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Rear Admiral Angus Essenhigh, UK National Hydrographer

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Dr Diane Dumashie, FIG President

Ladies and Gentlemen

As you are all probably aware, the IHO-NIPPON Foundation GEOMAC Project has now been running for fourteen years. However, the conception of the project dates back to March 2006, when the United Kingdom Hydrographic Office (UKHO) formalised its bilateral arrangements with the Japan Hydrographic and Oceanographic Department (JHOD) and the Japan Hydrographic Association (JHA) with a paper chart (Dual Badge) and ENC distribution agreement. At the time, our Japanese partners were keen to expand and diversify with an international capacity building project. It took a further three years for the now five parties JHOD, JHA, IHO, NF and UKHO to decide that a nautical cartography programme at S-8 CAT B level would be the best solution. As the UKHO had such a programme for its own internal training needs, accredited since 2005, and deliverable in a highly modular format this was the agreed way forward and at last, the project commenced in the fall of 2009.

The Nippon Foundation generously funded the project, which was called the Hydrographic Data Processing & Marine Cartography course for a five year period which took us up to 2013 noting that the UKHO's CAT B programme was of 16 weeks duration - 15 weeks spent in the UKHO's training facility and

one weeks distance learning. The programme continued with little change for a further three year cycle 2014 to 2016 but in 2017 at the start of the next three year cycle the course title changed to the IHO-NF CHART project, the 'chart' acronym standing for Cartography, Hydrography and Related Training to better reflect the course content, though it was still of 16 weeks duration.

My active participation in this story ended in 2018 when I retired, but I was very aware as the UKHO's International Training & Capacity Building Manager that there were changes afoot as a result of the IBSC (International Board of Standards and Competences) revision of the S-8 Standard with new content, a new minimum duration and a mandatory four week final project, all of which would result in a longer course. Also, the rapidly evolving data centric environments and leading edge technologies (for example, S-100 developments, the digital twin and MSDI) needed to be reflected in the programme, so for the 2020 to 2022 cycle the GEOMAC (Geospatial Marine Analysis & Cartography) course was born with a 22 week duration.

So to sum up, over the past fourteen years we have had three different course titles and some additional topics added to the S-8 CAT B nautical cartography programme, but there is one constant through all this change and that is that all students have stayed at the same hotel, the Bloreng House! I expect you have varying memories of your stay at the Bloreng, some good and some not so good, but when I was tasked to find a hotel centrally located in Taunton at a reasonable cost with WIFI and free use of the kitchen and washing facilities, I can assure you I couldn't believe my luck!

This is the third Alumni Seminar, and I have had the honour of attending all three. Firstly, with the inaugural meeting in Bangkok in 2016, and the second in Singapore in 2019. On both occasions it was a truly rewarding and heartening experience to see and hear how our students had flourished and used their new found skills to such great effect at their respective hydrographic offices.

As some of you might know I took a very similar nautical cartography course when I joined the UKHO 50 years ago and the skills that I learnt enabled me to forge a thoroughly satisfying and absorbing 45 year career at the UKHO which culminated in my appointment as Capacity Building Manager in 2008 – a position I held until my retirement in 2018.

Over the course of that decade I was privileged to work closely with the IHO's Directing team, hydrographic office colleagues all around the world and numerous industry partners, but I can sincerely say that nothing gave me greater pleasure and professional satisfaction than the delivery of the IHO-NF S-8 CAT B nautical cartography programme.

So, in an era when the future of the paper chart is the subject of debate as the world continues its transition to digital navigation, what relevance does a course in nautical cartography still have?

Well, in my opinion plenty, because the S-8 content has never been just about paper chart production. As you all know the course covers hydrographic data

types, hydrographic database management, data assessment, ENC production, ENC maintenance, Notice to Mariners preparation etc etc.

I also believe that the need for accurate digital navigational charts will be of even greater importance in the future as the world transitions to MASS (Marine Autonomous Surface Ships) supported by Artificial Intelligence and networks & systems. A sobering thought that our ENCs could, in the future, be used by a machine with no human interaction.

But over and above these considerations, our funding organisation the Nippon Foundation is well into one of the most prominent and ambitious hydrographic projects the world has ever seen – the Seabed 2030 Project and I'm sure I'm not the only one here who is aware of the fantastic progress this project has made in the past few years. When the project was launched in 2017 (and I have taken the following statistics from the latest issue of the 'Hydro International' magazine) only 6% of the ocean had been mapped to modern standards. This figure has grown considerably, with just under a quarter, or 24.9%, of the entire ocean floor now charted on the GEBCO grid. This represents a massive tranche of hydrographic sounding and contour data, which in my opinion, should be assessed, and if relevant, added to the world's navigational charts. This is where the IHO NF GEOMAC Project becomes such an essential element of the Seabed 2030 undertaking.

So to finish I would once again like to thank the Nippon Foundation for inviting me to this Seminar, the JHOD, JHA and IHO for having faith in my ability to

assist in the delivery of this ground breaking project, and last but not least my previous employer the United Kingdom Hydrographic Office, for trusting me with so many of their capacity building initiatives over the years.

Thank you, and I look forward to a highly productive and successful Seminar over the next three days.