

EDA IED DETECTION PROGRAMME (IEDDET)

Agenda

1. Context
2. Overall goal
3. R&T Goals
4. CST
5. Structure
6. Projects
7. T&E
8. Current status

1. Context

1. C-IED confirmed as top priority in the EDA Capability Development Plan (CDP) 2014 Revision
2. Launching of the IEDDET programme identified as implementation of this priority in terms of technology development
3. EDA PT C-IED identified detection as a shortfall and called for R&T activities to close this gap.

2. Overall programme goal

The overall programme goal is to improve and field test IED detection capabilities in support of defining Future Route Clearance and Attack the Network capabilities beyond 2020.

Thereby this programme contributes to operational Freedom of Movement and Force Protection required for successful missions

3. R&T Goals

MOBILE

- 1a. Early warning
- 1b. (Stand off) Detection
- 1c. (Close in) Confirmation and Identification

ISR

- 1d. ISR (Persistent Surveillance; AtN)

STATIC

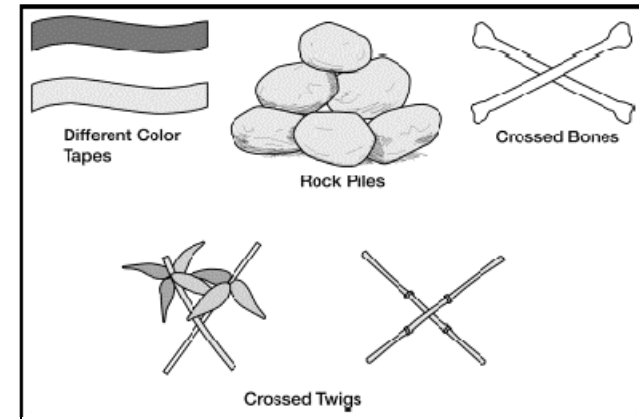
- 2. Force protection

3. R&T Goals

1a. Early warning

■ Desired targets:

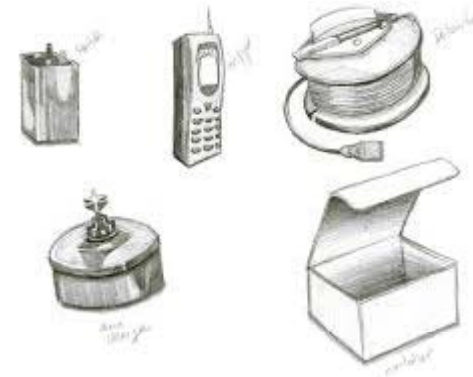
- Detection of indicators of IED presence
- Detection on move with at least 20-30 km/h
- Very low false rate
- Low operator workload
- The stand-off distance can be obtained through UGV and/or UAV deployment of the sensor-suite or forward looking sensors from ground vehicles



3. R&T Goals

1b. Stand-off Detection of IED components

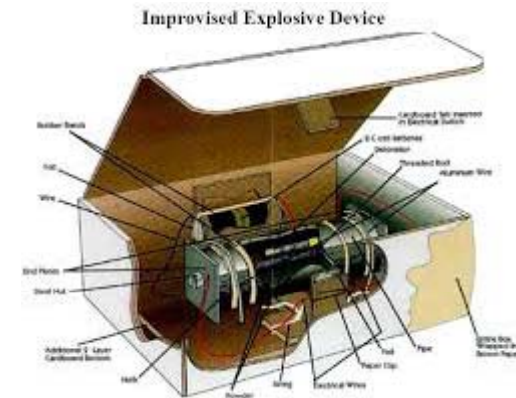
- Stand-off distance can be obtained through:
 - Forward looking multisensor detection systems
 - Remotely operated multisensor platforms
- Desired targets:
 - Detection of IED components
 - Detection on move with at least 10-20km/h speed
 - Minimum 30 m stand-off distance
 - Minimum depth 25 cm under the surface
 - Remote platforms controlled from within jamming bubble
 - Sideward detection of road obscured by vegetation and/or camouflage
 - Low false alarm rate should be such that the operator(s) can support the required up-tempo of the convoy



3. R&T Goals

1c. (Close in) Confirmation and Identification

- Desired targets
 - Automated or semi-automated
 - Close-range or remote means for detection and classification
 - Ability to provide detailed information
 - Ability to be mounted on an interrogation arm, or be part of an unmanned ground vehicle with combined sensing and interrogation capability

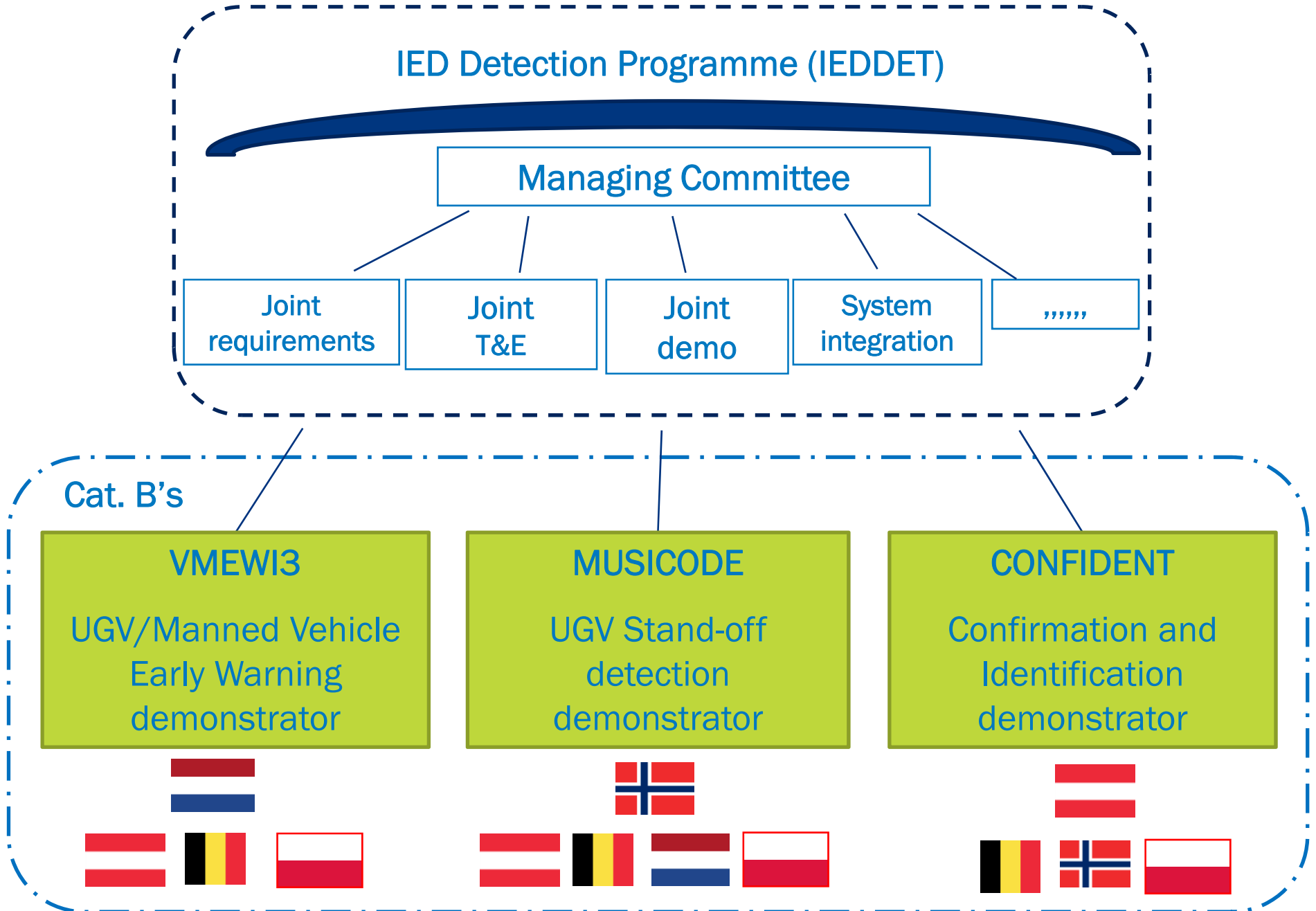


4. Common Staff Target FRCC

- Mounted Route Clearance
 - Stand off detection
 - Forward looking
 - Remotely operated
- RC Operation split in Phases
 - Early Warning indirect indicators
 - Stand off Detection IED components
 - Close-in Confirmation and Identification
- R&T goals IEDDET
 - Automatic (detection) processing
 - Multi-sensor systems
 - Sensor Fusion
 - Low operator workload



5. IEDDET Structure



6. IEDEET projects

Vehicle Mounted Early Warning of Indirect Indicators of IEDs < UGV platform > (VMEWI3)

Aim: test and demonstrate automatic early warning support in Route Clearance Operation.

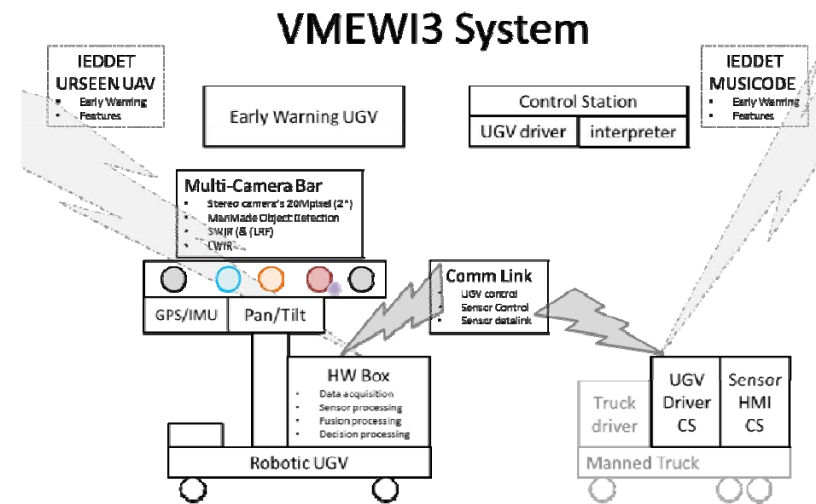
pMS: NL lead, AT, BE, PL



Objectives:

Develop technology demonstrator TRL 6-7 with the following main features:

- Operated by military at low operator workload on a representative vehicle for Route Clearance operations.
- Detection of indirect indicators of IEDs (e.g. disturbed soil, changes terrain, artificial objects) will be detected.



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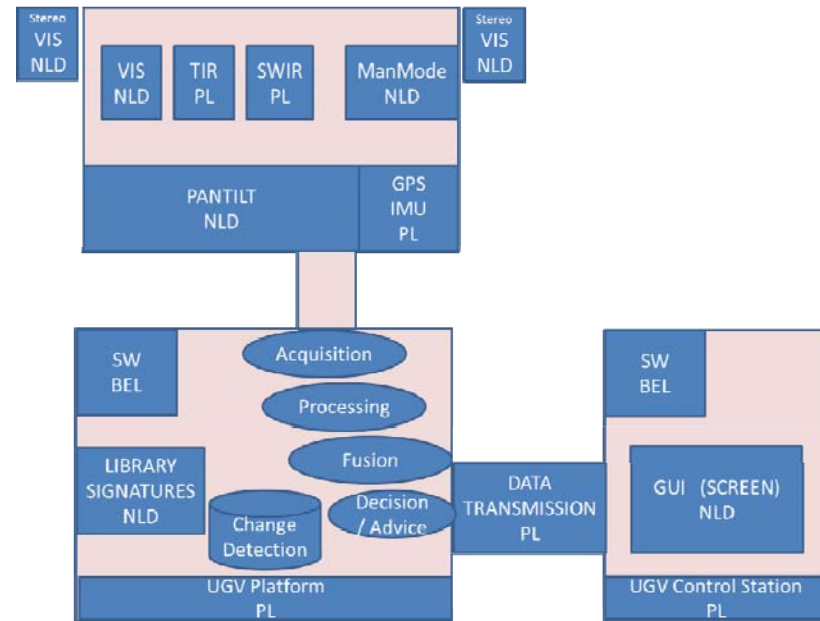
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6. IEDDET projects

UGV Stand-off detection platform for IED components detection (MUSICODE)

Aim: to demonstrate a multi sensor UGV for detection of IED components.

pMS: NO lead, AT, BE, NL, PL

Objectives:

- Illustrate that combining a multi-sensor solution with advanced data processing can improve the performance with regard to
 - standoff detection ability
 - advance speed
 - area coverage
 - operator workload



Image: Raytheon UK

- Combination of existing state-of-the-art sensors beyond present solutions on the market
- Exploit and support the larger system of systems
- Stand-off capability partly obtained by distance to UGV, not sensor package

6. IEDDET projects

Confirmation, Identification and Airborne Early Warning of (CBRN) IEDs (CONFIDENT)

Aim: Develop close-in and stand-off (about 10m) confirmation and identification of IEDs including the detection and identification of explosives and chemical or radiological agents in order to contribute to defeat CBRNe improvised devices.

pMS: AT lead, BE, NO, PL



Objectives:

The demonstrator should be able to access the IED safely in order to take samples and/or drain the agent. The project will contribute to defeat a CBRNe/improvised device. Technology demonstrator TRL 6-7 should have the following main features:

- CBRNe sensor/equipment package incl. remote identification of CBR agents
- Non CBRNe specific sensors on robots
- Sensor fusion
- Sensor package integration and robotics integration
- Robotics & Communications

IEDDET Projects

Vehicle Mounted Early Warning of Indirect Indicators of IEDs < UGV platform> (VMEWI3)

The objectives of the Project is to focus on the detection of indirect indicators with forward looking camera systems. The technology demonstrator will be based on remotely operated UGV platform with multi-camera head. The UGV platform will be controlled from first manned vehicle.



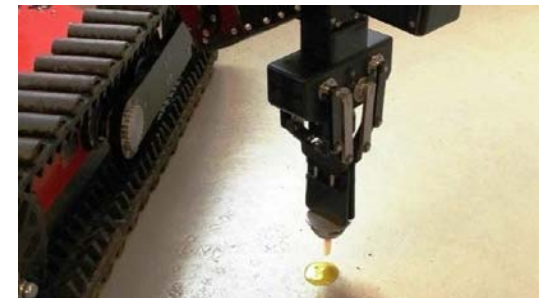
UGV stand-off multi-sensor platform for IED component detection (MUSICODE)

The project will develop a new multi-sensor deployment and processing to present the detection and relevant information to the operator. The remote operation from within the jamming bubble will be studied, but will not be a critical design requirement for MUSICODE project.



Confirmation, Identification and Airborne Early Warning of (CBRN) IEDs (CONFIDENT)

The objectives of the Project are to focus on the confirmation of IEDs and identification of relevant components including electronic parts, explosives and CBRN payloads prior to the release of the agents. Potential leakages are part of the scenario. The demonstrators will be based on remotely operated platforms (robot and UAV).



7. IEDDET T&E and Demonstration

- Common test site proposed by AT
- Tests and data collection at local facilities – to be planned in each project
- Tests and data collection on common test site – 1 month time windows
 - T0+12
 - T0+24
 - T0+34 – obligatory
- Combined demonstration
 - Not a test
 - T0+36
- Combined evaluation



T&E use cases

- Use cases under consideration in VMEWI3
 - 30km/h in front of the convoy,
 - 10km/h in front of convoy at same speed as MUSICODE (potentially the two technology demonstrators could be on same UGV platform),
 - Halted to quickly inspect in further detail Hotspots/suspect areas detected earlier and/or reported in off-line “detection-map”.
- Use cases under consideration in MUSICODE
 - 10km/h in front of convoy,
 - 5-10km/h in front of convoy using “detection-map”
 - Halted to quickly inspect in further detail Hotspots/suspects areas reported as early warnings in off-line “detection-map”.
- Use cases under consideration in CONFIDENT
 - Halted to quickly inspect in further detail Hotspots/suspects areas reported as detections in off-line “detection-map”,
 - Close-in detection and confirmation of IED with robot and/or Micro UAV, including complex IEDs and CBRNe devices and in an urban scenario.

IEDDET

IED Detection programme

- **Project type:** cat. B programme
- **cMS:** AT, BE, NL, NO, PL
- **Budget:** ~ 14 M€
- **Aim:** Improve and field test IED detection capabilities in support of defining Future Route Clearance beyond 2020.
- **Timeframe:** 2016/2019
- **Proposed programme R&T goals:**
 - Mobile
 - 1a. Early warning
 - 1b. (Stand off) Detection
 - 1c. (Close in) Confirmation and Identification

