

<p>Institution: Southampton Solent University</p> <hr/> <p>Unit of Assessment: UoA15 General Engineering</p> <hr/> <p>a. Context</p> <p>This submission in UoA15 draws upon research clusters in maritime, acoustics, computing and built environment within the Maritime and Technology Faculty (MarTec). Activities across these four clusters focus on two common themes:</p> <ul style="list-style-type: none"> • applied research concerned with human health and wellbeing in work, leisure and living environments; and • addressing deleterious environmental impacts to increase efficiency, effectiveness, sustainability and economic productivity. <p>Sustainability has been identified as a unifying thread and includes appropriate treatments of this theme in each of the subject areas. The various disciplinary approaches to sustainability are being explored in many research projects that are under way. For example, investigations into the effects of noise on individuals, the safe manoeuvring of ships in confined spaces, the environmental management of shipping, reducing power consumption in mobile communications, environmental data use to improve comfort levels in buildings all include sustainability as a core element, within a social, business or environmental context.</p> <p>Research activity is in an early stage of maturity and ensuring the sustainability of research within the Faculty is also a priority. This is currently being achieved by: the recruitment of early career researchers/academics; increasing the external profile through linkages with industry; encouraging consultancy projects and applications for external funding; and using available internal funding to support seedbed projects.</p> <p><u>Maritime Group</u></p> <p>The maritime group pursues research in shipping operations and marine environmental issues. The focus of this group's efforts is on the operations of international shipping companies whose activities embrace the safe transport of goods and passengers in the marine environment, and on other users of the marine environment and regulatory bodies concerned with its conservation. Consequently, the main beneficiaries are shipping company managers, individual seafarers and their families, other employers and workers whose livelihoods depend on the condition of the marine and maritime environments, workers in shore-based companies associated with shipping, and the travelling public, as the main subjects of the research are safety of life at sea and protection of the marine environment. The main types of impact are:</p> <ul style="list-style-type: none"> • at the international level, by influencing regulatory changes through the work of the sub committees of the International Maritime Organisation (IMO), an agency of the United Nations; • at European level, through the dissemination of project outcomes influencing EU regulatory bodies and European policy; • at national level, through the maritime regulator in the UK Government: the Maritime and Coastguard Agency (MCA); • by influencing industrial "best practice" through industry associations; and • by influencing the working practices of individual shipping companies and marine/maritime employers.. <p><u>Acoustics Group</u></p> <p>Solent Acoustics specialises in training, education, professional development, consultancy and research in all areas related to noise and acoustics. Specific projects in which non-academics are beneficiaries have looked at the occupational health risk and hearing loss of musicians and students of popular music, as this is a population identified as being at high risk of hearing damage. Further studies have examined leisure noise exposure from personal music players, and the use of hearing protection of staff and customers in music venues. Staff members are also working on projects relating to the control of noise emissions from aircraft engines, transmission of noise and vibration on board maritime vessels and environmental noise, thus benefiting the</p>
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travelling public. One key project in this field is environmental noise exposure, and particularly the relationship of noise in residential areas and deprivation and social welfare. This is particularly linked to the 'access' to quiet areas, identified by the EU as a critical factor for urban populations as noise exposure is linked to increasing levels of stress-related disease.

Computing Group

The two areas of adaptive heuristics for optimisation and data mining seek to promote applications of this research for industrial research and development where possible through dissemination at conferences and seminars. The computing pedagogy group has a number of academic beneficiaries, but the provision of a continually improving learning experience for our computing/IT students has been a key driver for inquiry into contemporary pedagogical issues (flagged by institutions such as HEFCE, QAA, HEA and the EU) since 1998. Consequent publications include: an online approach to course design, balancing software development theory and industrial practice approaches to harnessing technology for pedagogy, sharing online resources, the provision of formative feedback, and integrating the learning experience, which currently includes employability and its link to internationalisation.

Built Environment Group

The aim of the Sustainability and Health in the Built Environment research cluster is to investigate, develop and test innovative ways of delivering efficient design, construction and operation of constructed facilities in a sustainable manner using experiments, virtual design and simulation studies. Members of the group specialise in the use of digital modelling of buildings including simulation modelling, virtual design and visualisation techniques; experimentation with renewable energy solutions and monitoring of performance of buildings for intended functions in terms of space, energy, acoustics; and the evaluation and testing of materials and development of sustainable and practical solutions to the design and management of emergency shelters. Its non-academic beneficiaries are therefore twofold: the construction industry itself; and members of society in general through building healthier homes and places of work.

b. Approach to impact

The approach to the interaction of research-active staff within the research group with non-academic users, beneficiaries and audiences, and to achieving impact from the research activities, encompasses the following elements:

- working with regulators in the relevant industries at the highest possible level to effect change. Examples of this are in the two maritime case studies where the impact of the research is being felt at both global and at European levels.
- Working with national and international professional bodies. Examples are provided by the close links with Chartered Institute of Builders; the Institute of Acoustics, The British Computing Society, and membership of several maritime industry working groups.
- Working with end-users of research. Examples include the work with local companies in the built environment group; the specific work with companies by the acoustics and maritime groups. Details are to be found in REF5.
- Development of Knowledge Transfer Partnerships (KTP). Examples include the acoustics and built environment research groups.

c. Strategy and plans

The common strategy elements for the four groups are to:

- use Southampton Solent University's (SSU) marketing and press offices to increase the existing extensive networking to industry and other end-users by seeking opportunities to engage with organisations in applied research to provide solutions to social, economic and environmental issues;
- recruit early career researchers through the SSU "new role" initiative;
- develop KTP and postgraduate research student numbers to support research projects;
- link to SSUs strategy on green issues and sustainability, especially within health and

- wellbeing initiatives;
- inform the next generation of graduates by incorporating research-informed teaching into our curricula and ensuring that it is relevant to a social, economic and environmental agenda.

d. Relationship to case studies

Project HORIZON

Project HORIZON is a good example of the summation of a long-term strategy to conduct significant research utilising the specialist facilities of the Faculty’s Warsash Maritime Academy and the skills and experience of its staff, with the aim of having a major research-led impact on the shipping industry. The main outcomes and benefits to the global shipping industry are included below and these will be taken forward in successor funded research arising from HORIZON:

- The project results have been debated by member states at the International Maritime Organisation (IMO). Conference and other presentations have been disseminated to a wide audience through the project website;
- Increased knowledge of European collaborative partnerships has resulted in a strong consortium which has successfully bid for and won subsequent funding of \$1.5million for the follow-up project MARTHA. Further larger EU bids are now part of future strategy.
- Engagement with stakeholders and “interested parties” via the project website, which is updated regularly, has drawn in further collaborators, for example research groups in Australia are now evaluating the software from the project and at least two navies will be running trials. Sectors of the shipping industry, in addition to shipping companies, such as insurers and legal firms, are now debating HORIZON and the impact it will have on regulatory frameworks for controlling hours of work and rest in the industry.
- The close interaction of staff with end-users through membership of international industry committees and working groups.

Wadden Sea project

The Wadden Sea, in the southern North Sea, is a dynamic tidal ecosystem and a significant nursery area for commercial fisheries. It is also adjacent to one of the world’s busiest shipping lanes. The main outcomes and benefits to the global shipping industry and commercial fisheries are included below and these will be taken forward in successor funded research arising from the Wadden Sea project:

- The final report from this project formed the basis for considering shipping and safety in the Wadden Sea during the Trilateral Government Conference on the Protection of the Wadden Sea at Sylt. During this conference Ministers from Germany, Denmark and the Netherlands addressed the issue and the findings of the SSU evaluation and hence the research served as an input to the resulting Ministerial Council Declaration, known as The Sylt Declaration.
- The appointment of a Shipping Task Group by the Wadden Sea Board represented a major success for the research project. The Task Group organized a workshop in order to present the PSSA study and discuss the results with representatives from national competent authorities and key stakeholders. The Trilateral Workshop entitled ‘Particularly Sensitive Sea Area (PSSA) Wadden Sea: Towards a Vision for the Wadden Sea PSSA’ took place in Hamburg.
- As the basis for this workshop, the results of the SSU evaluation were presented by members of the research team. This led to agreement to publish the Evaluation Report on the Wadden Sea Board’s website and seek ways to respond to its findings. It acknowledged as key findings that (a) awareness enhancing and (b) data alignment of shipping and environment are priority areas. This is currently being progressed.
- In addition to the impact of the research and subsequent developments with regard to the Wadden Sea, the research has had wider dissemination feeding into the broader context of seafarer awareness, including presentations at the World Ocean Council, Sustainable Ocean Summit in Belfast.