



# Special Projects Office

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Director

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# Special Projects Office



## Counter Emerging Threats

- Chem-Bio Defense Systems
- Underground Facilities
- Cruise Missile Defense

## Keep Surface Targets at Risk

- Moving, Emitting, CCC&D
- Entire Kill Chain
- Emphasize Robustness

## Critical Technologies/Systems

- Navigation
- Advanced Sensors/Signal Processing



# Chem-Bio Defense Systems



- **Sensor System Engineering**
  - Characterization/integration of promising technologies
  - Applications-driven technology goals
- **Emphasis on Early Stages of Chem-Bio “Event”**
  - Pre-consequence management
  - Active defense
- **Non-Battlefield vs Active Battlefield Events**



# Immune Buildings



- **Exploit Existing Infrastructure**
- **Explore all “Degrees of Freedom”**
  - **Sensors, HVAC responses, neutralization, decontamination, forensics**
- **Ongoing Study, Starting with “Controllability”**
- **Potential Opportunities Defined by End of FY99**

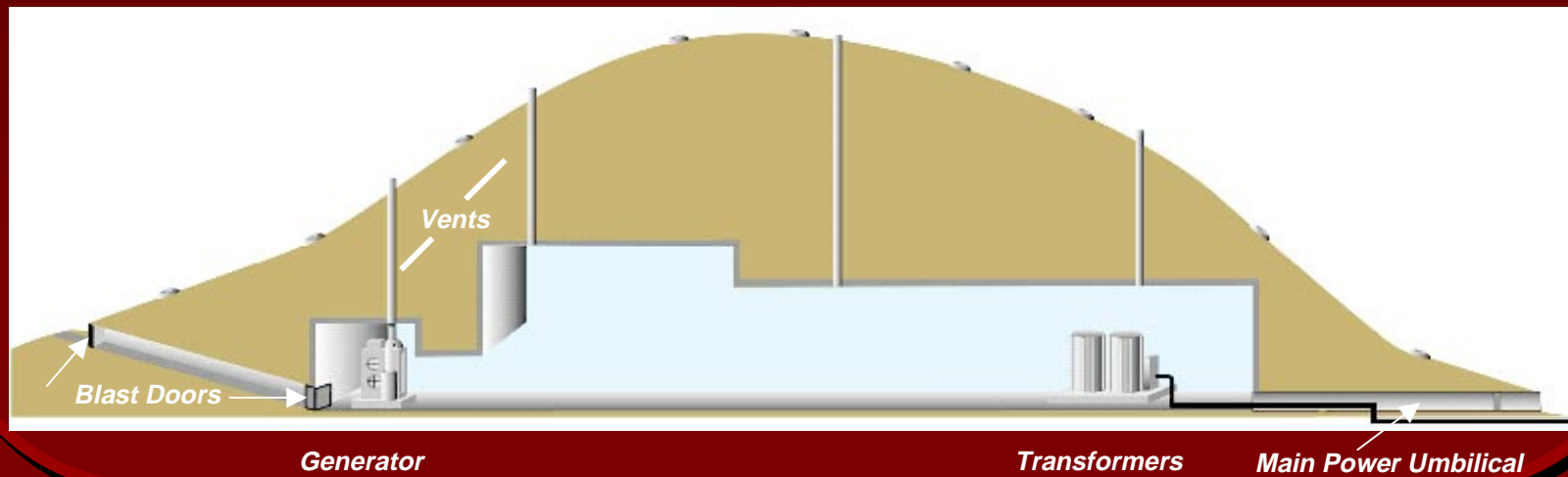




# Counter Underground Facilities (CUGF)



- **Ultimate Concealment Technique for Critical Functions**
- **Very Challenging, but Degree of Impossibility Varies Substantially**
  - **Wide parameter space (crisis level, function, depth, location, etc.)**
- **DARPA Focus on Critical “Characterization” Functions**

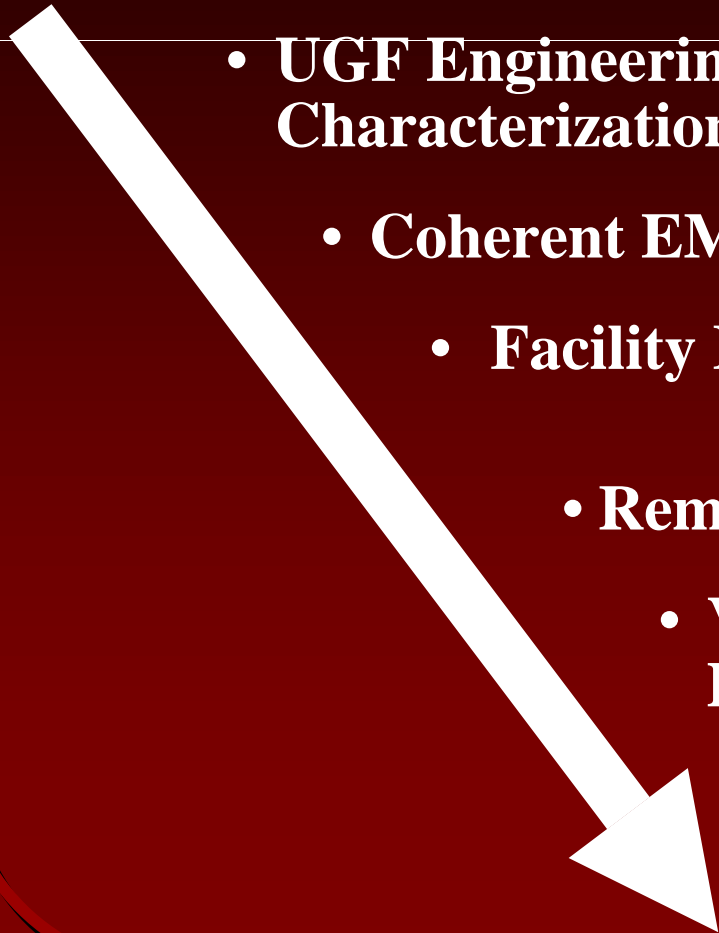




# CUGF Investment Road Map



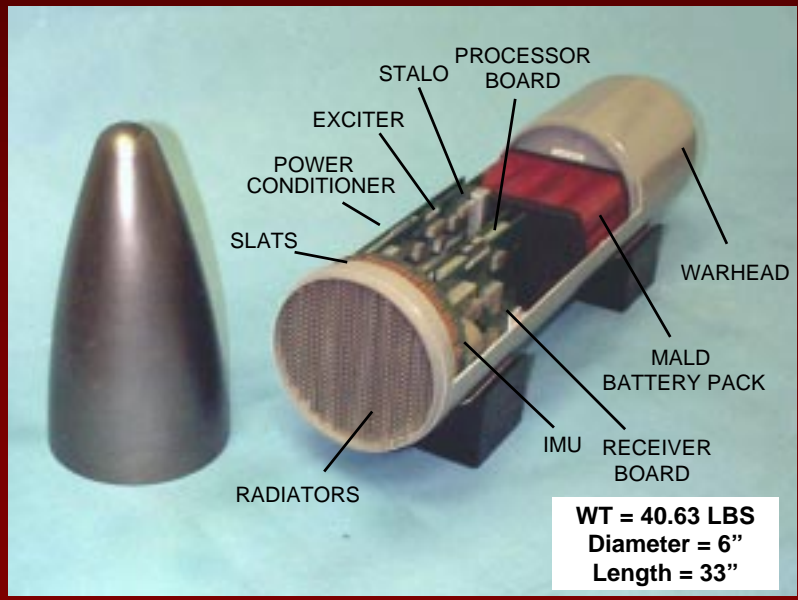
- **Rigorous Exploration of Observables**
- **UGF Engineering and Process Characterization**
  - **Coherent EM/Seismic Monitoring**
    - **Facility Imaging**
      - **Remote Seismology**
        - **Vent/Adit Detection/Monitoring**
          - **Induced Observables**
            - **Others**



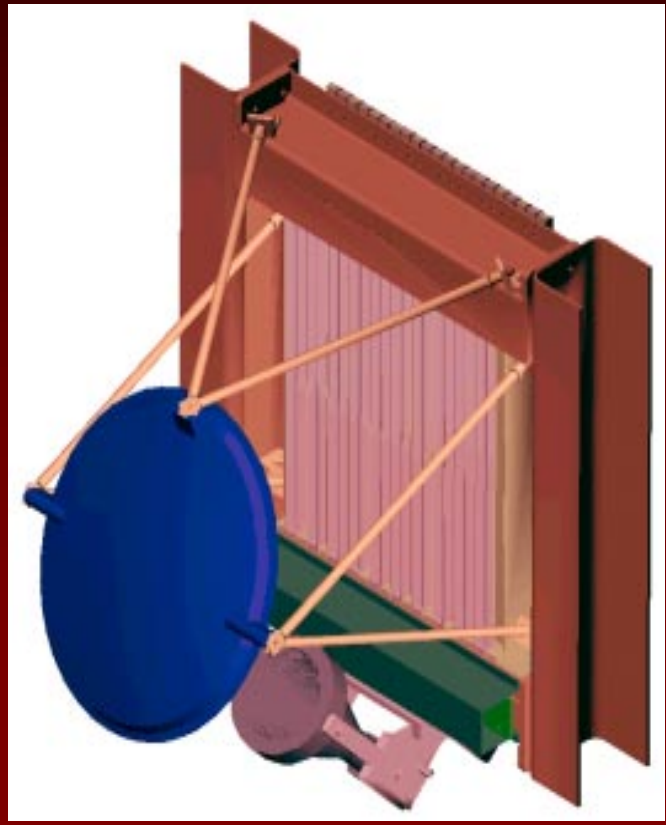


# Low-Cost Cruise Missile Defense **SPO**

## Weapons



## Sensors





# Surface Targets

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## Air Targets

- **Partial Dominance Achieved**
- **BM's/CM's/UAV's**

## Surface Targets

- **Opportunity to Truly Dominate**
- **Keep All Classes at Risk**
- **Leverage Against Launchers**
- **Keep Underground**

## Underground Targets

- **Long Term Challenge**





# Surface Target Engagement



## Technology Challenges

- Concealment, Camouflage
- Moving/Intermittent Targets
- Rapid Tactical Signal Exploitation
- “Low Latency” BM/C<sup>3</sup>
- Countermeasures
- Robust, Precision Guidance
- Combat ID

**Focus on Entire Kill Chain,  
Firepower, and Affordability**



# Other Opportunities

## Combat ID (Surface Targets)

- **Full RF Exploitation (ATR)**
  - Space, polarization, time
- **Multiple Phenomenologies (EO/IR, etc.)**

## Navigation

- **Extremely Precise Weapon/Sensor Delivery**
- **Personal Navigation**
  - GPS-denied

## Unconventional Sensing

- **Inherently Robust Waveforms and Techniques**
- **Highly Distributed**



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# Points of Contact

**Chem-Bio Defense - Amy Alving, Millie Donlon, John Smith**

**Underground Facilities - Steve Buchsbaum, Dan Cress**

**CMD Technologies - Ed Gjermundsen, John Smith, Tom Wiener**

**Affordable Moving Surface Target Engagement - Tim Grayson,  
Bruce Johnson**

**Lethal SEAD Targeting - Beth Kaspar**

**Foliage Penetration Radar - Lee Moyer**

**Spectral Imaging - Brad Tousley**

**Sensor Exploitation - Tom Strat, Steve Welby, Steve Hennessy**

**Combat ID - Bob Hummel**

**Door Always Open - - Good Ideas Wanted**