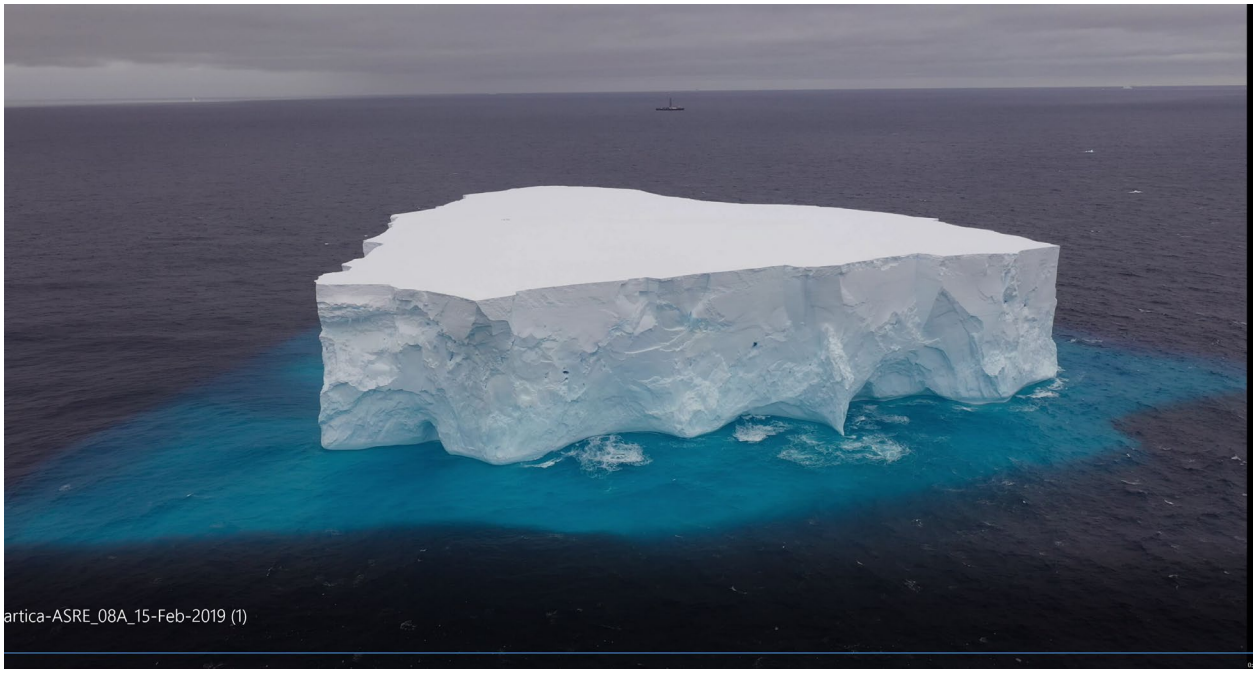
ENGINEERING Exp 379 AMUNDSEN SEA
18 Jan 2019 to 20 March 2019

Mike Meiring

ENGINEERING



Credit: Phil Christie

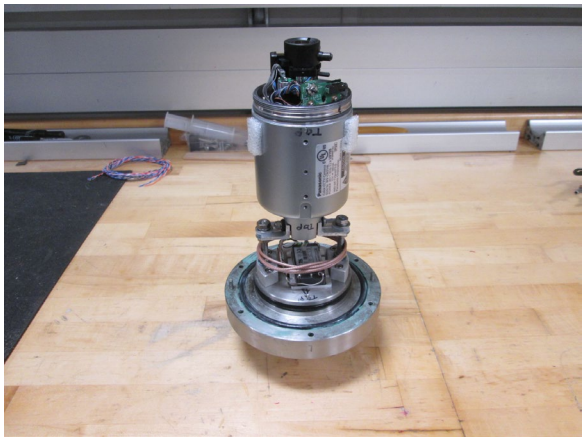
OVERVIEW:

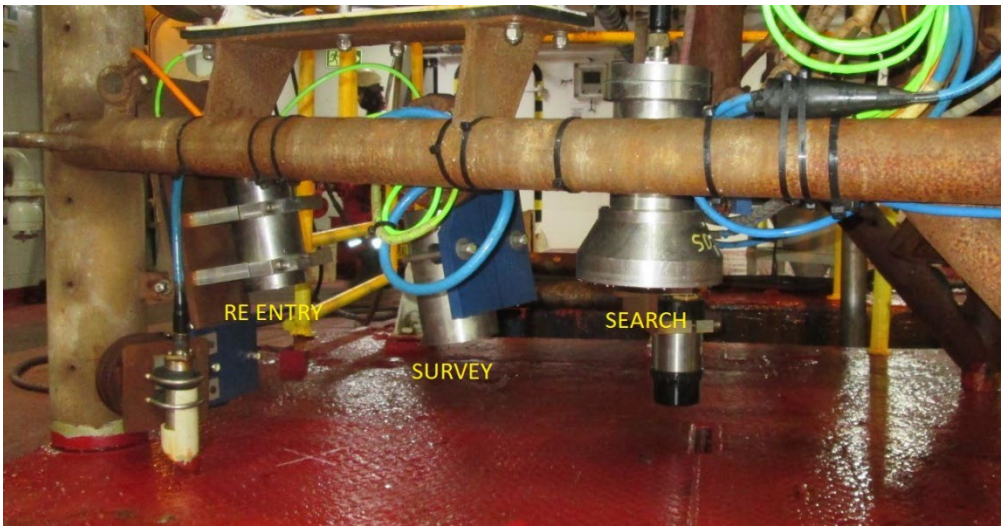
A new Wide Field Of View camera was installed and tested during 4 X VIT deployments made to >4000m.

VIT:

NEW “SEARCH” CAMERA:

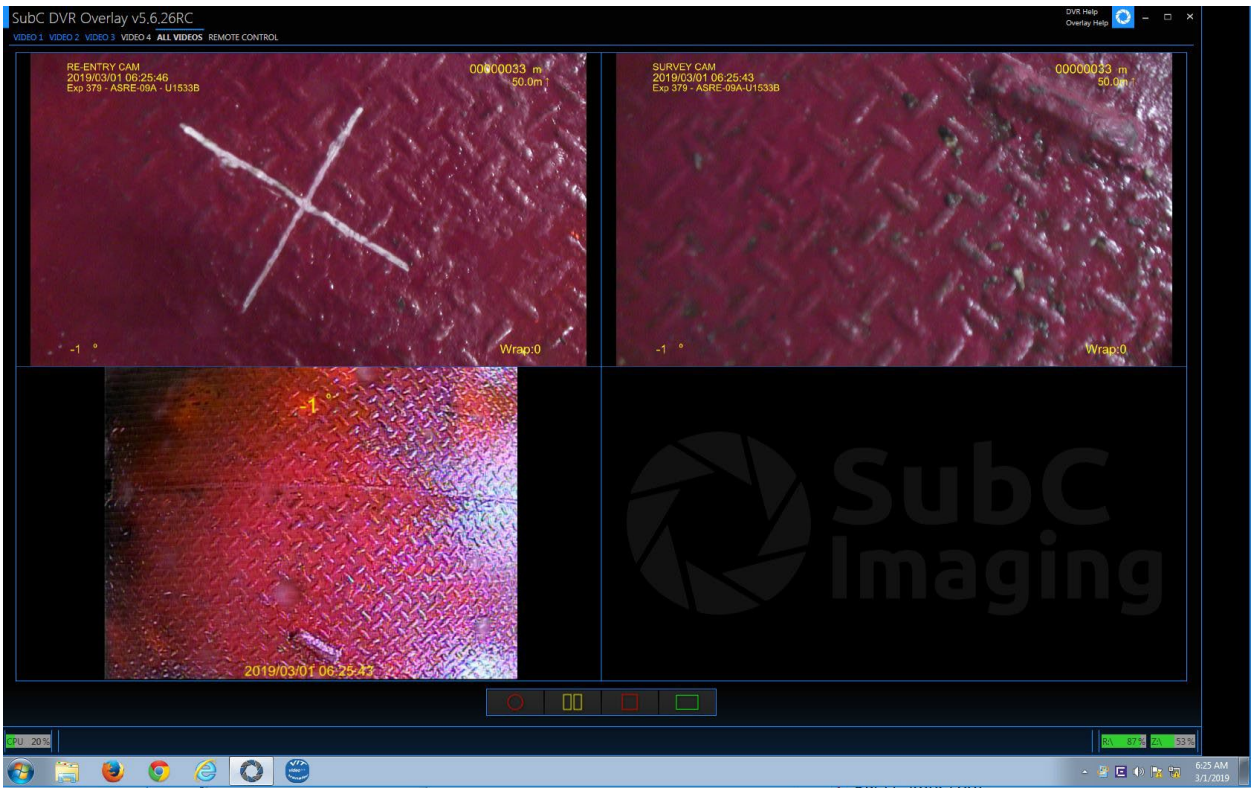
- There was a need for a Wide Field Of View(WFOV) camera to sooner locate the re-entry cone and then to keep it within the camera FOV while maneuvering for re-entry.
- A Panasonic WV-CW314L (PAL) S/N RHV 02181 “Search” camera was installed into one of the older pressure vessels (S/N SD2) and mounted to the frame on a plastic bracket.





- The camera setup was done by manually adjusting the Zoom control to ~ 90deg FOV angle and then adjusting the focus for this Zoom position. As the LED lighting angle is ~90deg, lighting may not be sufficient for camera angles >90deg.
- Video from the Search Cam enters the SUBCDVR on Port [In 1C]. It gets data overlayed and exits on Port SDI(4) to Ship TV CH-8. It is also viewable on the SUBCDVR and DP Monitor AV input.

From the screengrab below the wider FOV of Search cam is obvious when compared to the HD Cameras, when observing the cross-pattern on the deck.



- Operators of the VIT system found the added capability this camera offered, helpful.
- A spare "Search" camera ordered to be installed in the second older pressure vessel.
- Addition of this composite video camera will also improve redundancy as it eliminates the need to change-over the HD-cams from HD-SDI to NTSC format in the case of HD-SDI path failure.

PAN/TILT SIDUS:

Removed the P/T device (S/N 3006) and packed for shipping to CS. Returns an error on PAN commands. TILT normal.

- Both P/T devices now faulty and shipped for repair.

PLASTIC BRACKETS

- Both the Survey and Search cameras and one of the LED lights are now mounted to the frame on plastic brackets.

- Although these brackets appears to be suitable, were exposed to sub zero temperatures on deck for most of the expedition and did 3 X deployments to >4000m, a qualified person needs to verify their suitability for this application. E-mail 03142019
- The plastic-type identified is:
  Material: UHMW Plastic
  Hardness: Medium/Durometer 66D
  Outdoor use: Yes
  Temp Range: -20 to 180degF
  Impact strength: Excellent/No Break
  Tensile Strength: 5500-5800psi
  Specifications Met: ASTM D4020, UL 94HB
  Performance Properties: High Strength, Impact Resistant, Low Water Absorp.
  Also see McM# 85705K43
- Unlike its metal counterpart, plastic is lighter, machineable, cheaper, not prone to galvanic corrosion and offers some shock isolation.

PRESSURE COMPENSATOR:

- Pressure Compensator piston rod now fully extended, obviously abnormal. Verified that there was no water in j-box. Did not want to risk exploring the reasons for the abnormal condition as there is no spare onboard. No change noted during 4 x deployments to >4000m.
- Spare pressure compensator on order.

GYRO:

- Gyro heading error has two components:
  a) Gyro drift. (constant), <1deg/hr as per specification.
  b) Earth rate. (function of latitude)

We are only correcting for Earth rate (up to 15deg/hr at the poles) as the gyro drift specification of ~1deg/hr is within the noise of the accuracy required.
From actual measurements at different latitudes it was found that: GYRO total error = ~2 X Earth rate.

	Lat(deg)	**E-Rate(d/hr)**	**Total(d/hr)**
Subic Bay	14.8	3.8	7
Punta A	53	12	22
Antartica	68.5	14	28

HD VIT SOFTWARE UPGRADES:

- The Earth-rate calculation issue was resolved, however, the software was now compensating in the wrong direction. Version VITOF2017_1.1.exe was forwarded from CS which resolved the direction issue, however, this version has no comms with the Re-Entry cam. Changed back to *VITOF 2017_1.0 NEW.exe.* E-mail DF 02132019

- HD VIT not seeing Nav data from Winfrog. Data comes from either one of two Winfrog PCs in Underway. HD-VIT only monitors one. Winfrog currently running on the other. E-mail DF 03112019
- Request from operators to remove both analog(blue pointer) and digital indication of "Ship heading" from display. E-mail DF 03112019
- It was suggested to alter the Earth rate correction code in HD-VIT to 2 X Earthrate. (See GYRO above). e-mail DF 03112019

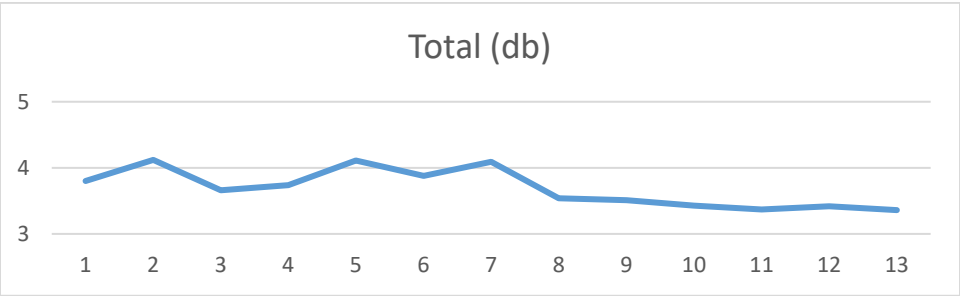
GENERAL MAINTENANCE:

- Flushed devices/connectors with fresh water following deployments and sprayed with silicon lubricant.
- Exercised Optical splicing instruments.
- VIT System serviceable and ready for deployment.

OPTICAL LINK INTEGRITY:

OTDR measurements are periodically made on the spare Brown Fiber from DP to the VIT Frame J-Box. Compared against measurements from previous Expeditions, this could be an early indication of potential issues especially on the FORJ and Umbilical. OTDR measurements on the BRN fiber shows no evidence of optical link degradation.

EXPEDITION	SUBSEA J-BOX (db)	FORJ (db)	Total (db)	Length (m)
Exp 362T	1.26	1.3	3.8	7513
Exp 362T 700m	1.6	1.54	4.12	7513
Exp 366 Start	1.12	1.02	3.66	7512
Exp 366 3670m	1.16	1.1	3.74	7511
Exp 366 End	1.59	1.48	4.11	7511
Exp 368 Start	1.35	1.17	3.88	7512
Exp 368 2780m	1.52	1.42	4.09	7511
Exp 371 Start	0.35	0.95	3.54	7512
Exp 372 End	0.94	0.85	3.51	7511
Exp 375 Start	0.34	0.94	3.43	7510
Subic Dry dock	0.9	0.79	3.37	7467
Exp 368X	0.31	0.9	3.42	7467
Exp 379	0.31	0.94	3.36	7466



PROJECTS:

CORE ORIENTATION TOOL:

- Created conceptual design of tool packaging. e-mail 02192019
- Identified STIM202 as potential GYRO sensor. E-mail 02222019

NEW VIT FRAME:

- Worked with EricS on new frame design. E-mail 03082019

RIS:

TRACER PUMP:

- Altech 301 Pump B was emitting a high freq noise/vibration and not pumping. Found open circuit 0.5ohm/1watt resistor in stepper motor drive circuit. Failed due to high friction in pump mechanical drive chain. Replaced resistor, cleaned and lubricated drive mechanism. Pump serviceable.
- Comms to Tracer pump in Mud room failed: Found RJ-11 connector on instrument not properly mated.

PIPE COUNTER:

- Replaced reflectors for pipe counter sensor after it was painted by other fricin crew.

DHML:

APCT3:

- Request by Ops Sup. to have all available serviceable APCT3's onboard, rather than in CS.

SET2:

- SET2 S/N 628 shipped to CS for repair to a cracked connector.

INVENTORY:

APCT3	S/N 002
APCT3	S/N 007
APCT3	S/N 031
APCT3	S/N 032
SET2	S/N 530
MicroSmart 10k	S/N 40129
MicroSmart 10k	S/N 40121
MicroSmart 10k	S/N 40060
MicroSmart 10k	S/N 4986
MicroSmart 15k	S/N 4997
MicroSmart 15k	S/N 4981 could not be located?
ERS	S/N 1
ERS	S/N 2

OTHER:

- Reviewed VIT and RIS AUG with Karen Graber

SHIPPING RECEIVED:

- 1 x Panasonic camera OV 0100.

SHIPPING RETURNED:

- SET2 S/N 628
- P/Tilt device S/N 3006 OV0811
- 12ft section of UI optical/electrical core for MINRL pigtail.

ORDERS/REQUESTS:

- 1 x Panasonic camera OV 0100 (Spare).
- HD-VIT code change: Remove Heading indication e-mail DF 03112019
- HD-VIT code change: Earthrate correction X 2 e-mail DF 03112019
- HD-VIT code change: HD VIT not seeing both Winfrog PCs. e-mail DF 03112019
- McMASTER Order: e-mail 03152019
  a) 2 X Vibration Damping U-Bolt McM# 3176T16.
  b) 6 x Reflectors, McM# 1927N21
  c) 1 X Plastic sheet McM# 85705K43

ORDERS/REQUESTS OUTSTANDING:

- HD-VIT code change: Earth rate correction. e-mail DF 03282018
- HD-VIT code change: Camera focus and other settings e-mail DF 03272018
- DowCOMM User Guide update. e-mail DF 08142017
- PAN/TILT repair S/N 3524. e-mail JvH 09142018
- ERS motors. e-mail DF 03192018
- Pressure compensators for VIT J-Box. e-mail JvH 09182018
- 2 X U/W Cables for cameras. OV0841. e-mail JvH 11272018
- Main hybrid Pod/Umbilical connector/pigtail. e-mail JvH 0222018
- 2 X U/W LED Y cable for LED lighting. OV0820. E-mail JvH 11242018