Innovations in Mine Action (Part I)

Chair: Ms. Celine Francois, Senior Programme Officer, West & Central Africa and Colombia Programmes, UNMAS

Panelists:

- Mr. Henrik Rydberg, Consultant Information Manager Advisor, GICHD
- Mr. Roly Evans, Advisor, Land Release, Operational Efficiency & Training Development, GICHD
- Dr. Sandra Bialystok, Digital Media Coordinator, GICHD
- Mr. Nick Torbet, Head of Programme Development / Global Chief Technical Advisor (IEDD), The HALO Trust
- Mr. Jean-Guy Lavoie, Programme Manager, UNMAS Mali
- Mr. Paul William Fotheringham, Founder, 3D LifePrints
- Mr. Will Meurer, IED Threat Mitigation Advisor, UNMAS
Innovations in Mine Action

22nd International Meeting of National Mine Action Programme Directors and United Nations Advisers

Part I
Minimum data requirements for Mine Action
Minimum data requirements
For Mine Action

- Information requirements
- Data requirements for activities and products
- Standard definitions
- Data model
Information requirements

Global information requirements collected from Mine Action stakeholders
Through research, workshops and consultations

Conventions – APMBC, CCM, CCW

IMAS

Stakeholder requirements

Experience and best practice
Data requirements for activities and products

Data requirements grouped in elements based on MA activities and products

- Required data fields per element
- Definitions of data types
- Naming conventions for data fields to enable easy identification
Standard definitions

Definitions for key terms and measurements

Domain lists

Methods and units for measurements
Data model

A suggested model for the storage of minimum data requirements

Scalable

Open for change
Results

Consistent collection of key data globally

Common understanding of MA information and data

Ability to compare data between programs

Ensuring availability of data for reporting to convention and stakeholders
WHAT IS THE CSL?

• Too much experience is left in the field and lost – we want to help change that.
• The new GICHD Case Study Library (CSL) captures and records best practice from the field.
• This best practice is then presented online in a way that maximises engagement from as many Mine Action participants as possible.
The CSL will complement existing journals and guides by providing a platform for recording operational detail with many illustrations.

We will present a range of operational activities that may fall under Mine Action.

These might be classical land release activities, EOD, MRE activities, VA activities, AMD activities.

We are keen to work with partners to show their good work in the field.
• Clearance of Pattern minefield in the Falklands/Malvinas.
CASE STUDIES SO FAR

- Clearance of the Skallingen Peninsula.
CASE STUDIES SO FAR

- Disarmament of Cluster Munition Stockpiles (SHADOW).
CASE STUDIES SO FAR

- The Ageing of Ammunition.
CASE STUDIES SO FAR

• Key Performance Indicators in Mine Action.
CASE STUDIES SO FAR

- Use of GIS in Mine Action.
• The GICHD is looking to partner with Mine Action operators in order to capture their best practice and present it in a professional and educational way.

• Partners have editorial control over content.

• Full credit is of course given to partners and donors.

• GICHD does all the work.
The CSL stand is in the corridor.

Please come and talk with the GICHD Training Development Team to see the content we have already and discuss possible collaboration in the future.
Why VR
Thank You!
gichd.org
War amongst the people: Urban Survey in the Middle East and North Africa

Nicholas Torbet
Head of Programme Development/Global CTA IEDD
Kobane, Syria
Marawi, Philippines
Where the new challenges lie...
Where the new challenges lie...
Where the new challenges lie...
Where the new challenges lie...
## Innovations and Opportunities: Harnessing expertise outside of Mine Action

### 1. Multi Story Light Frame Building

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Expected damage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mostly wood frame, box type – up to 4 floors</td>
<td>Earthquake – Common failure is ductile racking (tilting) of first story. Tilted floors/stories may subsequently collapse following aftershocks.</td>
</tr>
<tr>
<td>Residential or Light Commercial</td>
<td>Explosion – Walls become disconnected from floors (horizontal diaphragms), leading to partial or total collapse.</td>
</tr>
<tr>
<td></td>
<td>Fire – Rapid combustion and collapse unless fire resistant. Light wood truss systems are especially hazardous.</td>
</tr>
</tbody>
</table>

### 6. Heavy Floor Buildings

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Expected damage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete frames, may have concrete walls or brick/masonry infills</td>
<td>Earthquake – brittle failures of columns and beam/column connections, leading to partial or pancake collapse. Aftershocks cause added collapse, falling hazards and shifting.</td>
</tr>
<tr>
<td>Office, commercial</td>
<td>Explosion – Failures of columns, slab or beam connections leading to loss of column stability and collapse/pancake collapse.</td>
</tr>
<tr>
<td></td>
<td>Fire - Good resistance to fire, but fire may cause spalling of concrete surfaces.</td>
</tr>
</tbody>
</table>

### High energy/non-explosive projectile impact

- Little resistance to collapse in immediate area of impact. Remainder of structure remains stable.
- Damage limited to area of impact. Could leave damaged columns/beams of questionable strength.
Innovations and Opportunities: Mobile technology and structures
## 1. Building General

<table>
<thead>
<tr>
<th>1.1 Associated Task ID</th>
<th>[auto-generated]</th>
<th>1.2 Building ID (A,B,C...)</th>
<th>1.3 Building category (drop down list/free text)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>☐ Administrative ☐ Educational ☐ Medical</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>☐ Residential ☐ Industrial ☐ Commercial</td>
</tr>
<tr>
<td>1.4 Number of stories/floors</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.5 Building use</td>
<td>☐ Intact ☐ Partial collapse ☐ Complete collapse</td>
<td>☒ Intact ☐ Partial collapse ☐ Complete collapse</td>
<td>☐ Intact ☐ Partial collapse ☐ Complete collapse</td>
</tr>
<tr>
<td>1.6 Building status</td>
<td>☐ Intact ☐ Partial collapse ☐ Complete collapse</td>
<td>☒ Intact ☐ Partial collapse ☐ Complete collapse</td>
<td>☐ Intact ☐ Partial collapse ☐ Complete collapse</td>
</tr>
<tr>
<td>1.7 Hazard status</td>
<td>☐ Confirmed ☐ Suspected ☐ No evidence</td>
<td>☒ Intact ☐ Partial collapse ☐ Complete collapse</td>
<td>☐ Intact ☐ Partial collapse ☐ Complete collapse</td>
</tr>
<tr>
<td>1.8 Hazard Type</td>
<td>☐ Minefield/Victim operated IED ☐ UXO/battlefield (non-victim operated)</td>
<td>☒ Intact ☐ Partial collapse ☐ Complete collapse</td>
<td>☐ Intact ☐ Partial collapse ☐ Complete collapse</td>
</tr>
<tr>
<td>1.9 Non-explosive hazards</td>
<td>☐ Gas supply ☐ Toxic industrial chemicals ☐ Falling debris</td>
<td>☒ Intact ☐ Partial collapse ☐ Complete collapse</td>
<td>☐ Intact ☐ Partial collapse ☐ Complete collapse</td>
</tr>
<tr>
<td></td>
<td>☐ Bio-hazards ☐ Structural collapse ☐ Confined/underground spaces</td>
<td>☐ Intact ☐ Partial collapse ☐ Complete collapse</td>
<td>☐ Intact ☐ Partial collapse ☐ Complete collapse</td>
</tr>
<tr>
<td>1.10 Number of visible entry points (doorways)</td>
<td>☐ Fully ☐ Partial ☐ No</td>
<td>☐ Intact ☐ Partial collapse ☐ Complete collapse</td>
<td>☐ Intact ☐ Partial collapse ☐ Complete collapse</td>
</tr>
<tr>
<td>1.11 Estimated year of construction (to nearest 5 years)</td>
<td>☒ Intact ☐ Partial collapse ☐ Complete collapse</td>
<td>☐ Intact ☐ Partial collapse ☐ Complete collapse</td>
<td>☐ Intact ☐ Partial collapse ☐ Complete collapse</td>
</tr>
<tr>
<td>1.12 Current occupation by civilians</td>
<td>☐ Fully ☐ Partial ☐ No</td>
<td>☐ Intact ☐ Partial collapse ☐ Complete collapse</td>
<td>☐ Intact ☐ Partial collapse ☐ Complete collapse</td>
</tr>
</tbody>
</table>

## 2. Building Detail

<table>
<thead>
<tr>
<th>2.1 Floor/story assessment (delete/add floors as required)</th>
<th>Floor status</th>
<th>Column/wall damage class</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Floor status</td>
<td>☐ Intact ☐ Partial collapse ☐ Complete collapse</td>
<td>☐ I ☐ II ☐ IV</td>
<td>☐ V</td>
</tr>
<tr>
<td>Column/wall damage class</td>
<td>☐ Intact ☐ Partial collapse ☐ Complete collapse</td>
<td>☐ I ☐ II ☐ IV</td>
<td>☐ V</td>
</tr>
<tr>
<td>Remarks</td>
<td>☐ Intact ☐ Partial collapse ☐ Complete collapse</td>
<td>☐ I ☐ II ☐ IV</td>
<td>☐ V</td>
</tr>
</tbody>
</table>

## 2.1 Floor/story assessment

<table>
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<td>☐ I ☐ II ☐ IV</td>
<td>☐ V</td>
</tr>
<tr>
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<td>☐ I ☐ II ☐ IV</td>
<td>☐ V</td>
</tr>
<tr>
<td>☐ Intact ☐ Partial collapse ☐ Complete collapse</td>
<td>☐ I ☐ II ☐ IV</td>
<td>☐ V</td>
</tr>
</tbody>
</table>

## 2.2 Photo attachments

## 2.3 Sketch map attachments
Questions?
IED threat awareness in Mali: A field IED-GIS pilot project for peacekeeping

5 February 20...
Problem statement

- 123 IED incidents in 2017
- 200 IED incidents in 2018

- locating IEDs before

MINUSMA victims 2013 - 2018

421 victims
- 67 killed
- 354 injured
MINUSMA troops have located over 50% of IEDs on main supply routes in 2018

Challenges:

Ground navigation challenging

Availability IED maps at tactical level

Limited awareness of high risk areas

Unknowingly entering high risk areas

Limited deployment of Search assets
IED-GIS pilot project for peacekeeping

GIS software

IED threat on smartphone or tablet

IED type and color-coded date range

High risk areas marked

Minimal training required
IED-GIS pilot project for peacekeeping

Current position updated

GPS (no network necessary)

Precision 3–15 meters

Click on event for more info
Thank you
Utilising 3D technologies for enhanced EOD and IED Threat Mitigation training
GPR / METAL signature comparable SURROGATES FOR DETECTOR & EOD TRAINING
Artificially RUSTED 3d printed REPLICA
**Problems**

- TIME CONSUMING TO MAKE FOR TRAINER
- GIVES DETAILED KNOWLEDGE TO STUDENT
- CAN BE EASILY STOLEN / MIS-USED
- DOESN’T COVER ALL IED ACTIVATION MODES
- CAN’T BE RE-USED / NOT ROBUST TO disruption / SEPARATION techniques
- CURRENT SOLUTIONS CAN COST UP TO $1200
- STATIC / LIMITED FUNCTIONALITY

**solution**

- STANDARDISED DESIGN / READY TO GO
- BLACK BOX SOLUTION
- GPS TRACKABLE / DEACTIVATE FAILSAFE
- RADIO, TREMBLER, MERCURY, TIMER, & Pressure modes
- RE-USABLE / ROBUST
- SIGNIFICANTLY CHEAPER DEVICES
- FUNCTIONALITY EASILY ADDED / MOBILE PHONE CONTROL INTERFACE
Appendix 1 – 3d printed calibre guide
SMART
IED Threat Mitigation Technology Roadmap
(SMiTMMiTR)

Bridging the GAPs
Mine Action
(S)VBIED GOA
Two (S)VBIEDs Ber Ocktober 2018
Main charge of conventional munition and 400-600 KG of HME
Complex Victim Operated IEDs

Anti-Lift Device

Pressure plates

Main charge
Complex Victim Operated IEDs
Can you see the threat?
Come to the workshop on Friday 8 February 11.45 to find out more.
<table>
<thead>
<tr>
<th>DATE</th>
<th>TIME</th>
<th>DISTRICT</th>
<th>REGION</th>
<th>SECTOR</th>
<th>ASSESS. TARGET</th>
<th>IED TYPE</th>
<th>EMPLACEMENT</th>
<th>INCIDENT DETAILS</th>
</tr>
</thead>
<tbody>
<tr>
<td>31 December, 2018</td>
<td>1400</td>
<td>Houdan</td>
<td>Benadir</td>
<td>Sector 1</td>
<td>SNA</td>
<td>Explosion</td>
<td>UVIED</td>
<td>31.12.18, approx 1430 Hrs, Tarkaburka, Hodan District. SNA officer was targeted by UVIED while he arrived at his homestead near Tarkaburka within Hodan District. During the explosion the officer was not in the vehicle but two-civilian women who were resting next to the homestead were slightly injured.</td>
</tr>
<tr>
<td>30 December, 2018</td>
<td>1100</td>
<td>Jammama</td>
<td>Louder Juba</td>
<td>Sector 6</td>
<td>SNA</td>
<td>IED</td>
<td>RCIED / Roadside</td>
<td>30.12.18, approx 1100 Hrs, Sungail. Jammama District. Reports received on 30 Dec 18 indicate that a remote controlled IED was discovered inside SNA CP at Sungail FOB.</td>
</tr>
<tr>
<td>28 December, 2018</td>
<td>1400</td>
<td>Belet Weyne</td>
<td>Hirshen</td>
<td>Sector 4</td>
<td>SPF</td>
<td>Explosion</td>
<td>UNKNOWN</td>
<td>28.12.18, approx 1430 Hrs, Beletreyne Town, Hirshen Region. An IED functioned at the entrance to the SPF formed command post, injuring an on-duty woman who later succumbed to injuries and damaging two houses. The targeted SPF Commander was not in the house at the time of the incident.</td>
</tr>
<tr>
<td>27 December, 2018</td>
<td>1200</td>
<td>Algooya</td>
<td>Lower Shabelle</td>
<td>Sector 1</td>
<td>AMSOM</td>
<td>Explosion</td>
<td>UNKNOWN</td>
<td>27.12.2018 at approx 11:30 hrs, ABIDI about 2.5 KMs from LACCL, Algooya District, Lower Shabelle, an AMSOM UPOF Logistic convoy from Adiska/B524 Hwy was targeted by an IED attack in which one AMSOM EOD vehicle was damaged and two AMSOM UPOF soldiers were injured.</td>
</tr>
<tr>
<td>27 December, 2018</td>
<td>1400</td>
<td>Kismayo</td>
<td>Lower Juba</td>
<td>Sector 6</td>
<td>SNA</td>
<td>Explosion</td>
<td>OTHER</td>
<td>27.12.18, approx 1430 hrs, an IED that was planted in a cafe used by SNA to drink tea in Kulilawo, approximately 32 km Northwest of Kismayo, has exploded. 01 SNA soldier was killed, 03 SNA soldiers and 02 civilians injured.</td>
</tr>
<tr>
<td>27 December, 2018</td>
<td>1200</td>
<td>Waaberi</td>
<td>Benadir</td>
<td>Sector 1</td>
<td>Civil Servant</td>
<td>Explosion</td>
<td>UVIED</td>
<td>27.12.18 at 12:12 Hrs. Waaberi District, Mogadishu. The Administrator of the Somaliland Prime Minister’s office was targeted with UVIED as he was driving his white Toyota Harrier SUV March 1st within Waaberi District. The Administrator was slightly injured in the incident and rushed to Darud Shifa Hospital in the city, Mogadishu. There were no other casualties as a result of this incident.</td>
</tr>
<tr>
<td>27 December, 2018</td>
<td>1300</td>
<td>Baido</td>
<td>Middle Shabelle</td>
<td>Sector 5</td>
<td>AMSOM</td>
<td>IED</td>
<td>BURIED</td>
<td>27.12.18, approx 1300 Hrs, Galgaly village, AMSOM BNEF Route Search team discovered an IED at Galgaly which was targeting an AMSOM return convoy from Jowhar to Jirfadda and Mogadishu. The device was successfully defused in situ by AMSOM and the convoy continued its way to Baido.</td>
</tr>
<tr>
<td>25 December, 2018</td>
<td>1000</td>
<td>Dinsor</td>
<td>Bay</td>
<td>Sector 3</td>
<td>SNA</td>
<td>Explosion</td>
<td>BURIED</td>
<td>25.12.18, approx 1000 Hrs, Dinsor town. As IED targeting SNA check point in the Dinsor town exploded injuring 3 SNA soldiers. The IED was placed in a small shed where SNA soldiers used it as a check point. One of the casualties was CASEDIA to Badaga AMISOM Level 2 Hospital.</td>
</tr>
<tr>
<td>DATE</td>
<td>TIME</td>
<td>DISTRICT</td>
<td>REGION</td>
<td>SECTOR</td>
<td>ASSAILED TARGET</td>
<td>IED TYPE</td>
<td>EMPLACEMENT</td>
<td>INCIDENT DETAILS</td>
</tr>
<tr>
<td>------------</td>
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<td>------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>14 January, 2019 1800</td>
<td>Hooden</td>
<td>Banadir</td>
<td>Sector 1</td>
<td>Unknown</td>
<td>Explosion</td>
<td>UVIED</td>
<td>On 14.01.19 at approx. 1800hrs, a vehicle (reported to be a white Toyota Premio) exploded near the Village Restaurant parking area within Hodan district. One civilian injury was reported, and several vehicles that were parked within the same parking lot were also reported to have sustained damage. At this time, UPDF EOD Team from Celedjuale have been deployed to investigate.</td>
<td></td>
</tr>
<tr>
<td>14 January, 2019 1900</td>
<td>Marke</td>
<td>Lower Shabelle</td>
<td>Sector 1</td>
<td>Unknown</td>
<td>Explosion</td>
<td>UVIED</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14 January, 2019 1300</td>
<td>Gorgoley</td>
<td>Lower Shabelle</td>
<td>Sector 1</td>
<td>AMISOM</td>
<td>IED</td>
<td>BURIED</td>
<td>On 14.01.19 at 1315 hrs, IVO Brejo village (Gorgoley District) The AMISOM EOD Team from Balbado (mentored by UNMAS) discovered an IED bured on the route and successfully destroyed the device in situ. The EOD team was supporting a logistics convoy from Gorgoley to Balbado.</td>
<td></td>
</tr>
<tr>
<td>12 January, 2019 1400</td>
<td>Helwe</td>
<td>Banadir</td>
<td>Sector 1</td>
<td>AMISOM</td>
<td>Explosion</td>
<td>BURIED</td>
<td>On 12.01.19 at 1400hrs, an IED detonated at Salka village as the AMISOM convoy was passing through the area. 1 x AMISOM driver was injured and 1 x truck was damaged. The damaged vehicle was supporting a logistics convoy from Balbado to Balbado.</td>
<td></td>
</tr>
<tr>
<td>10 January, 2019 1500</td>
<td>Hooden</td>
<td>Banadir</td>
<td>Sector 1</td>
<td>Clan Leader</td>
<td>Explosion</td>
<td>UVIED</td>
<td>On 10.01.19 at approx. 1500hrs, a UVIED exploded in a vehicle (Reg No. AU795) belonging to a local clan leader. The device functioned at Diggar junction (within Hodan District) as the vehicle was being driven. The explosion damaged the vehicle but did not injure the clan leader. It was reported that the clan leader is usually driven by a driver, but during this incident he was driving the vehicle by himself. The UVIED was assessed to have been attached under the front passenger seat beneath the front passenger seat of a car.</td>
<td></td>
</tr>
<tr>
<td>09 January, 2019 1700</td>
<td>Badane</td>
<td>Lower Juba</td>
<td>Sector 2</td>
<td>AMISOM</td>
<td>Explosion</td>
<td>UVIED</td>
<td>Engaged AS elements who were in the process of paying an IED. After the engagement, in which AS was engaged towards the nearby forested area, AMISOM recovered the following items: 12 volt vehicle battery, Motorcycle alarm system (including key fobs), 2 electric detonators, Small length of detonating cord (blue), Mobility personal mobile radio (PMR), Knife, Metallic container (container for main charge), Digging tools, 2 plastic containers (containing explosive material), 3 bags, 3 tubes of glue.</td>
<td></td>
</tr>
<tr>
<td>06 January, 2019 1300</td>
<td>Civilian</td>
<td>Sector 1</td>
<td>CIVILIAN</td>
<td>Explosion</td>
<td>UVIED</td>
<td>On 08.01.19 at approx. 1230hrs, IVO Soreale (Hodan District) a vehicle (Reported as a Toyota Surf, Reg No. AS 236/00) belonging to the son of an upper house MP (Abdi Gaidid) was targeted with a UVIED. The device functioned as the vehicle being driven. The MP's son was driving the vehicle during the incident, along with another passenger. As a result of the explosion, the driver sustained minor injuries and the passenger lost his leg. The UVIED was assessed to have been located under the front passenger seat.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DATE</td>
<td>TIME</td>
<td>DISTRICT</td>
<td>REGION</td>
<td>SECTOR</td>
<td>ASSESS. TARGET</td>
<td>IEC TYPE</td>
<td>EMPLOYMENT</td>
<td>INCIDENT DETAILS</td>
</tr>
<tr>
<td>------------</td>
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<td>--------</td>
<td>---------------</td>
<td>----------</td>
<td>------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>21 January, 2019</td>
<td>1800</td>
<td>Heliwon</td>
<td>Banadir</td>
<td>Sector 1</td>
<td>AMISOM</td>
<td>Explosion</td>
<td>UNKNOWN</td>
<td>On 21.01.19 at 17:45HR, an AMISOM logistics convoy returning from Jowhar Airfield to Academy encountered an IED on route. A civilian truck was slightly damaged by the explosion and continued its journey.</td>
</tr>
<tr>
<td>21 January, 2019</td>
<td>0800</td>
<td>Dayniye</td>
<td>Banadir</td>
<td>Sector 1</td>
<td>N/A</td>
<td>Premature Explosion</td>
<td>UNKNOWN</td>
<td>On 21.01.19 at approx. 09:00HR, 5 KM South of a bridge near Tooyo, there was a premature explosion reported. It was reported to have occurred during AMISOM emplacement on a road. Number of AMISOM killed are unknown.</td>
</tr>
<tr>
<td>11 January, 2019</td>
<td>1900</td>
<td>Jamaame</td>
<td>Lower Juba</td>
<td>Sector 6</td>
<td>SNA</td>
<td>Complex Attack</td>
<td>VBIED</td>
<td>On 19.01.19 at approx. 17:00HR, an AMISOM convoy attacking the bridge was attacked by a team of SNA soldiers. Two explosions targeting SNA vehicles that exploded near 5KM south of a bridge. 2 x SNA soldiers were killed while 2 other SNA soldiers were injured in the explosion. The SNA vehicle was reported to have sustained damaged.</td>
</tr>
<tr>
<td>11 January, 2019</td>
<td>1200</td>
<td>Wantaweyn</td>
<td>Lower Shabelle</td>
<td>Sector 1</td>
<td>SNA</td>
<td>Explosion</td>
<td>UNKNOWN</td>
<td>On 18.01.19 at approx. 1430HR, 2 x SNA soldiers were killed and 2 x SNA soldiers were injured. SNA vehicle was reported to have sustained damages.</td>
</tr>
<tr>
<td>11 January, 2019</td>
<td>0900</td>
<td>Baidoa</td>
<td>Bay</td>
<td>Sector 3</td>
<td>AMISOM</td>
<td>Complex Attack</td>
<td>BURIED</td>
<td>On 18.01.19 at approx. 1200HR, an AMISOM convoy attacking the bridge was attacked by a team of SNA soldiers. The SNA vehicle was destroyed and 2 x SNA soldiers were killed and 2 x SNA soldiers were injured in the explosion.</td>
</tr>
<tr>
<td>11 January, 2019</td>
<td>0900</td>
<td>Bu-Horakay</td>
<td>Baidoa</td>
<td>Sector 3</td>
<td>AMISOM</td>
<td>Complex Attack</td>
<td>BURIED</td>
<td>On 18.01.19 at approx. 1000HR, an AMISOM convoy traveling from Baidoa to Balad was attacked by a team of SNA soldiers. The SNA vehicle was destroyed and 2 x SNA soldiers were killed and 2 x SNA soldiers were injured in the explosion.</td>
</tr>
<tr>
<td>11 January, 2019</td>
<td>0800</td>
<td>Baidoa</td>
<td>Bay</td>
<td>Sector 3</td>
<td>AMISOM</td>
<td>Explosion</td>
<td>RCIED / Roadside</td>
<td>On 18.01.19 at approx. 1200HR, an AMISOM convoy traveling from Baidoa to Balad was attacked by a team of SNA soldiers. The SNA vehicle was destroyed and 2 x SNA soldiers were killed and 2 x SNA soldiers were injured in the explosion.</td>
</tr>
<tr>
<td>11 January, 2019</td>
<td>1100</td>
<td>Baidoa</td>
<td>Bay</td>
<td>Sector 3</td>
<td>AMISOM</td>
<td>Explosion</td>
<td>UNKNOWN</td>
<td>On 18.01.19 at approx. 1110HR, an AMISOM convoy traveling from Baidoa to Balad was attacked by a team of SNA soldiers. The SNA vehicle was destroyed and 2 x SNA soldiers were killed and 2 x SNA soldiers were injured in the explosion.</td>
</tr>
<tr>
<td>11 January, 2019</td>
<td>1800</td>
<td>Baidoa</td>
<td>Bay</td>
<td>Sector 3</td>
<td>AMISOM</td>
<td>Explosion</td>
<td>UNKNOWN</td>
<td>On 18.01.19 at approx. 1200HR, an AMISOM convoy traveling from Baidoa to Balad was attacked by a team of SNA soldiers. The SNA vehicle was destroyed and 2 x SNA soldiers were killed and 2 x SNA soldiers were injured in the explosion.</td>
</tr>
<tr>
<td>11 January, 2019</td>
<td>0800</td>
<td>Baidoa</td>
<td>Bay</td>
<td>Sector 3</td>
<td>AMISOM</td>
<td>Explosion</td>
<td>UNKNOWN</td>
<td>On 18.01.19 at approx. 1110HR, an AMISOM convoy traveling from Baidoa to Balad was attacked by a team of SNA soldiers. The SNA vehicle was destroyed and 2 x SNA soldiers were killed and 2 x SNA soldiers were injured in the explosion.</td>
</tr>
<tr>
<td>11 January, 2019</td>
<td>1800</td>
<td>Baidoa</td>
<td>Bay</td>
<td>Sector 3</td>
<td>AMISOM</td>
<td>IED</td>
<td>BURIED</td>
<td>On 18.01.19 at approx. 1900HR, an AMISOM convoy traveling from Baidoa to Balad was attacked by a team of SNA soldiers. The SNA vehicle was destroyed and 2 x SNA soldiers were killed and 2 x SNA soldiers were injured in the explosion.</td>
</tr>
<tr>
<td>11 January, 2019</td>
<td>1100</td>
<td>Baidoa</td>
<td>Bay</td>
<td>Sector 3</td>
<td>AMISOM</td>
<td>IED</td>
<td>BURIED</td>
<td>On 18.01.19 at approx. 1110HR, an AMISOM convoy traveling from Baidoa to Balad was attacked by a team of SNA soldiers. The SNA vehicle was destroyed and 2 x SNA soldiers were killed and 2 x SNA soldiers were injured in the explosion.</td>
</tr>
<tr>
<td>05 January, 2019</td>
<td>1200</td>
<td>Bouhdin</td>
<td>Banadir</td>
<td>Sector 4</td>
<td>UNKNOWN</td>
<td>Explosion</td>
<td>UNKNOWN</td>
<td>On 05.01.19 at approx. 1200HR, an AMISOM convoy was attacked by a team of SNA soldiers. The SNA vehicle was destroyed and 2 x SNA soldiers were killed and 2 x SNA soldiers were injured in the explosion.</td>
</tr>
<tr>
<td>05 January, 2019</td>
<td>1300</td>
<td>Bertiwayne Hiraan</td>
<td></td>
<td>Sector 4</td>
<td>UNKNOWN</td>
<td>Explosion</td>
<td>UNKNOWN</td>
<td>On 05.01.19 at approx. 1300HR, an AMISOM convoy was attacked by a team of SNA soldiers. The SNA vehicle was destroyed and 2 x SNA soldiers were killed and 2 x SNA soldiers were injured in the explosion.</td>
</tr>
</tbody>
</table>
IED Threat Evolution and Mitigation

- Capability gaps
- IED TM
- IED sophistication
- IED Threat mitigation efforts
- Capability gaps insurgency

Time

IED evolution
UN SMART IED Threat Mitigation Technology
Roadmap (SMiTMIiTR)

Scientific Research

UN IED Threat Mitigation ToE

Standardized Current and Evolving IED threat
SMiTMiTR
UN IED Threat Mitigation by Bridging the GAPs

Thank you for your attention
Do you have any Questions?
Challenges beyond conventional munitions
Opportunities...
Afghanistan Trials...
Simple solutions, produced locally:
Simple solutions, produced locally:
Camera systems
Mechanical Clearance
Questions?