



INSTITUTE FOR DEFENSE ANALYSES

**Scoring the Witnessed Demonstrations of Capability  
for the DoD Advanced Geophysical Classification  
Accreditation Program (DAGCAP) (Poster)**

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#### About This Publication

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# Scoring the Witnessed Demonstrations of Capability for the DoD Advanced Geophysical Classification Accreditation Program (DAGCAP)

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## Unexploded Ordnance (UXO)



- To remediate land of **UXO**, the DoD has successfully demonstrated advanced geophysical classification:
  - Technology (instruments and software)
  - Processes (quality control and quality assurance)
- Advanced geophysical classification** can:
  - Focus UXO remediation efforts on removing explosive hazards while
  - Avoiding the costly and unnecessary excavation of non-explosive clutter
- The **DoD Advanced Geophysical Classification Accreditation Program (DAGCAP)** supports the transition of advanced geophysical classification to commercial use:
  - Geophysical Classification Organizations (GCOs)** participate in DAGCAP to seek formal accreditation in advanced geophysical classification
  - The last step of the DAGCAP requires each GCO to perform a **witnessed demonstration of capability**
  - A site has been established for witnessed demonstrations at **Aberdeen Test Center (ATC)**, Aberdeen Proving Ground MD

## Procedure

- DAGCAP personnel provide a CD to the GCO containing:
  - Coordinates of vertexes outlining the half-acre demonstration area
  - Coordinates of two Schedule 80 Industry Standard Objects (ISO80) – surrogates for UXO – emplaced in the demonstration area for quality control
  - Coordinates, depths, azimuths, dips, and types of **Targets of Interest (TOI)** – inert and surrogate UXO – emplaced in the Instrument Verification Strip (IVS) for instrument calibration
  - Excel templates for preparing deliverable
- The GCO uses advanced electromagnetic induction instruments to **collect data**:
  - MetalMapper *OR*
  - Man Portable Vector OR*
  - Time-domain ElectroMagnetic Towed Array Detection System (TEMTADS)
- The GCO uses advanced software (e.g., library matching algorithms) to process the collected data into a **ranked anomaly list**:
  - An ordered set of locations detected in the half-acre demonstration area, sorted by likelihood of containing TOI
  - A **dig threshold** indicating which locations would require excavation in a real remediation project, due to their high likelihood of containing TOI
- The GCO delivers the list to DAGCAP personnel



TEMTADS

### Ranked Anomaly List

Rank	Easting (UTM m)	Northing (UTM m)	Dig Decision 1 = Excavate 0 = Leave Unexcavated
1	XXXXXX.XX	YYYYYY.YY	1
2	XXXXXX.XX	YYYYYY.YY	1
3	XXXXXX.XX	YYYYYY.YY	1
4	XXXXXX.XX	YYYYYY.YY	1
...	...	...	...
...	...	...	...
N-3	XXXXXX.XX	YYYYYY.YY	0
N-2	XXXXXX.XX	YYYYYY.YY	0
N-1	XXXXXX.XX	YYYYYY.YY	0
N	XXXXXX.XX	YYYYYY.YY	0

TOI Likelihood ↑

Dig Threshold ↓

## Scoring

- DAGCAP personnel use software to automatically compare the ranked anomaly list to **ground truth** to count:
  - Number of True Positives (TP)**, locations on the list for which:
    - The location has a 1 in the Dig Decision column *AND*
    - There is a TOI within 0.25 m of the location *AND*
      - That TOI is within the half-acre demonstration area *AND*
      - That TOI has *NOT* already been found within 0.25 m of another location further up the list
  - Number of False Positives (FP)**, locations on the list for which:
    - The location has a 1 in the Dig Decision column *AND*
    - EITHER*:
      - There are no TOI within 0.25 m of the location
    - OR*:
      - There is a TOI within 0.25 m of the location *AND*
        - That TOI is within the half-acre demonstration area *AND*
        - That TOI has already been found within 0.25 m of another location further up the list
  - Number of False Negatives (FN)**, TOI for which:
    - The TOI is within the half-acre demonstration area *AND*
    - The TOI is *NOT* within 0.25 m of any location on the list with a 1 in the Dig Decision column

## Reporting

- DAGCAP personnel determine if the GCO has passed the demonstration:

**Pass Criteria:**

FN = 0 *AND*  
 FP ≤ **ROUND**DOWN( 0.40 × Number of clutter items  
 emplaced in half-acre  
 demonstration area )

- DAGCAP personnel deliver pass / fail results to GCO:

Month DD, YYYY

SUMMARY REPORT

GCO Information:

GCO Name	Example Company, Inc.
GCO Point of Contact	Jane Smith

Test Information:

Accreditation Board Technical Observer(s)	John A. Doe
Accreditation Board Process Observer(s)	Jon B. Doe
ATC Point of Contact	Gene Fabian
ATC Site Representative	Rick Fling
Standard Operating Procedure	DAGCAP-1
Test Area	#XXX - North Area
Vertices	
Easting (UTM)	Northing (UTM)
XXXXXX.XXXXXXXXXX	ZZZZZZ.ZZZZZZZZ
XXXXXX.XXXXXXXXXX	ZZZZZZ.ZZZZZZZZ
XXXXXX.XXXXXXXXXX	ZZZZZZ.ZZZZZZZZ
XXXXXX.XXXXXXXXXX	ZZZZZZ.ZZZZZZZZ

Test Result: **Pass OR**  
 Fail – one or more false negatives (FNs) caused by failure to detect *AND/OR*  
 Fail – one or more false negatives (FNs) caused by incorrect classification *AND/OR*  
 Fail – too many false positives (FPs)

- More information about DAGCAP can be found at:  
<http://www.denix.osd.mil/mmrp/home/>



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