

Dual Sensor (DS) Test October 2007

Background & Results Lessons Learned

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1

Background

- A DS ITEP trial was prepared with the participation of all existing DS including one single GPR from Russia
- Cy-Terra (HSTAMIDS) and Vallon (MineHound) cancelled the participation on short notice – ended with the cancellation of the trial in general by Germany
- Japan and Croatia took over the concept and conducted the trial with two Japanese systems, ALIS and using the Gryphon platform with a MD & GPR
- Relationship mines : clutter – 1:2
- Three test lanes used
- Operator training 2 weeks

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2

Test Protocol Evaluation

- Evaluation of the test protocol included
 - Test approach - reliability test 😊
 - Data evaluation model used for MD test 😊
 - Comparison of dual sensors/metal detectors 😊
- Development stage of dual sensors:
 - Reduction of FAR 😊
 - Reliability of dual sensors 😞
 - Improvement of the single systems used 😐
 - Efficiency evaluation 😐
 - Search speed 😞
 - Clearance speed ?? (too much variables)

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3

Restrictions and Limitations

- Foreseen protocol partially fulfilled
- The reliability of the test results is statistically limited
- Training only 10 working days
- General problem of data interpretation
- One operator was extremely less capable compared to the others

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4

Selected Main Test Results

- ◆ Significant reduction of the false alarm rate (FAR) by the GPR of about 50 % for both systems
- ◆ False alarm rate reduction was for both systems connected with a reduction of the POD level
- ◆ The GPR missed detected mines by the metal detector.
- ◆ Comparing the devices Gryphon achieved more stable results than ALIS.
- ◆ The average time achieved for scanning the test lanes about 2.5 hours for 28 m² reduced to about 2 hours the last day
- ◆ The results do not allow to investigate the human factors that influence in detail on sensor performance but operator comparison clearly shows differences
- ◆ It is desirable to achieve maximum exclusion of the human factor developing new solutions for training and on the use of the device in operations
- ◆ The reliability tests establish conditions that are not for comparison to the reality but for comparison of the tested equipment.
- ◆ A reliability test where all sensors can find all test objects does not provide any comparable results.

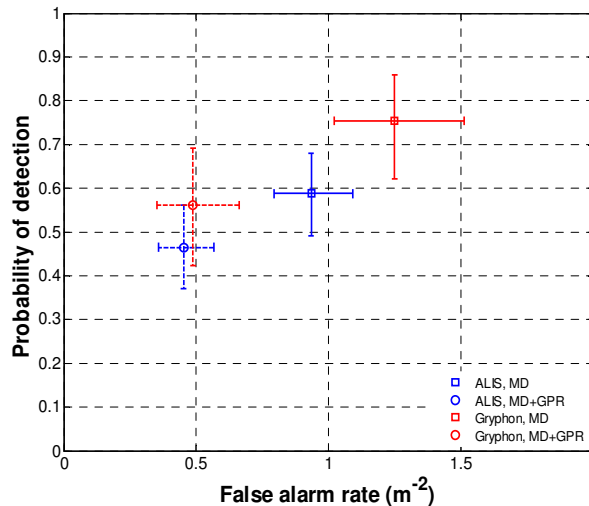
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5

Main Results CTRO/JST Test Oct 2007 Benkovatc

- ◆ FAR reduction of about 50-60 %



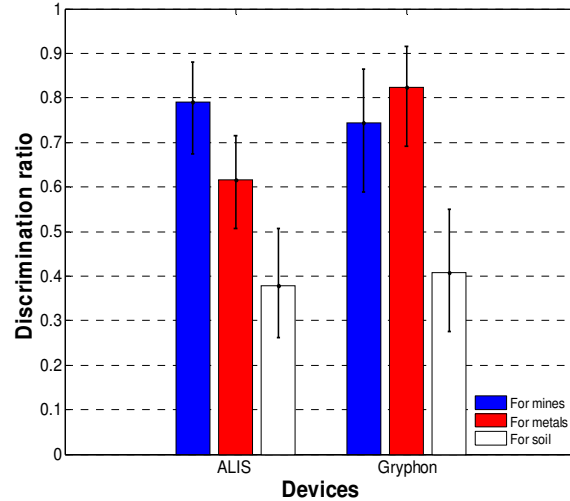
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6

Discrimination ratios for each device (FAR)

- Similar results for the systems in metal and soil but significantly different in discrimination
- Significantly different for mines cc the both GPR

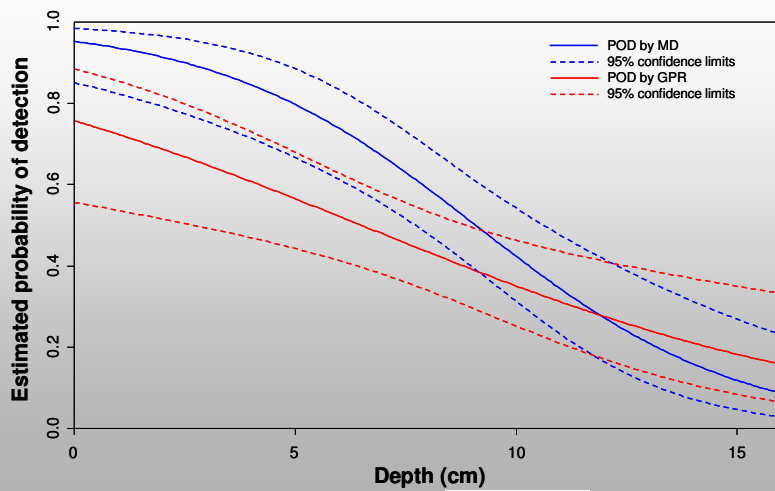


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7

Modelled POD with respect to depth



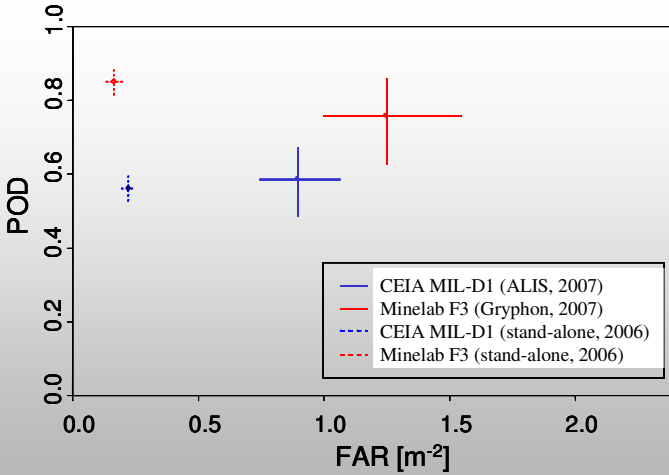
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8

ROC Minelab F3 & CEIA MIL-D1 2006 & 2007

- ◆ Statistics:
 - 2006 – 36
 - 2007 – 9
- lanes scanned by the operators
- ◆ POD the same
- ◆ FAR
- 2006 – clutter not counted
- 2007 – all incl.

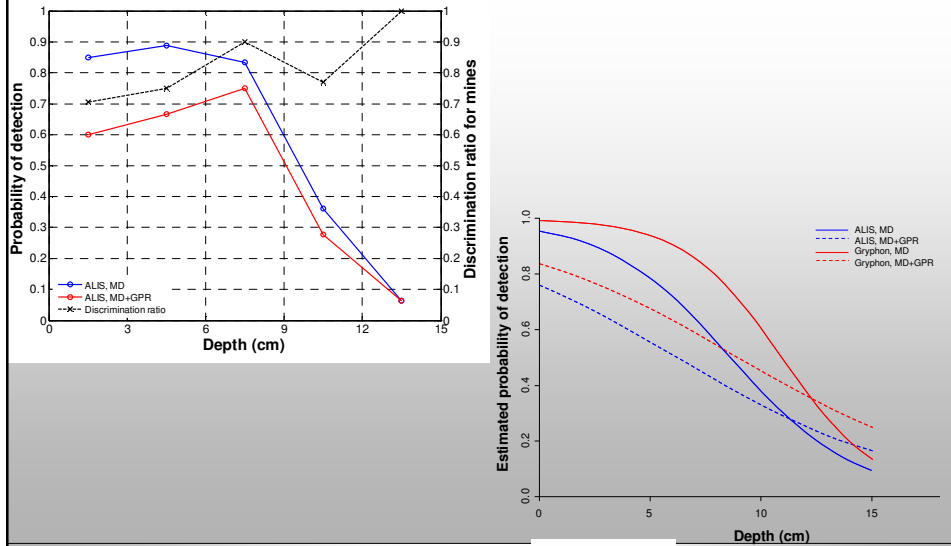


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9

Lanes 1, 3, 5 real data & modelled

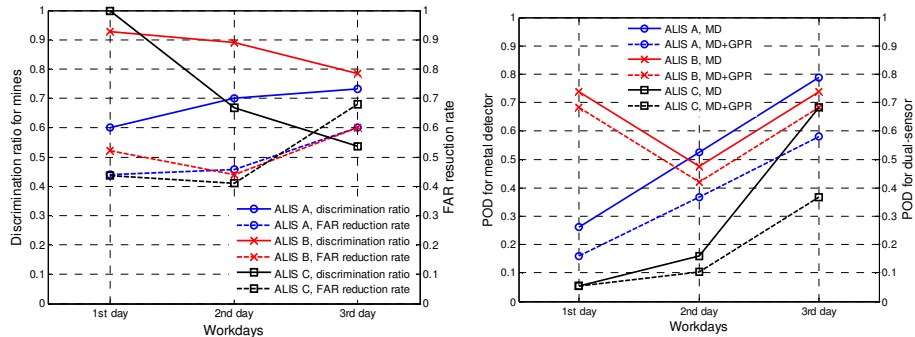


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10

Human factor



➔ The results are as different as the persons delivering them

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11

Lessons Learned

- ➔ The manufacturer of DS behave quite different as MD manufacturers in their interest to give knowledge about their equipment away, excluding Japan
- ➔ The time and intensity of training is much higher than for MD
- ➔ The influence of the human factor can be very extreme
- ➔ The GPR produces a significant false alarm reduction for the MD **BUT it may miss a mine**
- ➔ The way out is used by HALO with adjusting the clearance procedures to the tool
- ➔ At the moment no reliable data for the increase of efficiency are available

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12

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Questions

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13