19. Management, monitoring and communication

19.1 Introduction

This chapter describes the operating and monitoring framework that will be in place during both the development and the operation of the AMETS project.

An AMETS management organisation (such as a company limited by guarantee) will be established by SEAI to manage the construction and operation of AMETS. Once established, the AMETS Management Organisation's role will be to prepare, implement, review and monitor adequate operating procedures for AMETS, covering all aspects of the operation, appropriate for the detailed technical design and in line with best practice and consent constraints at that time.

A working committee or similar structure for the AMETS project will also be established in parallel to the AMETS Management Organisation to ensure involvement of other relevant statutory bodies in the management and governance of the project.

While management of operations will be a considerable element of the AMETS Management Organisation's remit, environmental monitoring will also be a major responsibility. Critical to successful environmental monitoring will be the design and implementation an Environmental Management System to ensure that environmental conditions (as characterised during the baseline studies), will be monitored on an on-going basis, so that any negative impacts can be addressed at the earliest possible stage.

19.2 Operational management

The proposed AMETS facility will provide the means for wave energy conversion technology developers to deploy novel devices in a dynamic open ocean environment. It will provide the opportunity to develop and test many varied operating procedures involving an assortment of technologies. The AMETS Management Organisation will, therefore, be responsible for developing and implementing a robust, but flexible Operational Management System to allow the broadest variety of operations to take place in a safe and controlled manner.

It is envisaged that the AMETS Management Organisation will appoint a dedicated Operations Manager to administer and coordinate the Operational Management System for AMETS. There are four principle areas of operational activity that will be covered by the AMETS Operational Management System, each of which is now described in turn.

19.2.1 Marine element

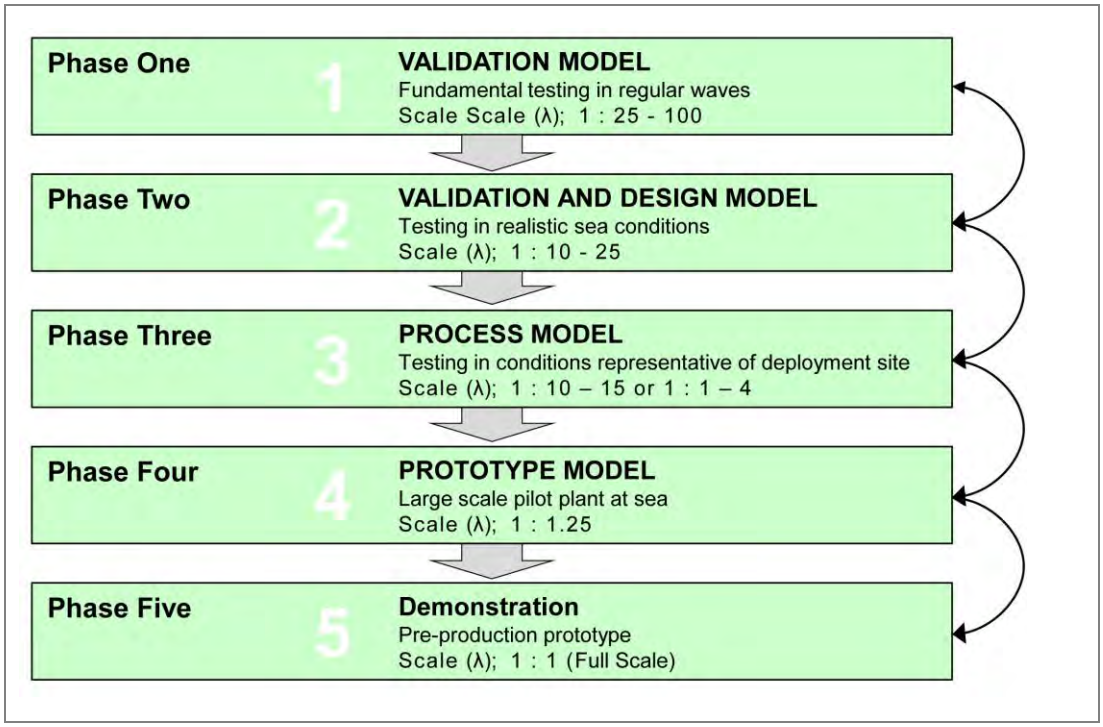
Marine operations will include the following aspects:

A: Qualifying for a test site berth

The AMETS Operational Management System will include a qualification procedure to ensure that prospective clients are sufficiently prepared and capable of undertaking operations in the marine environment.

The primary requirement will be that prospective clients demonstrate that their technology is sufficiently mature and robust for safe deployment at AMETS. The AMETS Management Organisation system will require that they have progressed satisfactorily through to Phase 5 of the Development and Evaluation Protocol of the Hydraulics and Maritime Research Centre (HMRC). This protocol prescribes standard indices to evaluate the technology readiness level of devices, in line with the standards proposed in the IEA Ocean Energy Systems *Implementing Agreement Annex II* report on recommended practices for testing and evaluating ocean energy devices.

Table 19-1: Overview of HMRC Development and Evaluation Protocol



Only wave energy converters that have already been comprehensively tested and that comply with an appropriate internationally recognised design and construction standard such as that of Det Norske will be considered for deployment at AMETS .

Aside from the readiness of the core technology for operations in the marine environment, the Operational Management System will require proof that clients have the financial, technical and human resources to deploy, operate and decommission the WEC(s) at AMETS.

Clients will be required to provide:

- A comprehensive marine operational plan,
- Recovery plans to deal with emergencies such as mooring failure or collision
- Environmental report specific to their technology

B: Monitoring and control of activities

AMETS will consist of a variety of moored devices, both client ocean energy technology and measurement equipment. To access, monitor and maintain this equipment, work vessel activities will be required. Therefore, as described in the Navigation Risk Assessment (NRA) (See Chapter 12), service vessels operating at the proposed AMETS facilities will include those of the clients and others working on behalf of the AMETS Management Organisation.

The NRA has indicated that volumes of passing vessel traffic are low and these are largely fishing boats and the occasional cargo vessel. The location of the test areas will be marked on navigation charts and the large permanently moored Special Mark navigation buoys delineating the test areas will carry automatic identification system (AIS) transceivers. All passing vessels will be required to keep clear.

The intention is that the AMETS Management Organisation will participate in on-going liaison with fishermen and other marine users to consult on issues of mutual concern. It can be said at this stage that any activities by external vessels on site, such as retrieval of fishing gear gone adrift, will need to

be planned and agreed in advance and will be carried out in close consultation with the AMETS Management Organisation.

In line, therefore, with the recommendations of the Navigation Risk Assessment, activities at the proposed AMETS areas and at local landing facilities will need to be carefully monitored and controlled as part of the AMETS Operational Management System.

This will include the monitoring and coordination by the AMETS Management Organisation of vessel activity in and around the test areas by means such as AIS, radar and other real-time monitoring methods. Work vessels will only be allowed access to the site in close consultation with the AMETS Management Organisation. Access will depend on weather and there must be an acceptable plan of work.

All significant moored assets on the site will also be required to carry GPS and/or AIS-based off-station warning systems feeding into the real-time monitoring system implemented at AMETS. This will enable the condition and status of every asset to be automatically monitored and all important alarms will be escalated to the control of the AMETS Management Organisation as appropriate.

19.2.2 Land-side element

Land-side operations will include activities in and around both the AMETS substation and the main office-based Operations Centre in Belmullet. It is at the substation that clients will have their monitoring and any relevant electrical transformer equipment. The main Operations Centre in Belmullet will be an office environment used to remotely monitor and control operations at the substation.

The substation will normally be unmanned, with all processes under remote supervision either from the AMETS Operations Centre for the power supply side or from ESB Networks on the power delivery side. It is not expected that client's staff will need to enter the substation premises often; and where this is necessary, prior approval will be required. All operations at the substation will be carried out according to a previously prepared work plan and will be monitored remotely from the Operations Centre.

The substation will be divided into two sections; the supply side, where the electricity comes into the substation from the WECs under test at sea, and the delivery side, which transmits the electricity to the national grid via the local network. The delivery side will not be accessible to AMETS and is outside the scope of the AMETS Operational Management System, being entirely ESB Networks' responsibility.

The AMETS Operational Management system will control operations at the supply side of the electricity substation. Client personnel will only be allowed qualified and supervised access to their own and/or AMETS monitoring equipment in the supply side of the substation. During the qualification stage, prospective clients will be required to identify and demonstrate which staff are appropriately qualified to undertake their operations at the supply side of the substation.

19.2.3 Maintenance element

Recognising the harsh conditions at the proposed location, the AMETS Operational Management System will include proactive maintenance operations. This will be based on the failure mode and effects analysis of each asset, including client's assets, and will include processes to build up knowledge and experience over time.

The maintenance element of the AMETS Operational Management System will include provision for scheduled checking of the integrity of the sub-sea electrical cables and moorings and will outline emergency detection systems such as water ingress and off-station warnings.

While clients of the AMETS facility will be responsible for maintaining the integrity of their own assets, the AMETS Operational Management System will oversee client's procedures to monitor and undertake preventive and reactive maintenance of the assets, particularly the moorings of their WEC and the structural integrity of the WEC itself.

19.2.4 Information technology element

In addition to the physical and electrical infrastructure, AMETS will provide information technology infrastructure. This will support the extensive requirement for the observation of environmental parameters and the monitoring and control of the hardware and processes offshore and at the substation.

The AMETS Operational Management System will include an Information Technology Management System to ensure the integrity and safety of the IT infrastructure; this is likely to include the following:

- On-board WEC monitoring equipment
- Navigation equipment
- Environmental monitoring equipment
- Security equipment
- Electrical control
- Resource assessment equipment
- Network equipment
- Power management

While the AMETS Operational Management System will include operations and procedures that ensure the integrity and efficiency of the AMETS IT infrastructure, no significant implication for the environment are envisaged in this operational element.

19.3 Health & Safety management

The AMETS Health &Safety (H&S) Management System will recognise the risks inherent in working with high voltage electricity and in the deployment and management of an assortment of equipment in the dynamic marine environment, acknowledging that there are other terrestrial and maritime activities in the area and environmental sensitivities. It is intended that a qualified and competent H&S Manager will be appointed by the AMETS Management Organisation to oversee the implementation of a H&S plan (such as OHSAS 18001 occupational health and safety management system) for the AMETS operation. This will consist of:

- A Health & Safety (H&S) Management System Manual, including process mapping to define the safe interaction between different elements of the AMETS management
- A series of relevant H&S Management System Procedures, which will reflect specifically the activities to be performed throughout the development phases of the AMETS project
- A series of supporting HSE Management System Document Templates, designed to ensure compliance and gather all necessary and appropriate data to encourage best practice

The H&S Manager will monitor and define the operational tasks, roles and responsibilities within the AMETS Management Organisation, and ensure they are clearly described throughout the HSE Management System, while recognising that many roles may be performed by external subcontractors. The H&S Manager's role will include attending at the test site to perform H&S audits on subcontractors, facilities and vessels, to obtain all necessary evidence of compliance with all relevant H&S legal requirements as defined in the AMETS H&S Management System.

The H&S Management System will follow best practice and be implemented in four steps:

a) Plan A policy arising from the evaluation and recognition of the significant risks faced, setting out the roles and responsibilities and how they are communicated with the staff and clients.

b) Delivery Ensuring 'ownership' of risk, confirming that the procedures are adequately and competently resourced; training according to defined requirements; ensuring on-going risk assessments are carried out and that clients/staff are involved in

decisions that affect their health and safety and accept responsibility; considering safety implications of introducing new processes, new working practices or new personnel, dedicating adequate resources to the task and seeking advice where necessary.

c) Monitor Ensuring that preventative information is adequately communicated and that incident data (such as accident and near accident) is properly reported and acted upon; checking that periodic audits of the precautions are carried out.

d) Review Reviewing by the Board of performance to the stated protocols and accident reports at least once a year, including whether the precautions reflect the AMETS Management Organisation's current operation and whether risk management actions have been effectively reported to the board; reporting health and safety shortcomings; determining actions to address weaknesses.

19.3.1 Marine element

To inform the design and assessment work undertaken for AMETS, a Navigation Risk Assessment has been performed. Recommendations arising from the assessment and the guidance provided by the statutory consultees and other stakeholders will inform the marine element of the H&S Management System.

The marine element of the H&S Management System will include the requirement for clients of the test site to present a comprehensive safety plan covering the deployment, operation and recovery of their test WEC, before they will be invited to deploy. Each client will be required to appoint a qualified individual responsible for all health and safety matters relating to their operation at AMETS. As part of the H&S Management System the risk associated with the client's proposed use of the facility will be assessed. Where necessary consultation with other stakeholders in the vicinity such as fishermen and yachtsmen will take place.

The AMETS H&S Management System will also cover the AMETS Management Organisation's own equipment in the marine environment, such as markers and wave and weather buoys and will address associated operations at piers and slipways as well as the mitigation of risk to passing vessel traffic.

19.3.2 Land-side element

The H&S Management System will cover activities of test facility clients in and around the substation. These will be carefully defined and rigorously monitored and controlled. As discussed previously, while the substation will be unmanned, clients will have access to the facility to install, maintain and remove test equipment from the substation. These operations will be administered by the AMETS H&S representative and the client H&S representative as part of the integrated H&S Management system.

19.3.3 Operations Centre element

The H&S Management System will govern activities at the proposed AMETS Operations Centre in Belmullet. The H&S Management System will include the conventional workshop and office safety procedures for staff and visitors, such as fire procedures and training.

19.3.4 Emergency response element

It is recognised that while due care and precautions will be taken as prescribed by the H&S Management System, the open ocean is a dynamic and often unpredictable environment. Furthermore, the purpose of the test site is to evaluate novel technologies in this dynamic environment. So, in addition to precautions such as risk assessment, mitigation and training, the H&S Management System must include an emergency response element.

This emergency response process will make clear how and who will be alerted in the event of clear and immediate risk, or serious incidents, and will ensure that appropriate mitigation can take place quickly. The emergency response element of the H&S Management System process will include alerts from automated security systems such as radar surveillance and Emergency Position Indicating Radio Beacons (EPIRB). The H&S Management System will make clear the emergency point of contact and it is intended that this will be manned by appropriately qualified personnel during all times of the site's operation.

19.4 Environmental management and monitoring

A core activity of the AMETS will be the on-going research and development programme including monitoring of the environmental effects of small numbers of a variety of different types of wave energy converters, so that the results can be extrapolated to the likely impacts of future full scale wave farms and can inform licencing and policy decisions as to the appropriate location and scale of future farms. This concept is core to the 'deploy and monitor' strategy envisaged in the Strategic Environmental Assessment of the Offshore Renewable Energy Development Program. One of the roles of the AMETS Management Organisation will, therefore, be to design and implement an Environmental Management System, including audit of sub contractors and developers to make these assessments.

The AMETS Environmental Management System will ensure that the environmental conditions, as characterised by the baseline studies, will be monitored on an on-going basis, so that any negative or positive impacts, caused by the AMETS project, can be addressed at the earliest possible stage. An Emergency Response Plan for environmental related issues will be developed.

19.4.1 General ecological monitoring

Ecological monitoring at the AMETS test site will be continued in the marine environment for a period extending up to March 2012. This will include monthly sampling for marine mammals, birds and benthos. This information will provide a good baseline description of the area pre-deployment.

19.4.2 Recommendations for future marine monitoring

A programme of marine monitoring will be developed in consultation with Key Stakeholders, (e.g.National Parks and Wildlife Service, Bord Iascaigh Mhara, Marine Institute, others as appropriate) to assess the impact of wave energy converters and their operation. Monitoring will take place at the at the test site test areas, substation and along the submarine electricity cable route to shore . The monitoring programme will become operational when the test site itself becomes operational and wave energy converters are deployed on site.

The extent and duration of the monitoring will be agreed with the Stakeholders and WEC Developers. The marine monitoring programme will include the following:

- Wave and weather data for the site
- Ecological surveys
- Underwater Noise monitoring using acoustic hydrophones to characterise the background noise at the site and the noise emitted from the WEC devices *in situ*.
- Specialist studies
- Brown crab survey
- Artificial reef effects from rock armouring
- Effects of nursery area created by the test site test areas
- Water quality surveys
- The output of the monitoring programme will be used to inform and guide the management of the test site and provide data to enable a robust assessment of the impact of wave energy converter types and the test site itself on the ecology of the area. The data

will be provided to WEC developers to enable them modify designs to mitigate against identified environmental impacts specifically associated with their device. It will also inform future environmental assessment processes for larger scale commercial ocean energy development internationally.

19.5 Communication management

It is recognised that that some aspects of the AMETS facility, such as the deployment and testing of novel WECs will create interest amongst various stakeholder groups. The AMETS Management Organisation will be responsible for establishing a Communication Management System to make sure that both local stakeholders and the wider public are fully informed of developments and also, where required, involved directly in the project at relevant process stages.

It is intended that a Communication Management System, informed by the public consultation process undertaken in relation to this EIS, will operate throughout the life time of the proposed AMETS operation, to meet the communication objectives outlined immediately below.

19.5.1 Communication objectives

The overall objectives for Communication Management System will be to ensure:

- Authentic engagement that strengthens relationships between SEAI, the AMETS Management organisation, AMETS staff, and the local community
- High quality (evidence-based) decision making that recognises and is responsive to community needs
- Better understanding of the needs and expectations of stakeholders
- Solutions to issues resulting from operations at the AMETS that will work and that will be accepted
- Increased benefits of the AMETS project to the local community, through learning, and social capital

The AMETS Communication Management System will be designed and implemented with the following formal objectives:

Objective 1: *To ensure that the local Erris/Iorrais community is kept fully informed, in timely fashion, of plans and developments at AMETS, including advance notification of key developments such as construction of the onshore facilities, installation of the cables and deployments of WECs for testing.*

The intention is that the community can, where technical and financial constraints allow, influence how AMETS will operate.

It is intended that the AMETS Management Organisation will appoint a Communications Manager as the single individual contact point for all communications with the local community. Other communication channels will probably be used also – for example, regular email bulletins and a dedicated AMETS website. Additional communication will take place via occasional articles and advertisements in local media and items on local radio.

It is envisaged that the AMETS Management Organisation will have a Public Forum Group, which will include representatives from interested local organisations, and industry clients. This group will serve as a forum to consider and discuss the AMETS operation, including evaluating the impacts, both positive and negative, of the on-going project.

Objective 2 *To ensure the wider regional (Mayo) and national (Island of Ireland) community is informed of developments at AMETS.*

This includes both the general public and statutory bodies.

It is intended that the wider community will be kept informed by means of:

- Local press releases and occasional update items on local and community radio
- Update meetings as required with regional public representatives and statutory bodies such as Mayo County Council, Udarás na Gaeltachta, National Parks and Wildlife Service and An Bord Iascaigh Mhara.
- Regular updates of the AMETS operation published by email bulletins and a dedicated AMETS website.

Objective 3 *To ensure the ocean energy industry is informed of developments at AMETS.*

This includes the prospective clients in the technology development community, and the broader industry and utility stakeholders.

The broader global industry will be kept informed and consulted by means of:

- Regular industry conference presentations of the operation's progress
- One to one meetings with prospective industry clients, to understand their interest in the site, readiness and requirements
- Publicity through industry media outlets

19.6 Security management

The proposed AMETS facility consists of numerous valuable physical, electrical and information technology assets located in the general vicinity of the Mullet peninsula. To ensure the integrity and safety of the AMETS facility the AMETS Management Organisation will develop and implement a Security Management System.

19.6.1 Marine element

As noted, it is intended that the AMETS Management Organisation will implement real-time automatic and manned remote surveillance systems, such as radar and CCTV. Additionally, a real-time data monitoring system will be effected to monitor the condition of the equipment, including moorings, via the fixed optic fibre and backup wireless communication links.

These systems and procedures will monitor the location and movement of assets deployed at the test areas, and vessel activity in the vicinity. According to regular risk assessments, provision will be made for a rapid response service to allow immediate action to be taken to prevent damage or increased damage to vessels or equipment.

19.6.2 Land-side element

The land-side assets, such as the substation compound and Operation Centre will be monitored in real-time by a manned security system. It is intended that a local rapid response protocol will be implemented to ensure care is taken to prevent elevation of risk arising from deterioration in the integrity of the systems.