The Scottish Government

SURVEY, DEPLOY AND MONITOR LICENSING POLICY GUIDANCE

Version 2

Introduction

The intention of this guidance is to provide regulators, and developers, with an efficient risk-based approach for taking forward wave and tidal energy proposals. It is designed to enable novel technologies whose potential effects are poorly understood to be deployed in a manner that will simultaneously reduce scientific uncertainty over time whilst enabling a level of activity that is proportionate to the risks. It distinguishes between those proposed developments for which there are sufficient grounds to seek determination on a consent application based on a lesser amount of wildlife survey effort and analysis to develop site characterisation pre-application, and those where the combination site sensitivities, technology risk and project scale make a greater level of site characterisation appropriate. It then highlights how those developments will be deployed and monitored.

Whilst the guidance has been developed specifically for wave and tidal development it is possible to apply the principles to other novel technologies, and this will be considered by Scottish Government where appropriate.

Survey, Deploy and Monitor will only be applied following discussion with Marine Scotland at the scoping stage of the application process. Developers will still be required to undertake assessments as part of the statutory licensing and consenting process, such as the provision of Environmental Impact Assessments and other procedures necessary for compliance with national and European conservation legislation.

Pre-consent survey

The focus of this section of the guidance is on the extent of site characterisation surveys and device testing that is appropriate to inform the consenting process, in relation to the perceived relative environmental risk posed by the development. Reduced data presentation or collection requirements, in relation to lower risk proposals, should facilitate earlier consenting decisions and more rapid build out of overall low risk projects.

The pre-consent survey section of the guidance is based upon an understanding of risk informed by 3 general factors:

1. Environmental Sensitivity (of the proposed development location)
2. Scale of Development; and
3. Device (or Technology) Classification.

Environmental Sensitivity

Environmental sensitivity for the purposes of this policy, relates to designated areas, protected species, and protected habitats and other relevant environmental factors. Marine Scotland will undertake an assessment of the relative environmental sensitivity of the proposed location of a renewable energy project, based on the environmental sensitivity maps attached at Annex 1. These maps combine data from 19 different environmental datasets, enabling areas of relatively higher and lower sensitivity to be distinguished.

The maps should be considered to be indicative only (i.e. it is possible that at a local scale specific sites may have a relatively greater or lower sensitivity than is shown). They are relevant only to marine renewables (wave and tidal power) development and those factors which might influence the duration of site characterisation studies. They are neither an overall assessment of a site's environmental richness or biodiversity nor of its complete environmental sensitivity or sensitivity to other forms of development. The maps will be subject to revision and upgrade as more datasets become available and/or existing ones renewed.

Following any discussions deemed necessary with the developer, Marine Scotland will assign an overall assessment of High, Medium or Low environmental sensitivity.

Scale of Development

Relevant measures of the scale of development are based on the proposed total installed generating capacity in megawatts (MW) of the development. The scale of the development will be assessed on a three point scale, as below, with associated assessment as Low, Medium, or High:

	Criteria	**Assessment**
Small Scale:	Up to 10MW	L
Medium Scale:	More than 10MW, to 50MW	M
Large Scale:	More than 50 MW	H

Device (or Technology) Risk

Device (or Technology) Risk is an expression of how the device or technology (including moorings or support) is installed, moves, behaves and interacts with the surrounding environment and is a broad assessment of the potential effects of the device on marine life.

The table below contains some examples of environmental hazards which will be considered (please note this table is not necessarily an exhaustive list). It has been derived from the report *'A Review Of The Potential Impacts Of Wave And Tidal Energy Development On Scotland's Marine Environment'* commissioned by the Scottish Government and issued by Aquatera

	Environmental hazards related to the device/technology	**Assessment of environmental significance (H, M L)**
1	Potential for harmful collision between marine mammals/basking sharks and offshore wave and tidal energy converters and associated moorings/support structures	
2	Potential for harmful collision between diving birds and with the moving turbine blades / hydrofoils of tidal energy converters.	
3	Direct loss of protected or sensitive sub-littoral seabed communities due to the presence of wave and tidal energy converters and associated moorings/support structures on the seabed The potential wider/secondary effects on protected or sensitive sub-littoral seabed due to installation and operation of wave and tidal energy converters and associated moorings/support structures	
4	The potential for release of polluting substances to the sea	
5	Potential barrier to movement for marine mammals/basking sharks due to physical presence of wave and tidal energy converters and associated moorings/support structures The potential for cetaceans / basking sharks to become entangled in mooring lines Potential risk of entrapment of marine mammals (cetaceans/seals)/ basking sharks from wave and tidal energy converters and associated moorings/support structures	
6	Potential for direct loss of habitat used by seals/otters due to the installation of shoreline wave energy converters Direct loss of breeding habitat used by coastal breeding birds due to the installation of shoreline wave energy converters Direct loss of protected or sensitive littoral coastal communities due to the placement of	

	shoreline/nearshore wave energy converters The potential wider/secondary effects on protected or sensitive littoral coastal communities due to installation and/or operation of wave and tidal energy converters and associated moorings/support structures	
7	Operational noise: The potential effects on marine mammals and basking sharks from underwater noise generated by: device operation; and the presence of support structures. The potential effects on marine mammals/basking sharks from shock/pressure waves generated by wave and tidal energy converters. The potential effects on marine mammals from above surface noise generated by wave and tidal energy converters. The potential effects on diving birds of underwater noise and vibration generated by wave and tidal energy converters The potential effects on diving birds of above surface noise generated by wave and tidal energy converters with generators/air turbines housed in surface-piercing components	
8	Installation noise: The potential effects on marine mammals and basking sharks from underwater noise generated by: device installation The potential effects on diving birds of underwater noise and vibration generated by wave and tidal energy converters during drilling activities	
9	Potential displacement of essential activities of marine mammals/basking sharks due to the presence of wave and tidal energy converters and associated moorings/support structures Potential displacement of essential activities of marine birds due to the presence of wave and tidal energy converters and associated moorings/support structures Potential effects of changes in turbulence on foraging success of marine birds due to the presence of wave and tidal energy converters and associated moorings/support structures	
10	Potential for harmful collision or other interaction with migratory fish	

The developer will provide Marine Scotland, if requested, with information to support a robust assessment of the elements of project risk in terms of the hazards listed above. Marine Scotland will then undertake a risk assessment

using the aforementioned report. The individual assessments in both cases will be combined into an overall Device (or Technology) risk assessment by Marine Scotland Licensing Operations Team, expressed as Low, Medium, or High using the scoring system as described in Annex 1. The final overall Device (or Technology) risk assessment will be assigned by Marine Scotland on the basis of the considerations outlined above.

Application of Survey, Deploy and Monitor

We propose to express the overall risk to the environment posed by the development, taking account of the equipment to be used, the size of the development and the environmental sensitivity of the location, as a combination of the assessments under the three factors discussed above. The process of combination to obtain the final overall project environmental risk will make use of the scoring system in Appendix 2.

This final project environmental risk will be expressed as low, medium or high and will be used to guide the requirements for pre-application site characterisation and assessment of the environmental interactions of the devices. Rather than a "one size fits all" approach, it is a risk management process with the purpose of applying an appropriate and proportionate approach to licensing which depends upon the circumstances surrounding the development proposal.

This approach takes account of unknown risks and/or the application of precaution in the early years of assessing licensing novel/contentious and potentially risky applications, e.g. where device or technology risk is not properly understood or assessed as High, then the overall project environmental risk is more likely to be considered to be High which may then limit the potential to apply efficiencies in the licensing process of development, taking account of the environmental sensitivity and scale of development.

Proposals Assessed As High Risk or Uncertainty. A large development proposed for an area of higher environmental sensitivity and device risk could have an overall project environmental risk assessment of High. In such a case, there would be little scope to apply a fast-tracking approach. A minimum of 2 years site characterisation data would be necessary to support an application. In addition, the developer would normally be expected to undertake testing and impact monitoring of a test device or demonstration array[1] elsewhere, providing the results of studies on wildlife interactions with their device(s) in support of their application.

Proposals Assessed As Medium Risk or Uncertainty. An overall project environmental risk assessment as Medium would require an approach intermediate to that of High and Low risk schemes. The initial presumption

[1] A proposal for a large (>50MW) array should be informed by studies of a smaller 'demonstration array'; a proposal for a demonstration array should be informed by studies of a single demonstration device (and/or relatively smaller demonstration array).

would be that 2 years of site characterisation data would be required. However, if Marine Scotland considers after one year that the environmental risk is less than anticipated, or that the data gathered to date have been adequate to inform both the EIA and HRA processes, then they would be prepared to discuss relaxation of the requirements for further site characterisation, on receptor-specific or hazard-specific bases. This is known as a 2-1 approach and it is important, for purposes of data quality, that the 2nd year's studies are not suspended except on the explicit direction of Marine Scotland. An application for a scheme assessed as Medium risk should also normally be supported by impact monitoring data from a relevant demonstration device or devices.

Proposals Assessed As Low Risk or Uncertainty. A small development proposed for an area of low environmental sensitivity made up of devices with limited device risk would have an overall project environmental risk assessment of Low. In such a case, if the environmental risk information was considered robust or underpinned by strategic survey information we might consider fast tracking the application. Marine Scotland will, in such situations, ask for up to 1 year of site characterisation data (or equivalent) to inform an EIA, HRA (if this is required) and licence application. It is possible that this survey data may alert the regulator that further data collection is required (e.g. because of unexpectedly high numbers of a protected species). Should that be the case, the EIA and licence application may go forward in parallel with the additional survey work but consent will not be determined until the additional data[2] have been collected and analysed. Impact monitoring of a test device will not be a pre-requisite for assessment of a Low risk application, but developers should be aware that provision of such data will, invariably, facilitate consenting decisions, irrespective of the perceived risk of the scheme in question.

Deploy

Following the Survey, deploy and monitor approach, for larger scale projects consent is likely to be conditional upon the company deploying the devices in a phased approach. Phase one of the development will be limited to a maximum number of devices and all subsequent stages of the development will be subject to the prior written approval of the Scottish Ministers.

Phased deployment means that development is likely to start at a small scale. This then allows the application of a demonstration strategy to allow intensive monitoring of the environment to provide real empirical data to cover the identified main impact risks. This can then be used to inform the reliability of the modelling used and also to inform any future phases of deployment.

[2] New data would be considered as further information under the EIA Regulations and an addendum would be required if this new data came after the submission of the ES.

The approval of any subsequent phases the development would only be granted when Scottish Ministers are certain the risks associated with potential environmental impacts are appropriately understood.

Monitor

Monitoring, post-construction is likely to be a condition on most consents granted, not least so as to provide the information necessary to support subsequent applications for further schemes. The nature and duration of this will, however, be project specific and only determined and agreed if / once a licence or consent has been secured. Any work undertaken through condition would complement work being undertaken through the Demonstration Strategy.

Demonstration Strategy

Demonstration strategies are part of an overall Survey, Deploy and Monitor policy as demonstration projects provide an opportunity for addressing some of the scientific uncertainty surrounding the licensing of marine renewable developments in Scottish waters.

The principle behind the demonstration strategy is that Marine Scotland forms partnerships with developers to take advantage of the opportunities presented by early projects to make targeted investigations of particular aspects of the environmental interactions of each development. Information obtained from demonstration projects, will be available for, and used by, other developers and regulators to inform the consenting of future marine renewable developments.

Priority for demonstration strategy investigations will be given to those interactions which are relevant to features of the environment that may be designated under EU (or national) legislations, i.e. seabed habitats, seabirds, marine mammals (seals and cetaceans), and migratory fish (primarily salmonids).

As monitoring results are produced, these will give a better understanding of interactions, enabling decision making associated with subsequent phases and licensing future project to be better informed. Where appropriate, the risk profiling associated with the pre-consent survey aspect of the policy will also be informed by monitoring results.

Conclusion

Through this policy, the extent of pre-consent surveys and the role of pre-deployment testing requirements will be identified, appropriate to the overall risk of the project inferred from its size, location, and technology. It is recognised, however, that there will be circumstances where these three parameters alone do not adequately define the risk posed to a particular

receptor or receptors, and the licensing process(es) may require greater understanding of potential impacts than will be furnished through the provisions herein. Under the terms of the policy larger projects are likely to require a phased approach, with monitoring to reduce the scientific uncertainties informing decisions regarding subsequent phases and projects. Demonstration strategies are promoted under the policy to address priorities associated with species and habitats afforded statutory protection. A flexible approach to application of the policy will therefore be pursued, using it as a guide, rather than applying it rigidly in every situation, and thereby ensuring that statutory licensing requirements are still met.

Annex 1 – Environmental Sensitivity Maps

The maps below indicate areas of low, medium and high environmental risk in respect of wave (Figure A1.1) and tidal stream (Figure A1.2) projects.

The cell size of the underlying data leads to some uncertainty in the classification of cells adjacent to the coast. As a first approximation in such cases, the classification of the cells immediately offshore should be taken as applying to the adjacent coastal cells.

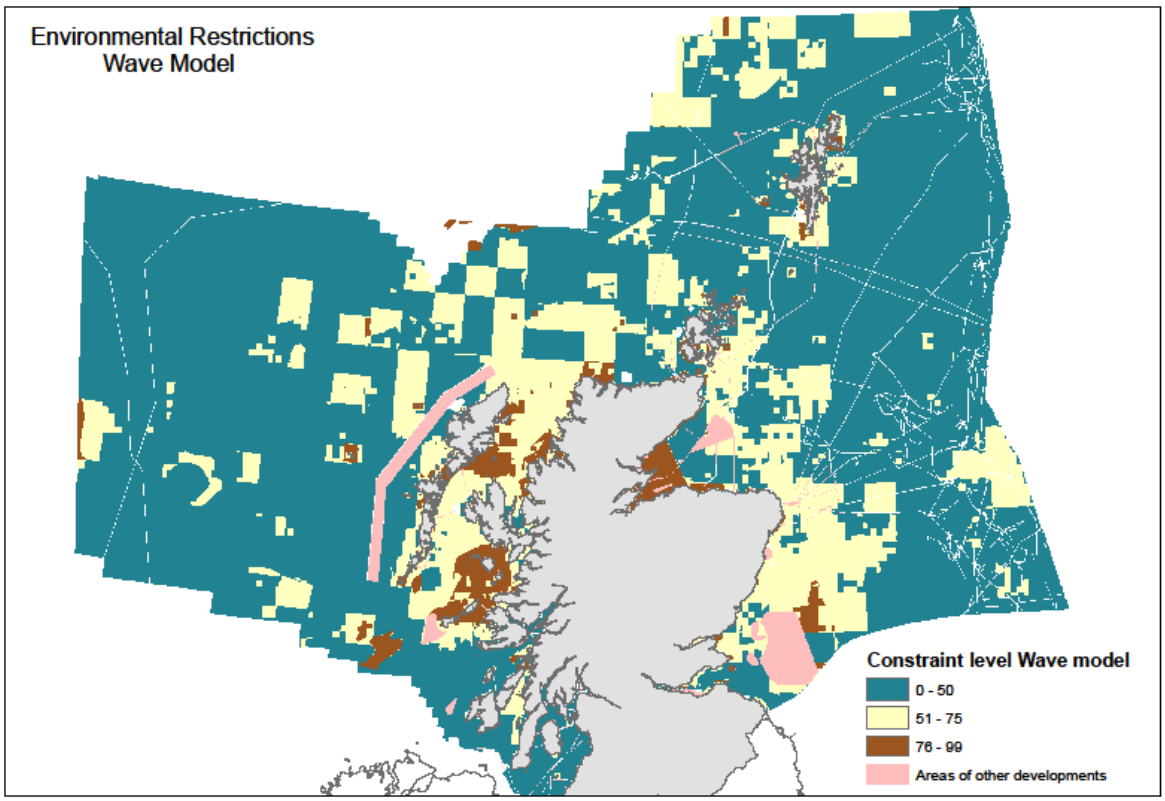

Figure A1.1 Environmental risk map for wave energy projects, showing areas of low (blue, medium (yellow) and high (brown) environmental risk.

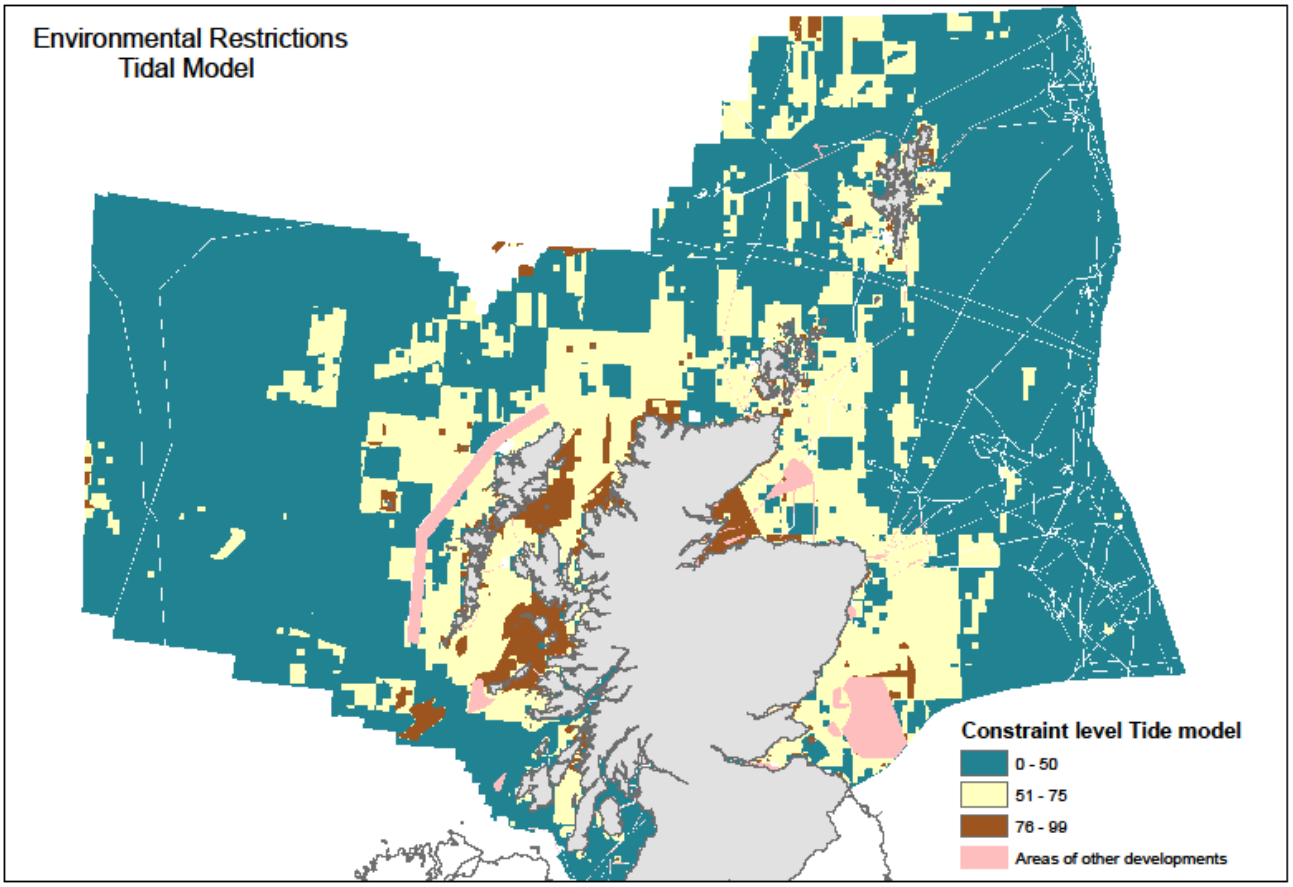

Figure A1.2 Environmental risk map for tidal stream energy projects, showing areas of low (blue), medium (yellow) and high (brown) environmental risk.

Appendix 1

Derivation of overall device (technology) risk

The assessment of overall device (technology) risk is based on a series of individual assessments of environmental hazards that may arise from the device being assessed. These are each categorised as High, Medium or Low. In order to combine the device risk with the environmental sensitivity assessment and the scale of development, it is necessary to summarise the series of individual assessments into a single device (technology) risk assessment.

The procedure to undertake this is as follows:

1 Each individual assessment is scored 1, 2 or 3 for Low, Medium and High assessments respectively.

2 The geometric mean of the scores is calculated by multiplying the scores together and taking the tenth root of the product.

i.e. Geometric Mean = $((X_1)(X_2)(X_3).....(X_N))^{1/N}$
where
X = Individual score
N = Number of scores

3 The overall device (technology) risk is expressed as High, Medium or Low according to the geometric mean, as shown below.

Geometric mean score	Overall risk
1 – 1.60	Low
1.61 – 2.20	Medium
2.21 – 3.0	High

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Appendix 2

Summarising the overall project risk

The assessment of overall project risk is based on assessments of environmental risk, project size, and device (technology) risk. These are each categorised as High, Medium or Low. It is necessary to summarise these three assessments into a single project risk assessment.

The procedure to undertake this is as follows:

1 Each individual assessment is scored 1, 2 or 3 for Low, Medium and High assessments respectively.

2 The geometric mean of the scores is calculated by multiplying the scores together and taking the cube root of the product.

i.e. Geometric Mean = $((X_1)(X_2)(X_3))^{1/3}$

3 The overall project risk is expressed as High, Medium or Low according to the geometric mean, as shown below.

Geometric mean score	Overall risk
1 – 1.60	Low
1.61 – 2.20	Medium
2.21 – 3.0	High