

**Aberdeen Evening Meeting:
Diving Technologies**
Robert Gordon University, Aberdeen



Wednesday 20th February 2019

By Andrew Macnamara

Attendance: 53

COBRA Rebreather – A joint presentation by Allan Nairn (Director of Diving at Rever Offshore) and Graeme Clark (Head of Sales for Commercial Diving Products at JFD Global)

Graeme kicked off the evening by identifying the problem statement; the supply of gas to the diver in the event of a loss of primary supply from the umbilical. The traditional solution (SCUBA) is limited by virtue of the volume of gas it's possible for the diver to carry, which is impacted by the depth at which the diver is working and limited through loss of gas as a result of SCUBA being open circuit. Graeme took us through the various industry guidance and the calculations for the gas volumes required for the diver to be able to reach a place of safety, which clearly highlighted the limits of current solutions. Applying ALARP thinking and asking; is it reasonably practicable to improve on SCUBA had previously seen the introduction of Secondary Life Support (SLS) systems. SLS does extend the time available for the diver to reach a place of safety, however the high cost of the systems, combined with an inability to test the integrity of the system prior to use resulted in a limited update. It was at this point that JFD developed COBRA (Compact Bailout Rebreather Apparatus), demonstrating ALARP in providing a practicable solution to significantly extend the time available for a diver to reach a place of safety. Graeme highlighted the key features of COBRA; Offline Positive Pressure (to continuously ensure system integrity), Warmth and Hydration (to ensure the soda lime bed is always ready for use), Rapid Recharge (for ease of operation) and Single Turn Activation (for ease of use). Subsequently COBRA has been fully certified as a sat diving emergency breathing system, the only system in the world to achieve such certification.

Allan told how after a serious incident where they lost the supply of gas to a diver, Bibby (now Rever) first introduced COBRA onto the Bibby Topaz in 2018 and then throughout their fleet. Experience of using COBRA has highlighted that it struggles with the enriched HeO₂ mix at depths shallower than 60msw, otherwise at depths greater than this Rever plan on using COBRA as standard. In 2018 Bibby (now Rever) achieved more than 400 dives using COBRA at depths of up to -186msw. Given the ease of COBRA's on and off function, throughout these dives the divers were able to regularly practice and gain experience with the COBRA system. On one dive, a diver was able to use the COBRA system for 22 minutes, with significant gas pressure still remaining at the end of the dive. JFD had issued the divers with a 13-page questionnaire to complete following each use of the COBRA system and in this collaborative way Rever and JFD have been able to refine and improve its use and maintenance.

Safety Assurance of Automated Dive Vessels: The Last 10 Years v The Next 10 Years – Ed Gardyne (Managing Director at Safewell Solutions)

Ed told us how his focus is on educating and raising awareness of the “invisible risks” presented by the use of PLC’s in industrial automation of critical systems (such as dive systems). PLCs and elements of industrial automation began to be introduced into dive systems as early as 2002, becoming more significant in 2008 in the automated systems of the Bibby Topaz and then even more so in 2009 with the introduction of the highly automated Seven Atlantic. Faced with the challenge of how to assure the “invisible risks” of the PLC automation systems, Shell UK brought in Safewell Solutions to develop an assurance framework, which quickly led to the development of an IOGP sub-committee on the same subject. In 2013, these “invisible risks” became reality with an uncontrolled dive bell decent incident onboard the Skandi Arctic. Subsequently, the assurance framework developed has been used on many vessels operating in the North Sea and ultimately the IOGP sub-committee has published associated recommended practice for use throughout the industry.

Real World Operational Experiences of Diving Utilising the Novel “Mother – Daughter” Solution – Hamish Peterson (Managing Director at KD Marine)

Hamish highlighted the problem of how to put a diver on a worksite where traditional DSV access was limited and where diving from the host facility was not supported (i.e. not allowed as a result of the inability of decompressing divers to evacuate the facility in the event of an emergency). KD Marine’s solution to this problem was to develop the Subsea Intervention Daughter Craft (SIDC). The SIDC provides a traditional floating diving platform but is distinct from a RIB or SCUBA replacement. Given the very specific design and functional requirements for the SIDC, no existing hull design was found to be suitable and a naval architect was brought in to develop the SIDC as a purpose build design. Having addressed the issues of; class certification, personnel accommodation, stability, interface with the mothership (including the design of the launch and recovery system), KD Marine have further considered the safety, health and wellbeing of the personnel onboard the SIDC, addressing fatigue in their resourcing and rota patterns.



L-R - Allan Nairn, Rever Offshore, Graeme Clark, JFD Global, Hamish Peterson, KD Marine, Ed Gardyne, Safewell, Andrew Macnamara, Shell (Chair)