

A FEW DAYS IN THE LIFE OF AN ENGINEERING GEOPHYSICIST

Ray Gordon

I appreciated the recent serious discussion between Messrs Stapledon and Fell on the value of engineering geophysics. My own experience when trying to utilize geophysics in an integrated site investigation has been generally one of despair. For the education of readers I attach an actual TRIP LOG made during a recent geophysical survey of a port site. There have been bigger disaster areas in this potent field but not many as this state of affairs is often the lot of a contractor using other peoples gear from seismic equipment to survey vessels. Names in the TRIPLOG have been changed to protect the innocent. How can geophysicists remain SANE under conditions like these - oh yes, well, maybe they don't?

Ray Gordon.

MONDAY - 30 NOVEMBER 1987

- 08:30 Able proceeds to Port to mobilise vessel, power supplies and transducer bracket being arranged. Ten boxes of equipment from PWD in Port store.
- Equipment unpacked and installed on vessel with assistance from Port staff. Documentation on PWD manufactured interface boxes and amplifiers missing, and some cables apparently missing. Some cables extra to requirement.
- 12:45 Baker arrived on vessel with computer and interface notes from PWD.
- 15:00 Line filter obtained from Port. Awaiting Pinger bracket fabrication.
- 16:00 Geophysical equipment mobilization completed as far as possible, computer not reading bathymetric data. Power cable for trigger amplifier manufactured.
- 16:30 Departed vessel.

TUESDAY - 1 DECEMBER 1987

- 07:00 Arrived at vessel, prepared Boomer for sea trials.
- 08:00 Purchased additional power distribution board, Pinger transducer assembly arrived.
- 09:45 Slip for trials using Boomer; system giving records and required final tuning. Baker setting up computer.
- 11:45 Computer not operational, returned to suppliers for checking.
- 13:00 Computer returned but apparently not 'talking' to Micro-fix or Sounder. Tests with Pinger show system runs intermittently.
- 16:00 Computer working, but not logging bathymetry.
- 16:15 Departed vessel.

WEDNESDAY - 2 DECEMBER 1987

05:55 Arrived at vessel.
06:00 Port staff arrived and unlocked gate.
06:10 Port surveyors on board then setting up batteries at shore stations.
07:05 Tests with Boomer prior to running lines. Base Station No.3 installed.
07:15 Station running however problem with computer.
07:30 Returned to jetty.
08:30 System apparently operational, standing by for return to boat crew from hospital (eye damage).
09:30 Leave for trials.
10:00 Returned to jetty, problem with continuous fixing on analogue data. Problem with continuous fixing, 'locking-up' of computer and expanded display on helmsman display.
12:00 Replacement computer sourced.
13:00 Computer arrived, however, 10 volts found on earth line between Geophysics (tied to sea-earth) and Micro-Fix so computer returned.
14:00 Further investigations showed 10 volts on earth between Micro-Fix and Helm Monitor.
15:00 Boat returned to pen for modifications to Micro-Fix/Monitor.
15:30 Port obtained replacement monitor.
18:00 Staff leave.

THURSDAY - 3 DECEMBER 1987

05:50 Arrived at vessel, gate locked.
06:00 Port staff arrived.
06:10 Surveyor at vessel, other Port surveyor setting up base stations.
06:40 Stations installed.
07:00 Testing system at sea; working, then computer 'locked-up' again.
08:05 Back alongside to work on computer.
12:00 Still interface problem with computer, apparently the output from Micro-Fix too low. Port staff to Racal for replacement Micro-Fix.
13:15 Replacement Micro-Fix arrived, 240 volts and no power lead.
15:10 Power lead arrived. Micro-Fix output apparently insufficient for computer.
16:00 Decision to use manual fixing. Port installing logging unit to use with Port Micro-Fix.
16:30 Proceeded to river.
17:00 Boomer output power lead shorted to earth, checked Boomer plate and found earth plug off. Plug reconnected and held in place. System run up again, still short circuit and sparking at power unit. Examined power lead and found damaged insulation.

18:30 Completed attempts for days work.

FRIDAY - 4 DECEMBER 1987

06:45 Standby for Port staff due at 08:00.
08:00 Surveyors installing stations.
08:45 Leave harbour.
08:44 Boomer running.
08:58 Turn on SOL. On line 1 but no fixing due to bad ranges.
09:02 Fix 13, EPC recorder dropping out.
09:21 Abort work, EPC problem. Port surveyor to office to calculate line co-ords. New stylus belt installed on EPC.
09:34 Running to line 2.
09:37 Interference from ship's radio seen to stop EPC.
09:56 Line ended, bad fixation, problem with Micro-Fix ranges. Returned to jetty to install alternative Micro-Fix unit.
10:00 Gear control on ship's engine failed and hit bridge. Pinger transducer hit but no apparent damage. Pinger and EPC recorder run for 1 hour. EPC ran without failing once, and Pinger transducer fired continuously.
14:27 Vessel repaired and preparing to survey.
14:34 Surveying, primary lines Inner Harbour.
15:40 EPC recorder failed.
17:05 EPC fault rectified.
18:40 Completed surveying for day. Base stations being retrieved using vessel. Apparent problem with position of precalculated lines - wrong grid parameters in Micro-Fix; Port surveyors to rectify.
19:00 Vessel alongside.

SATURDAY - 5 DECEMBER 1987

05:40 Arrived at vessel.
07:30 Vessel in survey area, Port setting up stations.
07:57 Start of survey in Outer area, data affected by noise from seastate or the large number of vessels in the area.
08:10 Lost navigation, lost ranges.
08:34 SOL 2, data poor. Retrieved equipment and found Boomer joy plug burnt out.
10:46 Boomer plug repaired. Small generator failed to start.
11:00 Generator running and although the supply was suspect the equipment was operational.
11:18 Line conditioner installed.
11:20 Boomer system run up, no power from Boomer supply unit.
12:25 Pinger system run up and operated on internal trigger for approximately 1 hour. Reflection from seabed obtained; however, only very weak and discontinuous

penetration recommended that use of Pinger would not achieve useful data in the prevailing soil conditions.

13:25 Boomer checked for open circuit. Boomer cable/plate has resistance 0.7 ohms. Dummy load (sparker) made and confirms that original ignitron and Boomer cable OK. Attempted to locate spare Boomer plate.

SUNDAY - 6 DECEMBER 1987

06:00 Decision made to decommission vessel until replacement parts can be sourced.

08:45 Equipment packed in Port store.

FRIDAY - 11 DECEMBER 1987

08:30 Status meeting.

10:00 Departed for Port.

11:00 Meeting at Port.

13:00 Departed.

FRIDAY - 18 DECEMBER 1987

08:40 Able at Port.

09:30 Equipment unpacked and ready to load.

11:30 Survey vessel apparently unserviceable.

17:30 Departed Port office.

MONDAY - 21 DECEMBER 1987

07:30 Able and Baker at vessel picked up Atlas Deso 20 transducer and overside mounting bracket.

08:15 All small equipment loaded, waiting on crane to lift generator, shiprights and welder. Port staff located their own Deso 20 transducer and overside bracket.

10:00 Bench installed and instruments set up ready for testing, waited for completion of welding prior to test.

11:10 Transducer bracket welded and earth attached.

12:00 High voltage (Boomer source) tested. Low voltage/instruments run using shore power due to loose carburetor on generator.

12:30 Generator repaired and seismic equipment ready for 'sea trials'.

15:45 Sea trials and equipment operational after tuning, however, no echo sounder or Micro-Fix operational at this time.

17:00 Tied up alongside.

17:15 Departed.

TUESDAY - 22 DECEMBER 1987

06:00 Arrived, waiting on surveyors to set up base stations.

06:25 Slipped berth, problems with Micro-Fix monitor.

07:20 Alongside for Micro-Fix.

07:40 Slipped berth, no helmsman monitor on Micro-Fix.

08:00 Boomer deployed, data marginal due to seastate. Returned to sheltered waters and noted gradual weakening of signal (seismic).

08:20 Complete failure of hydrophone, dismantled unit and found to be low in oil, returned to berth to source oil.

13:15 Sea trials using repaired hydrophone, signal still weak.

14:00 Operational system obtained.

14:39 Surveying, seastate marginal.

15:29 Commenced surveying in relative shelter, unable to survey in harbour due to lack of suitable base stations. Some Outer primary lines and diagonal tie lines surveyed.

16:47 Abandoned work for the day due to the seastate.

17:05 Alongside.

WEDNESDAY - 23 DECEMBER 1987

05:00 Arrived at vessel, standby for surveyors to install base stations.

05:20 Slipped berth.

05:40 Boomer equipment deployed and ready to survey. Surveyed outer primary lines, outer tie lines and diagonal tie lines.

10:50 Break off survey for coxswain rest spell and adjustment of base station configuration.

12:30 Resume survey, Inner Harbour tie lines.

14:20 Break of survey for coxswain replacement, continue Inner Harbour tie lines.

16:25 Completed days survey.

17:00 Boat returned to pen in time for coxswain relief.

THURSDAY - 24 DECEMBER 1987

07:36 Slipped berth.

08:00 Equipment deployed and operational, survey in Beach area.

09:00 Returned to berth.

10:00 Equipment unloaded and placed into store.

