

The Sydney – Kormoran Project: Conducting a 3D Imaging Survey of the HMAS Sydney (II) and the HSK Kormoran



Report on SUT Perth Branch Evening Technical Meeting
Wednesday 10th February 2016

By Mark Casey, Perth Branch Committee Member

The first technical evening for 2016 hosted by the SUT at the Parmelia Hilton included an extremely interesting and informative series of presentations that took in both the human and technical aspects of a major tragedy event that occurred in the throes of World War II.

The evening was opened by SUT Perth Branch Chair, Julie Morgan and chaired by SUT Committee Member Mark Casey. The event was sponsored by DOF Subsea, Curtin University and the Western Australian Museum.

The HMAS Sydney II and HSK Kormoran sank each other in a fierce battle on 19th November 1941 in the midst of World War II. The exact location of the two wrecks remained unknown for almost 70 years – ensuring that the story remained the subject of significant debate and mystery. The discovery of the two wrecks in 2008 fed the Cole Commission of Inquiry, which ruled on the loss of both vessels, but there remained a desire to tell the story of the Sydney and Kormoran wrecks in a highly visual modern manner. Hence the mission was born to return to the two wrecks, to conduct a detailed 3D imaging survey of the two wrecks, in a way that had not been done before.

Four technical presentations were delivered during the evening, all covering various aspects of the event, including the search, the discovery and the follow-up:

1. **“The Mission”** - Dr Michael (Mack) McCarthy, Curator, Maritime Archaeology, Western Australian Museum.
2. **“Vessel and ROV Logistics”** - John Rossier, General Manager Operations, DOF Subsea.
3. **“Technology and Data”** - Dr Andrew Woods, Research Fellow, Centre for Marine Science & Technology, Curtin University.
4. **“Rusticles and Science Sampling”** - Laura Machuca Suarez, Research Fellow, Corrosion Engineering Industry Centre, Curtin University

Available presentations can be viewed at http://www.sut.org/event/perth-evening-technical-meeting-6/?tribe_event_display=past&b=556

Mack McCarthy kicked off the evening with a very informative, fascinating and at times emotive presentation of the historical aspects of the tragedy, leading us through the various impediments that existed through the years, to finally the mounting of an expedition to find the wrecks. In the end, it was a small band of individuals dedicated to finding the truth that prevailed, including Mack himself. One very important aspect of Mack’s presentation was the discussion on the delicate subject of whether it was appropriate to encroach on the final resting place of these many sailors. This was answered by Mack with his own experience

and realization that these brave sailors are still to this day serving, by assisting in the ongoing scientific research on the decaying of the wrecks.

John Rossier then described the hardware deployed by DOF Subsea to first locate the wrecks in 2008, then return to remap the wrecks in April/May 2015, in 2,500 metres of water, using the vessel Skandi Protector and using its two Triton XLX work-class ROVs. John summarized the presentation with the key components to the success of the Project despite it's complex nature, including the extensive pre-testing of ROV systems early on, and the high levels of collaboration with the Curtin University and WA Museum teams.

The conclusion of this presentation was a perfect Segway into the next, where Andrew Woods presented a technical overview of the equipment package developed specifically for the 2015 project (comprising a custom lighting package, fourteen digital still cameras, six 3DHD cameras, and a range of additional sensors). Around 50TB of data has been collected from the expedition, which is now being processed, including leading edge work in 3D reconstruction using the Pawsey Supercomputing Centre. Andrew showed some stunning video and still images of the wrecks, which showed amazing clarity and definition, even clearly showing the internal gun barrel grooves in one of the 6" Kormoran guns.

The legacy created by the development of this technology for the project will no doubt be useful in the mapping of subsea debris fields, which have been much in the news lately.

The concluding presentation for the night was expertly given by Laura Machuca Suarez from Curtin University, who leads her field in the specialist area of Microbiologically Influenced Corrosion (MIC) and the role of microorganisms in deterioration processes such as atmospheric, marine and oilfield corrosion. Her current research focuses on the application of biomolecular, electrochemical and surface analytical technologies to study MIC.

Laura described how the 2015 expedition was an ideal opportunity to collect water, sediment, biological samples and importantly "rusticles" from the wrecks in 2,500 metres water depth. Rusticles are mineralized structures, mainly composed of iron oxides and hydroxides and complex microbial consortia, that when formed on shipwrecks continue to grow larger and denser, thus indicating continuing deterioration of the wrecks. Rusticle samples collected from both wreck sites have already revealed interesting insights about the metallurgy of the two wrecks, whereby two different types of steel have been exposed to the same conditions for 74 years.

Laura also highlighted that it is expected that this research will provide useful information about deep-water corrosion for the oil and gas industry. A summary of other science sampling conducted and an indication of the early results were also be provided by Laura.

Following completion of all presentations, there was an active Q&A session, which was a testimony to the quality and interest in each of the presentations. All the presentations provoked more questions than could be fitted into the available time - but were no doubt addressed at the bar afterwards.

Many thanks must go to our distinguished speakers and sponsors DOF Subsea, Curtin University and the Western Australian Museum, whom all contributed to a very successful night enjoyed by all.