MARITIME INDUSTRY AUSTRALIA LIMITED

MARINE BIOSECURITY MANAGEMENT OF VESSELS SERVICING THE OFFSHORE RESOURCES INDUSTRY

An Environment Plan Reference Case

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Version 2.0

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1. INTRODUCTION – WHY REFERENCE CASES?

Offshore petroleum titleholders and title applicants are required to prepare an environment plan (EP) in accordance with the requirements of the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009* (Environment Regulations) for submission to the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA) for assessment. Once accepted by NOPSEMA, titleholders must conduct petroleum activities in accordance with an EP.

Since the establishment of NOPSEMA in 2012, the quality of EP content has improved in many ways, however a combination of factors has also seen EPs grow unnecessarily in size and complexity. EP's are usually prepared by titleholder companies in isolation, at times resulting in a lack of consistency in impact assessments and management approaches between titleholders and in other cases unnecessary duplication of effort when preparing common EP content. There is a desire among stakeholders to see a range of environmental impacts and risks more consistently, effectively and efficiently managed in most circumstances across Australia's offshore resource industry.

The cross jurisdictional nature of marine contractor operations in Australia's offshore resource industry means that vessel operators need to comply with both state, Northern Territory and Commonwealth legislation, as well as additional, and sometimes more stringent requirements imposed by titleholders via accepted EP's. Given the diverse and dynamic nature of offshore vessel operations, managing marine biosecurity to meet the range of requirements in this sector is challenging. Gaps in scientific understanding of marine biosecurity risk in relation to the interaction between offshore installations and vessels servicing them, contributes to this challenge.

As a result, confusion and duplication occurs, which can result in either non-compliance, increasing the risk of non-indigenous marine species (NIMS) introduction or over compliance, leading to management practices and processes that go well beyond what might be considered reasonable to reduce marine biosecurity risk to an acceptable level, resulting in perverse outcomes, project inefficiencies and cost blowouts for contractors.

This 'Environment Plan Reference Case – Marine Biosecurity Management of Vessels Servicing the Offshore Resources Industry' is being used to achieve a consistent approach to marine contractor biofouling management practices that are commensurate with the NIMS risk. The objective-based principles of the Environment Regulations as well as other relevant Commonwealth, state and Northern Territory regulations continue to apply and this document and the other reference material are only valid for certain circumstances. Titleholders have flexibility to apply case-by-case environment plan content that differs from this reference material as it fits with the circumstances of their activity. EPs that adopt this reference case information as well as those that deviate from this approach will continue to be assessed in the usual manner under the Environment Regulations and NOPSEMA's assessment policies and procedures.

More information about the environment plan process is provided by NOPSEMA at https://www.nopsema.gov.au/environmental-management/assessment-process/environment-plans/.

2. DEFINITIONS

Australian offshore resources industry – encompasses the offshore petroleum and renewable resources industry

Australian waters – All waters within the outer limits of Australia's EEZ including state and territory waters, and the JPDA

Ballast Water Management Convention - International Convention for the Control and Management of Ship's Ballast Water and Sediments.

Biofouling Guidelines - means the IMO 2011 Guidelines for the Control and Management of Ships' Biofouling to Minimise the Transfer of Invasive Aquatic Species as described in IMO Resolution MEPC.207(62)

Bioregions - Marine biological regions defined by environmental conditions

Detection - the finding of a NIMS on a vessel, or other translocation vector, which has not previously been recorded in the environment at that location.

Establishment – a NIMS introduced to a location and existing as a self-sustaining viable population.

Facility – Same definition as found in the *Offshore Petroleum and Greenhouse Gas Storage Act 2006*
Introduction – the colonisation by a NIMS of an environment where it has not previously established.

Marine biosecurity – is the management of risks to the economy, the environment and the community, of marine pests and diseases entering, emerging, establishing or spreading.

Non-indigenous marine species (NIMS) - a marine organism introduced by humans – either intentionally or accidentally - outside of its natural past or present distribution. NIMS may or may not be an invasive marine species.

Offshore installations – includes mobile offshore drilling units (MODU), jack up rigs, semi-submersible drilling rigs, production platforms, floating storage and offtake facilities (FSO), floating productions storage and offtake facilities (FPSO) and floating LNG production and processing facilities (FLNG). Includes installations either in operation or under construction.

Offshore resource activities – may be used interchangeably with 'offshore petroleum activities' to reflect activities undertaken to exploit Australia's energy resources within State and Territory and Commonwealth waters. Includes, but is not limited to oil and gas exploration, extraction and demobilisation activities

Ports – includes designated first points of entry, terminals, supply bases and other relevant locations at the land/sea interface

Residence time – time spent in a location such as a bioregion

Source – prior location of vessel

State and Territory Waters – also known as 'Coastal Waters' is a belt of water between the limits of the Australian States and the Northern Territory and a line 3 nautical miles seaward of the territorial sea baseline.

Territorial Sea - the Territorial Sea is a belt of water not exceeding 12nm in width measured from the territorial sea baseline.

Trading ships – cargo ships used to offtake petroleum products for transport overseas or to an Australian port.

Translocation – the movement of a species from one location to another by means other than natural dispersal.

Vessel (used interchangeably with 'ship') – any ship or boat.

3. ACRONYMS

ALARP – As low as reasonably practicable

BFMP – Biofouling Management Plan

BFRB – Biofouling Record Book

BW – Ballast Water

BWC – Ballast Water Management Convention

BWE – Ballast water exchange

BWMC – Ballast Water Management Certificate

BWMP – Ballast Water Management Plan

BWRB – Ballast Water Record Book

DAWE – Department of Agriculture Water and Environment

EEZ – Exclusive economic zone

EP – Environment Plan as required under the Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009

EPBC – Environment Protection and Biodiversity Conservation Act 1999

EPO – Environmental performance outcome

EPS – Environmental performance standard

FSO – Floating storage and offtake facility

FPSO – Floating production storage and offtake facility

FLNG – Floating LNG production and processing facility

JPDA – Joint petroleum development area

MGPS – Marine Growth Prevention System

MODU – Mobile offshore drilling unit

NIMS – Non-indigenous marine species

NOPSEMA – National Offshore Petroleum Safety and Environmental Management Authority (Commonwealth)

RC – Reference Case

4. SCOPE AND APPLICATION OF REFERENCE CASE

This reference case considers the possible and variable risks of introducing and translocating non-indigenous marine species (NIMS) associated with the movement of vessels and equipment deployed from those vessels into and/or within Australia for the purpose of providing services to the Australian offshore resources industry, and the measures vessel operators and titleholders should adopt to mitigate those risks to as low as reasonably practical (ALARP) and acceptable levels.

Operational Scope

This reference case applies broadly to all vessels providing services to the offshore resources industry and the management of the ballast water and biofouling of those vessels to minimise the marine biosecurity risk. With reference to management of the risk associated with biofouling, there may be circumstances where risks specific to the location of the activity, vessel type and immersible equipment should be evaluated and addressed within the EP as well as within the biofouling management plan (BFMP).

This reference case does not apply to 'topside' biosecurity management of international vessels.

Geographical Scope

This reference case applies within Australian waters including state and Territory waters, to the outer limits of Australia's EEZ, including of the JPDA. This broad geographical scope is necessary to ensure coverage of all risk pathways, as in many circumstances risk is derived from the vessel connectivity between locations and regions that cross jurisdictions.

It should be noted that while the control measures outlined in this reference case can be applied within the JPDA, this area is outside the jurisdiction of NOPSEMA.

Application

This reference case may be used by titleholders to describe how marine biosecurity risks associated with the use of vessels to undertake offshore resource projects will be managed. Risks relating to the use of vessels include the discharge of ballast water and the accumulation of biofouling on the underwater surfaces are addressed.

As the primary mechanism to manage biofouling to ALARP and acceptable, each ship specific biofouling management plan will identify specific technical and operational measures that will be taken to minimise marine biosecurity risk associated with that ship. BFMP content will address variation in vessel type and operations. As such, the vessel types to which this reference case (RC) applies is intentionally broad.

Exclusions

This reference case does not apply to the following:

- Offshore installations
- Trading ships

5. PURPOSE

The primary purpose of this reference case is to evaluate the marine biosecurity risks and impacts associated with vessels servicing the offshore industry and identify appropriate control measures and environmental performance parameters that should be implemented to ensure that the impacts and risks of the activity are ALARP and of an acceptable level.

This RC establishes good practice management that can be applied across a wide variety of vessel types via ship specific adaptation of measures described in the BFMP as well as the legal requirements associated with managing the risks of ballast water management.

Content contained within this RC can be utilised by titleholders during EP preparation when addressing marine biosecurity

risks posed by their proposed activities and can also be utilised by vessel operators during tender preparation to ensure common understanding of good practice and expectations.

This RC aims to achieve a consistent approach to marine contractor biofouling management practices that are commensurate with the NIMS risk. The objective-based principles of the Environment Regulations as well as other relevant Commonwealth, state and Territory regulations continue to apply and this document and the other reference material are only valid for certain circumstances, such as circumstances where those activities described in 8a) and the environment described in 8b) apply. Titleholders have flexibility to apply case-by-case EP content that differs from this reference material as it fits with the circumstances of their activity.

In addition, vessel operators that are operating in compliance with this RC will be able to demonstrate a high level of compliance with other relevant marine biosecurity requirements across Australian jurisdictions, as described in Table 1, although additional reporting requirements may exist.

Some activities will require consideration of this RC in conjunction with other reference cases and other relevant marine biosecurity aspects of EP's.

6. CONDITIONS OF USE

The RC material may be used to guide or replace EP content in relation to the management of marine biosecurity risks subject to the titleholder being able to demonstrate that the activity and existing environment fall within the scope and limitations of this material.

Limitations: Titleholders should evaluate specific circumstances and characteristics of their project area and activities, considering sensitive areas, shallow waters and shoals and areas of known NIMS infestation and what additional controls would be necessary to ensure impacts and risks of the activity are ALARP and of an acceptable level.

This RC does not apply to World Heritage Areas.

7. LOCATION, ONGOING REVIEW AND UPDATES

This reference material is located on the MIAL website (https://mial.com.au/our-work/marine-biosecurity-reference-case-for-offshore-vessels) and is published and maintained by Maritime Industry Australia Ltd (MIAL) for use by:

a) Offshore petroleum titleholders and title applicants within the Australian *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009* (Environment Regulations) regime to guide or replace EP content. These regulations require offshore petroleum titleholders to carry out petroleum activities in accordance with an EP that has been accepted by NOPSEMA.

b) Offshore supply vessel operators, servicing Australia's offshore oil and gas industry across Australian Commonwealth and state/Northern Territory jurisdictions, as a guide to the expectations in relation to accepted marine biosecurity management practices.

Legislative change and changes to widely accepted best practice resulting from new research and technology development and feedback from peer review will trigger review of this document. A review and update may also be required where new information from authoritative sources suggests or implies that prior conclusions regarding the acceptability of environmental impacts and/or risks can no longer be relied upon. At minimum, this reference case will be updated every 5 years.

8. ENVIRONMENTAL ASSESSMENT

The following information provides context for environmental assessment by documenting the existing environment that may be affected by the activity, and those aspects of the activities that have a bearing on the environmental risk being considered.

The information also establishes links between the activity and possible events that could lead to environmental impacts, describes the elements of the activity which may contribute to the risk that the activity may have an environmental impact and describes the existing practice, including the systems, procedures, items of equipment or persons that will be used to reduce environmental impacts and risks

A) DESCRIPTION OF THE ACTIVITY

Applicable regulation: 13(1)(a)(c)(d) – Description of the activity

The offshore resources industry utilises a range of mobile and permanent facilities to undertake offshore resource exploration, production, construction, and decommissioning activities, including MODU's, FPSO's, FSO's, FLNG facilities and seismic vessels as well as a range of other exploration and production platforms and facilities.

For the purpose of this reference case, these facilities are collectively referred to offshore installations and while some aspects of good practice outlined in this reference case may be applicable to some of these mobile offshore installations, they are out of scope.

The industry engages a wide variety of vessels, undertaking a broad range of activities, in support of these exploration, production, construction and decommissioning projects. In general terms, these vessels may travel to Australian offshore installations from places outside Australia, between Australian offshore installations and title areas, within 500 metre exclusion zones around installations and to, from and between Australian supply ports.

These vessels have highly variable and sometimes unpredictable operational profiles. They may operate 24 hours a day and the length of time that a vessel may remain alongside a facility or in port can vary from several hours to days and weeks. The speed at which vessels travel is dictated by the operational requirements of the activity, however, unless rapid transport of materials or cargo is required, vessels travel at economical speed.

This reference case may be relevant to the activities undertaken by, but not limited to the following vessel types:

Offshore support vessels

- Towing of offshore installations to new locations. This requires the vessel to travel at slow speed for a significant amount of time, depending on the distance required to cover and the operational limitations.
- Anchor handling, personnel transport and accommodation, material and waste transport, diving support and deployment of remotely operated vehicles (ROV) and other equipment, the provision of standby emergency response and other general support and supply activities that require the use of a vessel

Infield support vessels

- Provide towage assistance for offtake ships berthing during facility operations and the provision of standby emergency response.
- Often at variable speeds and in proximity to offshore facility and offtake ships.

Dredging, construction and pipelaying vessels

- Assist in the construction of offshore facilities and laying of pipelines on the seafloor.

- Can work in proximity with other vessels and barges for weeks and months.
- Usually slow moving and often stationary.

Seismic support vessels

- Transport of personnel, stores, materials, and waste to and from seismic vessels and port locations and supply bases.
- Handling and placement of seismic streamers and ensure safe passage of seismic ship and integrity of streamers by patrolling and warding off approaching vessels.
- Can work in proximity with other support vessels from days to months at a time.
- Operates at variable speeds, highly dependent on the activity being undertaken.

B) DESCRIPTION OF THE ENVIRONMENT

Applicable regulations: 13(2) and 13(3) – Description of the environment

This reference case applies to the marine biosecurity management of vessels engaged in offshore support activities as part of an offshore resource project. Vessel activities can occur within Commonwealth and state/Northern Territory waters between offshore petroleum title areas and supply port locations. The vessels may operate in or near:

- Deep open ocean environments through to submerged reefs and nearshore waters surrounding offshore islands and along the mainland coast
- Water depths from 10's of metres through to >1000m
- Within and between bioregions, depending on the location of the title area and chosen supply base or port location
- Biologically important areas, key ecological features and critical aquatic resources, such as aquaculture, mariculture and wild catch fisheries.

Restrictions on activities in relation to Commonwealth and state/Northern Territory marine parks are outlined in the relevant marine park management plans and will be adhered to. If operating in close proximity to Australian Marine Parks, titleholders should consider if additional control measures are required

The environment that may be impacted if a NIMS was introduced from vessel activities consists of a range of marine habitats and environmental receptors including:

- nearshore soft sediment habitats supporting benthic invertebrate assemblages or seagrass
- hard substrates supporting sessile and mobile epifauna and benthic primary producers such as corals, kelps and other macroalgae
- intertidal sand and mudflats supporting mobile invertebrates
- rocky shorelines supporting sessile and mobile invertebrates
- nearshore threatened and migratory species habitats
- commercially important fisheries and aquaculture operations with large commercial value
- coral reef habitats.

C) REQUIREMENTS

Applicable regulations: 13(4) – Requirements

Table 1 lists the Commonwealth and state/Northern Territory legislative marine biosecurity obligations that will be met through application of this RC. There may be other requirements, such as reporting via the Maritime Arrivals Reporting System (known as MARS) that will need to be considered and titleholders using this RC should be prepared to add further details as to how the legislation is relevant to biosecurity matters and how they intend to meet those requirements for their specific circumstances.

Table1: Legislative requirements and guidelines

Jurisdiction	Relevant legislation	Administering Authority	How RC meets requirements
Commonwealth	*Biosecurity Act 2015* *Biosecurity (Ballast Water and Sediment) Determination 2017*	Department of Agriculture Water and Environment	• Reduces marine biosecurity risk to ALARP • Requires vessels to manage ballast via an approved method of ballast water management • Requires vessels to have an approved ballast water management plan and certificate. • Requires vessels to keep records of ballast water operations
	Offshore Petroleum and Greenhouse Gas Storage Act 2006	National Offshore Petroleum Safety and Environmental Management Authority	Meeting the marine biosecurity requirements of Environment Plans
	Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009	National Offshore Petroleum Safety and Environmental Management Authority	Minimises marine biosecurity risks to ALARP and acceptable
	Environment Protection and Biodiversity Conservation Act 1999	Department of Agriculture Water and Environment	• Minimises marine biosecurity risks to commonwealth marine areas as required ALARP and acceptable • Considers how matters protected under Part 3 of the EPBC Act are addressed in relation to the potential for pest species to become established in a Commonwealth marine area.
Western Australia	*Fish Resource Management Act 1994*	Department of Primary Industries and Regional Development	s.103 to 105, Noxious Fish. Must not bring noxious fish into State or move noxious fish within State.
	Fisheries Resource Management Regulations 1995	Department of Primary Industries and Regional Development	Regulation 176, translocation. Must not bring non-endemic fish into State.
	Environmental Protection Act 1986	Department of Primary Industries and Regional Development (on behalf of Office of the Environment Protection Authority)	Satisfy Ministerial conditions to address marine biosecurity risk.
	Aquatic Resources Management Act 2016	Department of Primary Industries and Regional Development	• s. 106 Must not bring declared organism into State or move declared organism within State. • s.108 Demonstrates reasonable measures taken to ensure vessels free from declared organisms
	Biosecurity and Agriculture Management Act 2007	Department of Primary Industries and Regional Development	• s.15 Must not import prohibited organism or prescribed potential carrier • s.21 Must report notify of prescribed potential carrier import • Part 2, s24 Must not bring into the State a prescribed potential carrier of declared organism

	Petroleum (Submerged Lands) (Environment) Regulations 2012	Department of Mines, Industry Regulation and Safety	Marine biosecurity management in accordance with Part 2 – Environment Plans
Northern Territory	*Petroleum Act 1984*	Department of Primary Industries and Resources	The reduction of marine biosecurity risks, so far as is reasonable and practicable, of harm to the environment during activities associated with exploration for or production of petroleum
	Petroleum (Environment) Regulations	Department of Primary Industry and Resources	Describes the environmental impacts, risks and outcomes as they relate to marine biosecurity
	Fisheries Act 1988	Department of Primary Industry and Resources	s.11(2) illegal translocation
	Fisheries Regulations 1993	Department of Primary Industry and Resources	s.17 movement of Noxious species
Victoria	*Offshore Petroleum and Greenhouse Gas Storage Act 2010*	Department of Jobs, Precincts and Regions	Reflects the marine biosecurity management aspects of Part 1.4 Sustainability Principles
	Fisheries Act 1995	Department of Transport	s. 75 – 76, 84, Noxious Aquatic Species. Offence to bring in or transport declared noxious aquatic species.
	Environment Protection Act 2017	Environment Protection Authority	• Part 3.2 – General Environmental Duty to prevent harm to environment • Parts 6.3 and 6.4 duties relating to deposit and discharge of wastes (till mid 2020) • State Environmental Protection Policy (Waters) Clause 51– Management of water and wastewater from ports, marinas and vessels
South Australia	*Fisheries Management Act 2007*	Primary Industries and Regions South Australia	s. 78 Unauthorised activities relating to exotic organisms or noxious species prohibited.

D) EVALUATION OF ENVIRONMENTAL IMPACTS AND RISKS

Regulation 13(5)(a)(b): Evaluation of Environmental impacts and risks

Potential impacts of NIMS

NIMS are marine plants or animals that have been introduced to Australia from beyond their natural range, usually via anthropogenic means. NIMS that survive, reproduce, and establish populations have the potential to harm Australia's marine environment by reducing marine biodiversity through increased predation pressure and competition for habitat. This may change ecosystem structure and health which can, in turn, have negative impacts on Australia's fishing, aquaculture and tourism sectors.

Coastal, shallow water and disturbed environments with artificial structures are thought to be areas that are most vulnerable to NIMS and are certainly areas that are populated by NIMS in greatest numbers. As a result, vessels that visit these environments are themselves exposed to potential settlement or uptake of NIMS in their various life stages, and consequently, can potentially transport these species to other locations.

The majority of the more than 250 NIMS[1]known to occur in Australia are benign, having no documented harmful impacts. However, some, such as the northern Pacific seastar and European green shore crab, which were both most likely introduced to Australia in ballast (seawater and rock), do impact on native communities. Toxic dinoflagellates, a type of microscopic alga that produces natural toxins that are harmful to humans, were introduced in ballast water, and now cause annual bloom events in Tasmania. Economic impacts associated with

[1] http://www.agriculture.gov.au/pests-diseases-weeds/marine-pests

fisheries closures and product recalls have been estimated to cost about $23m[2] when they occur.

While there is a need to undertake further scientific studies to better understand the impacts of NIMS in Australia, there are reports of direct and localised impacts of NIMS, particularly on highly value industries such as aquaculture.

NIMS Pathways - Source and voyage history

As a result of many factors, such as historical maritime trade patterns, port and bioregion connectivity, natural range extension, less effective biofouling management technologies and the absence of marine biosecurity regulations through maritime history, some locations harbour many NIMS, whilst other are relatively or completely NIMS free. As such, vessel movements and voyage history influence the marine biosecurity risk of an individual vessel.

By their very nature, NIMS are highly tolerant and adaptable to a range of environmental conditions. The likelihood of vessel biofouling or the release of unmanaged ballast water leading to a successful new establishment depends on a range of environmental variables including:

- suitable environmental conditions to trigger a significant spawning event from reproductively mature organisms attached to a vessel, or for the survival of organisms discharged in ballast water.
- offshore currents and hydrology holding propagules in the environment of the marine infrastructure, other vessels or natural habitat until they are able or competent to settle.
- water depth of receiving environment.
- vulnerability of receiving environment to settlement of new species. NIMS are predominantly opportunistic species that rapidly colonise new or exposed artificial surfaces, or disturbed natural habitats. Man-made infrastructure is commonly colonised by non-native species because the habitat is different to the natural physical environment.
- suitability of receiving environment to the biological and physical requirements of NIMS to enable successful settlement, recruitment, maturation and further spawning of to create an established population.

Marine biosecurity risk associated with vessels servicing the offshore resources industry

There are two potential pathways for the translocation of NIMS in offshore resource activity: 1) organisms in juvenile or planktonic form can be taken up in ship's ballast water and discharged at a different location and; 2) biofouling organisms that settle on the immersed surfaces of vessels (smooth hull areas and niche areas, such as inside sea chests, intake grates, rudders, propellers, anodes, seawater pipework, etc) can be dislodged or spawn when vessels are in transit to, or arrive in new areas.

NIMS pathway – Biofouling

Biofouling risks are evaluated by considering the biological characteristics of the biofouling organisms and the surrounding marine environmental conditions, along with the operational characteristics and the associated management practices employed by the vessels involved. These factors have a strong influence on the likelihood of biofouling occurring.

The time a vessel spends in a location (residence time) has an influence on the likelihood of species attachment or uptake at a source. The longer a vessel sits in any one location, the more likely it is to be colonised by biofouling species due to increased propagule pressure. Propagule pressure is a combination of the frequency of colonisation

[2] Hallegraph, G. et.al (2018) Improved understanding of Tasmanian harmful Algal blooms and biotoxin events to support seafood risk management

events and the magnitude of these events.

In the presence of mature organisms on a structure or in an environment, the longer a vessel is close by, the greater the likelihood of a reproductive event occurring due to the greater likelihood of the environmental triggers for propagule release being met. Also, the longer a vessel is present in that location, the greater the exposure of the vessel to propagules and the opportunity for organisms to settle on, or in the vessel.

The precise environmental conditions for propagule release vary between species; some release propagules continuously once mature, others have short but intense propagule releases, stimulated by environmental triggers. However, colonisation risk increases with increasing residence time within both scenarios.

Furthermore, the length of time a vessel spends stationary can impact on the performance of some types of antifouling coatings, in particular, self-polishing copolymers (Floerl & Coutts 2009)[3] , which work by releasing biocide gradually when the paint is eroded through hydrolysis. If a vessel is stationary, such conditions may slow the rate of biocide release and allow organisms to colonise areas of the hull, consequently reducing the future effectiveness of the biofouling coating.

NIMS Pathway - Ballast water

Seawater ballast is used to manage vessel stability and trim and is taken up, discharged, and moved via pumps into, out of and between ballast water tanks while the vessel works cargo. The risk of species introduction is greatest when coastal water is taken up in one location and discharged at another with similar physical and environmental characteristics.

E) DETAILED DESCRIPTION OF CONTROL MEASURES

Regulation 13(5)(c) Description of requirements (including legislative requirements) relevant to biosecurity Management

Ballast Water Requirements

Ballast water is managed to address risk by undertaking ballast water exchange in the open ocean, or the use of a ballast water treatment systems to 'sterilise' the ballast water in accordance with the International Convention on the Control and Management of Ship's Ballast Water and Sediment (Ballast Water Management Convention, BWC).

The Ballast Water Management Convention applies to waters out to 200 nm and is given effect in Australia through the *Biosecurity Act 2015*, *Biosecurity (Ballast Water and Sediment) Determination 2017* and the Australian Ballast Water Management Requirements. The Australian legislation also extends application of the requirements of the Ballast Water Management Convention to domestic vessel activities which includes a requirement for vessels servicing the offshore resources sector to manage ballast water.

The Ballast Water Management Convention and associated guidelines specify requirements for international vessels including:

- Methods used and standards to be met in ballast water exchange
- Discharge standards to be met for ballast water treatment systems
- Ballast water management plans
- Ballast water record keeping

[3] Floerl, O. and Coutts, A. (2009) Potential ramifications of the global economic crisis on human -mediated dispersal of marine non-indigenous species. Marine Pollution Bulletin.

- Survey and certification for compliance

All ships are required to manage ballast water in accordance with one of the acceptable methods of ballast water management prior to arrival in Australian waters.

During ballast water exchange, coastal ballast water is discharged into the open ocean and replaced with oceanic ballast water, in accordance with a vessel specific ballast water management plan (to ensure the ongoing structural integrity and safety of the vessel) reducing the likelihood that coastal species remain in the ballast tanks. Ballast water exchange meets the D-1 standard of the Ballast Water Management Convention.

Ballast water taken up alongside an offshore installation presents an unknown risk. Although the seawater is essentially oceanic, the installation provides structure and habitat that may be colonised by NIMS. If these organisms are fertile, reproductive spawn or dislodged fragments could possibly be taken up into ballast tanks during ballasting activities.

Vessels that operate between offshore resource installations and Australian ports are also required to manage their ballast water before arrival at the installation and/or Australian port if they plan to discharge ballast. The acceptable area for ballast water exchange between an offshore installation and an Australian port is in sea areas that are no closer than 500 metres from the installation, and no closer than 12 nautical miles from the nearest land.

Type approved ballast water treatment systems utilise a combination of filters and membranes, chemical dosing, electro chlorination and UV sterilisation to meet in the D-2 standard of the Ballast Water Management Convention. The type of system selected and installed on a vessel will vary according to the vessel type, size, and operational requirements.

All vessels, including offshore vessels, to which the Ballast Water Management Convention applies must meet the D-2 or D-1 standard in accordance with the revised implementation schedule as outlined Regulation B-3 of the Ballast Water Management Convention (MEPC.297(72)). As per the revised implementation schedule, by 8 September 2024, all ships to which the Convention applies will be required to meet the D-2 discharge standard.

Biofouling good practice management

The most critical factor influencing the risk of introducing NIMS via biofouling is vessel hull condition. A vessel operated and maintained in accordance with a ship specific BFMP should be able to effectively withstand large scale settlement of marine organisms – including when vessels are exposed to locations of NIMS infestation. To achieve this, the ship specific BFMP should adhere to the 2011 Guidelines for the Control and Management of Ships Biofouling to Minimise the Transfer of Invasive Aquatic Species (the IMO Biofouling Guidelines), as an internationally consistent approach to biofouling management and record keeping.

In addition to reducing marine biosecurity risk, there are operational, economic and environmental benefits in maintaining underwater surfaces free of fouling. Biofouling causes a range of operational problems for vessels. Marine growth in seawater intakes and piping systems reduces the efficiency of cooling systems and can lead to machinery failure. Fouled hull surfaces increase drag, fuel consumption and consequent atmospheric emissions, and can reduce vessel responsiveness and manoeuvrability.

Modern antifouling coatings are highly effective and formulated to suit specific vessel types and activity profiles. However, to achieve the best performance, it is critical that vessel's hulls are treated with the antifouling coating most suitable to that vessel, and that this is applied and reapplied strictly in accordance with the manufacturer's specification and under their technical supervision.

Given the varying water flow and hydrodynamics over and within different areas of a vessel's hull, hull apertures and niche areas, a single antifouling coating may not be appropriate to give maximum performance in different areas on the same vessel. Different antifouling coatings and biofouling management systems, including marine growth prevention systems (MGPS), can be applied to different areas of the hull, sea chests and internal pipework systems to minimise biofouling.

MGPS are designed to release a biocide, either electrochemically from anodes or by direct liquid dosing, to prevent or deter the settlement of organisms within a seawater system. As with antifouling coating systems, it is critical to select a proven system designed for the particular vessel configuration, and for the system to be operated and maintained in accordance with the manufacturer's specifications and operating manual.

The IMO Biofouling Guidelines provide internationally agreed guidance on how to minimise biofouling on vessels through application of biofouling prevention measures and hull husbandry practices provide a basis upon which operators can develop a ship specific BFMP which:

- Provides specific details of the antifouling technology used, including antifouling paints and MGPS and how and when they are operated where relevant.
- Describes the operating conditions suitable for the chosen technology.
- Describes the operational profile of the vessel including operating speeds and time spent stationary.
- Provides details of the areas of the hull that are particularly susceptible to biofouling, such as niche areas, and how the technology applied addresses this increased risk.
- Provides information relating to the schedule of planned inspections, repairs, maintenance, inspection, and renewal of antifouling systems as well as circumstances by which opportunistic inspection to monitor efficacy might occur.
- Describes the documentation required to verify any treatments and activities recorded in the biofouling record book.

The Biofouling Record Book (BFRB), which accompanies the BFMP, provides a mechanism whereby implementation of the BFMP can be verified.

In 2009 the Australian Government published a series of national biofouling management guidelines for a range of marine applications including the:

- National Biofouling Management Guidelines for the Petroleum Production and Exploration Industry
- National Biofouling Management Guidelines for Commercial Vessels
- National Biofouling Management Guidelines for Non-trading Vessels

Along with the IMO Biofouling Guidelines, the three national biofouling management guidelines provide direction in the development of a ship specific BFMP.

In addition to the above, the NOPSEMA has published *Information Paper - Reducing marine pest biosecurity risks through good practice biofouling management* to guide the offshore petroleum industry's performance in relation to biofouling risk assessment and management. The information paper is relevant to titleholders, MODU operators and vessel operators that service offshore activities.

Biofouling Risk Assessment

In the absence of or in addition to a vessel implementing a ship specific BFMP and BFRB that demonstrates low risk due to good practice management, a vessel risk assessment can be conducted that can provide an indicator of vessel risk. The risk factors included in the vessel risk assessment should be guided by the biofouling

management elements of the IMO Biofouling Guidelines, voyage history and environmental matching of previous, current and proposed vessel locations.

Where a risk assessment indicates that the risk posed by a particular vessel is high, additional control measures could be applied to validate the risk, such as conducting an in water inspection by a qualifies inspector, or if its deemed appropriate, reduce the vessel risk from high to low by reducing vessel residence time.

Acceptable level of risk

It would not be acceptable for a NIMS to establish as a result of the activities of vessels servicing Australia's offshore resources industry. The establishment of NIMS and associated potential impacts as described in this reference case is of relevance with respect to the titleholder's environmental responsibilities, however this reference case focusses on the prevention side – the prevention of introduction and translocation via vessels.

Adherence to all legislative requirements and international best practice as outlined in Table 3 will ensure operations are maintained above the identified acceptable level of risk.

Evaluation of control measures

The following table (Table 2) describes the risks associated with the use of vessels to service offshore resource activities and an evaluation of each of the control measures applied to mitigate those risks. Titleholders should note that there may be circumstances where risks specific to the location of the activity, vessel type and immersible equipment are such that additional control measures are required. These should be evaluated and addressed within the EP as well as within the relevant BFMP.

Table 2: Evaluation of control measures

Source of risk	**Control measure**	**Evaluation of Control measure**
Vessel translocating NIMS via ballast water	Adherence to the Australian ballast water requirements. Australia is a signatory to the BWC and implements the requirements through the *Biosecurity Act 2015* and subordinate instruments. This includes the implementation of an approved BWMP and completion of a BWRB. The Commonwealth also applies ballast water management requirements to domestic ballast water and the discharge of ballast by vessels servicing the offshore resources sector. *** Applicable ballast water treatment standard** • Vessels constructed on or after 8 September 2017 must meet the D-2 standard (manage ballast using a type approved ballast water treatment system) from the time they enter service • Vessels constructed before 8 September 2017 must meet	Ballast water management, either to the D-1 or D-2 standard, depending on the year of build in line with the agreed implementation schedule* mitigates the risk of NIMS translocation by treating the ballast water to remove entrained organisms, or exchanging ballast via an acceptable method. The ship specific BWMP outlines the specific methods and safety considerations for handling and treating ballast water on the ship. The BWRC ensures a means to verify compliance with the ballast water requirements.

	the D-2 standard by the 1st, or 2nd renewal survey. All vessels must meet the D-2 standard by 2024	
Vessels translocating NIMS via biofouling.	<u>Application of BFMP</u> Requirement for the application of a ship specific BFMP consistent with the IMO Guidelines.	Ship specific BFMP will identify the specific ship design and structural elements (hull, niche areas, on-board treatment systems and submerged equipment and machinery) as well as the operational profile of the vessel it applies to. This will ensure appropriately flexible technological and operational biofouling prevention and detection techniques can be applied that optimise biofouling management and address the specific biofouling risks that are characteristic of the particular vessel and its design. For example, a BFMP developed for a platform supply vessel will include a comprehensive list niche of areas and describe for each measures have been taken, such as the use of different antifouling treatments on areas of lower hydrodynamic flow, to limit potential biofouling growth in those areas. Further, a BFMP developed for a dredge will include consideration of operational aspects such as the potential impacts of operating as a very low speed and having contact with the seafloor. This BFMP may include periodic inspection of equipment on board and ROV inspections of hull and niche areas. All BFMP's will describe the operation of on-board treatment processes and systems such as MGPS and internal seawater systems and their inspection and maintenance schedules as well as measures to be taken to manage biofouling if these systems cease to be operational.
	<u>Use of BFRB</u> Requirement for the use of a BFRB to record all actions taken to implement the BFMP.	The BFRB ensures a means to verify compliance with the ship specific BFMP.
	<u>Vessel biofouling risk assessment</u> Assessment of vessel risk utilising a methodology that considers how the vessel performs against all the relevant elements of good practice biofouling management in accordance with the IMO Biofouling Guidelines.	In the absence of or in addition to detailed information about the proactive measures taken to prevent biofouling via BFMP, vessel biofouling risk assessment can be used. This considers a range of information relating to hull and niche area husbandry and vessel history, which can have an influence on the likelihood that a particular vessel may pose a marine biosecurity risk. The vessel biofouling risk assessment result can be used to determine if additional measures need to be taken, such as in water inspection and/or hull cleaning to mitigate any potential risk of transfer of an invasive aquatic species to ALARP and acceptable levels.

F) ENVIRONMENTAL PERFORMANCE OUTCOMES, STANDARDS AND MEASUREMENT CRITERIA

Applicable Regulations: 13(7)(a)(b)(c)

Table 3 includes the acceptable level or risk, reflected in the Environmental performance outcome (EPO), description of the control measures (including source and type), environmental performance standard (EPS) and measurement criteria.

Table 3: Environmental performance outcomes, standards and measurement criteria

Activity	*Aspect*	*EPO*	*Control measure*	*Control source*	*Control type*	*EPS*	*Measurement criteria*
Vessels entering Australian waters and transiting between locations for the purpose of providing services to the offshore resources industry.	Discharge ballast water in port or alongside an installation.	No new introduction or translocation of NIMS attributable to the activity.	International ballast Vessels arriving at an offshore installation from a place outside of Australia, must manage their ballast water in accordance with one of the acceptable methods of ballast water management prior to arrival. Where ballast water exchange is utilised, it must be conducted in accordance with the approved methods of ballast water exchange and the ship's ballast water management plan. Domestic ballast Vessels that operate between offshore installations and Australian ports, or between offshore installations, are required to manage their ballast water before arrival. Vessels using ballast water exchange must complete their exchange no closer than 500m from the offshore installation and 12nm from nearest land. Ballast water exchange must be done in accordance with the ship's ballast water management plan.	• Ballast Water Management Convention • Biosecurity Act 2015 • Biosecurity (Ballast Water and Sediment) Determination 2017 • Australian Ballast Water Management Requirements (as amended)	Procedure or equipment	Approved methods of ballast water management adopted and implemented. Ballast water management activities undertaken in accordance with the Australian Ballast Water Management Requirements.	• BWMC held on board and available for inspection. • Approved BWMP held on board and available for inspection. • BWRB that demonstrates compliance with the BWMP, and records ballast water management activities held on board and available for inspection • BWRB includes: ○ Time, date and location of each uptake, treatment, and discharge of BW. ○ Method of BW treatment used and relevant details (i.e. volume exchanged etc). ○ Details of any accidental discharges. ○ Signature of officer in charge.
	Exposure of vessels to fouling organisms leading to the possible introduction and translocation of NIMS between offshore installations and other	No new introduction of NIMS attributable to the activity.	a) Implementation of a ship specific biofouling management plan that adheres to the requirements of IMO Biofouling Guidelines.	• Biosecurity Act 2015 • IMO Biofouling Guidelines	Procedure and equipment	A ship specific BFMP is implemented that includes at least the content outlined in the IMO Biofouling Guidelines, highlighting areas of biofouling risk on the vessel and what measures have been taken to maximise efficacy of available biofouling technology.	• BFRB is held on board and includes at least the content outlined in the IMO Biofouling Guidelines, recording biofouling management activities, signed by the person in charge, held on board and available for inspection. • BFRB demonstrates compliance with the BFMP.

	locations in Australia.					The BFMP is reviewed and updated when circumstances require it, such as when changes in recommended best practice occur, or structural changes to the vessel's underwater surfaces carried out that may have an impact on biofouling attachment.	
			b) In lieu of option a), vessel to undergo risk assessment that examines relevant risk factors relating to biofouling management elements referred to in the IMO Biofouling Guidelines (including periods of layup/inactivity since last dry dock, details of antifouling system applied including type, date applied and service interval specified and presence or absence of MGPS), to determine if the vessel's management practices are sufficient to mitigate the risk of transfer of an invasive aquatic species to ALARP. Titleholders may also require a vessel risk assessment in addition to option a). <u>Risk results</u> **Low risk**: vessel to continue operation as planned, considering any recommendations or comments provided in association with the risk rating provided. **Uncertain/high risk**: time within 500m of an installation and time in port does not exceed 48 hours, until low risk status can be demonstrated via in water or drydock inspection. Alternatively, operators should verify the risk via some form of inspection to inform the risk and act on any necessary required mitigation measures.	Vessel check or an alternative risk assessment tool	Procedure	Risk assessment undertaken using input values related to biosecurity risk factors that may have a bearing on the marine biosecurity risk of a vessel. Where risk assessment result indicates high or uncertain risk, residence time is controlled to time within 500m of an installation and time in port does not exceed 48 hours, until low risk status can be demonstrated via in water or drydock inspection. If this is not achievable or desirable, risk to be verified via inspection and necessary risk mitigation to be undertaken to reduce risk to low.	• Risk assessment outcome documented and retained on board and available for inspection. • Uncertain/high risk vessel logs demonstrate vessel has spent less than 48 hours either within 500m of an installation or in port. • Where actions have been undertaken to demonstrate low risk status, records of such actions should be retained on board and available for inspection.

9. REFERENCES

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