



mates



aquateira

EB2: MRE project planning

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Why this module ?

Relevant for:

- Project developer
- Policy researchers
- Business start ups
- Members of the wider public / observers

Significant for:

- Understanding the different project planning steps and procedures to take a marine energy project forward
- Learn about the key requirements to complete project planning documents

Overview of module

- Project planning
 - Documentation
 - Communication
- Other Project characteristics
 - Project timetable
 - Risk management
 - Legislative issues
- Project Implementation
- Device removal and demobilisation



Project Planning

Project planning documentation

There is with each project a set of documents that are either essential to the project (due to regulation or company procedure) or useful to the project such as:

- Corporate Management System
- Project Execution Plan
- Safety plan
- Hazard Identification and Risk Assessment report
- Risk register
- Emergency Response Plan
- Detailed method statements
- EIA and licensing documentation
- Public information plan

This follows the UK system but similar systems used in other countries

All these documents essentially make up the project plan

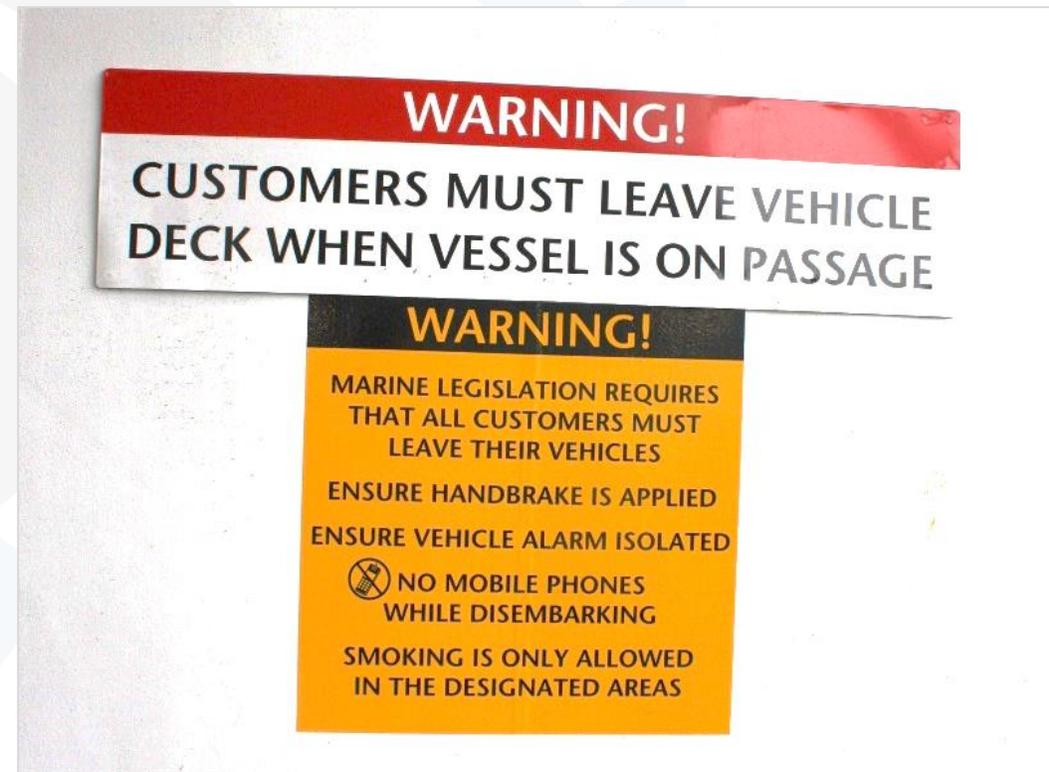
Corporate Management System

The main organisations responsible for executing the Project must agree an appropriate and coherent set of management policies, standards and procedures to be applied across the Project.

- British standards - ISO 9001, ISO 10002
- International standards
 - EMEC
 - IMO

The main organisations being:

- Client (Project Developer)
- Principal contractor
- Sub-contractors



Project Execution Plan (PEP)

Purpose

The purpose of the Project Execution Plan (PEP) is to describe in one document the Project and how it will be carried out.

- The PEP is the key project management/technical document within a set of Project documents, such as Project HSE Plan, Navigation Risk Assessment (NRA), Hazard Identification and Risk Analysis (HIRA), Environmental Statement (ES).
- The PEP is of great importance in providing a description of the scope of operations to inform the development of the HIRA process, and the Navigation Risk Assessment .
- The PEP also provides the basis on which the more detailed Method Statements (or Project Task Plans) for each phase of the Project are developed.

PEP - Summary Scope of Work

The scope of work required for the PEP is covered in the points below. These are general descriptions and it will depend on the size of the project how much information or how many sub tasks will be required.

- Project organisation
- Technology overview
- Site description
- Description of operations
- Weather planning
- Vessels and equipment
- Operations base
- De-mobilisation

PEP- Project Organisation

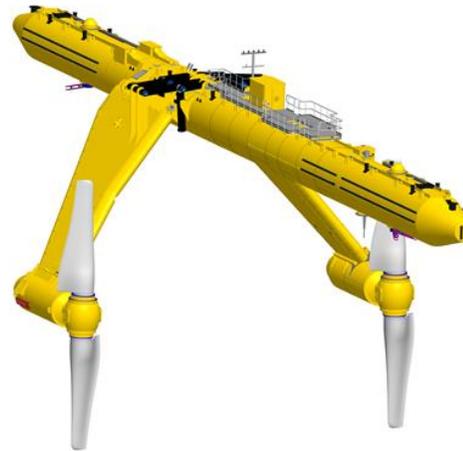
This is an example of an organisational structure for a marine energy project



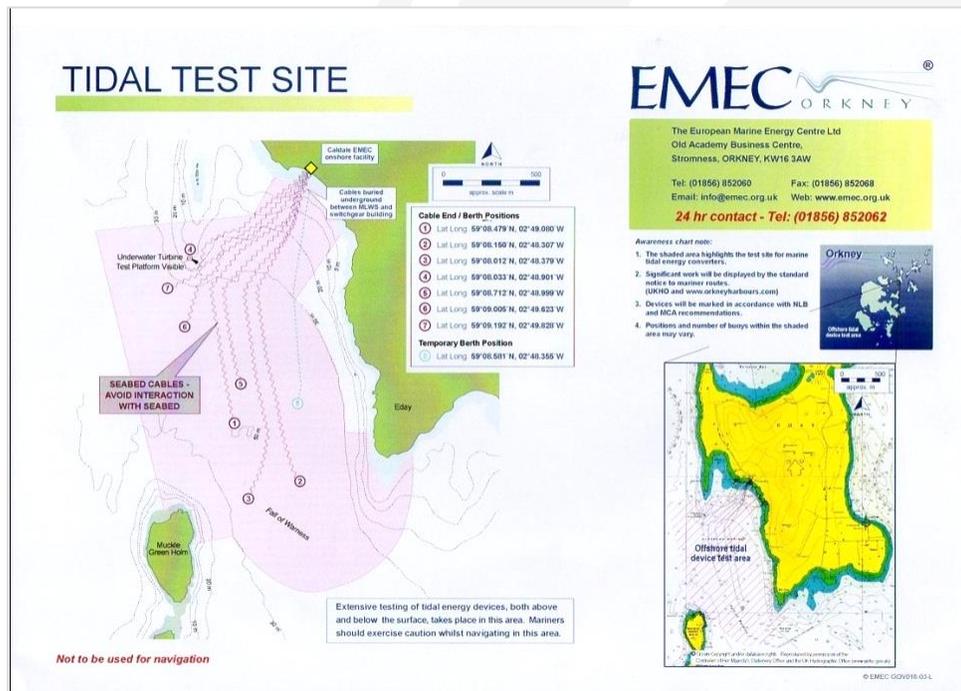
PEP - Technology Overview

The technology overview will list the main technological information against the headings listed.

- Principle of Operation
- Development and Fabrication
- Transport of Device
- Mooring/Foundations
- Power Transmission



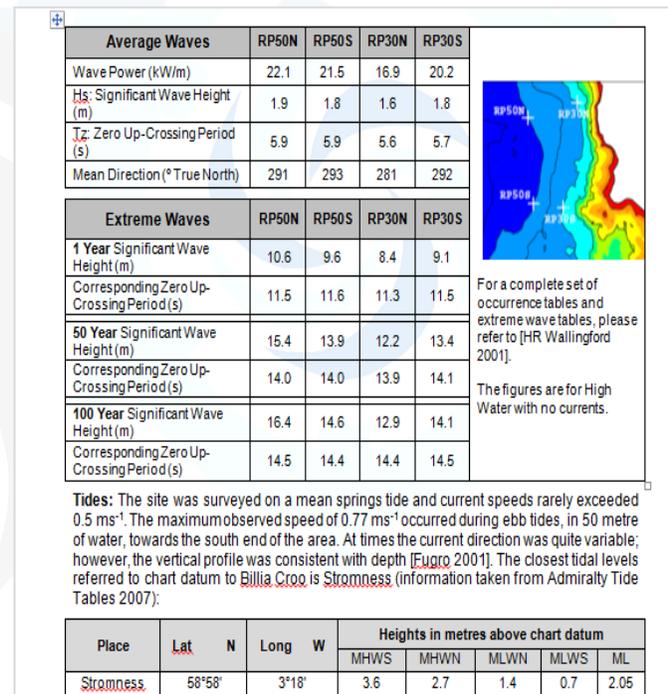
PEP - Description of Deployment Site



Location

Bathymetry

Sea Bed Obstructions

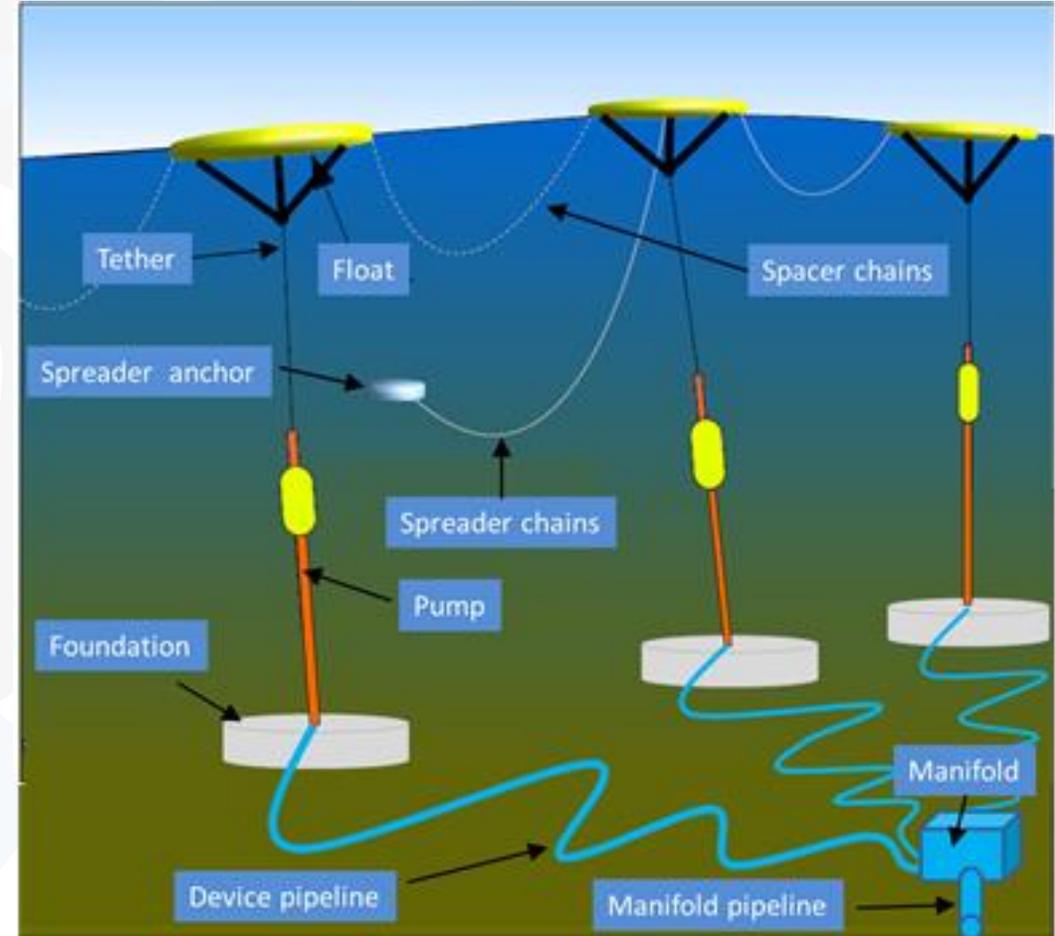


Weather/Climate

PEP - Description of Operation

The operational plan should cover how the project intends to operate. This plan will describe certain Phases of the project such as:

- Mobilisation
- Preparatory Works
- Deployment to site and installation
- Operations and Maintenance Support



PEP - Weather Planning



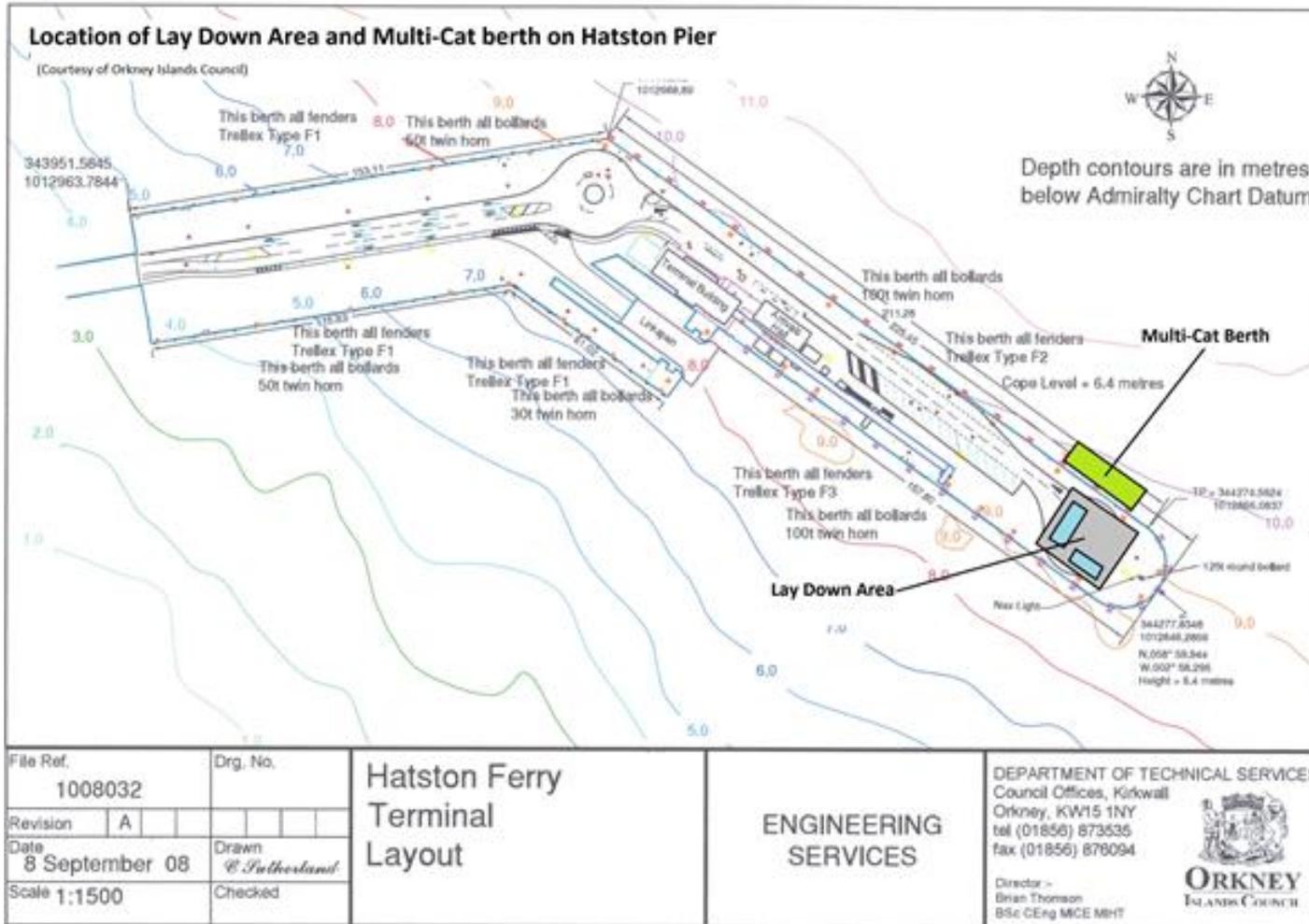
- Scope of who is involved and how weather will affect operations
- Roles of the different team members during operations
- Forecasting
 - How
 - When
- Communications to team members
- Limits for go or no go
- Operational Parameters

PEP -Vessels and Equipment



- Length, breadth, draft
- Positioning Capability
- Number of cranes
- Lifting Capacity
- Berths
- Helicopter Pad
- Propulsion
- Number of winches and capacity
- Bollard Pull
- Specialist Equipment
- Heavy Lift
- Moorings

PEP - Description of Operations Base



- Location
- Navigation and berthing
- Site Security
- Site Safety
- Welfare
- Operational limitations
- Traffic movement on and offshore
- Services available
- Communication hierarchy

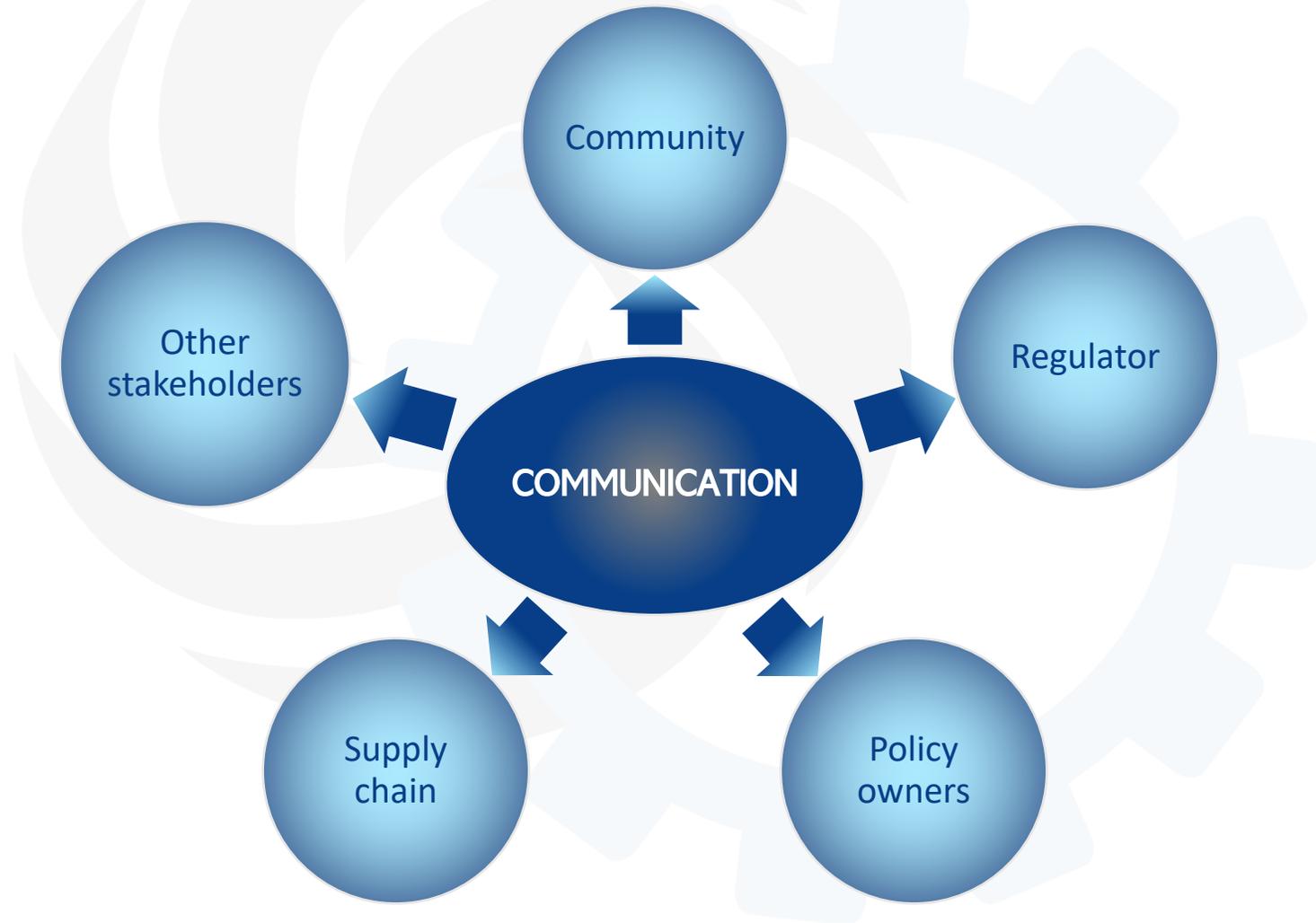
Project Communications planning

Communications are vital throughout a project. They can make a project work well and deliver above expectations or can also cause delays and financial risk

There are a whole host of communications required throughout the project from suppliers, clients, funders, regulators, the general public, press and other sea users.

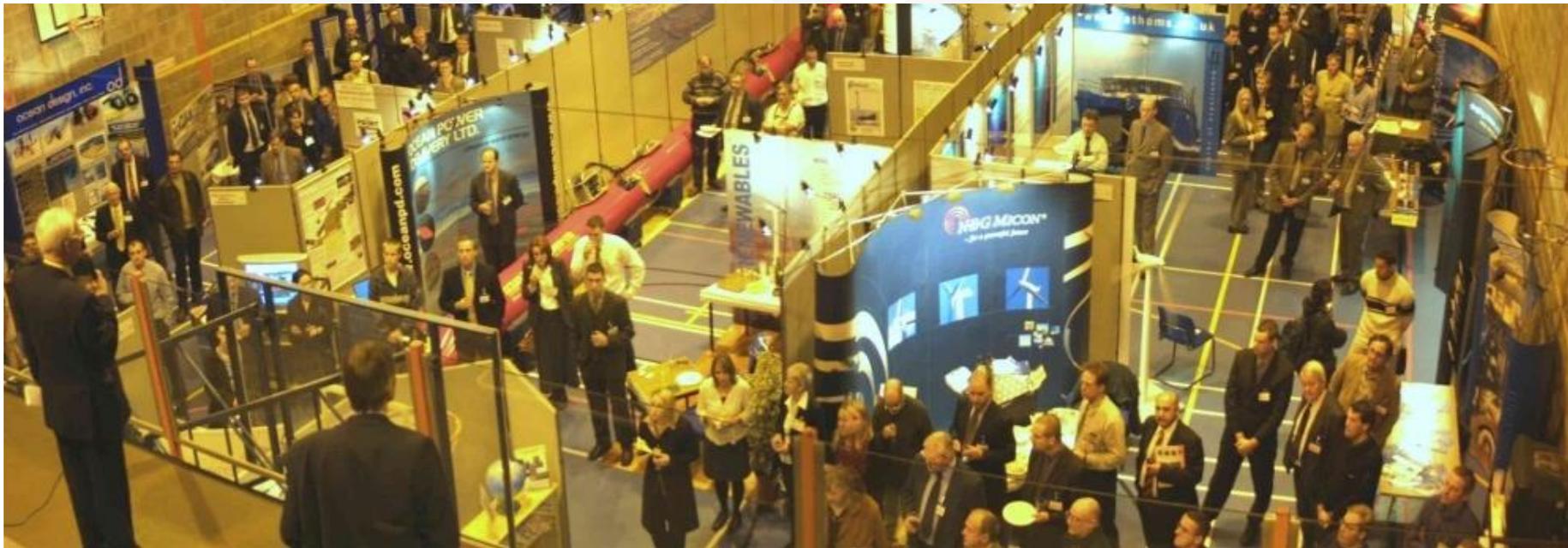
All of these stakeholders need to be informed correctly, timeously, regularly with accurate information appropriate to there needs

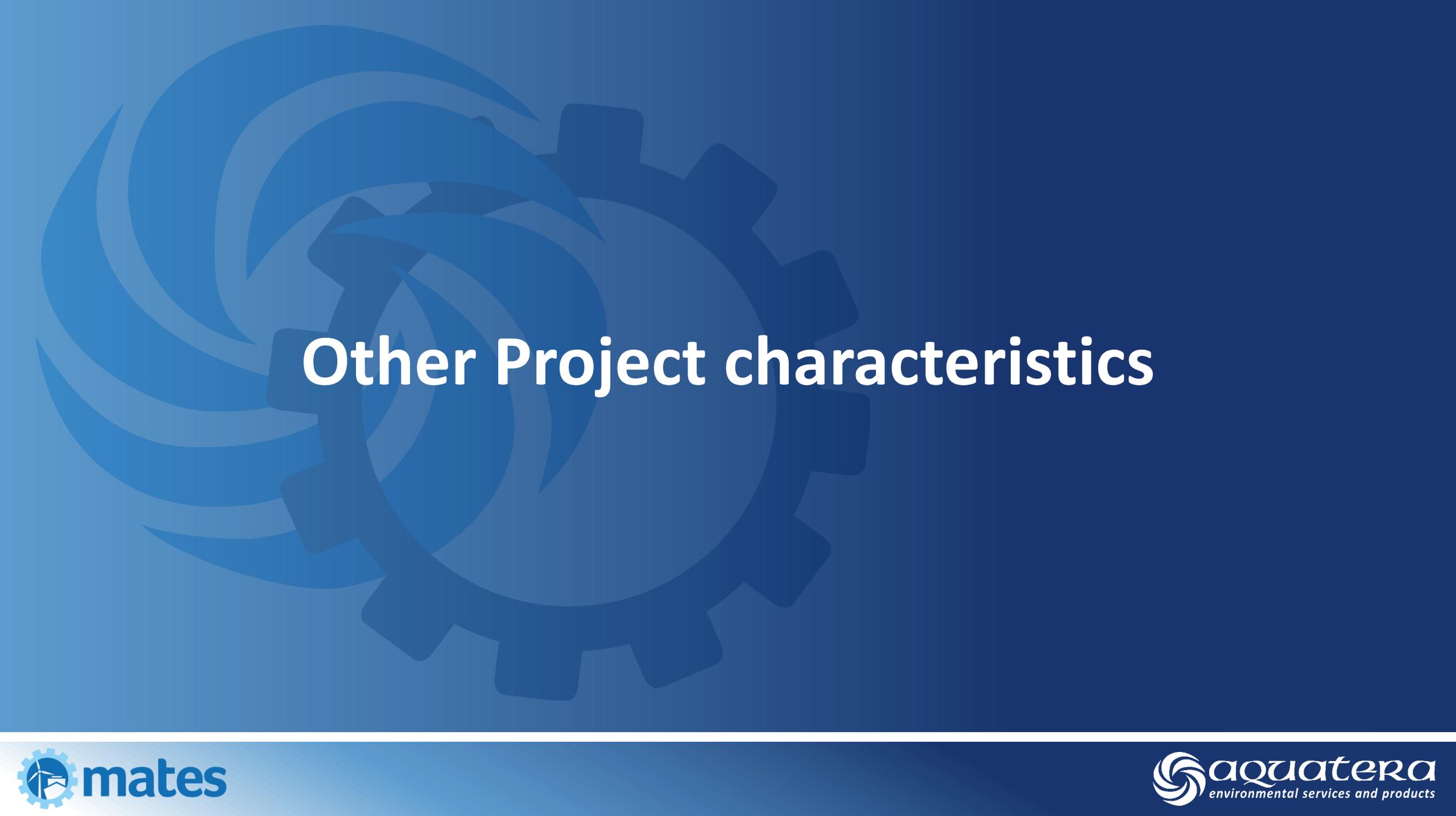
Project communication Linkages



Public information planning

Stakeholder engagement: (covered in other module) but there is often a requirement to submit to local government or national government a **stakeholder engagement plan** setting out how and when the project team are going to engage with the public while developing the project as well as during the lifetime of the project





Other Project characteristics

Project timetable

Vital piece of information for the project. It needs to be constantly monitored and reviewed against milestones and deliverables.

The project time tabling can have a very strong influence on a number of areas within a project for example:

- Financial
 - Increased costs due to delays
- Risks
 - Issues if projects are rushed or delayed
- Contractual
 - Stage gates missed for key project milestones
- There are a number of other areas that can be impacted

Risk planning processes

- Safety Plan
 - The project Safety Plan links the Corporate Safety Management System and the specific requirements and execution of the project
- Hazard identification and Risk assessment (HIRA)
 - Overall risk management through the project
- Emergency response Planning
 - Covers what is required in an emergency

Safety Management System Records

Actions

- Action Tracking System
- Contractor evaluation
- Individual competence evaluation
- HIRA meetings
- Risk Assessments
- Tool Box Talks – recorded in Daily Operations

Documents

- Risk Register
- Permits to work
- Site safety inspections
- First aid book
- Accident and incident reports
- Witness reports
- Audits
- Nonconformities
- Emergency response
- Management review



Risk Assessment for Lion TV "Bomber Command"			
Risk No.	Risk Assessment	Location/Event	Risk Assessment at
1	Members of the public, land or crew coming into contact with spinning aircraft		
2	Members of the land and crew coming into contact with an spinning aircraft while working the site		

Note: The table above is a simplified representation of the visible content in the image. The actual image shows a more detailed risk assessment table with columns for Likelihood (L), Consequence (C), and Risk Rating (R), and rows for various hazards.

HIRA Process

The HIRA process should start as soon as a preliminary method statement is available.

Normally a “workshop” is set up in which key managers, contractors and the Designated HSE Representative are present.

Each stage of the project is assessed, discussed and examined and the hazards identified.

A risk register is produced and continuously monitored and updated as the project develops



Summary of HIRA Process

Task 1	Establishment of background, principles and scope of a project.
Task 2	Definition of boundaries
Task 3	Expert panel HAZard IDentification (HAZID) of all potential activities and associated tasks
Task 4	Risk assessment through classification of likelihood and consequence
Task 5	Identification of potential risk avoidance, mitigation, management opportunities
Task 6	Description of residual risks and identification of individual risk champions
Task 7	Completion of Safe Work Method Statements and emergency response plans for all activities.
Task 8	Confirmation of specific roles and responsibility for risk management
Task 9	Maintaining and updating the risk register

HIRA Process -Risk Register

- The output of the workshop is the first draft of the project risk register.
- The project risk register is then maintained by the HSE Representative as a “live” document
- New risks being added as the project develops.
- This includes new risks that are identified or re-assessed from Task Risk Assessments that are undertaken during operations.

Risk Control Register Rev 1.7 2nd June 2011		Risks				Prevention & Recovery Actions									
No.	Phase2	Task	Hazard	Top Event	Consequence	Existing prevention measures	Existing recovery measures	Frequency	Severity	Initial Risk	Add'l prevention measures	Add'l recovery measures	Mitigated Frequency	Mitigated Consequence	Residual Risk
1	General Operations	Personnel working at sea	Over/near water and deck operations.	Man overboard (MOB)	Injury or fatality	Comply with: Project Operating Procedures for a) Vessel/Contractor/Crew selection and vetting; b) Vessel or Penguin Access Method; c) Working over/near water Plus comply with Vessel Operating Procedures governing deck working Plus physical prevention measures applied: handrails, non-skid deck coating.	Vessel Operating procedures cover MOB response. Project Emergency Response Plan (ERP) also covers MOB recovery scenarios.	3	4	High	Tool box talk and Task Risk assessment(TBT/TRA) will be carried for every critical task (taking guidance from OMMC Operations Risk Assessments)	Seek assistance from nearby vessels. Request Search and Rescue Services (SAR) (Penguin operations always supported by standby vessel equipped for MOB recovery)	2	4	Medium

HIRA - Assessment of Risk

Likelihood and Severity descriptions (linked to MAIB statistics)	Less than 1 in 10yr in UK merchant fleet	Less than 1/yr in UK merchant fleet	More than 1/yr in UK merchant fleet OR has occurred in marine renewables	More than 10/yr in UK merchant fleet OR more than 1/yr in marine renewables	More than 100/yr in UK merchant fleet OR more than 10/yr in marine renewables.
	1.Very unlikely	2.Unlikely	3.Possible	4.Quite likely	5.Very likely
5. Multiple fatalities		Confined space entry to Penguin - asphyxiation			
4. Single fatality		Chain puller failure – instability/MOB Collision risks	Diving ops – personnel at risk Diving & lifting SIMOPS – personnel at risk Personnel transfer to Penguin – MOB Personnel deck ops on Penguin - MOB /struck by Installing mooring – deck ops		
3. LTI or multiple medical attention		Water ingress while hatches open	Tow with roll plates unstable (project risk)		
2. Medical attention or multiple first aid				Work in confined space – slips, trips, falls and need for rescue	
1. Single first aid					

Emergency Response Plan

The Emergency Response Plan contains guidance on how to respond to emergencies that may arise during operations

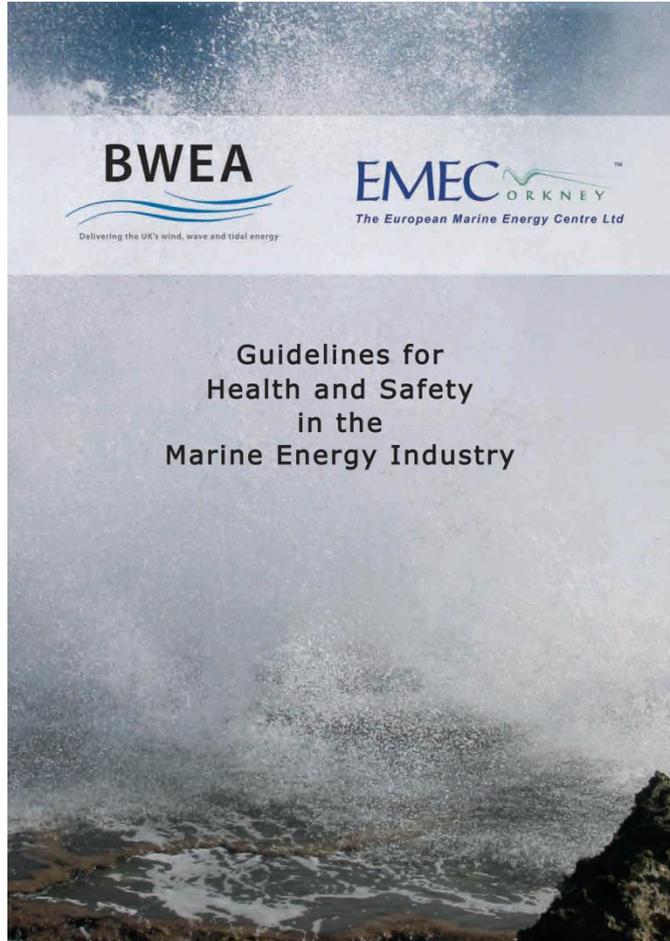
The ERPs will dovetail with local and regional emergency response systems and with the safety management systems of the developer and main contractors.

Emergency Planning will take into account the nature of the works, the significant risks identified in the HIRA and Risk Control Log

The Emergency Response Plan will be developed for the project in order to take account of the particular hazards and circumstances and to link closely with each contractor's activities and procedures.



Health and Safety in the Marine Energy Industry



Useful documentation:

- Guidelines for Health and Safety in the Marine Energy Industry
- Relevant to all organisations contributing to the life cycle of marine device arrays (from initial feasibility studies through to de-commissioning)

Legislation - Responsibility

In order to complete a project safely and successfully the legislation and guidance should be fully embraced.

With legislation comes a range of responsibilities:

- Corporate responsibility
- Social responsibility
- Personal responsibility

All of these need to be covered in project planning and fully documented part of the project

EIA and licensing

For marine energy environmental legislation as well as marine planning consents are key components of developing successful projects

Environmental Impact Assessment(EIA) - required for most projects and will include reports on all areas of the environment that will be impacted upon by the project as well as how any concerns will be mitigated

Environmental management plan(EMP) – detailed report on how the project will manage the risks to the environment

Environmental monitoring plan – how when and what will be monitored during the project operation period

Marine licence – issued by the national government through an agency allowing the project developer to deliver the project as outlined

Other licences - may be required for different jurisdictions or under different planning regimes

(More information in the environmental session)

Project implementation

How a project is implemented needs to follow the project plan but involve a lot more detail and practical tasks cover by following specific method statements

Method Statements

Execution of Tasks – detailed list of tasks involved at each stage providing -

- Scope
- Responsibilities
- Detailed schedule
- Operational constraints
 - Weather
 - Daylight
 - Tides
 - Manpower

Examples of Method Statements

Dive plans

- Diving Methods (Dive Tables)
- Air Supply
- Decompression Arrangements
- Dive work task summary
- Dive work method

Vessels

- Equipment operation
- Sea Fastening
- Rigging
- Personnel
- Responsibilities
- Rest
- Welfare

Control and supervision

- Responsible Persons
- Communication
- Local and national authorities
- Simultaneous Operations (SIMOP'S)

Operating parameters

- Heave
- Strain
- Power
- Wave height
- Wind speed direction
- Current speed direction

Method Statements – Navigation and Positioning



Execution of Tasks

- Accuracy requirements
- Position fixing type and back up
- Passage planning and options
- Ports of refuge
- Safe anchorages
- Dangers on route

Device removal and Demobilisation

Project planning requires that removal and demobilisation are also covered. A plan is often required prior to licencing for a project but it is also required by funders and investors to be sure there is sufficient budget allocated in case required. Some of the main things that need to be covered are:

- Sequence
- Schedule
- Roles and Responsibilities
- Vessels
- Equipment
- Method Statements
- Disposal
- Environmental statement



Discussion points

- How do we make Marine energy cost competitive?
- What is the most important element of project planning?



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QUESTIONS



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