

IEEE KITCHENER-WATERLOO MTT Chapter Presentation

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“Protection of Canada’s Maritime Regions based on Surveillance and Reconnaissance using HF Surface Wave Radar, AIS reports and Ancillary Assets”

Abstract: To protect maritime sovereignty, security forces require real-time information concerning the activity of surface vessels entering a nation's 200 nautical mile Exclusive Economic Zone (EEZ). Monitoring this activity is limited and largely dependent on voluntary communications from ships, and sightings reported by patrollers. Canada has the longest coastline of any country in the world, stretching nearly a quarter of a million kilometers and looking out on more than ten million square kilometers of ocean territory. The coastlines are largely uninhabited and the problem of providing adequate surveillance is enormous and beyond the scope of any one sensor. Shore based HF surface wave radars provide continuous, over-the-horizon surveillance to well beyond the EEZ. A network of surface wave radars is in the process of being deployed that will provide a real-time picture of surface activity. However this is only part of the picture since radar can not provide the required positive identification. All vessels over 300 tons are mandated to carry a VHF transponder system that continuously transmits detailed information about the vessel, its crew, course, cargo, and position. AIS base-stations may be established along the shore to monitor the movement of vessels within the range of the transponder, approximately 30 nautical miles. Elevating the base-station using an airborne platform such as a tethered lighter-than-air UAV can extend the range of AIS surveillance coverage. Combining AIS information with track data obtained from the HFSWR systems allows an operator to isolate those vessels that wish to remain anonymous and if necessary deploy reconnaissance assets to further investigate. This presentation describes a Network Centric, Maritime Surveillance and Reconnaissance architecture that is being developed in Canada to provide the Maritime Domain Awareness picture of all activity occurring in and beyond the EEZ.

Biography: Tony Ponsford worked for a number of years as a Radio Officer in the mercantile marine prior to receiving the B.Sc. degree in Maritime Technology from the University of Wales Institute of Science and Technology, Cardiff. He subsequently received a PhD degree in Digital Beamforming Techniques for HF Radar from the University of Birmingham (UK) in 1990. From 1983 to 1987 he was employed as a Research Associate in the Department of Electronic and Electrical Engineering at the University of Birmingham, here he specialized in the use of HF surface-wave radar for the tracking of ships. From 1988 to the present he has been employed in Canada as the lead engineer in the continuing development of HF Surface Wave Radar technology. He is presently an Engineer Fellow with Raytheon Systems Canada Limited, and is Technical Director of their OTH Surveillance programme.

DATE: Tuesday October 26, 2004

All are Welcome!

TIME: 5:30 pm

LOCATION: EIT 3142, University of Waterloo Invited by Prof. R. Mansour E&CE