ROV Usage in Recovery of Drowning Victims within the United Kingdom
Types of Incident and Recovery

- In Open Sea
- Diver incidents
- Fishing vessel
- MOB or sinking
- Freshwater
- Inland waterway
- Inland loch, and flooded quarries
- All search areas considered “crime scene” until proven otherwise
Tools to make the Job easier

• Planning the job – Research
• Sonar – Sidescan and/or Scanning
• Preparation of the ROV
• Back-up plan
Sonar – Side Imaging
(And traditional downward beam “fish finders”)

Images courtesy of Johnson Outdoors Inc.
Side Scan – Towed fish
Sonar – Scanning, On seabed mounted tripod or frame dependant on conditions.

Images courtesy of Kongsberg Mesotech Inc.
Sonar – on the ROV – Scanning sonar

Images courtesy Halma Group Plc and VideoRay Llc
Sonar – on the ROV Multi-beam
Lochaline Case Study
Background

• Missing Diver
• Well-known wreck
• Weather had delayed efforts so far
Lochaline Case Study

Planning: Location

Sound of Mull

• Near shore
• 32m Depth
Lochaline Case Study

SS Shuna.

1400 tons. 240’ Long 35’ Beam

Tripp expansion engines

2 Holds FWD.

2 Holds STEEN.

1/2 size loco masts in between S/STRUCTURE + ENRINEKOM

Zoom from Shuna.

SS 33 26 N 05 54 52 W

32m to seabed 25 to deck 18 to top of W/House.

Orientation: ? (N-S probably). 130°

Green Drum on masts/
Lochaline Case Study

Planning: Environment

- Nearby wreck
- Nearby fish farm
- Salt water
- Low visibility
Planning: Access

Use of dive centre day boat - Tidal area - Exposed to weather
Method: Sonar Baseline

- Initial sonar scan of site
- Interpretation of data
- “Ground-truth” data with ROV

- Overlap search sectors
- Out to maximum achievable range
- Approx 70m radius
Preparation

Sonar deployment platform
ROV ballasted for salt water
Additional strain-bearing tether

Sonar on Tripod
ROV on Buoyant tether
Shot weight on line
Planning: Potential Hazards

Station-keeping of dive boat – Mooring spread

• Entanglement with fish farm - Entanglement with wreck
Lochaline Case Study

- Fewer sonar targets than expected
- Some fairly large & dense
- Lots of small debris
Lochaline Case Study

- ROV investigation
- Mooring buoy
- Boulders
- Wreck debris
Lochaline Case Study

Sonar scan – third area, stern of wreck toward shore

- Few sonar targets
- Some fairly large & dense
- One very conspicuous target
Lochaline Case Study

Target on ROV sonar

Hard return from cylinders

Shadow from fins
Lochaline Case Study

• ROV used to positively identify target
• Find video taped and passed to investigating officers
• Marker shot-line placed next to find for recovery next day
Lessons – to be learned

Better cable handling & communications was required during sonar operation when communication was poor. The vessel skipper was not aware of the sonar cable – this led to the sonar tripod being pulled over at one point.

Shot-line arrangement meant no tidal problems during ROV operations – ROV had limited excursion but full control even with tidal effects.

Review information, draw out a plan AFTER the job.

What could have been done better, or was done just right – what part did luck play, and how to ensure that luck every time – make it by design not luck.
Banff Coast – lost fishing vessel

• Vessel known overdue for approx five days
• Skipper alone on vessel
• Skipper – “of advanced years”
• Intended trip for prawn grounds
• Air /Sea rescue search proved fruitless
• No surface debris.
• Local knowledge invaluable, other prawn vessel had snagged nets on previously clear ground.
Banff Coast – lost fishing vessel

• Police use VideoRay to investigate wreck take video and forensic evidence prior to victim recovery.
• MAIB then hire local VideoRay owner/operator for vessel inspection both internal and external.

• Large hazard from nets still out, but clearly identified on sonar
Canal Search – Missing pensioner

- Missing for four days, land search started after an hour away from home.
- Known to suffer from vascular dementia
- Known to walk regularly at canal side
- Extensive canal area to search
- High profile in local news
Dorothea – The “Killer Quarry”

• Quarry extensively used by divers despite repeated efforts by landowner to prevent access
• Quarry has two pools, one with depths in excess of 100m, other much shallower.
• Water areas are crossed by old quarry workings gantry wires and since flooding many divers shot lines – hazards of may kinds, wire rope, extensive shot line networks and old quarry buildings and infrastructure
DOROTHEA QUARRY

DEPTHS IN METRES

WALL
TUNNEL AT 5M
WIRE
ON PEAK
8M SLOPE
TUNNEL AT 12M
WIRE
TUNNEL (REMEMBER)
CABLES

DANGER
MIXED GAS ONLY

* 300 BAR *
DIVERS AIR AT ABERDYSCH
01758 712845

TO ORIGINAL QUARRY (FLOODED - LITTLE PARKING)

WAY IN FROM TALY-SARN

CAR PARK
ROUGH PARKING
NANTLE

UPATED 22.1.98
R. BUTTON

WAY IN FROM TALY-SARN

GATE
STRELS
VILLAGE

35M
EXCAVATIONS
CAR PARKING
RUIN

8M SLOPE
60M CABLES
48M CAR PARKING
50M CABLES
3M, 4M TUNNELS
3M, 4M TUNNEL
2M, 3M TUNNELS
1PM TUNNELS
Dorothea is used extensively by divers for training, seen as ideal in respect of the deep water availability and the lack of reliance on weather conditions.

- Female Diver, highly experienced on rebreather system
- Training dive for charity event
- Loss of buoyancy, caused diver to grab at surface buoy which then came down and entangled diver
- Diver went down, buddy diver unable to free her and had to surface, subsequently airlifted to decompression chamber.
- Buddy surfaced and immediately called for assistance, no other depth capable divers on site.
- Victim failed to surface and emergency services called to site
- 22nd diver killed in Quarry since 1994
Dorothea

- Northwest Police Dive Team, responded with VideoRay to attempt recovery
- VideoRay tangled and trapped at 50m
- Customs and Excise “Phantom” mobilised, also becomes trapped
- Second VideoRay mobilised by Underwater Visual Services
- Two VideoRay used to see snags and clear each other, both vehicles at one point tied in large quantity of rope lines, video from one system used to help clear first.
- VideoRay retrieved to surface and “seat belt cutters” fitted
- Further launch cleared both systems and allowed diver retrieval to continue.
- Diver found at 76m “wrapped” in rope, extensive cutting of rope free’s diver
- Diver descends to bottom – 92m at this point
- VideoRay descends, hooks divers D rings and retrieval successful
- VideoRay launched again on following day and successfully cuts free trapped C & E “phantom” vehicle
- Very difficult job under observation from family on shore and with extensive in water hazards
River search

- Missing person
- Fast flowing river
- Very difficult access due to lack of road
- Evidence pointed strongly to victim being in river
- Sonar scans essential for area coverage
- VideoRay used to provide video confirmation and evidential backup
Sonar scan from close to shore – fast flowing river

Target identified on sonar as worthy of further investigation
On-Going

• Loch Morar – deepest water in UK, over 1000ft, sharp ledge from 300ft down, search continues intermittently for young fisherman lost over side of small boat late 2005

• Murder investigation – Search in drainage system of city centre Leeds – current – Evidence found which may lead to a conviction

• Murder investigation – search for torso and limbs of victim from “Glasgow gangland killing” extensive search in 70m plus waters in Sound of Mull – current search

• Diver – diver recovery from vessel “Konig” in Scapa Flow – wreck penetration and search, vessel extremely fragile and entry hole to small for anything other than VideoRay
Links

- www.buccaneer-ltd.co.uk
- www.videoray.com
- www.underwatervisualservices.co.uk
- www.subsea-rov-services.co.uk
- www.tritech.co.uk
- www.kongsberg-mesotech.com
ROV Usage in Recovery of Drowning Victims within the United Kingdom