

Written submission from Scottish and Southern Energy Power Distribution (SSEPD)

Summary

Scottish and Southern Energy Power Distribution (“SSEPD”) group companies own and operate the electricity distribution and transmission networks that supply some 750,000 customers in the north of Scotland, including the islands. These networks include some 111 subsea distribution cables that are critical to the provision of a secure electricity supply to 59 Scottish islands.

These cables have been laid on the surface of the seabed over the past 60 years with only one exception. They are marked on Admiralty and other charts, and show up on GPS systems. Vessel operators therefore know where the cables are and avoid them.

SSEPD is not aware of any evidence that these established cables have caused any injuries or damaged fishing or other vessels operating in the area.

The cables require to be maintained, repaired and in due course replaced on a like for like basis generally following the same route. Where faults occur within the cables, isolated island communities depend on SSEPD arranging the fast repair or replacement of these cables.

The consultation draft of Scotland’s National Marine Plan (“SNMP”) (on which there was a 16 week consultation) did not include policies on the repair or replacement of such cables, focusing instead on new cables for the renewables and telecommunication sectors. It was only on 11 December 2014 that the new draft SNMP included policies extending to the established electricity distribution and transmission networks. There has been no formal consultation with industry on the new policies. The Report of the independent investigation into the consultation draft does not mention these new policies; nor does the Addendum to the Sustainability Appraisal Report take them into account. The Final BRIA and the Modifications Report do not discuss the impacts of these policies on the electricity networks industry and its customers.

SSEPD estimates that the policies in Chapter 14 of the draft SNMP, which in effect propose that all new cables should be buried unless that is unfeasible, would add some £280m to the calculation of customers’ electricity bills over the coming 8 years. Under the industry’s statutory regulation, such additional costs fall to customers. Moreover, the policies would also make it impossible for cables to be replaced quickly during good weather, and therefore would leave vulnerable customers with only less reliable backup power for months at a time.

The UK Marine Policy Statement requires marine plans to adopt a risk-based and proportionate approach to marine planning. While it has not been consulted on these policies to date, SSEPD is concerned that the SNMP fails to reflect this requirement, and would prevent the electricity industry from meeting its own statutory requirement to maintain an efficient and economical network.

SSEPD therefore invites the Committee to recommend:

- that the cable policies in the new Chapter 14 of the draft Scotland's National Marine Plan should be consulted upon with all interested stakeholders in early 2015, before the Scottish Government finalises Scotland's National Marine Plan;
- that in relation to the established electricity network such policies should reflect the overarching policies in the UK Marine Policy Statement and adopt a proportionate and risk-based approach, using sound evidence and allowing for prompt replacement of cables; and
- that the issue of repairing faulty cables should be referenced and a 'fast track' approach adopted to secure customers' electricity supplies.

Detailed Response

Introduction

SSEPD welcomes the opportunity to respond to the RACCE Committee's call for evidence. This response should be considered in regard to SSEPD's activities in Scotland's marine environment that include a number of issues of significance to the 750,000 customers who rely on the electricity network in the north of Scotland.

The policies in the SNMP, once adopted, will flow down into the plans to be created and adopted for the Scottish marine regions. These plans will deal with matters such as management and consenting policy for specific areas of water around the coast of Scotland. It is therefore vital that the provisions in the SNMP are fully consulted on and appropriate to form the basis of the regional plans so that a consistent planning regime can be put in place.

This response covers a range of issues in relation to the draft SNMP published on 14 December 2014.

Scottish and Southern Energy Power Distribution

SSEPD is the electricity network division of the SSE Group and comprises the following companies which own, operate and maintain both the electricity distribution and electricity transmission networks in the north of Scotland.

Scottish Hydro Electric Power Distribution (SHEPD) owns and operates the electricity distribution network in the north of Scotland, delivering electricity to some 750,000 customers. The SHEPD operating region covers a quarter of the UK landmass which attracts unique challenges both in terms of distance and location. As well as the major cities of Aberdeen, Dundee, Inverness and Perth, SHEPD's network connects most Scottish inhabited islands with over 100 subsea Distribution cable links, including the Inner and Outer Hebrides, Arran and the Orkney Islands. SHEPD also serves the Shetland Islands which run as a separate electrical system without a connection to the mainland but with a number of inter island subsea links.

For Submarine cables specifically, which are directly affected by the draft Scotland's National Marine Plan ("SNMP"), SHEPD owns and operates 111 submarine cables totalling 454km in length, supporting 59 Scottish islands. Submarine cables have

been installed to support Scotland's remote island communities since the 1950s, providing reliable electricity supplies and benefitting island economies ever since electrification. SHEPD operates well over 90% of the subsea distribution network cables in the UK

As part of the next financial price control review with the Office of Gas and Electricity Markets (OFGEM), SHEPD has determined which of its submarine cables will need to be replaced due to asset health condition over the next eight years.

Scottish Hydro Electric Transmission (SHE Transmission) owns and maintains the 132kV, 275kV and 400kV electricity transmission network in the north of Scotland, in some of the UK's most challenging terrain. Some of SHE Transmission's circuits are situated over 750 metres above sea level and are up to 250km long. Furthermore, SHE Transmission's operating area contains a vast renewable energy resource and this is being exploited by wind and marine generation which is all dependent on SHE Transmission for transportation to the load centres to the south.

SHE Transmission is currently installing its first subsea Transmission cable between Kintyre and Hunterston with a second approved circuit between Caithness and Moray.

To avoid confusion, and other than in Appendix 1, only SSEPD will be referred to in this submission beyond this point.

SNMP process

Unlike the initial publication of the original draft SNMP in June 2013, the version published on 14 December 2014 now includes an entirely new chapter on Submarine Cables (Chapter 14). This chapter appears to be based on the previously published provisions dealing with submarine electricity cables for renewable generation and telecommunications networks and now includes reference to Distribution (electricity network) cables not previously included in this or the existing UK Marine Plans. The inclusion of this new chapter at this late stage in the process, without any formal consultation with key stakeholders in this subject area and other affected and interested parties, does not allow for sufficient and robust scrutiny of the policy proposals.

In particular, SSEPD has significant concerns about the policy of cable burial/protection due to the substantial cost implications this would have for electricity bill payers in the north of Scotland, a policy which has not been adequately risk assessed, evidenced or costed in full.

The policy of cable burial/protection for electricity network submarine cables first came to light during SSEPD's recent application to replace the Mainland to Jura submarine cable which faulted in June 2014 (as discussed in Appendix 3 more fully). Prior to this cable fault, and as recently as April 2014, Marine Scotland had not applied a policy of cable burial/protection when dealing with new or replacement submarine cables.

Throughout SSEPD's dealings with Marine Scotland during the Mainland to Jura replacement cable application process SSEPD made clear that further detailed

consultation was required before such a policy could be properly assessed, adopted or applied.

Prior to SSEPD becoming aware of Marine Scotland's purported policy requiring protection/burial, the SSE group (of which SSEPD forms part) in its response to the then consultation draft of the SNMP in November 2013, clearly set out its concerns that there was a lack of consideration for electricity networks and noted that this needed to be addressed due to the critical lifeline service electricity connections provide to Scotland's island communities.

Despite making the need for further consultation relating to electricity networks clear on many occasions, SSEPD and other interested and affected parties are now left with a very short timescale to provide additional commentary regarding the new submarine cable section as the Scottish Parliament has a period of only 40 days to scrutinise the SNMP.

SSEPD is also concerned that the Parliamentary scrutiny period will be shortened due to the two week winter recess.

Cost implications of the cable burial/protection policy in the SNMP

As an economically regulated business, the cost of operating and maintaining the electricity distribution network in the north of Scotland is ultimately paid for directly by customers in the north of Scotland (See Appendix 1). The costs are not funded by SSE plc as many assume.

These costs are determined and approved by the energy regulator Ofgem as part of a 'price control review'. Ofgem recently provided its final determination for the forthcoming price control for the 8 year period from April 2015 to March 2023.

Due to the vast and remote nature of the electricity distribution network in the north of Scotland (covering 25% of GB land mass), coupled with the proportionately relatively small number of customers (750,000) compared to other distribution networks in GB, the cost per customer of maintaining the network in the north of Scotland is the highest in the GB energy market.

The cost per customer of using the electricity network is the same for each energy supplier, irrespective of network ownership.

In recognition of the higher than average cost to consumers in the north of Scotland, the Hydro Benefit Replacement Scheme and Common Tariff Obligation already has the effect of lowering the costs of electricity transportation paid by customers in the SSEPD area. This is funded (at a current annual level of £56.13m) by charges ultimately levied on electricity customers throughout Great Britain, for the benefit of customers in the north of Scotland.

Ofgem's Final Determination on SSEPD's business plan for the 8 year period from April 2015 to March 2023, proposed an underlying cost reduction of 18% in 2015, recognising energy affordability is one of consumers' greatest financial concerns.

Marine Scotland's proposed policy of cable burial/protection places this proposal in jeopardy due to the significant cost implications cable burial/protection would have for consumers living in the SSEPD region.

In Ofgem's Final Determinations, November 2014, it has allowed approximately £33m for planned submarine cable replacements with a further allowance of approximately £15m for submarine cable faults. SSEPD estimate Marine Scotland's policy would increase this to £255m for planned replacements and it is estimated that £75m would be required for cable faults. This would represent 140% of SSEPD's total asset replacement investment over the 8 year price control period for just 1% of its asset base.

This potential estimated increase equates to approximately £76 per customer over 8 years. Subsequent similar investments in later years would add cumulatively to this value.

The additional costs associated with burial/protection is likely to have a significant effect on the viability of providing new and upgraded electricity networks that will facilitate renewable developments.

Lack of evidence

SSEPD currently operates 111 submarine cables in Scottish waters, only one of which is currently buried with the remaining 110 cables laid directly on the seabed. These cables have been in situ for anything up to 60 years with no reported safety incidents with other marine users.

All SSEPD cables are clearly marked on Admiralty Charts, are clearly marked at each shore end and are well known by mariners. Fishermen and other mariners have a primary duty to avoid conflict with subsea infrastructure and should take all reasonable steps to do avoid conflict.

SSEPD understand from discussions with Marine Scotland that the SNMP approach to burial is based on i) the need to protect the cable; and ii) to prevent conflict with other marine users. However based on SSEPD's extensive experience of operating submarine cables in Scottish waters, this policy is not proportionate to the risk of cable damage by/to other mariners.

Long term burial depths will vary due to movement of seabed sediments so cannot be guaranteed at any particular time. As such long term safety can only be ensured by mariners avoiding possible contacts with cables which are known to exist.

The presence of subsea cables is in many ways similar to working in proximity to overhead lines and underground cables on land. Health and Safety Executive Guidance Notes GS5 and GS6 exist to cover these situations and clearly put the onus on securing safety with those who are working in proximity. SSEPD believes there is no reason why this type of approach should not be replicated in the marine environment.

SSEPD's experience leads it to believe that the presence of subsea cables does not present an undue risk to other mariners, providing other mariners mitigate the risk through the responsible operation of their vessels.

SSEPD has yet to be provided with any substantive evidence confirming any safety incidents due to the presence of submarine cables in Scottish waters.

In the rare cases when fisheries gear comes into conflict with subsea cables there are recommended compensation guidelines administered by Subsea Cable UK for use by its members to compensate the affected fisheries for loss of equipment. The aim of Subsea Cables UK documentation is to provide guidelines for its members on how to handle claims from the fishing industry. This in turn ensures the fisheries industry receives from the cable industry a reasonably consistent response to their claims.

SSEPD therefore proposes that an appropriate and properly considered Cost Benefit Analysis provision is included in the SNMP to ensure that protection for each individual cable installation is evidence based, taking into consideration the cost, risk and benefit of burial/protection or otherwise.

A Cost Benefit Analysis approach would ensure decisions are evidence based; protecting customers from the otherwise unnecessary costs resulting from a blanket burial/protection approach to all submarine cables. SSEPD believes this is a pragmatic and proportionate proposal, whereby if the costs associated with submarine cable burial/protection can be clearly justified due to the wider benefit to mariners and others then burial/protection would be required; whereas in the instances where it is apparent that there is no such benefit then submarine cables would continue to be laid directly on the seabed as has been the practice in almost all cases to date.

Fault restoration provisions

The extensive SSEPD subsea cable network serving Scotland's islands suffers one or two faults per year on average. The vast majority of these faults are caused by wear and tear due to cable movements in the heavy sea currents that exist around the coast. Occasionally manufacturing or man made defects cause faults in the deep waters and significant depths these cables are laid. In a few instances ships anchors have been known to catch these cables causing damage that often only becomes apparent years later.

When a cable fault occurs the customers connected by it immediately lose their electricity supply. On some islands, like Islay, SSEPD has embedded diesel generation that can restore supplies quickly and operate continuously until the cable is repaired or replaced. In other cases, and on most other islands, customers go off supply until SSEPD installs mobile diesel generators from the mainland. The logistical challenge of operating these diesel generators is extremely onerous with 24 hour cover required.

For Distribution subsea cables SSEPD's investment decisions are based on a balance between burying the cable at greater cost to improve security versus laying it on the seabed at much reduced cost but accepting that on average it could fault

approximately every 20 years. SSEPD's Cost Benefit Analysis indicates there is an overwhelming argument that subsea cables should be laid on the seabed. For subsequent faults it is also far easier and less costly to locate faults and repair cables that are not buried.

There is no provision for fault restoration within the SNMP which has significant repercussions for both electricity distribution and transmission.

From a distribution perspective this threatens the reliability of electricity supplies to Scotland's island communities; and from a transmission perspective it could potentially reduce system security and result in additional constraint payments to generators who are unable to export generated electricity. These costs are ultimately borne by electricity bill payers.

For faults to the electricity network that occur on land, electricity distribution network operators, such as SSEPD, have statutory access rights to legally permit immediate access to carry out repairs.

Whilst SSEPD recognises there are significant differences and requirements with network activity between the onshore and the marine environments, particularly regarding the need to consult other mariners before any marine works are undertaken, SSEPD believes there needs to be a far greater focus on clearly setting out within the SNMP a process for ensuring expedited emergency marine planning applications when the reliability of electricity supplies to island communities is jeopardised.

Taking SSEPD's recent Mainland to Jura submarine cable replacement as an example, from the day the previous cable faulted to the day the new cable was successfully installed took almost 6 months (as detailed in Appendix 3). Jura, Islay and Colonsay are all connected to the main electricity distribution grid by a single submarine cable. Should this cable fault, all three islands are reliant on Bowmore diesel power station on Islay to maintain supplies for the period of fault repair/replacement.

SSEPD connects the vast majority of Scottish islands, many of which do not have back up generation provisions and have to rely on temporary mobile generation which requires to be transported and installed as and when faults occur to maintain electricity supplies pending submarine cable repair/replacement. SSEPD accepts that for planned cable replacements or new cable installations, a longer consultation process may be desirable, but when it comes to emergency works to reconnect supplies to the main distribution network, there is a strong case for a significantly quicker process to reconnect supplies.

Again, taking the Mainland to Jura example, SSEPD's proposal was to lay a new, replacement cable, in the same location where the previous cable had been in place without incident since its initial installation in the early 1970s. Provisions should be made within the SNMP that would allow this type of work to be approved within a far quicker and more clearly set out timescale than was the case with the Mainland to Jura replacement cable.

SSEPD would therefore propose provisions are made within the SNMP that would allow the immediate approval of a like-for-like cable replacement to take place in emergency situations, with post-installation burial/protection measures being considered at a later date, informed by a Cost Benefit Analysis.

Conclusion

SSEPD asks that the committee considers SSEPD's knowledge and experience of operating the surface laid cables that serve Scotland's island communities; the lack of evidence of incidents and injuries based on these methods; and the significant cost implications that the SNMP submarine cable policy would have on electricity bill payers in the north of Scotland. SSEPD questions whether the significant additional cost is justified or proportionate in response to the low risk that submarine cables pose to other mariners.

SSEPD also urge the committee to consider the need for fault restoration provisions to be clearly set out within the SNMP to prevent a repeat of the recent experience with the Mainland to Jura replacement submarine cable, which regrettably resulted in consumers on Jura, Islay and Colonsay having a far less reliable electricity supply than would otherwise have been the case with significant costs ultimately paid for by SSEPD customers in the north of Scotland for the operation of Bowmore Power Station.

Given the above SSEPD invites the committee to recommend:

- that the cable policies in the new Chapter 14 of the draft SNMP should be consulted upon with all interested stakeholders in early 2015, before the Scottish Government finalises Scotland's National Marine Plan;
- that in relation to the established electricity network such policies should reflect the overarching policies in the UK Marine Policy Statement and adopt a proportionate and risk-based approach, using sound evidence and allowing for prompt replacement of cables; and
- that the issue of repairing faulty cables should be referenced and a 'fast track' approach adopted to secure customers' electricity supplies.

Appendix 1 – SSEPD regulatory background and environment

SSEPD – a regulated network environment

- SSEPD is a network business focused on providing a safe, reliable and efficient service for all SSEPD's customers
- SSEPD is licenced by a national regulator focused on ensuring the interests of customers are protected
- Regulator and licence holders have a statutory duty to ensure the efficient and economic operation of the energy networks
- SSEPD's revenue is based on a regulatory framework (RIIO) which ensures benefits driven investment decisions
- Increased investment in networks to deliver additional outputs is ultimately a cost to the energy consumers in the north of Scotland

- An additional £280m of expenditure on submarine cable burial/protection during ED1 will lead to a 9% real increase in customer charges by the end of eight years of investment.

Scottish Hydro Electric Power Distribution (SHEPD) and Scottish Hydro Electric Transmission (SHE Transmission) owns and operates the distribution and transmission networks in the north of Scotland. Both entities invest in and maintain their extensive networks, covering many thousands of kilometres and operating in some of the harshest environments in Great Britain.

As monopoly electricity networks SHEPD and SHE Transmission are licenced and regulated by the Office of the Gas and Electricity Markets Authority (Ofgem). Ofgem undertakes periodic reviews to determine how much licensees should recover from customers through system charges; what targets to set as conditions for revenue allowances and the mechanisms for incentivising ongoing efficiency improvements.

This process enables licence owners to recover the revenue necessary for the ongoing development and maintenance of their network assets. It also ensures that the cost to customers is justified by the benefits delivered, is efficient and is dependent on the delivery of stakeholder informed outputs.

The current price control review period is based on the **RIIO** model,

RIIO: **R**evenue = **I**ncentives + **I**nnovation + **O**utputs.

This framework provides a clear link between revenue for justified investment and the delivery of outputs for customers. SHE Transmission commenced its RIIO-T1 price control period in April 2013; SHEPD received the Final Determinations of the RIIO-ED1 review at the end of November 2014.

The role of both regulated network and regulator; the RIIO principles and the impact of significant increased expenditure from cable protection on customer charges are all outlined in the following sections.

Regulated Networks – statutory duty to provide an efficient network

Under the Electricity Act 1989 (the Act) SHEPD and SHE Transmission have a statutory duty *‘to develop and maintain an **efficient**, **co-ordinated** and **economical** system of electricity distribution / transmission¹*. This requirement drives the investment behaviour of each business.

Both SHEPD and SHE Transmission make every effort to balance investment in developing the network with expenditure on replacing and maintaining critical assets. The foundation of this decision must be a clear understanding of the benefits from each expenditure decision and the costs of delivering it. The result is a network delivering its outputs, capacity and reliability, at the lowest possible cost. In essence a network focused on delivering the highest value for customers.

¹ Electricity Act, 1989, Part 1, Section 9.

The Regulator – statutory duty to promote an efficient network

The Act directs Ofgem to undertake their duties to ‘*promote **efficiency** and **economy** on the part of persons authorised by licences*’, ‘*to secure a diverse and viable long-term energy supply*’, and ‘*have regard to the effect on the environment of activities connected with the generation, transmission, distribution or supply of electricity*’ where “consumers” includes both existing and future consumers.’

Ofgem seek to maintain a balance between minimising the cost to the customer and ensuring licensees are awarded sufficient allowances to deliver a safe, reliable and efficient network with high levels of customer satisfaction. This is the balance between revenue and outputs, RIIO.

Regulatory and regulated entity engage in wide ranging stakeholder engagement to ensure the views and requirements of all their customers and interested parties are identified and considered when setting network allowances.

RIIO – a balanced regulatory framework

In October 2010 Ofgem introduced the RIIO regulatory framework. This model builds upon the previous RPI-X arrangements and clearly links future expenditure and the anticipated benefits to customers, both underpinned by sound justification. It seeks to meet the principle objective of the regulator,

*‘to protect the interests of existing and future consumers in relation to... electricity conveyed by distribution and transmission systems... regulating the **revenues** that the monopoly energy network companies are allowed to recover from consumers to ensure that the associated charges consumers face **reflect economic and efficient network operation**.*²

A core concept of the RIIO model is the pursuit of value for money, outlined in Ofgem’s October 2010 publication, ‘**long-term value for money**: value for money is about delivering sustainable network services at as low a long-term cost as possible.’³

To realise this objective, recent regulatory price control reviews for Transmission (T1), Gas Distribution (GD1) and Electricity Distribution (ED1) have been based on the analysis of costs and benefits, CBA techniques. This approach has been adopted to inform choices between differing stakeholder requirements; optimum levels of investment to reduce risk and increase reliability; and maximising intangible benefits such as environmental losses and carbon reduction.

Within the RIIO framework increased allowances to deliver incremental outputs continues to be conditional on the demonstration that there is a net benefit. This assessment is undertaken in advance of the revenue determination, reviewed by external consultants and open to public consultation.

² Handbook for implementing the RIIO model October 2010, Context

³ Handbook for implementing the RIIO model October 2010, section 1.10

Role of Cost Benefit Analysis (CBA) in RIIO

Incorporating CBA techniques within the RIIO framework has necessitated consideration of all benefits which may accrue to both customers and wider stakeholders. This has incorporated tangible benefits, such as reductions in ongoing operating costs; and the intangible factors, such as reduced carbon emissions or improvement in network losses. The standard analysis also incorporated a quantification of potential changes in risk to health and safety for both public and network employees.

The CBA techniques used in RIIO are based on the principles set out in the Treasury Green Book and followed common models set out by Ofgem in advance of the price control process. This ensures consistent evaluation of expenditure proposals within a network's plan and between licenced entities.

Within the ED1 price control, SHEPD modelled the benefits from proactive and reactive replacement of submarine cable assets; the choices to invest in increased capacity; and reduction in network losses. Consideration was given to the relative benefits in reduced faults arising from proactive network replacement.

Ongoing role of Cost Benefit Analysis (CBA) during RIIO-ED1

Coming out of recent debate around enhanced cable protection SHEPD is already committed to work with Ofgem in developing existing CBA models further to recognise any identifiable social benefits. A process to work in partnership with Marine Scotland and Ofgem guided by best practice from the Scottish Government was instigated in October 2014 with a view to develop a common tool to assess cable installation proposals and ensure that any impact on wider stakeholders is balanced with the need to ensure economic operation of the regulated networks.

SHEPD strongly believe that this process should be permitted to continue and that the output of a common model, the best value solution, should be recognised in the SNMP as the primary factor in future licencing directions.

Impact on network customers

SSEPD has estimated that undertaking enhanced protection for SSEPD's cable replacement programme during RIIO-ED1 will incur an additional £280m of investment. SSEPD's statutory obligation and that of the regulator, to ensure and promote the efficient and economic development of electricity networks necessitates careful consideration of the case for increased investment in cable protection as this expenditure will have a direct and enduring impact on customer charges.

The licence arrangements for ED1 enable recovery of a proportion of expenditure as it is incurred, c. 30%, and the remainder over a 45 year period, including an allowance for the network's cost of capital. For SHEPD the incremental increase in costs of £280m incurred equates to the following impact on customer charges:

£280m incremental expenditure leads to **9%** increase in average annual domestic customer charges across north of Scotland customers by the end of ED1

£405m – total charges recovered from SHEPD customers during asset life (real prices)

When reflecting on these significant changes in customer charges it is clear that there is an imperative for clear and balanced justification for the additional costs. SSEPD believe that adopting a common CBA modelling approach will direct the correct outcome in future cable protection decisions, reflect the impact on all stakeholders and ensure the electricity customers in the north of Scotland are protected from unjustified increases in their energy bills.

Appendix 2 – Review of Draft Scotland’s National Marine Plan

Overview and Context

Page 4 of the UK Marine Policy Statement states inter alia *“The Marine and Coastal Access Act 2009 requires all public authorities taking authorisation or enforcement decisions that affect or might affect the UK marine area to do so in accordance with the MPS unless relevant considerations indicate otherwise. It also requires that Marine Plans must be in conformity with any MPS in effect in the marine plan area, unless relevant considerations indicate otherwise.”* This is reflected in the SNMP which at the outset states:

The Marine Acts set out a tiered approach to developing marine planning in the UK and Scotland. The framework includes the following elements:

2.3 UK Marine Policy Statement (MPS): *The UK Administrations share a common vision of having clean, healthy, safe, productive and biologically diverse oceans and seas. Joint adoption of a UK wide Marine Policy Statement provides a consistent high level policy context for the development of marine plans across the UK to achieve this vision.*

2.4 Scottish National Marine Plan: *This National Marine Plan sets out strategic policies for the sustainable development of Scotland’s marine resources out to 200 nautical miles. It is required to be compatible with the UK Marine Policy Statement and existing marine plans across the UK, in particular where there is interaction between England inshore and offshore marine plans and Northern Ireland Marine Plans.*

Given the above the SNMP requires to be consistent with the UKMPS.

Section 2.3.2 (High level principles for decision making) of the SNMP states:

2.3.2.1 Enforcement or authorisation decisions that affect or might affect the UK marine area must be made in accordance with the relevant marine policy documents unless relevant considerations, such as advances in scientific knowledge and technology for example, indicate otherwise....The level of assessment undertaken for any project should be proportionate to the scale and impact of the project as well as the sensitivity of the environment concerned...

2.3.2.2 *There are a number of principles that should also be taken into account, specifically that decisions should:...*

- *Be taken using a risk-based approach that allows for uncertainty, recognising the need to use sound science responsibly as set out in the high level objectives;*

Chapter 6 of the SNMP

Paragraph 6.22 of the SNMP states that *there are emerging issues concerning the interactions between the fishing industry and other interests which should be borne in mind in any proposed marine development and factored into marine planning processes*. SSEPD would highlight:

- it is not clear from the SNMP what these emerging issues are vis-à-vis electricity distribution and network cables; and
- the SNMP acknowledges that there are a wider number and types of sea users whilst not providing any hierarchy amongst these. This paragraph creates a de facto hierarchy which would be against the general approach in the SNMP.

Paragraphs 6.23-6.26 of the SNMP (Interactions with new physical development and associated activity) deals with the installation of energy developments (including a specific reference to cabling arrays associated with the energy development). SSEPD would highlight:

- there is no definition of energy developments in the SNMP. The rationales for policies in the SNMP focus on renewable and generation developments and not distribution or transmission networks supplying power to various parts of Scotland. According it is not clear which type submarine electricity cables (distribution and transmission to serve islands or connect parts of Scotland or those required to export electricity generated from offshore renewables) are being discussed in these paragraphs;
- the Marine Planning Policies at the end of chapter 6 do not explicitly deal with interactions between fisheries and submarine cables – accordingly it is unclear what paragraphs 6.23-6.26 achieve.

Chapter 14 of the SNMP

As is noted in the Modifications Report which accompanied the publication of the SNMP, this chapter has been modified from its 2013 consultation version, which dealt with telecommunications cables to cover all submarine cables. Objectives 1 and 2 were in the 2013 consultation version and accordingly whilst these purport to apply to all submarine cables their origins lie in the way that telecoms cables were to be dealt with. Whilst objective 5 covers all forms of electricity cable the remainder of parts 1 and 2 of chapter 14 focus on cables required by offshore renewable generation. SSEPD would highlight:

- it is unclear what the rationale is for applying blanket policies for all forms of submarine electricity cables; and

- there has been no consultation or consideration of evidence which makes it appropriate for submarine electricity distribution and transmission cables to serve islands or connect parts of Scotland to be covered by the policies proposed in the SNMP. SSEPD considers that the completely new approach taken in chapter 14 is fundamentally different to that taken in the 2013 consultation version on which the SSE group provided a consultation response. The policies in this new draft are not only different from those previously adopted in Scotland, they are different from those in the consultation draft SNMP and have been extended to apply to the established electricity distribution grid. In these circumstances, Ministers should undertake a short consultation process with interested stakeholders, to ensure that the final policies rest upon a firm evidence base and reflect both the objectives of the MPS and the needs of the particular industries and customers concerned.

Paragraph 14.3 states *Cables are laid on the seabed and are routinely buried where the possibility of impact by other activities exists and where seabed conditions are suitable, i.e. where there may be shallow gradients and softer sediments... Renewable power export and array cables are typically in water depths of no more than 50m to 60m currently to though this may increase in the future...However not all cables can be buried or should be buried for a variety of reasons.* SSEPD would highlight:

- the rationale in paragraph 14.3 takes no account of submarine electricity distribution and transmission cables to serve islands or connect parts of Scotland;
- as owner of the relevant distribution network, Scottish Hydro Electric Power Distribution PLC currently operates 111 submarine cables in Scottish waters, only one of which is currently buried with the remaining 110 cables laid directly on the seabed. Accordingly it is not correct to state that submarine electricity cables are routinely buried; and
- it is not clear what criteria should be used to determine whether or not a submarine electricity cable should or can be buried. Taken together with the requirement in paragraph 2.3.2.2 in the UKMPS to take a risk based approach to decision making there is considerable uncertainty as to the criteria to be used when determining whether a submarine electricity distribution and transmission cables serving islands or connecting parts of Scotland should or should not be buried. Such uncertainty will increase cost and time when carrying out reinforcement or repair work of the distribution or transmission networks operated by the SSEPD companies.

Whilst paragraph 14.5 considers improvements required to the power grid, again this is in the context of submarine power cables required to support the offshore wind and renewables sector. This does not take into account the distribution or transmission networks operated by the SSEPD companies.

Paragraphs 14.7 and 14.9 both state that increases in the submarine cable industry increases the risk of interactions with other users and potentially damage to cables or fishing vessels. Accordingly in paragraph 14.9 the SNMP states *Submarine*

cables should be buried, where feasible, or suitably protected, to reduce conflict with other users and prevent damage to cables. SSEPD would highlight:

- the position noted above misunderstands how risk operates and should be assessed. Firstly, whatever the present risk is that fishermen will foul their nets, given the care taken to mark charts etc., that risk does not increase with the number of cables laid on the seabed: the risk is the same each time each vessel passes each cable. Second, the SNMP may again be mis-applying concepts prepared for new renewables and telecom projects: where SSEPD repair or replace network cables this is not a new or more intense activity. Therefore there is not any increase in risk;
- whilst it is correct to state that fouling on a cable could be hazardous to vessels and damage to cables can be expensive to repair whilst being disruptive, there is no evidence to demonstrate that this has occurred for the currently installed submarine electricity cables. Further given the statutory and licence obligations under which the SSEPD companies operate (in particular the duty to develop and maintain an efficient, co-ordinated and economical system of electricity distribution/transmission) then were there was evidence of such fouling then the SSEPD companies would require to install appropriate protective measures such as burial or rock dumping;
- it is not clear why the wording in italics above is in this section of chapter 14. The wording reads like a policy statement and should not be included in part 2 of this chapter. It is also inconsistent with both (i) part 3 of chapter 14 and (ii) paragraph 14.11;
- there is no hierarchy of sea users. Accordingly other users such as the fishing sector should conduct its business in accordance with best practice to minimise vessels fouling on submarine electricity cables. SSEPD has not been given any indication, and the SNMP does not set out, that such best practices are to change resulting in fouling occurring. This position is to some extent reflected in paragraph 14.11. Further this paragraph creates a de facto hierarchy which would be against the general approach in the SNMP.

Paragraph 14.12 of the SNMP introduces significantly changes the position compared to the 2013 consultation draft of the SNMP. Electro Magnetic Fields (EMFs) are a natural consequence of transporting electrical energy in cables (whether overhead or underground). Distribution subsea cables are laid with their 3 phase cores wound together in a spiral. This minimises the EMF value and reduces any possible impact considerably. SSEPD is not aware of any research that indicates the EMF impact of subsea cables has an adverse impact on human or any other life form.

Policy CABLES 1 in part 3 of the SNMP requires cable and network owners to engage with decision makers as early as possible when cables are to be laid, repaired or replaced. As part of this engagement appropriate and proportionate risk assessments should be provided which may include cable protection measures and mitigation plans. SSEPD would highlight:

- this approach does not take into account the practicalities of carrying out urgent repairs particularly where there may be short weather windows to carry out works. Where an electricity distribution network cable fails then Scottish

Hydro Electric Power Distribution PLC often requires to install emergency local generation so that electricity supplies to customers served by the cable can be restored as quickly as possible. Emergency generation is by way of diesel generators which are expensive, prone to failure (which results in blackouts) and have a significantly higher environmental impact than electricity generated by fixed power stations and then transported through submarine cables; and

- whilst SSEPD understands the importance of appropriate and proportionate risk assessments the recent experience of the failure of the mainland to Jura cable and the other marine planning policies demonstrate that SSEPD can have no certainty as to the timescales, process or licence conditions which will affect any cable failure. This adds a great deal of operational and economic uncertainty to the SSEPD submarine cable network. If a test of “proportionate...risk assessments” is to be used then this requires fleshing out to determine how such test would operate.

Policy CABLES 2 gives a list of factors that are to be taken into account on a “case by case basis” when reaching decisions regarding submarine cables. SSEPD would highlight:

- there is no test or guidance about when the factors should be taken into account and the “case by case basis” approach is too vague to be certain of correct and consistent implementation for every submarine cable that may be installed in the future.

Bullet one of CABLES 2 states that cables should be routed to provide sufficient requirements for installations and cable protections. SSEPD would highlight:

- this wording is unclear as there is no certainty about how the “sufficient requirements” wording will operate or be interpreted in the context of protection or routing; and
- this policy does not take account of replacement or repairs for existing cables – in particular whether a replacement cable can be routed along the same corridor as the original cable if the “sufficient requirements” test is failed. Further this does not take into account the practicalities of securing rights from The Crown Estate to run cables along pre-agreed routes.

Bullet two of CABLES 2 is concerned with “New” cables and requirement to minimise impacts *on the environment, seabed and other users where operationally possible and in accordance with relevant industry practice*. SSEPD would highlight:

- it is not clear if this applies to submarine cables being laid along a route for the first time or newly laid submarine cables being installed to replace existing submarine cables;
- there is no hierarchy of sea users in the SNMP however this policy creates a de facto hierarchy which would be against the general approach in the SNMP; and
- even if relevant industry practice can be agreed on (and at present it appears that there is no such consistent approach as demonstrated by some of the

approaches taken in the SNMP) then there is potential for significant disagreement about whether something is operationally possible or not.

Bullet 3 of CABLES 2 states that *Cables should be buried to maximise protection where there are safety or seabed stability risks and to reduce conflict with other marine users and to protect the assets and infrastructure.* SSEPD would highlight:

- there is significant uncertainty as to how “safety or seabed stability risks” will be determined which could result in a mandatory policy of burial being required which would contradict with paragraph 2.3.2.2 of the UKMPS (which states that decisions should...Be taken using a risk-based approach that allows for uncertainty, recognising the need to use sound science responsibly as set out in the high level objectives);
- as with bullet 4 below, there should be an assessment of risk before it can be determined whether or not burial should be required;
- there is no evidence to show that submarine cable burial should be mandatory and at present only 1 of the 111 cables installed and operated by Scottish Hydro Electric Power Distribution PLC is buried;
- for the policy wording to be applied there will be a need to measure and agree upon the existence, nature and scope of any safety risks and the nature of the seabed. It is entirely possible that any application for a marine licence to allow a submarine cable to be installed will require to show that there is no safety risk at all (as opposed to one which can be managed or should be avoided by best practice by other sea users), no risk of seabed instability before burial can be avoided. This policy could result in a significant number of appeals being made against the terms of marine licence conditions for submarine cables;
- there is no measure for the reduction of conflict with other sea users and it is not clear if this is a reduction to zero or how obligations for other sea users to work in accordance with best practice can be factored into this requirement; and
- the SSEPD companies are regulated by OFGEM and are required to operate their networks in an economic and efficient manner. As such the SSEPD companies are best placed to determine what would be required (if anything) to protect their submarine cables having regard to best industry practice and the regulatory regime in which they operate. This policy may cut across the SSEPD’s ability to do this where for example it is determined that no protection is required for a subsea cable.

Bullet 4 of CABLES 2 states that submarine cables may be protected through other measures where practical, cost effective and as risk assessment *direct cable burial is demonstrate not to be feasible.* SSEPD would highlight:

- there is no basis or guidance on how to determine whether or not burial is feasible for example it may be possible to bury but only at a significantly increased cost. Further it is not clear who would determine feasibility which could lead to significant disagreements around a requirement to protect which may only be settled through appeals of individual licences;
- this policy does not allow proportionality to be considered as part of a determination as to whether protection should be installed;

the potential for use of a risk assessment to determine whether protection would be required where burial is not possible is inconsistent with the approach in bullet 3 where there is no such ability to risk assess. Other than the method of protection the principles should be similar for each factor; and

- there is no provision for who determines what a risk assessment directs which could lead to significant disagreements around a requirement to protect which may only be settled through appeals of individual licences.

Bullet 5 CABLES 2 concerns post installation aspects. SSEPD would highlight:

- the wording is too vague to provide a framework which will be applied in a consistent and cost effective manner.

Appendix 3 – Case Study: Mainland to Jura Fault Repair

Background of SSEPD submarine cable faults

Since the first installation of SSEPD's submarine cables in the 1950s SSEPD has had an average fault history of one or two faults per annum. This is in line with the industry standard of 0.5 fault / 100km / year. When a fault occurs, a location is identified and is subsequently assessed, where possible, to determine the cause of failure. SSEPD keep a strategic stock of spare cable so that its fault response can be as quick as possible, which can be as little as 14 calendar days from first notification of the fault to the vessels being fully mobilised and ready to carry out the repair work.

Mainland – Jura Fault Repair Timeline

June 20th 2014

The cable from mainland (Carsaig Bay) to Jura (Lealt Bay) faulted on 20 June 2014. Marine Scotland Licensing Operations Team (MS-LOT) were notified that there was a possible fault on that day; this was subsequently confirmed as a subsea cable fault on 22 June 2014.

2791 customers go off electricity supply at 09:50am for a total of 61 minutes. Bowmore power station on Islay begins to generate to get the customers on Jura, Islay and Colonsay back on supply. This is a back-up power station and is intended only to be used on a temporary basis.

June 20th – December 7th 2014

Bowmore comes off line 6 times in total due to a combination of transient overhead line faults and issues with the diesel generators..

July 2nd 2014

SSEPD wrote to MS-LOT request that they waive the pre-application consultation on the grounds that there is an existing wayleave for the submarine cable under the Coastal Protection Act.

July 28th 2014

SSEPD submitted the formal application for consent to replace the existing submarine cable to Marine Scotland.

July 30th 2014

MS-LOT confirm SSEPD exempt from pre-application consultation

August 4th 2014

Marine Scotland issued formal consultation with 14 day period.

August 18th 2014

Consultation on the licence ends.

October 28th 2014

11 weeks after the consultation on the application to repair the Mainland to Jura cable ends, the draft licence is issued by MS-LOT. SSEPD gave significant comments on the draft including where provisions were unworkable, impracticable or disproportionately costly.

November 13th 2014

Full licence issued by MS-LOT with minor amendments to the original draft.

November 28th 2014

SSEPD issue the Cable Protection Plan, Environmental Management Plan and Fisheries Liaison Management Plan to MS-LOT for consideration as per the pre-conditions within the licence. MS-LOT approves the various plans and commitments made by SSEPD and work is allowed to progress.

There is still significant uncertainty as to whether SSEPD will be required to install burial/protection as this will depend on how survey results are interpreted and applied. There is no framework for how this will be determined and SSEPD has significant concerns that a requirement to bury/protect will be imposed irrespective as to whether this is proportionate or justifiable. The costs for such burial/protection could add circa £2m to the cost of this replacement project. During discussions with Marine Scotland SSEPD was informed that cost considerations were irrelevant to the condition in the marine licence for this project.

December 4th 2014

The submarine cable from mainland to Jura is laid end to end in preparation of being energised on Sunday December 7th 2014.

December 7th 2014

The mainland – Jura submarine cable is energised and temporary generation is taken offline. The network is restored back to normal.

Conclusion

It appears that the policy and process in the SNMP, which had not yet been adopted or formally approved, was implemented on the mainland to Jura submarine cable fault. Due to this, Jura, Islay and Colonsay were reliant on temporary back-up generation for a total of almost six months. As a consequence of this, the customer supplies were interrupted six times during that period which caused unnecessary risks to the local population.

Appendix 4 – Submarine Cables and Marine Safety

Introduction

Safety is the number one core value for SSEPD and as such SSPED takes safety extremely seriously. When planning projects SSEPD do not just concern themselves with safety relating to the project directly, but also assess the wider impact it has on those around the development after completion. Assessing risks associated with the project life cycle is essential when proposing works. For all identifiable risks there must be an assessment of the mitigation methods that could be adopted. Furthermore, SSEPD also assess the level of risk against the cost associated with the possible mitigation methods to determine what the best or most appropriate course of action is.

As in all activities it will not be economically viable to remove all risks, and it will be necessary to consider the likelihood of impact, the potential impact and the cost of alternative mitigation methods.

Submarine Cable Installation Methodology

SSEPD (through its predecessors) have had submarine cables in the water since the early 1950's and over time have added to the network. There are now 111 submarine cables installed in and around Scotland which supply vital electricity supplies to islands and remote customers. To date, the submarine cable installation methodology has been to bury cables from the shore to the low water mark, but to lay them on the seabed surface at lower depths.

The current methodology to surface lay cables along existing and well established routes has, in SSEPD's experience, not compromised the safety of mariners in and around Scotland. Based on historic records of SSEPD's submarine cables, there has been no evidence to suggest that SSEPD's assets have caused mariners any injuries or been associated with any deaths at sea.

All submarine cables are clearly identified and mapped on Admiralty Charts, which are updated by the UK Hydrographic Office, and Kingfisher information Service – Offshore Renewable and Cable Awareness (KIS-ORCA) are also informed of any changes to SSEPD's network. All this information is in the public domain and readily

available to mariners, whether it is paper based or on mariners Global Positioning System (GPS). There are no uncharted SSEPD submarine cables.

Based on SSEPD's experience with SSEPD's submarine cables and their associated environments, SSEPD would plan to replace these cables along the existing route. By carrying out works in the same location it will allow SSEPD to determine the life expectancy of the asset, based on historic knowledge, and most importantly, there will be no change to the existing environment and therefore no significant change to mariners and the current practices they adopt around SSEPD's submarine cables.

Responsibility of Mariners and Fishermen

There is a duty on all mariners to ensure that they adhere to safe working practices and skippers must ensure the safety of their vessel and crew. The marine environment is hazardous and there are a lot of unknowns that could cause vessels to snag, such as large rocks, geological anomalies and uncharted wrecks. As such, mariners must take every precaution to understand the locations that they are operating in and where hazards are identified, mariners must take care to avoid contact with them.

Mariners are assisted with navigation through the use of GPS, which identifies their location in relation to their surroundings.

By following safe working practice, mariners can mitigate the risks associated with being in the vicinity of known hazards.

Submarine Cable Risk Assessments and Investigations

Although SSEPD have not had any reportable instances relating to third party injuries or deaths due to coming into contact with SSEPD's assets, SSEPD have looked at the wider industry and UK waters to determine the rate of incidents more widely. To assess this SSEPD have utilised Marine Accident and Investigation Board (MAIB) data associated with incidents at sea that have caused injury, vessels to capsize and/or attributed to the death of mariners. The findings from the MAIB data were reported to Marine Scotland and are also provided herein.

MAIB Incidents at Sea Investigation

SSEPD were provided with MAIB data titled "Cases of MAIB Identified as Involved Snagging/Underwater Obstructions 1991 to April 2012."

This was subsequently analysed and the main points that SSEPD concluded were:

- there are no injuries identified on any of the incidents involving subsea cables;
- the vast majority of the incidents occurred in and around the English Channel. None of these are relevant to Power Distribution cables in Scottish waters; and
- some incidents are related to uncharted cables and this will clearly not be the case with SSEPD's cables. In addition modern GIS navigational aids make location of vessels and cables much more accurate and safe.

- SSEPD also notes that in one situation, a skipper snagged his gear in an area where the cable was supposed to be buried - a point that SSEPD has made previously with MS-LOT in that regardless of whether cables are buried or not there may always be a snagging risk that can only be mitigated by:
 - cable operators ensuring their equipment is clearly marked on Admiralty charts, and
 - marine users taking determined action to avoid contact with the cable in order to secure the safety of the vessel and crew. As SSEPD has said on numerous occasions, this is similar to working in proximity to overhead lines and underground cables on land.

As such SSEPD remains of the view that there is no evidence of incidents on SSEPD's network and in Scottish waters that justifies a need for the significant increased expenditure to bury submarine cables as proposed.

Fatalities at Sea Investigation

The information provided by the MAIB was split into incidents, as per the above, and deaths at sea. This information was also available within "Cases of MAIB Identified as Involved Snagging/Underwater Obstructions 1991 to April 2012."

From all the cases identified within the data that related to deaths at sea, none were attributed to snagging cables, as evidenced within the document.

SSEPD noted that there are many instances where the cause was not identified, and of those unidentified incidents, none were in close proximity (1Nm) of any submarine cables. By providing the relevant bodies with accurate information relating to the location and position of SSEPD's submarine cable assets, mariners can clearly identify areas where they must take additional care to ensure the safety of their vessel and their crew.

Risk Assessment

As stated, SSEPD undertake risk assessments to determine what risks are involved with a project during the design, construction and life of a project. Within these assessments, risks are identified and mitigation methods proposed for further assessment based on probability versus cost.

Although SSEPD undertake a UK wide assessment to assist with the overall risk assessment, SSEPD also looks at the risks on a local level as the dynamics of local operations can differ from the wider picture. Liaison with local fishery groups and mariners, along with fishing activity monitoring data such as Vessel Management System (VMS) and Automatic identification System (AIS), are all taken into consideration when assessing risks on a local basis.