

specific policies that any one country must adhere to, and each nation would follow their own best practices. The Singapore Standard 670:2021 (Singapore Standards Council, 2021) titled Specification for good aquaculture practice is one example of aquaculture farm production in the Island nation; (a) Food safety and quality; (b) Animal health and welfare; (c) Environmental integrity; and (d) Socio-economic aspects. However, the article does not specify aquaculture occupational health and safety practices intended for this study (Table 4).

Examples of Safety standards used worldwide for aquaculture normative Safety Practice:

Table 4 Safety standards used in aquaculture worldwide

No.	Standard / code of practice	Summary
1	Aquaculture Safety Code of Practice, Prince Edward Island (Prince Edward Island Aquaculture, 2008)	Requires aquaculturists and workers to identify and control hazards; covers safe use of tools and machinery and safe work practices for onshore and offshore operations.
2	Guidelines on Occupational Safety and Health in Fishing and Aquaculture Operations, Malaysia (OSH Act 1994) (Department of Occupational Safety and Health, 2001)	Applies to fishing operations in Malaysia; assists the industry in preventing accidents, injury, disease and death.
3	Aquaculture Industry OHS Code, Western Australia (2002) (Aquaculture Council of Western Australia, 2002)	Requires workplaces to meet statutory requirements under the Marine Act, OSH Act and Fish Resources Management Act; defines responsibilities of licence holders, managers, contractors and operators.
4	Code of Practice for Diving at Work, Singapore (SS 511:2018) (WSH Council, 2021)	Covers offshore diving; not prescriptive but requires proper planning and assessment of diving operations and compressed-air breathing apparatus.
5	Occupational health and safety in the aquaculture industry: a global review (Lloyd's Register Foundation, 2021)	Reviews OHS incident evidence and intervention effectiveness; categorises hazards as safety, physical, chemical, biological, ergonomic and psychosocial.

3.5 Risk assessment for feeding and harvesting activities

The main activities involved in manual and automated aquaculture operations, including feeding, equipment maintenance, and harvesting, are summarized in Table 5.

Table 5 Activities for both onshore and offshore farming

Activity	Manual	Automated
Feeding	Personnel wear non-slip boots and gloves and approach a tank or cage with a container of feed (URA Singapore, 2017).	An auto-feeder, scheduled by personnel, dispenses feed into the tank or cage (Hatchery International, 2021).
Equipment maintenance	Structural design provides pipes, containment tanks, water drainage and recirculating systems (Singapore Aquaculture Technologies, 2022).	Machinery includes feed dispensers, material conveyors, RGB cameras for movement and disease monitoring, close-containment tanks and water-quality sensors (Singapore Aquaculture Technologies, 2022).
Harvest	Personnel wear non-slip boots and carry containers to pick and place live fish stock (Singapore Aquaculture Technologies, 2022).	A conveyor transfers live fish stock while fresh water cleans the fish (Farm-Futurism, 2022).

Risk management According to the Code of Practice on Risk Management:

The steps in Hazard Identification, Risk Evaluation and Risk Control specify the methodology and requirements of this Code of Practice (WSH Council, 2011). Severity, likelihood, Risk Priority Number and the classification of risk are shown in Figure 1. The resulting assessments for manual feeding and harvesting are presented in Table 6 and Table 7, and for machinery-assisted operations in Table 8 and Table 9. Severity, Likelihood, Risk Priority Number and Classification of Risk is found with the infographics (Figure 1) followed by the Risk Assessment Form (Ministry of Manpower, n.d.).