Counter-IED S&T Community of Interest

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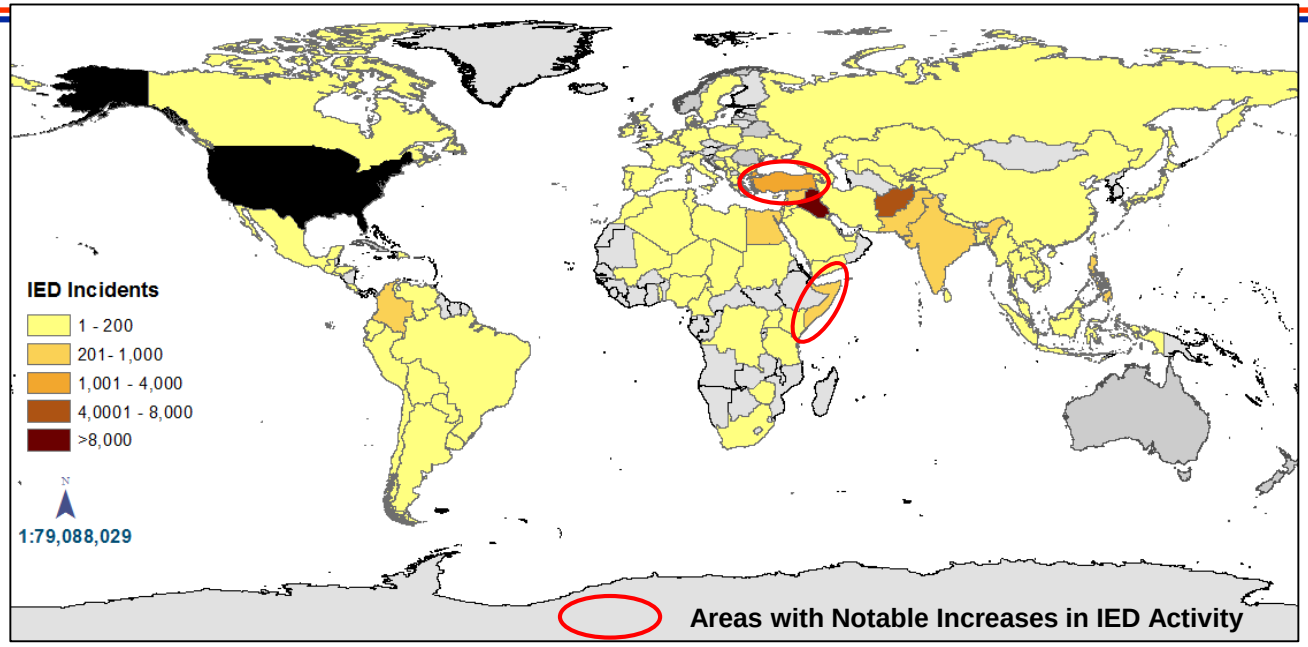
Global Improvised Explosive Device (IED) Trends

Reporting Period: 1 January 2016 – 31 December 2016 compared to the previous 12 months

Global Map of IED Incidents: January 2016 – December 2016



Global IED Statistics

IED Incidents	Casualties
20,750 Incidents	*48,350 Casualties*
-31%	*-28%*

Notable Increases in IED Frequency

Country	Δ Incidents		% Change
TURKEY	↑	775	218%
SOMALIA	↑	105	39%

Top 10 Countries Ranked by # IED Incidents

Previous Ranking	Current Ranking	Country	Jan 2016 - Dec 2016	
			Incidents	Casualties
1	1	IRAQ	8,700	21,800
2	2	AFGHANISTAN	5,500	10,250
8	3	TURKEY	1,130	2,850
3	4	SYRIA	950	3,240
4	5	COLOMBIA	890	155
5	6	EGYPT	445	810
6	7	INDIA	440	330
7	8	PAKISTAN	440	1,800
10	9	SOMALIA	375	1,190
12	10	PHILIPPINES	225	320

(U) Global IED Trends & Observations

- **Iraq** & **Afghanistan** remain the top hotspots for IED incidents & casualties
- **Turkey** now ranks 3rd in IED incidents; **Syria** ranks 3rd for IED casualties
- Of the top 10 IED countries: the frequency of IED Incidents increased most in **Turkey** and **Somalia**

Outside Iraq, Syria, and Afghanistan, IED incidents and IED-related casualties averaged about 500 and 1,100 per month, respectively.

- **Vehicle Borne IEDs were the prevalent threat type**
- **Military units were the prevalent target type**

Notes: *Numeric values presented on this slide are rounded. IED incidents & casualties that occurred in the U.S.A. were excluded from this analysis. Reporting based on different sources would likely yield different summary statistics. Casualties include persons killed or injured as a result of the IED explosion. Incidents exclude Hoaxes/Falses.*

Reliance 21 C-IED S&T Community of Interest

The Counter Improvised Explosive Device (C-IED) S&T COI was formed to encourage multi-agency coordination and collaboration in cross-cutting science and technology focus areas that have particular benefit addressing the proliferating and enduring challenge presented by IEDs. The COI concentrates on fostering the bonds between the Joint Improvised-Threat Defeat Organization (JIDO) and the DoD S&T Enterprise by improving the visibility of operational needs and technology gaps, and identifying alignment of S&T capabilities, experts, facilities, and programs/projects with these gaps.

C-IED S&T COI Membership

Bold Denotes Service Agency Principal Member

ASD(R&E)/RD: Dr. Karl Dahlhauser (Co-Chair)
JIDO: Lisa Swan (Co-Chair)
SAF/AQR: vacant
Joint Staff: LCDR Erik Kenny
MDA: vacant
DTRA: Dr. Donald Cronce
Army ERDC: Dr. Mark Moran
Naval C-IED Knowledge Network: Debra Powers
DASA(R&T): Matt Donohue
ARL: Kelly Sherbondy
USMC MCSC SIAT: Dave Karcher
USMC MCCDC CDD FPID: Maj Steven Lucas

NVESD: Dr. Mike Grove
ONR: Dr. Joong Kim
OSTP: Chris Fall
DHS: Elizabeth Obregon
OSD – JRAC: Chris O'Donnell
DARPA: vacant
CTTSO: Lou Wasserzug
JSEOD: Keith Plumadore
UXOCOE: Bill Windsor
Army SMDC: Dr. Mark Rader
NGIC: Randy Scholl
AFRL:1st Lt Michael Duenes

C-IED COI Thrust Areas

- **Identify Threat Networks that Employ and/or Facilitate IEDs**

Detection & predictive analysis of threat networks and their functions through the analysis of intelligence, network activities, exploitation, and signatures.

- **Detect IEDs and/or IED Components**

Detection of IEDs in every operational environment (mounted, dismounted, in water, or from the air) as rapidly as possible and at distances beyond the serious injury zone of each device. Various types of sensors, as well as the capabilities of humans and animals, may be used to detect any of the common components of an IED: main charge, initiator, switch, container, or power source.

- **Prevent and/or Neutralize IEDs**

Neutralization can include: pre-detonation, render safe, and disposal of the IED or the disruption of the detonation command signals. Where neutralization is impossible or impractical, methods such as disabling the trigger mechanism or preventing emplacement of the device are effective alternatives.

- **Mitigate IED Effects**

Maximize the survivability of personnel, facilities and equipment by mitigating the blast and fragmentation effects of IEDs.

- **Distribute IED Related Data across the Community of Interest**

Synchronization of intelligence and operational forces by sharing appropriate all-source information and intelligence up and down the chain of command from the strategic to the tactical level, across Federal Department and Agencies and with our allies and partner nations. IED related data includes, but is not limited to, significant event reports, post blast analysis, forensic and biometric data, trends analysis, C-IED capability assessments, crime pattern analysis, network analysis, intelligence products and reports and new innovative analytic techniques.

- **Train C-IED Capabilities**

Employing relevant and effective C-IED tactics, techniques and procedures by rapidly developing, defining, and implementing materiel C-IED training tools, including standards, and integrating into appropriate Service, Joint, and DoD concepts, policy and doctrine.

Technologies that Support Improved C-IED Capabilities

- Sensor Fusion & Processing
- Explosive Detection
- Autonomous Systems
- Optical Spectroscopy
- Knowledge Management
- Electronic Attack/Jamming
- Advanced Armor
- Robotics
- UAVs
- Forensics/Biometrics
- Human Social Cultural Behavior Modeling
- Hyperspectral Imaging
- ISR Sensors
- Infrared Imaging
- Lasers
- Insurgent Network Analysis
- Tagging, Tracking & Locating
- Electronic Support/SIGINT
- Advanced Electronics
- RF Directed Energy

C-IED S&T COI Activity In-Year (1 of 2)

- **Continuing Focus on engaging S&T toward**
  - Anticipating new and emerging threats
  - Developing operational C-IED capabilities for different environments

- **Technology transitions, demonstrations, JCTDs, prototyping, pilot programs**
  - Modular Explosive Hazard Detection System (MEHDS) technology concept demo
  - Axl – Technology upgrade for Route Clearance Patrols

- **New areas of JIDO and cross-Service collaboration**
  - Army BAA on Innovative Concepts in Countering Explosive Hazards
    - Participation by ONR, ECBC, JSEOD, DHS
  - Service S&T Participation on JIDO Technical Working Groups
    - Counter-Tunnel Working Group
    - EW Working Group

C-IED S&T COI Activity In-Year (2 of 2)

- **Major accomplishments**
  - Identified Standoff Detection Priorities for Joint Staff
  - Joint Laboratory Board: Solicitations focusing on critical challenges
  - Project Harvest: Capturing S&T knowledge for S&T Enterprise
- **Engagement outside of DoD**
  - C-IED Joint Program Office (DOJ-DHS-DoD run) GAO Report
  - CoI supported C-IED Workshop in India to identify cooperative projects
    - Part of India Defense Technology and Trade Initiative (DTTI)
  - NATO Research Technology Groups
  - NATO C-IED Technology Workshop
  - National Academy of Sciences Committee on CUAS (Army Sponsored)

Opportunities to Develop/Enhance the Following Technology Areas:

- Identify and track network activities
- Capture, catalog & identify IED component signatures
- Collection and analysis of biometric data, forensic data, and documents for exploitation
- Detect IEDs from a safe stand-off distance
- Detect IEDs while dismounted, mounted, and from the air
- Detect waterborne IEDs
- Detect homemade explosives
- Disable IEDs in multiple environments
- Neutralize / Pre-detonate IED while dismounted, mounted and from aircraft
- Neutralize waterborne IEDs
- Mitigate the effects of IED attacks while mounted or dismounted
- Distribute IED related data across the Community of Interest

Summary

- **The C-IED COI adapts to new threats and needs (as the IED threat evolves)**
  - New threats, environments and threat vectors
  - Potential Service priority shifts to near-peer conflicts
  - Service Laboratory and Industrial Base accommodation of reduced OCO funding
- **Fostering strong collaboration between Service S&T Enterprise and JIDO**
  - Tackling technology challenges
  - Fielding capabilities
  - Addressing need for enduring capabilities
- **Continued engagement to address critical technology needs**
  - FFRDCs and UARCs
  - International partners
  - Industry
  - Academia