding Shortfalls
- Evolutionary (Block 1 & 2) acquisition strategy
 - Reduces risk to field Block 1 ASAP
 - Puts capability in hands of war fighter sooner
 - Provides opportunity for user feedback