4th UK MASRWG CONFERENCE
Friday 18th January 2019

"Training Standards and Accreditation"

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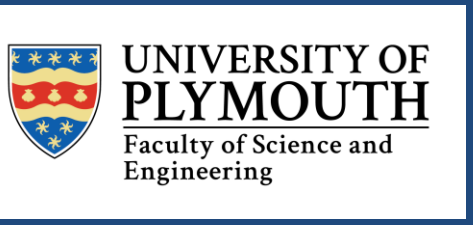


Maritime Autonomous Surface Ships – UK Code of Practice

Chapter 11:

Operator Standards of Training, Competence & Watchkeeping

But -Where do these “Standards” come from?

Origins of Navigation Schools:

16th Century: Ocean voyages need astro-navigation which became the first academic vocational subject taught away from the workplace

17th Century : Mathematical practitioners address all aspects of Navigation: methods, instruments, charts, mathematics, logarithms, tables, text books, teaching

18th Century: Private Navigation schools… Navigation teaching is widespread across Britain and Europe, development of common rules and standards

19th Century: Network of state-aided Navigation schools – development of Mercantile Marine Acts on exams & certificates

20th Century: Navigation/maritime schools in technical colleges, polytechnics and universities. Technological developments in Navigation. Basic standards set. STCW

The Changes (and challenges)

- Wood to Iron
- Sail to Steam
- Coal to Oil
- Astro to Electronic
- Traditional to Technical

…and today –

Fully manned (minimum onboard crew) to Maritime Autonomous Surface Ships (MASS)

Seafarers seem to react well to the challenge of change

They adapt and embrace change when they can see and understand the reasons for the change and recognise the benefits.

Chapter 11.
Operator Standards of Training, Competence & Watchkeeping

Questions:

New v old skills - which are valid

Do operators need “seagoing /seamanship” experience

Competency requirements

How should operators be assessed

Who will be responsible for the assessed standards

The aim of Chapter 11 of the Code is to establish industry agreement on skill and competency requirements for MASS operation in advance of and alongside the establishment of governing regulations.

MASS Operators should demonstrate a clear understanding of the relevant IMO instruments COLREGs, SOLAS, MARPOL and STCW.

Skill and competency levels and team size for specific MASS operation should be defined in a

Safe Operating Plan

The Industry will ensure the appropriate level of training and certification for all MASS operational staff to meet their Safe Operating Plan.

It will enable staff development and the sharing of best practice through professional maritime bodies.

Also,

MASS operational Staff should be trained and certified to at least the same recognised Flag State Authority or national equivalent standards, to a level equivalent to that appropriate for a similar manned vessel.

And that…

Companies within the Industry will have staff development processes in place to capture and progress skill generation.

Additionally, The Code of Conduct states:

"Whilst the industry acknowledges that in time the desire is for standardisation for a wide range of unmanned and autonomous systems. In the meantime it is important that training is provided to the highest standards possible and wherever possible to …

a level that would be an assessed as suitable by an external and accredited organisation resulting in suitably qualified and experienced personnel."

4 key points:-

1. To enable staff development and the sharing of best practice through professional maritime bodies

2. Trained and certified to a level equivalent to that appropriate for a similar manned vessel.

3. Development processes in place to capture and progress skill generation.

4. An external and accredited organisation

Next steps:-

- Development of an Association of MASS Operators.
- This would enable the “sharing of best practice” and provide a datum “that would be an assessed as suitable… resulting in suitably qualified and experienced personnel.”
- A Generic MASS Operators Course?
- Provide a pool of experienced and accredited operators for industry and developing MASS, to provide mentoring and guidance for junior MASS operators and informed research.

Development of a Generic MASS Operators Course

This should include:-

- Principles of Autonomous Systems
- Regulations and Responsibilities
- Safety Principles and Risk Assessment
- Command Control and Communications
- Deployment and Recovery
- System Checks and Maintenance
- Sea Awareness and Handling
- Mission Planning and Operational Limits
- Emergencies contingencies and Faults

Development of a MASS Operators Record book

MASS operators should record and reflect on each mission.

This record is to include any learning opportunities, dangerous occurrences and good practice observed during the mission.

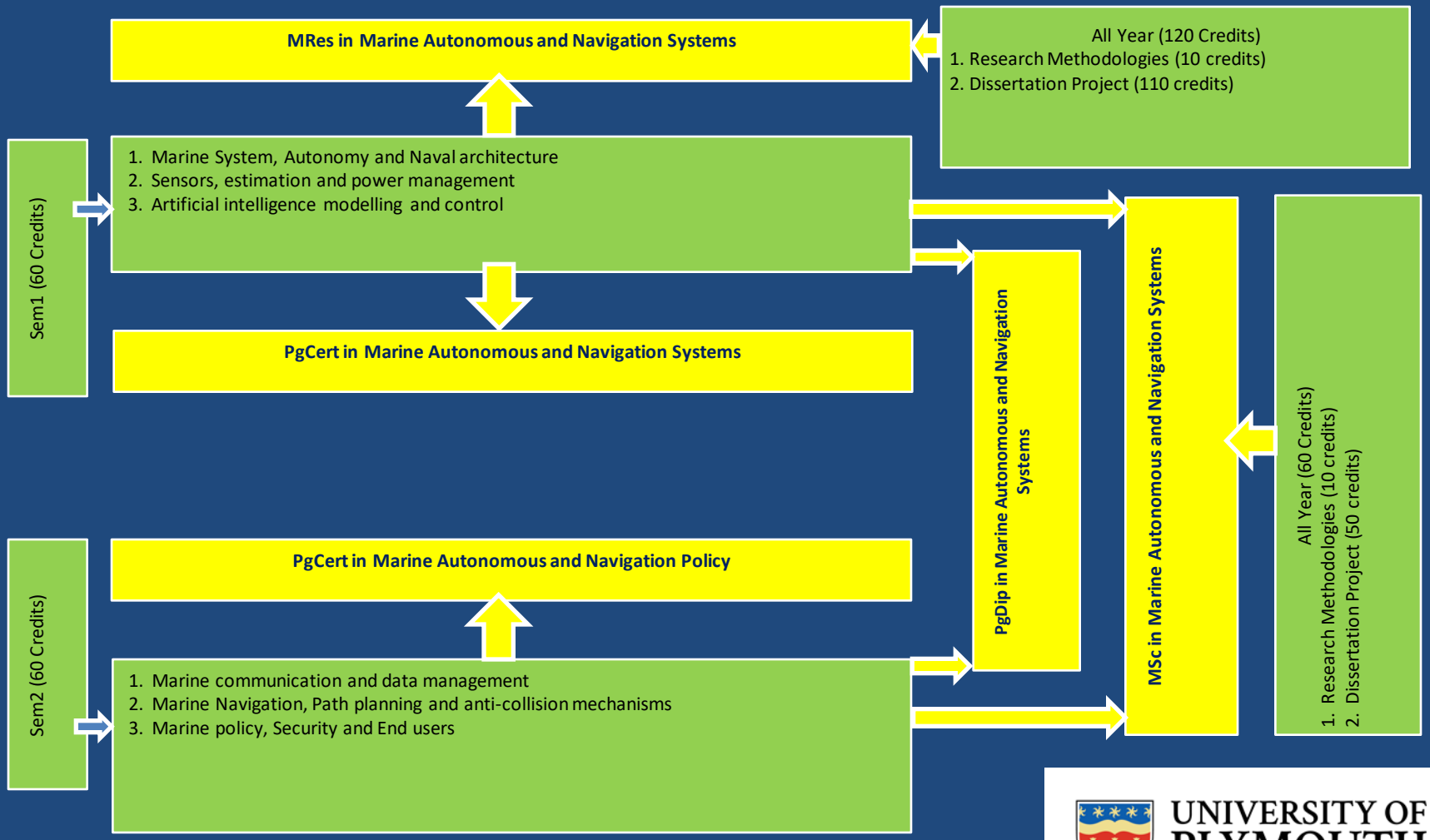
This portfolio of experience should be available for inspection, if required, by interested parties as well as the accrediting “organisation”

This could follow a similar format to The Nautical Institute’s Dynamic Positioning Log Book

The Integration of Maritime Autonomous Infrastructure with STCW certification

- A Smart balance of innovation and tradition
- Industry embracing new technologies … on both manned and “unmanned” vessels
- As new skill sets evolve these will need to be evaluated and, where appropriate, incorporated into the training requirements of both seafarers (STCW) and MASS operators.

Plymouth University: MSc in Marine Autonomous and Navigation Systems



UNIVERSITY OF PLYMOUTH
Faculty of Science and Engineering

Taught elements:

- Marine System, Autonomy and Naval architecture
- Sensors, estimation and power management
- Artificial intelligence modelling and control
- Marine communication and data management
- Marine Navigation, Path planning and anti-collision mechanisms
- Marine policy, Security and End users

Tomorrows Technology - Today

The facility is custom-designed for hands-on, around-the-clock monitoring and support of cruise ships.

Thomas Wilhelmsen, the CEO of the Wilhelmsen group recently said in an interview;-

"While autonomous shipping will be primarily seen in short-sea applications for the near future, the technology has multiple applications for manned ocean-going vessels.

The industry will be able to cherry pick relevant systems out of the autonomous domain and install them on existing vessels, enabling next generation conventional shipping,

So we shouldn't be looking at autonomy in isolation, but rather as a facilitator for nurturing wider development."

He went on to say…

"There's always going to be a need for maritime skill, for real operational understanding.

From the design phase through to operations, people need to feed in individual expertise of stability, navigation, loading and discharging, a whole range of different scenarios.

This knowledge doesn't stand in opposition to digital competency, it helps inform it.

As an industry we can't afford to overlook the 'old fashioned' skills, they must be valued and preserved."

“Training Standards and Accreditation”

www.plymouth.ac.uk/research/autonomous-marine-systems

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Thank you.