



UNRESTRICTED
WARFARE
SYMPOSIUM

14 - 15 MARCH 2006

MEETING THE UNRESTRICTED
WARFARE THREAT:
INTEGRATING STRATEGY,
ANALYSIS AND TECHNOLOGY

Observations on the IED Problem

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Background

- **Coordinator for C-IED basic research projects at the University of Washington**
 - **Research program begun by ONR in 2005**
 - **Long term focus**

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Common Adversary Weapons

- **IEDs**

- **A man-in-the-loop somewhere**
- **Shaped charges can be effective against armor**



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Common Adversary Weapons

- **RPGs**

- **Shoulder fired, used for close combat**
- **Can be serious threat to armored vehicles**



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Common Adversary Weapons

- **Suicide bombs**

- **Delivery by person or vehicle**
- **High explosives reportedly from Iran**

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Difficulties With Countering IEDs

- **Jamming**
 - Work-arounds
- **Mitigating with improved armor**
 - Larger explosives, shaped charges
- **Remote detection of concealed or buried IEDs**
 - Much work needs to be done
- **Drones: detecting IED placement**

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Challenges

- **Intelligence from local population**
 - Need for convenient technical means for safe clandestine reporting
- **When intelligence is not forthcoming**
 - Technology needed for detecting changes in behavior indicating major event is imminent
- **Detection:**
 - Need for sensors that detect changes and disturbances in road pavement, curbs, sidewalks, and surficial ground at standoff distances
 - Need for ground penetrating detection of devices at standoff distances

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Challenges

- **Detection:**
 - **Wide area coverage of trace detection of explosive chemicals, locating bomb factories**
 - **Technology for efficient monitoring of waste stream (garbage, sewage), locating bomb factories**
 - **Technology for locating the IED man-in-the-loop, away from urban areas.**
 - **Technology for detection of large-scale truck bombs, a possible threat in the U.S.**

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