BLUE ECONOMY
COOPERATIVE RESEARCH CENTRE

Australian Government
Department of Industry, Science and Resources

Cooperative Research Centres Program

SHORT SUMMARY

1.21.005 Code of Practice for Aquaculture Vessels

INTRODUCTION

The Australian Code of Practice for Aquaculture Vessels has been formulated to provide guidance for the planning, building, surveying, and operation of aquaculture vessels in Australian waters. This code serves as a resource for individuals engaged in the design, construction, production, ownership, or operation of aquaculture vessels. Its central objective is to facilitate the certification, commencement, and safe operation of these vessels, thereby fostering the efficient and secure provision of aquaculture services. Specifically tailored to domestic commercial vessels exclusively operating within Australia's Exclusive Economic Zone, the code addresses the unique challenges associated with aquaculture operations.

Aquaculture stands out as one of the most hazardous industries worldwide. Operating within this sector exposes individuals to harsh weather conditions, including winds, currents, and waves that lead to significant vessel motion. Additionally, technical, operational, and geographical challenges vary based on the farmed species and location. Given that most aquaculture vessels are categorised as small vessels, and with a lack of specific Work Health and Safety (WHS) procedures for aquaculture operations in Australia, there is a pressing need for comprehensive guidelines to address these multifaceted challenges in design, operation, and safety.

The formulation of an offshore aquaculture service vessels Code of Practice aligns with ongoing efforts in the shipping industry. This Code of Practice underscores the necessity of producing a guideline with broad adoption across both the industry and government spheres. Accordingly, it draws significant contributions from all segments of the aquaculture industry. The Code's objectives encompass improving design, enhancing safety measures, and elevating animal welfare.

These goals were pursued through a series of steps:

1. A comprehensive review of existing rules and regulations was conducted to gauge regulatory considerations. The review concentrated on regulations pertinent to aquaculture vessels within the National Standard for Commercial Vessels (NSCV), publications of the Australian Maritime Safety Authority (AMSA), guidelines from classification societies, the IMO-developed Special Purpose Ships (SPS) Code, and the developments of the Norwegian research centre for exposed aquaculture operations.

2. Stakeholders were engaged through interviews to gather feedback on prevailing aquaculture practices and guidance standards. Conversations delved into the existing regulatory landscape and aquaculture requirements, involving pertinent authorities, industries, and companies engaged in offshore aquaculture vessel operations. This dialogue aimed to extract insights on gaps identified through literature review and was conducted between September 2022 and January 2023. The interviewees, totalling 11 individuals, spanned four aquaculture sectors (research, authority, designer, and operator), ensuring diverse viewpoints. The interview questions encompassed five categories: design and operation, regulation, human safety, training and qualifications, and food safety management systems and live animal health and welfare during transport.

3. During this phase, interview findings were categorised into five themes, each highlighting challenges and potential solutions:

a. **Design and Operation:** The foremost concern was stability, with catamarans emerging as the preferred choice due to their stability in sea motions. Notably, challenges encompassed material handling and mooring complexities. Diverse hurdles across industry sectors were noted, accompanied by potential solutions such as multi-purpose vessels and dynamic positioning.

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b. **Regulations:** A critical issue was the service notation, causing vessels to be classified as fishing vessels, leading to compliance and safety complications. The absence of specific regulations for aquaculture vessels was evident. Suggestions from participants revolved around segregating fishing and aquaculture operations to enhance safety and efficiency.

c. **Human Safety, Training, and Qualifications:** Safety challenges within this category revolved around transitioning to offshore locations. Participants emphasised the need for enhanced training and work practices. Addressing challenges involved initiatives such as aquaculture management courses, effective management of asset contact, and tackling health and safety concerns, notably slips, trips, and falls.

d. **Food Safety Management Systems:** Ensuring the integrity of the cool chain for aquaculture products took precedence, demanding vessels to incorporate specific features to avert contamination. Challenges encompassed leveraging blockchain technology for traceability, as well as adhering to food safety standards and certifications. Notably, distinct roles within this aspect were attributed to the authority, operator, and designer sectors.

e. **Live Animal Health and Welfare During Transport:** This area presented challenges that involved delicate handling to mitigate stress, along with the imperative of monitoring water quality parameters. Essential parameters, including oxygen levels, temperature, ammonia concentration, carbon dioxide levels, salinity, and ozone, required continuous monitoring during the transport process to ensure the well-being and health of transported animal.

4. **Developing the Code of Practice for aquaculture vessels** based on regulatory review and stakeholder input. The code's formulation was a pivotal step in ensuring safe and sustainable vessel operation. By incorporating the feedback and focusing on the key areas identified, the draft of the Code of Practice was designed to be accessible to stakeholders across the spectrum. Iterative refinement, informed by additional stakeholder input, ensures the code's practicality and relevance.

KEY POINTS

- Development of a specialised Code of Practice for Aquaculture Vessels within Australia's Exclusive Economic Zone, aligning with the Offshore Engineering and Technology program's objective to build infrastructure for integrated offshore operations.
- Inclusion of insights from stakeholders representing various sectors, ensuring alignment with industry needs. This approach resonates with the Offshore Engineering and Technology program's emphasis on collaboration and contributions from different segments.
- Identification of challenges in aquaculture vessel design, regulations, human safety, training, food safety management, and animal welfare. The project directly contributes to the Research Program by proposing solutions to enhance safety, efficiency, and sustainability in offshore aquaculture operations.
- Iterative refinement of the Code of Practice through additional stakeholder input ensures practicality and relevance. This iterative process parallels the approach of the Offshore Engineering and Technology program, which emphasises continuous improvement based on real-world feedback and developments.
- The project's emphasis on creating a guideline with broad adoption across industry and government spheres is consistent with the Offshore Engineering and Technology program's goal of collaboration and widespread implementation of best practices. The Code of Practice addresses regulatory considerations and draws from international and national standards, fostering alignment with broader industry efforts.

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RESEARCHERS

A team of 15 researchers from 8 organisations contributed to this project.

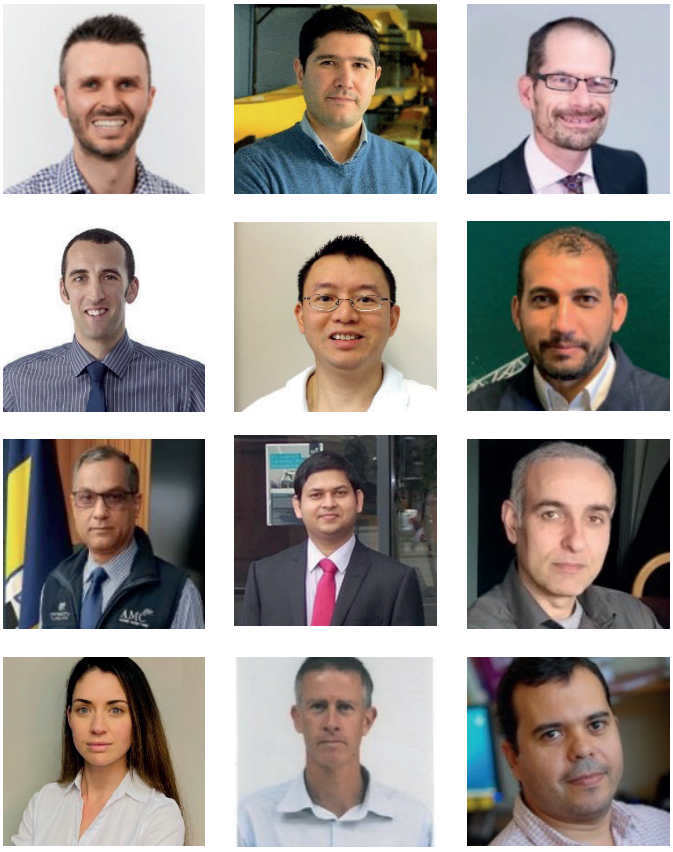

Figure 1. Members of the project team

Row 1 from left – Chris Shearer, Saeed Mohajernasab, Andrew Harris; **Row 2 from left** – Nick Tighe, Chris Chin, Nagi Abdussamie; **Row 3 from left** – Prashant Bhaskar, Rabiul Islam, Hossein Enshaei; **Row 4 from left** – Frances Huddlestone, Jonathan Abrahams, Pedro Fidelman; **No photo** – Jonathan Binns, Darren Lacey

THE CHALLENGE

Establishing a comprehensive framework for the planning, construction, surveying, and operation of aquaculture vessels within Australian waters.

The unique challenges associated with the aquaculture industry, such as inherent hazards and the absence of specific guidelines for aquaculture vessels within existing regulations, necessitated the development of the Australian Code of Practice for Aquaculture Vessels.

By categorising findings into key themes and developing the Code of Practice based on regulatory review and stakeholder input, the challenge was met with a solution that not only enhances the safety and sustainability of aquaculture vessel operations but also reflects a collective commitment to promoting best practices and ensuring efficient and secure provision of aquaculture services within Australian waters.

THE OPPORTUNITY

The opportunity lies in the formulation of an offshore aquaculture service vessels Code of Practice, aligning with industry efforts and government initiatives.

This code aims to improve design, enhance safety measures, and elevate animal welfare through a systematic process that includes regulatory review, stakeholder engagement, and addressing challenges in design, regulations, human safety, training, and food safety management systems.

The resulting Code of Practice not only ensures safe and sustainable vessel operation but also provides accessible guidance, fostering a commitment to efficient and secure provision of aquaculture services within Australian waters.

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OUR RESEARCH

Regulatory Review

Conducted a comprehensive review of existing rules and regulations within the National Standard for Commercial Vessels (NSCV), Australian Maritime Safety Authority (AMSA) publications, guidelines from classification societies, the IMO-developed Special Purpose Ships (SPS) Code, and insights from the Norwegian research centre for exposed aquaculture operations.

Stakeholder Engagement

Engaged stakeholders through interviews and workshops, involving authorities, industries, and companies engaged in offshore aquaculture vessel operations. The process aimed to gather insights on prevailing aquaculture practices, regulatory landscapes, and identified gaps, with interviews spanning four aquaculture sectors (research, authority, designer, and operator).

Categorisation of Findings

Categorised interview findings into five themes:

a. **Design and Operation:** Highlighted concerns about stability, with preferences for catamarans. Identified challenges included material handling and mooring complexities, with potential solutions such as multi-purpose vessels and dynamic positioning.

b. **Regulations:** Addressed critical issues related to service notation causing vessels to be classified as fishing vessels, suggesting a need for segregation of fishing and aquaculture operations.

c. **Human Safety, Training, and Qualifications:** Explored safety challenges in transitioning to offshore locations, emphasising enhanced training, work practices, and initiatives like aquaculture management courses.

d. **Food Safety Management Systems:** Prioritised ensuring the integrity of the cool chain for aquaculture products, with challenges including traceability using blockchain technology and adherence to food safety standards and certifications.

e. **Live Animal Health and Welfare During Transport:** Explored challenges related to delicate handling, monitoring water quality parameters, and ensuring the well-being of transported animals.

Code of Practice Development

Developed the Australian Code of Practice for Aquaculture Vessels based on regulatory review and stakeholder input. The formulation aimed to address identified challenges and improve safety and sustainability in vessel operations.

Iterative Refinement

Ensured the practicality and relevance of the Code of Practice through iterative refinement, incorporating additional stakeholder input. This process guarantees that the final code is accessible to stakeholders across the aquaculture spectrum, promoting safe and sustainable practices within Australian waters.

OUTCOMES

The primary outcome is the development of the Australian Code of Practice for Aquaculture Vessels. This comprehensive regulatory framework provides guidance for planning, building, surveying, and operating aquaculture vessels in Australian waters. It addresses the unique challenges of the aquaculture industry and is specifically tailored to domestic commercial vessels operating within the Exclusive Economic Zone.

Through a systematic process, the research identified and categorised challenges faced by the aquaculture industry into five themes: Design and Operation, Regulations, Human Safety, Training, and Qualifications, Food Safety Management Systems, and Live Animal Health and Welfare During Transport.

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OUTCOMES continued...

Each theme highlighted specific challenges and proposed potential solutions, contributing to the overall improvement of aquaculture practices.

The research actively engaged stakeholders from various segments of the aquaculture industry, including authorities, industries, and companies involved in offshore aquaculture vessel operations. The diverse viewpoints gathered through interviews and workshops enriched the research with valuable insights. The contributions from stakeholders were instrumental in shaping the Code of Practice and ensuring its practicality.

The formulation of an offshore aquaculture service vessels Code of Practice aligns with ongoing efforts in the shipping industry. The research underscores the necessity of producing a guideline with broad adoption across both the industry and government spheres. This alignment emphasises a collaborative approach to addressing challenges and promoting best practices in aquaculture operations.

The development of the Code of Practice involved iterative refinement informed by additional stakeholder input. This process ensures that the code remains practical and relevant to stakeholders across the aquaculture spectrum. The commitment to refining the code reflects a dynamic approach to addressing evolving challenges and maintaining its effectiveness over time.

NEXT STEPS

The continuous refinement of the aquaculture Code of Practice is crucial for its relevance in the evolving industry. This involves increased workshops and stakeholder engagement for diverse perspectives, integration of biosecurity measures, active participation in various aquaculture operations (especially offshore), a focus on identifying and promoting best practices, and a heightened emphasis on Work Health and Safety (WHS) in offshore aquaculture. These steps ensure the code remains practical, reflects industry wisdom, addresses emerging challenges, and contributes to the overall improvement of efficiency, safety, and sustainability in aquaculture.

PROJECT TEAM

- Chris Shearer (BMT)
- Saeed Mohajernasab (AMC)
- Andrew Harris (BMT)
- Nick Tighe (BMT)
- Dr Chris Chin (AMC)
- Dr Nagi Abdussamie (AMC)
- Associate Professor Prashant Bhaskar (AMC)
- Dr Rabiul Islam (AMC)
- Dr Hossein Enshaei (AMC)
- Darren Lacey (Tassal)
- Jonathan Abrahams (DNV)
- Frances Huddlestone (Oysters Tasmania)
- Professor Jonathan Binns (DST Group)
- Pedro Fidelman (UQ)

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PROJECT REPORTS/PUBLICATIONS

Mohajernasab, S., Abdussamie, N., Harris, A., Shearer, C., Tighe, N., Bhaskar, P., Chin, C., Islam, R., Enshaei, H., 2023, 'Code of Practice for Aquaculture Vessels, 1.21.005 – Literature Review', Blue Economy Cooperative Research Centre

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SHORT SUMMARY AUTHOR

- Saeed Mohajernasab (AMC)
- Andrew Harris (BMT)
- Nick Tighe (BMT)
- Chris Shearer (BMT)
- Chris Chin (AMC)
- Nagi Abdussamie (AMC)

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