RADASCAN APPLIED TO VESSEL UNDERWAY REPLENISHMENT AT SEA DP OPERATIONS

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RadaScan System Components

Vessel Mounted Sensor

Ship Mounted Transponders

Marine Display and Computer
Mini RadaScan System Components

Vessel Mounted Sensor

Ship Mounted Transponders

Marine Display and Computer
RadaScan Installations
RadaScan System Specification

- 3W FMCW radar at 9.2-9.3GHz (radiolocation band)
- 360° scanning with 1Hz data rate
- Range 10m - 1000m line of sight
- 1.2m diameter dome
Mini RadaScan System Specification

- 3W FMCW radar at 9.2-9.3GHz (radiolocation band)
- 360° scanning with 1Hz data rate (3Hz planned)
- Range 10m - 200m line of sight
- Range 200m – 350m careful setup
- 0.5m diameter dome
- Portable installation
System Specification (transponders)

- “sees” only RadaScan transponders
- Rotate polarisation by 90
- Add unique ID by modulation to reflection
- Demodulation of ID at receiver rejects clutter using communication style processing techniques
- 12 month Fixed battery life option
- Mini Transponder rechargeable, one month between charges
- All transponders are compatible
Position Measurement Repeatability

Data measured statically at the GNL test range
Replenishment at Sea

- Transfer personnel & materials between two vessels.
- Supply vessel controlled by Dynamic Positioning, position and heading supplied by RadaScan
- Match forward velocity and maintain lateral separation.
Replenishment at Sea Trials

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Vessels:
USCGC Mellon, a 378’ High Endurance Cutter (HEC)
HOS Gemstone, a 300’ Offshore Supply Vessel (OSV)

Dynamic Positioning (DP):
Gemstone fitted with L3 DP System
Position control solely from the RadaScan system

Manoeuvres:
Straight Line, 45 & 90 degree turns at 8-12 knots
Vessel separation: 60 feet.
RAS – USCGC Mellon
RAS – Transponder placement
RAS – HOS Gemstone – RadaScan placement
RAS – Vessels Holding Station at 12 knots
RAS – Crane extended between two vessels
RAS – HOS Gemstone Wake Trail during turn
RAS – RadaScan Data

Key

- **Slow approach of the HOS Gemstone**
- **Final approach and hold for RAS manoeuvre. Fore/Aft control to within 2’**
- **Break away of HOS Gemstone.**
Conclusions

- RadaScan has been shown to be a reliable sensor for RAS operations and is suitable for difficult weather conditions where laser systems struggle.

- Dynamic positioning combined with microwave sensor technology has been shown to be the way forward for RAS operations.
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