SUBSEA GLOBAL
SOLUTIONS

# The View From Below
# Regulatory Lessons in Advancing Hull Cleaning

Prepared for International AntiFouling Conference
10 September 2025

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# Service Locations

- ✓ Regulatory Environment
- ✓ Testing Challenges
- ✓ Technology Demonstration Update

## International Guidance

IMO's 2023 Guidelines and 2025 Cleaning Guidance

ISO's 20679 and 6319

Class Certification Efforts

Pending IMO Mandatory Instrument

## National Directives

New Zealand

Australia

Netherlands

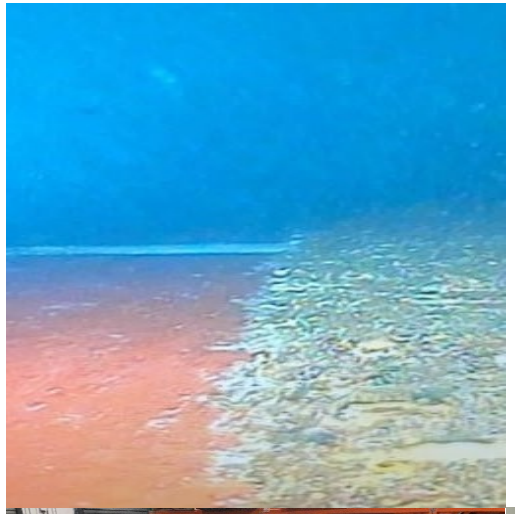
Belgium

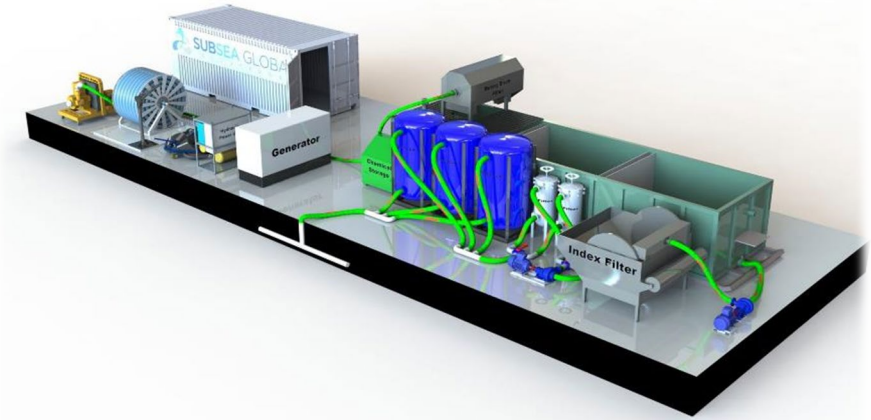
Brazil

Norway

United States

# Regulatory Environment





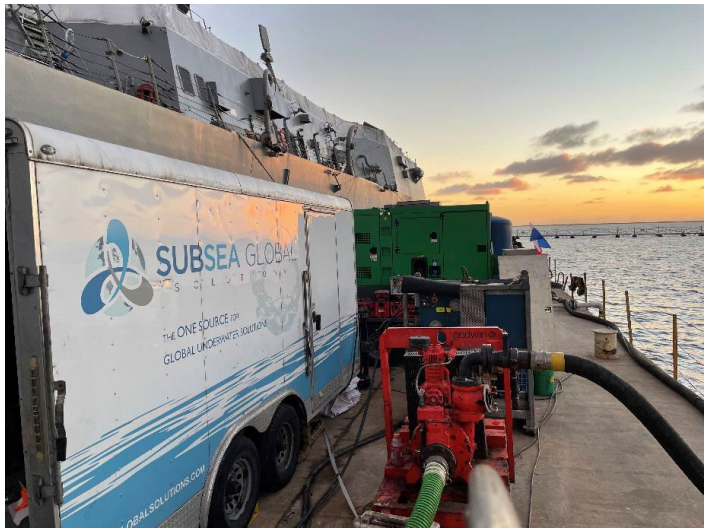

- What are we regulating? And why?
- What is “Best Available Technology”, and according to whom?
- What happens when policy references Guidelines?

# Regulatory Environment

- Who can grant or deny permission?
- Do rules match emerging technology?
- Can regulations be misapplied?


# Testing Challenges

- Lots of different standards and protocols still in place
- ISO 20679 has yet to become the universal standard
- There are practical aspects of 20679 that can still be refined, and additional guidance would be helpful.
- Demonstration events might have contractual requirements that differ from testing standards


- Testing can Get Pricey
  - 72 samples required testing
  - Lab cost of ~$333/sample
  - Sediment, metals and particulate distribution
  - Then we got to microplastics……..
  - $1800
  - Per sample

# Environmentally Complaint Cleaning all degrees of biofouling

## Equipment & Process

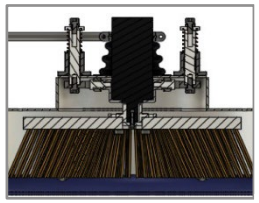
- Subsea Global Solutions Environmental Solutions shall test three (3) different underwater vehicles equipment with In-water Capture systems.
- All three (3) underwater vehicles shall be tested with the ***Whale Shark*** water filtration and processing system filtering particulates (organic and in organic) to one (1) micron and substantially removing ***soluble metals***.
- In-water Cleaning With Capture (IWCC) efficiency as well as ecological water impacts shall be tested.

**Remora**

- ✓ Diver driven cleaning vehicle
- ✓ In-Water Cleaning with Capture capable to clean all types of coatings with all degrees of biofouling

**C-ROV**

- ✓ Cleaning Remote Operated Vehicle
- ✓ In-Water Cleaning with Capture capable to clean all types of coatings with all degrees of biofouling



**Beluga**

- ✓ Diver operated Niche Cleaning and Propeller polishing
- ✓ In-Water Cleaning with Capture capable to clean all types of coatings with all degrees of biofouling

## Local Regulatory Checklist

*The following information determines environmentally compliant underwater maintenance feasibility*

| | |
|---|---|
| **Vessel Type** | ✓ |
| **Vessel Trade Route** | ✓ |
| **Applied Coating/Paint** | ✓ |
| **Local Environmental Regulations** | ✓ |
| **Marine Biological Growth** | ✓ |
| **Underwater Maintenance & Record Evaluation** | ✓ |

# Demonstration Requirements
# Performance on different levels of Biofouling

## Demonstration Requirements

*Specific testing milestones must be met to meet demonstration requirements.*

*Close coordination between Transport Canada and Subsea Global Solutions necessary.*

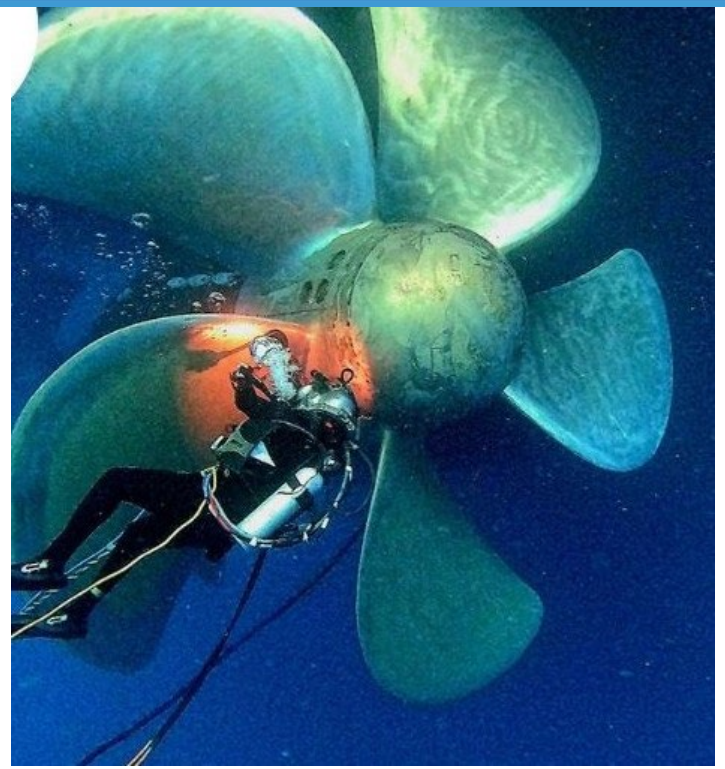
| | |
|---|---|
| **Vessel Selection** | ✓ |
| **Pre-Cleaning Activities** | ✓ |
| **Demo / Water Sampling** | ✓ |
| **Post-Cleaning Activities** | ✓ |
| **Data Management** | ✓ |
| **Reporting** | ✓ |

# Cleaning Industry Status

- Most cleanings worldwide are STILL being conducted by divers using traditional aggressive cleaning solutions with no reclaim
- The forward-leaning companies understand that **coating preservation** is a significant factor for shipowners and coating companies – not just biofouling removal
- Advancement is often coming from outside the dive industry (not exclusively though)
- The robots are coming!!!
  - In-transit solutions for proactive cleaning
  - Multi-robot cleanings pier side or at anchor
  - Niche Cleaning capabilities
  - Decision making at the machine level
- The Regulatory process(es) MUST reflect these realities

*Notes: The level of biofouling, and current or swell can influence actual speed of cleaning operations.*

# Thank you for your attention.



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# Operators

## Equipment Operators

- All Subsea Global Solutions personnel are responsible for pollution prevention, not just on hull cleaning operations,
- Personnel who undertake in-water cleaning are aware of regulations and requirements for the conduct of in-water cleaning, including regulations regarding the discharge of chemicals into the marine environment and the location of sensitive areas (such as marine protected areas).
- Dive teams and ROV operators are trained to perform cleaning operations and are familiar with the relevant clause for Underwater Ship Husbandry and Hull Fouling Discharges of the VGP (Clause 2.2.23 Underwater Ship Husbandry and Hull Fouling Discharges, VGP) and IMO Biofouling Guidelines.

## Training of personnel includes:

- Instructions on the application of biofouling management and treatment procedures.
- Maintenance of appropriate records and logs.
- Impacts of invasive aquatic species from ships' biofouling.
- Benefits to the ship of managing biofouling and the threats posed by not applying management procedures.
- Biofouling management measures and associated safety procedures.
- Relevant health and safety issues.

*Notes: The level of biofouling, and current or swell can influence actual speed of cleaning operations.*