DEPARTMENT OF ENERGY & CLIMATE CHANGE

National Policy Statement for Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4)

Planning for new energy infrastructure

July 2011

Department of Energy and Climate Change

National Policy Statement for Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4)

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Part 1 Introduction

1.1 Background

1.1.1 The efficient import, storage and transmission of natural gas and oil products is crucial to meeting our energy needs during the transition to a low carbon economy. We cannot achieve national objectives relating to security of supply without enabling investment in new infrastructure.

1.2 Role of this NPS in the planning system

1.2.1 This National Policy Statement (NPS), taken together with the 'Overarching National Policy Statement for Energy' (EN-1), provides the primary basis for decisions by the Infrastructure Planning Commission (IPC) on applications it receives for gas supply infrastructure and gas and oil pipelines as defined at Section 1.8. The way in which NPSs guide NPS decision making and the matters which the IPC is required by the Planning Act 2008 to take into account in considering applications are set out in Sections 1.1 and 4.1 of EN-1.

1.2.2 Applicants should ensure that their applications, and any accompanying supporting documents and information, are consistent with the instructions and guidance given to applicants in this NPS, EN-1 and any other NPSs that are relevant to the application in question.

1.2.3 This NPS may be helpful to local planning authorities (LPAs) in preparing their local impact reports. In England and Wales this NPS is likely to be a material consideration in decision making on relevant applications that fall under the Town and Country Planning Act 1990 (as amended). Whether and to what extent this NPS is a material consideration will be judged on a case by case basis.

1.2.4 Further information on the relationship between NPSs and the town and country planning system, as well as information on the role of NPSs, is set out in paragraphs 13 to 19 of Annex A to the letter to Chief Planning Officers issued by the Department for Communities and Local Government (CLG) on 9 November 2009[1].

1.2.5 Paragraphs 1.2.2 and 4.1.5 of EN-1 provide details of how this NPS may be relevant to the decisions of the Marine Management Organisation (MMO) and how the Marine Policy Statement (MPS) and any applicable marine plan may be relevant to the IPC in its decision making.

1 http://www.communities.gov.uk/publications/planningandbuilding/letternpsconsultation

1.3 Relationship with EN-1

1.3.1 This NPS is part of a suite of energy NPSs. It should be read in conjunction with the Overarching Energy NPS (EN-1) which covers:

- the high level objectives, policy and regulatory framework for new nationally significant infrastructure projects that are covered by the suite of energy NPSs and any associated development (referred to as energy NSIPs);
- the need and urgency for new energy infrastructure to be consented and built with the objective of contributing to a secure, diverse and affordable energy supply and supporting the Government's policies on sustainable development, in particular by mitigating and adapting to climate change;
- the need for specific technologies, including the types of infrastructure covered by this NPS;
- key principles to be followed in the examination and determination of applications;
- the role of the Appraisal of Sustainability (AoS) (see section 1.7 below) in relation to the suite of energy NPSs;
- policy on good design, climate change adaptation and other matters relevant to more than one technology-specific NPS; and
- the assessment and handling of generic impacts that are not specific to particular technologies.

1.3.2 This NPS does not seek to repeat the material set out in EN-1, which applies to all applications covered by this NPS, unless stated otherwise. The reasons for policy that is specific to the energy infrastructure covered by this NPS are given, but where EN-1 sets out the reasons for general policy these are not repeated.

1.4 Future planning reform

1.4.1 Aside from cases where the Secretary of State intervenes, or where the application is not covered by a designated NPS, the Planning Act 2008, as in force at the date of designation of this NPS, provides for all applications for development consent to be both examined and determined by the IPC. However, the enactment and entry into force of the provisions of the Localism Bill (introduced into Parliament in December 2010) relating to the Planning Act would abolish the IPC. The function of examining applications would be taken on by a new Major Infrastructure Planning Unit ("MIPU") within the Planning Inspectorate, and the function of determining applications on infrastructure projects by the Secretary of State (who would receive a report and recommendation on each such application from MIPU). In the case of energy projects, this function would be carried out by the Secretary of State for Energy and Climate Change.

1.4.2 If the Localism Bill is enacted and these changes take effect, references in this NPS to the IPC should be read as follows from the date when the changes take effect. Any statement about the IPC in its capacity as an examining body should be taken to refer to MIPU. Any statement about the IPC in its capacity as a decision-maker determining applications should be taken to refer to the Secretary of State for Energy and Climate Change in his capacity as decision-maker; MIPU would have regard to such statements in framing its reports and recommendations to the Secretary of State.

1.5 Geographical coverage

1.5.1 Responsibility for decision making on the infrastructure described in paragraph 1.8.1 will not all fall to the IPC but will vary across England, Wales and Scotland and also between onshore and offshore.

1.5.2 In **England**, the IPC will decide all applications falling under categories (i), (ii), (iii) and (iv) at paragraph 1.8.1.

1.5.3 In **Wales**, the IPC will decide only applications:

- under category (i), starting to use existing underground gas storage facilities in natural porous strata where the proposed applicant is a Gas Transporter;
- under category (iii) the English section of a Gas Transporter pipeline which crosses into Wales; and
- under category (iv), pipelines over 16.093km (10 miles) long which would otherwise require consent under Section 1 of the Pipelines Act 1962 together with diversions to such pipelines regardless of length.

1.5.4 In **Scotland**, under category (iv) the IPC will decide applications for cross border oil and gas pipelines over 16.093km (10 miles) long which would otherwise require consent under Section 1 of the Pipelines Act 1962 together with diversions to nationally significant pipelines regardless of length. This is where the pipelines have one end in England or Wales and the other end in Scotland. Under category (iii), the IPC will only decide the English section of a Gas Transporter pipeline which crosses into Scotland.

1.5.5 **Offshore**, the IPC should note that, the Secretary of State for DECC will be responsible for licensing gas storage and Liquefied Natural Gas (LNG) unloading infrastructure under the Energy Act 2008 where the unloading is to a pipeline or installation at sea. The offshore area comprises the territorial sea and the UK Continental Shelf. These arrangements include a consenting regime for construction of platforms and for the conversion of geological features for gas storage purposes. The Crown Estate is responsible for leasing the sub-sea storage area or area of the sea bed and water column.

1.5.6 Offshore oil and gas pipelines consents are also the responsibility of the Secretary of State for DECC and are issued in accordance with the Petroleum Act 1998. They cover marine pipelines in controlled waters meaning the UK territorial sea (up to the Low Water Mark or a bay closure line) and any part of the sea on the UK Continental Shelf.

1.5.7 In **Northern Ireland**, planning consents for all nationally significant energy infrastructure projects are devolved to the Northern Ireland Executive, so the IPC will not examine applications for energy infrastructure in Northern Ireland.

1.6 Period of validity and review

1.6.1 This NPS will remain in force in its entirety unless withdrawn or suspended in whole or in part by the Secretary of State. It will be subject to review by the Secretary of State in order to ensure that it remains appropriate. Information on the review process is set out in paragraphs 10 to 12 of Annex A in CLG's letter of 9 November 2009 (see paragraph 1.2.4 above).

1.7 Appraisal of Sustainability and Habitats Regulations Assessment[2]

1.7.1 All of the energy NPSs have been subject to an Appraisal of Sustainability (AoS)[3] incorporating the requirements of the regulations that implement the Strategic Environmental Assessment Directive[4]. General information on the AoSs can be found in paragraph 1.7.1 of EN-1. Habitats Regulations Assessment was also done for all the energy NPSs. Paragraph 1.7.13 of EN-1 sets out the conclusions of the HRA.

1.7.2 Key points from the AoS for EN-4 are:

- Gas supply infrastructure and gas and oil pipelines development has similar effects to other types of energy infrastructure, although because of the linear nature of cross-country, long distance pipelines, effects are spread across a wider area; therefore, for the majority of the AoS objectives, the strategic effects of EN-4 are considered to be neutral.
- Through supporting the transition to a low carbon economy, EN-4 is considered to have significant positive effects on security of supply and the economy and skills AoS objective in the medium term.
- Negative effects were identified for short/medium term for the Landscape, Townscape and Visual AoS objective due to the above ground infrastructure associated with gas supply infrastructure.
- Short term negative effects were identified for Ecology, Resources and Raw Materials and Water Quality largely associated with the dredging requirements of LNG terminals and the disposal of large quantities of brine generated during the solution mining of underground gas storage caverns. Short term negative effects were also identified for Noise during construction in sensitive rural areas.

2 Appraisal of Sustainability for the Gas Supply Infrastructure and Gas and Oil Pipelines NPS (EN-4) is available at http://www.energynpsconsultation.decc.gov.uk

3 As required by Section 5(3) of the Planning Act 2008

4 Directive 2001/42/EC of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment

1.7.3 As required by the SEA Directive, Part 2 of AoS 4 also includes an assessment of reasonable alternatives to the policies set out in EN-4 at a strategic level. The alternative assessed was that the Government would take a strategic view on locations where it is best to develop new oil and gas infrastructure (based on geology, cost etc) and limit consenting to those areas.

1.7.4 Assessment showed that the alternative is likely to have effects similar to those of EN-4, as the technologies resulting from EN-4 will be clustered in certain locations as a result of specific development requirements. For example underground storage of gas in salt caverns will be in Wessex, West Lancashire, Cheshire and the Yorkshire North Sea Coast, and LNG terminals require coastal locations with deep water channels to take large LNG tankers. This could result in a concentration of effects in the cluster areas, potentially elevating the effects from local to regional significance. Since in practice, the geographical constraints on underground storage and LNG terminals will dictate their location, and it is not clear that a more centrally planned approach to gas and oil pipeline development would be advantageous, the approach set out in EN-4 is preferred.

1.8 Infrastructure covered by this NPS

1.8.1 The infrastructure covered by this NPS is the nationally significant infrastructure caught by the relevant Planning Act thresholds (sections 17–21 of the Planning Act 2008), as follows:

(i) Underground gas storage and LNG facilities which meet one of the following two tests:

- *the storage or working capacity test*: a project would pass this test if the storage capacity on completion of the proposal is expected to be at least 43 million standard cubic metres (Mcm) of gas or higher; or
- *the maximum flow rate test*: a project would pass this test if it has a projected delivery flow rate of at least 4.5 million standard cubic metres of gas per day (Mcm/d).

An alteration to an underground gas storage facility or an LNG facility will be for the IPC to consider if it increases the storage capacity or the maximum flow rate of the facility by the above volumes.

Applications under this category will include: underground gas storage in natural porous strata (depleted hydrocarbon fields, aquifers); underground gas storage in caverns; and LNG facilities capable of receiving, storing and re-gasifying LNG.

(ii) Gas reception facilities with a projected maximum flow rate of at least 4.5 million standard cubic metres of gas per day (Mcm/d) (there is no capacity test). An alteration to a gas reception facility will be for the IPC to consider if it increases the maximum flow rate by the above volume. Applications under this category will cover gas reception facilities where gas is received in gaseous form from outside England, Scotland and Wales.

(iii) Gas Transporter Pipelines which are (a) expected to be more than 800mm in diameter and more than 40 kilometres in length or (b) likely to have a significant effect on the environment. The design operating pressure must be expected to be more than 7 bar gauge. The pipeline must be expected to convey natural gas for supply to at least 50,000 potential customers. These pipelines are referred to in this NPS as Gas Transporter Pipelines.

(iv) Pipelines over 16.093km (10 miles) long which would otherwise require consent under s.1 of the Pipe-lines Act 1962 together with diversions to such pipelines regardless of length. These pipelines are referred to in this NPS as cross-country pipelines.

1.8.2 Pipelines which meet the Planning Act threshold at 1.8.1 (iv) could be carrying different types of gas, fuel or chemicals. This NPS only covers those nationally significant infrastructure pipelines which transport natural gas or oil. However information in this NPS may be useful in identifying impacts to be considered in applications for pipelines intended to transport other substances.

1.8.3 Some pipelines which are not nationally significant infrastructure projects, may nevertheless be granted development consent as associated development by virtue of their connection with another nationally significant infrastructure project such as a power station. The guidance on associated development issued by the Department for Communities and Local Government (CLG) on their website (www.communities.gov.uk) provides more information about this.

Part 2 Assessment and Technology-Specific Information

2.1 Introduction

2.1.1 Part 4 of EN-1 sets out the general principles that should be applied in the assessment of development consent applications across the range of energy technologies. Part 5 of EN-1 sets out policy on the assessment of impacts which are common across a range of these technologies (generic impacts). This NPS is concerned with impacts and other matters which are specific to gas supply infrastructure and oil and gas pipelines or where, although the impact is generic and covered in EN-1, there are further specific considerations arising from the technologies covered here.

2.1.2 The policies set out in this NPS are additional to those on generic impacts set out in EN-1 and do not replace them. The IPC should consider this NPS and EN-1 together. In particular, EN-1 sets out the Government's conclusion that there is a significant need for new major energy infrastructure generally (see Part 3 of EN-1). EN-1 Part 3 includes assessments of the need for gas supply infrastructure and gas and oil pipelines. In the light of this and for the reasons given in Part 3 of EN-1, the IPC should act on the basis that the need for the infrastructure covered by this NPS has been demonstrated.

2.1.3 The sections below include references to factors influencing site selection by applicants for gas supply infrastructure and oil and gas pipelines. These are not a statement of Government policy, but are included to provide the IPC and others with background information on the criteria that applicants consider when choosing a site. But the specific criteria considered by applicants, and the weight they give to them, will vary from project to project. The choices which energy companies make in selecting sites reflect their assessment of the risk that the IPC, following the general points set out in Section 4.1 of EN-1, will not grant consent in any given case. But it is for energy companies to decide what applications to bring forward and the Government does not seek to direct applicants to particular sites for gas supply infrastructure and oil and gas pipelines.

2.2 Climate change adaptation

2.2.1 Part 2 of EN-1 outlines the policy context for the development of nationally significant energy infrastructure, including policies for mitigating climate change. Section 4.8 of EN-1 sets out generic considerations that applicants and the IPC should take into account to help ensure that new energy infrastructure is resilient to climate change. Additional information that is specific to the infrastructure covered by this NPS is set out below.

2.2.2 As climate change is likely to increase risks to some of this infrastructure, from flooding or rising sea levels for example, applicants should in particular set out how the proposal would be resilient to:

- increased risk of flooding;
- effects of rising sea levels and increased risk of storm surge;
- higher temperatures;
- increased risk of earth movement or subsidence from increased risk of flooding and drought; and
- any other increased risks identified in the applicant's assessment.

2.2.3 The IPC should expect that climate change resilience measures will form part of the relevant impact assessment in the Environment Statement (ES) accompanying an application. For example, future increased risk of flooding should be covered in the flood risk assessment.

2.3 Consideration of good design

2.3.1 Section 4.5 of EN-1 sets out the principles for good design that should be applied to all energy infrastructure.

2.3.2 For the reasons given there, applicants should demonstrate good design, in particular where mitigating the impacts relevant to the infrastructure.

2.4 Hazardous substances

2.4.1 Section 4.12 of EN-1 sets out the regime for obtaining hazardous substances consent from the IPC where it is required. All establishments wishing to hold stocks of certain hazardous substances, which include oil and gas, above a threshold quantity must apply to the Hazardous Substances Authority (HSA) for hazardous substances consent. In the case of natural gas, the threshold is 15 tonnes. In relation to gas supply infrastructure, the Health and Safety Executive (HSE) will advise the IPC on the risks, taking into account the quantities of gas to be stored, the installation type and specification, and the local population.

2.4.2 LNG is transported in specially designed cargo vessels. The Maritime & Coastguards Agency (MCA) is responsible for inspecting these vessels and the relevant Port Authority is responsible for ensuring that the rules relating to safe port operations are followed. The IPC should be able to rely on these regulatory controls being properly applied and enforced. The safety of shipping of LNG is not therefore a matter for the IPC unless in the individual circumstance of a specific case it regards it as relevant and important to its decision.

2.4.3 Two public information leaflets published in 2007 cover a number of safety issues relevant to underground gas storage and LNG import facilities:

- "Gas Storage in your area – your questions answered" is available at http://www.berr.gov.uk/files/file40536.pdf; and

- "LNG in your area – your questions answered" is available at http://www.berr.gov.uk/files/file40537.pdf.

2.5 Control of Major Accident Hazards

2.5.1 Gas storage and supply infrastructure sites are subject to stringent safety standards under the Control of Major Accident Hazards (COMAH) Regulations 1999. The COMAH Regulations apply to underground gas storage facilities, LNG import facilities and gas reception facilities. All these categories of infrastructure qualify as top tier COMAH sites (those carrying more than 200 tonnes of gas). Section 4.11 of EN-1 provides further information on the COMAH Regulations and the assessment which should be carried out by applicants.

2.6 Borehole sites

2.6.1 Where an activity or operation involves the extraction of a mineral, such as salt in the case of developing salt cavern storage, the site is defined as a borehole site and the Boreholes Sites and Operations Regulations 1995 apply from the beginning of operations on site and will continue to apply during the life of the facility until the borehole is decommissioned. The HSE enforces these regulations.

2.7 EU rules for the Internal Market in Natural Gas

2.7.1 EU Directive 2009/73/EC sets out common rules for the EU internal market in natural gas. Among the matters covered by the Directive is the granting of authorisations for natural gas facilities. The types of gas supply infrastructure and gas pipelines covered by this NPS are natural gas facilities. This NPS and EN-1 implement, as far as the development consent process is concerned, the requirement of Article 4(2) of the Directive that Member States "*lay down objective and non discriminatory criteria"* which shall be met by an applicant applying for an authorisation to build and/or operate natural gas facilities.

2.7.2 Article 4(2) also requires Member States to ensure that the procedures for granting such authorisations take into account the importance of any given project for the internal market in natural gas where appropriate. Therefore, applicants should make clear how, if at all, the developments they are proposing will be involved in the supply of gas across boundaries between EU Member States, and will contribute to the development of a competitive EU-wide gas market as envisaged by the Directive and described in paragraph 3.8.18 of EN-1, and, in addition to the other matters set out in chapter 3.8 of EN-1, the IPC should take account of the contribution which any proposed natural gas infrastructure could make to the functioning of the EU internal market in natural gas, when seeking to evaluate its potential benefits as part of the process of considering whether to grant development consent.

2.8 Underground Natural Gas Storage

Introduction

2.8.1 Underground natural gas storage can take place in porous rock and in salt caverns, both on and offshore. The IPC is responsible for the consenting of onshore natural gas storage facilities as described in Section 1.8 above.

2.8.2 Nationally significant underground natural gas storage facilities will hold 43 million standard cubic metres (Mcm) of gas or higher; or will have a projected delivery flow rate capacity equivalent to 4.5 million standard cubic metres of gas per day (Mcm/d) or higher.

2.8.3 Many of the generic impacts set out in EN-1 are relevant to the consideration of applications for underground natural gas storage facilities. The extent to which they are relevant may depend upon the phase of the proposed development being considered.

2.8.4 The applicant should submit an Environmental Statement (ES) including an assessment of the impact of the project (see Section 4.2 of EN-1).

Factors influencing site selection by applicant

2.8.5 There are limitations as to where natural gas can be stored underground, due to natural geological constraints. The subsurface geology influences the extent of the potential gas reservoir and the feasibility of using it for an underground storage facility.

2.8.6 Natural gas can be stored underground in a gaseous state in porous rock in a depleted or partially depleted oil or gas field. There are a limited number of suitable oil and gas fields in the UK and these tend to be concentrated in eastern England and the Weald basin in the south.

2.8.7 Natural gas can also be stored in man-made salt caverns. In some areas, Britain has salt present in strata which are, or could be, suitable for gas storage. The most extensive areas, where suitably thick natural layers of salt are found, are in northern England and in smaller areas further south.

2.8.8 Aquifer storage is another form of storage in porous media. Porous rock is filled with water and an artificial gas reservoir is created by drilling boreholes into the water bearing rock layer and displacing the water with gas. There must be an impermeable rock layer above the porous media and a suitable geological feature to trap the buoyant gas. There is no history of aquifer storage of natural gas in England and Wales although suitable aquifers are likely to exist.

2.8.9 Applicants should undertake, and supply to the IPC, a detailed geological assessment to demonstrate the suitability of the geology at the site for the type of underground gas storage proposed. When considering storage in porous rock, in a depleted or partially depleted oil or gas field, or in an aquifer, applicants should undertake a detailed geological assessment to determine the suitability of the rocks for underground gas storage. When considering storage in a salt cavity, the geological assessment should include depth below surface, salt thickness, salt purity and presence of shale bands which could affect cavern design. In addition, a study of the geological

integrity of the overlying strata and potential for collapse, taking account of the proposed minimum and maximum working pressures, will need to be undertaken. The assessments should include the construction, operational and decommissioning phases and should cover the long term integrity of the affected strata after decommissioning or closure of the storage facility. The IPC will consider the geological assessment alongside the environmental assessment if the former does not form part of the ES.

2.8.10 The siting of gas storage facilities will also be influenced by safety considerations. Section 4.12 of EN-1 and Section 2.5 of this NPS set out how the hazardous substances regime is applied to gas storage infrastructure.

2.9 Underground Natural Gas Storage Impacts: Noise and Vibration

Introduction

2.9.1 Section 5.11 of EN-1, sets out the generic considerations to be given to the impacts of noise and vibration. In addition, there are specific noise and vibration considerations which apply to underground natural gas storage as set out below.

2.9.2 The development of gas storage facilities could involve specific noise impacts, which may vary according to the type of underground storage facility. During the pre-construction phase there could be vibration effects from seismic surveys. During construction, noise impacts could arise from the drilling of new boreholes into existing gas bearing geological strata or other suitable natural cavities, and from brine pumping.

2.9.3 During operation, the different modes of operating gas storage facilities will include both free-flow and compression. Free-flow may involve a significant reduction in pressure from the reservoir to the National Transmission System (NTS) line pressure, thereby potentially giving rise to high noise levels. Sources of noise during the compression mode will include noise from the compressors and drivers (usually contained in buildings), associated pipework and external coolers.

Applicant's assessment

2.9.4 The ES should include an assessment of noise and vibration impacts (see Section 5.11 of EN-1) and include technology-specific issues such as those outlined above, where they are relevant. The assessment should cover the impact of any night-time operations, for example continuous drilling to maintain pressure, and explain the need for this.

IPC decision making

2.9.5 The IPC should follow the principles for decision making set out in Section 5.11 of EN-1.

Mitigation

2.9.6 Typical noise mitigation measures for gas supply and storage infrastructure include acoustic cladding for buildings, the use of sound attenuators on ventilation systems, acoustic lagging on pipework, multi-stage (inherently quiet) control valves, gas turbine exhaust silencers, acoustic enclosures on pumps, low speed cooler fans and the use of electric rather than gas powered compressors.

2.10 Underground Natural Gas Storage Impacts: Water Quality and Resources

Introduction

2.10.1 During the construction of an underground gas storage facility in a salt bed or in an aquifer there could be effects on the water environment. In a salt bed storage construction there will be a large demand for water. The specific issue to be considered is the abstraction of water to leach the salt caverns. The IPC needs an accurate picture of this in order to understand the environmental impacts of the proposed underground storage project. The impact of the subsequent disposal of the brine is covered in Section 2.11. In the case of aquifer storage, the issue is likely to be the displacement of groundwater.

2.10.2 Section 5.15 of EN-1 sets out generic policy on the protection of the water environment during the construction, operation and decommissioning of a project. Section 4.10 of EN-1 sets out considerations on the pollution control framework. EN-1 emphasises the need for good design and planning to ensure the efficient use of water, including water recycling. It also covers the biodiversity implications of water abstraction.

Applicant's assessment

2.10.3 In a salt cavity development, the applicant should provide an assessment of the effect of abstracting water for solution mining on groundwater resources, the natural environment and the public water supply. The applicant should assess whether water abstraction for the new development is likely to result in the loss or reduction of water available to any licensed or unlicensed groundwater abstractions or ecological receptors such as rivers and wetlands dependent upon groundwater. The applicant should also assess the impact of the mobilisation of salt and other pollutants, with respect to groundwater quality. This should be part of the ES (see Section 5.15 of EN-1).

2.10.4 It is likely that in most cases an abstraction licence will be necessary to obtain water for solution mining and, in some situations, to cover the removal of brine from the cavities.

2.10.5 In the case of aquifer storage, the applicant should assess the impact of the displacement of groundwater with respect to its potential interference with groundwater flow pathways, mobilisation of contaminants, flood risk, and potential effects on groundwater dependant ecosystems.

2.10.6 Applicants are advised to make contact, at or before the pre-application stage, with the Environment Agency (EA) to discuss the requirements for abstraction licences and environmental permits and other consents (see Section 5.15 of EN-1).

IPC decision making

2.10.7 Before making any decisions the IPC will need to liaise with the EA over any arrangements for licensing water abstraction. The IPC should not refuse development consent unless it has good reason to believe that

any necessary abstraction licences and environmental permits will not subsequently be granted (see Section 5.15 of EN-1).

2.10.8 The IPC should be satisfied that the impacts on water quality and resources are acceptable in accordance with Section 5.15 of EN-1. The IPC should liaise with the EA over the potential for the new development to result in loss or reduction of supply to any licensed abstraction or unlicensed groundwater abstraction, or any potential interference with current legitimate uses of groundwater or surface waters, including environmental permits or any negative effect on a groundwater dependent ecosystem.

Mitigation

2.10.9 Measures to control the abstraction of water will be covered by abstraction licences and environmental permits. Taking account of these and any EA advice, the IPC should consider whether any mitigation measures are necessary by way of conditions to the development consent order in accordance with Section 5.15 of EN-1.

2.11 Underground Natural Gas Storage Impacts: Disposal of Brine

Introduction

2.11.1 A newly developed salt cavern gas storage facility will require leaching new salt cavities, whether built on the site of an existing salt mine or not. This involves injecting water into the underground strata to dissolve the salt until cavities of sufficient dimension have been formed and then the brine is withdrawn through the same well bore. Where associated pipelines are required to carry brine, these should be part of the application. The issue is the disposal of the brine.

Applicant's assessment

2.11.2 The ES should include measures to dispose of brine which mitigate its potential adverse environmental effects. Where pipelines are required to carry the brine away, these should be located outside of source protection zones[5] 1 and 2. If it is not possible to avoid these zones, the applicant will need to demonstrate the use of best available techniques for pollution prevention (details of pollution control regimes are set out in Section 4.10 of EN-1). Wherever possible, measures should include disposing of the brine for commercial use by industry so that mineral resources are used sustainably. Applicants should only propose disposing of brine to an underground reservoir (for example, a disused salt mine) or to the sea as a last resort where there is no practical option for re-use. Where the proposed development involves any discharges to water bodies, including to groundwater or to the sea, the EA should be contacted early on in the process, at or before the pre-application consultation stage, to discuss the requirements (including the information required from the applicant).

IPC decision making

2.11.3 Before making any decisions, the IPC should liaise with the EA over any arrangements for discharging brine into a reservoir or the sea to ensure that any discharges can be adequately regulated. The IPC should not refuse consent unless it has good reason to believe that any necessary environmental permits or discharge consents will not subsequently be granted (see Section 4.10 of EN-1).

Mitigation

2.11.4 Measures to discharge brine into an underground reservoir or the sea, where either is an appropriate course of action, will need to be covered by environmental permits or discharge consents. Taking account of these and any EA advice, the IPC should consider whether any mitigation measures are necessary by way of requirements in the development consent order. Where the brine is discharged to the sea, for example, these could relate to the siting offshore of the outflow pipe (to reduce impact on sensitive flora and/or fauna) and the rate of discharge (to reduce saline concentration levels).

5 The Environment Agency identifies source protection zones as part of its groundwater protection policy. For further information see http://www.environment-agency.gov.uk/research/library/publications/40741.aspx

2.12 LNG Import Facilities

Introduction

2.12.1 LNG import facilities receive LNG from tanker ships. The gas is cooled to a temperature of -160 degrees C, reducing the volume by a factor of 600, for transport.

2.12.2 Conventional onshore LNG import facilities are major installations with unloading facilities (including a jetty), onshore storage and regasification plant. The storage tanks serve the important function of enabling the deliveries of LNG into the terminal to be stored and subsequently converted into gas for transportation by pipeline into the National Transmission System. The regasification plant is essential to raise the temperature of the LNG to convert it to gas.

2.12.3 Many of the generic impacts set out in EN-1 are relevant to the consideration of applications for LNG import facilities. The extent to which they are relevant may depend upon the phase of the proposed development being considered.

2.12.4 The applicant should submit an ES including an assessment of the impact of the project (see Section 4.2 of EN-1).

Factors influencing site selection by applicant

2.12.5 There are some important considerations which will affect the choice of LNG import and storage facility sites.

2.12.6 The primary technical siting considerations for a conventional LNG terminal will be the combination of a deepwater jetty for berthing LNG carriers, availability of a suitably large site for the necessary onshore industrial development and pipeline access from the LNG terminal to the National Transmission System. Safety considerations and proximity to dwellings, workplaces and other buildings and facilities used by the public will be relevant factors. Section 4.12 of EN-1 and Section 2.5 of this NPS set out how the hazardous substances regime is applied to gas supply infrastructure.

2.13 LNG Import Facilities Impacts: Noise and Vibration

Introduction

2.13.1 Section 5.11 of EN-1 sets out the generic considerations to be given to the impacts of noise and vibration. In addition there are specific noise and vibration considerations which apply to LNG import facilities as set out below.

2.13.2 LNG import facilities will be located in coastal regions. Noise sources will include process plant, including compressors. In addition noise may be generated by the LNG pumps located on board the LNG tankers, and this source of noise should not be overlooked in a noise assessment.

Applicant's assessment

2.13.3 The ES should include an assessment of noise and vibration effects (see Section 5.11 of EN-1) including the specific issues outlined above, where they are relevant.

IPC decision making

2.13.4 The IPC should follow the principles for decision making set out in Section 5.11 of EN-1.

Mitigation

2.13.5 Typical noise mitigation measures for gas supply and storage infrastructure include acoustic cladding for buildings, the use of sound attenuators on ventilation systems, acoustic lagging on pipework, multi-stage (inherently quiet) control valves, gas turbine exhaust silencers, acoustic enclosures on pumps and low-speed cooler fans.

2.14 LNG Import Facilities Impacts: Landscape and Visual

Introduction

2.14.1 Section 5.9 of EN-1 sets out the generic considerations to be given to landscape and visual impacts. In addition there are specific landscape and visual considerations which apply to LNG import facilities as set out below.

Applicant's assessment

2.14.2 The ES should include an assessment of landscape and visual effects (see Section 5.9 of EN-1) including the specific issues outlined under mitigation below.

IPC decision making

2.14.3 The IPC should follow the principles for decision making set out in Section 5.9 of EN-1.

Mitigation

2.14.4 EN-1 suggests that one way to mitigate the visual and landscape effects of a project would be to reduce its scale. However, as Section 5.9 of EN-1 recognises, reducing the scale or otherwise amending the design of a proposed energy infrastructure project may result in a significant operational constraint and reduction in function, making the project unfeasible. The appearance of some large gas supply infrastructure, such as the large storage tanks required at LNG import facilities, can be improved through countersinking or the use of squat tanks, without any significant operational constraint or reduction in function. Where visual impact is likely to be an issue, the applicant's assessment should consider such options.

2.15 LNG Import Facilities Impacts: Dredging

Introduction

2.15.1 EN-1 sets out generic considerations for impacts on biodiversity, coastal change (including the impact of dredging and dredge spoil deposition), waste management, water quality and resources. These are relevant across a range of energy infrastructure projects. This section sets out further considerations in relation to the impacts of dredging and spoil deposition at an LNG facility. Dredging is a licensable activity under Part 4 of the Marine and Coastal Access Act.

2.15.2 LNG import facilities are located on coasts and estuaries. During the operation of an LNG import facility, LNG tanker deliveries by sea will be essential to the facility. This activity gives rise to the need for dredging in order for the deep water channel and jetty to maintain declared depths and to deepen waters to accommodate the large tankers. Subsequently the dredge spoil has to be deposited responsibly.

2.15.3 Dredging may have specific effects on the local marine, coastal and estuarine environments, which are often of fundamental importance to biodiversity, particularly to bird and fish life. For example, dredging can result in the smothering of nearby habitats and benthic communities, and local increases in suspended sediment concentrations may have an effect on fisheries, leading to the migration of fish, whilst disturbed sediment could contain contaminated material. Dredging can also affect water quality and resources. Other potential impacts include chemical pollution, and morphological changes, exposure to contaminants and adverse effects on heritage assets.

Applicant's assessment

2.15.4 The applicant should include an assessment in the ES (see Section 4.2 of EN-1) of the dredging required (a) to construct the LNG import facility and (b) to maintain an access channel or berth integral to the facility. The assessment should take into account the magnitude and frequency of dredging and the method selected.

2.15.5 As explained in Section 5.3 of EN-1, the ES should set out any effects on designated sites, protected species and on other biodiversity afforded conservation priority. Where relevant, applicants should undertake sediment transfer modelling to predict and understand impacts and help identify relevant mitigating or compensatory measures. The assessment should include the effects on water quality and resources, and on coastal change (see also Sections 5.15 and 5.5 respectively of EN-1 for further information on these).

2.15.6 The applicant should assess the scope for mitigating impacts such as by avoiding dredging at certain times of the year.

2.15.7 As explained in Section 5.3 of EN-1, the applicant should be careful to identify the effects on Marine Conservation Zones and designated protected areas. Applicants should consult the Marine Management Organisation (MMO) at an early stage about this.

IPC decision making

2.15.8 In assessing the application, the IPC should ensure that the relevant marine agency has been consulted and that appropriate weight is attached to designated protected marine and coastal habitats, protected species, biodiversity and the water environment, and to impacts on coastal processes and geomorphology. Consultation of the relevant marine management agency should include consideration of the impact of a project in combination with any other developments that may be proposed, particularly those involving dredging and disposal.

Mitigation

2.15.9 Applicants should propose appropriate mitigation measures to address adverse effects of dredging. Applicants should also demonstrate that during construction and operation, best practice will be followed to ensure that risk of disturbance of, or damage to, species or habitats is avoided or minimised. Sections 5.3, 5.5 and 5.15 of EN-1 provide further information about mitigation measures.

2.16 Gas Reception Facilities

Introduction

2.16.1 Onshore gas reception facilities currently receive gas in gaseous form by pipeline from fields on the UK Continental Shelf (UKCS) and imports by pipeline from continental Europe. Gas reception facilities process gas to remove hydrocarbon liquids, water and other impurities, and bring it into a condition that is acceptable for entry into the National Transmission System (NTS) (where it needs to be in a state that is normally classed as dry sales gas and is fit for burning in domestic appliances).

2.16.2 Nationally significant gas reception facilities will have a projected maximum flow rate of at least 4.5 million standard cubic metres of gas per day (Mcm/d).

2.16.3 Many of the generic impacts set out in EN-1 are relevant to the consideration of applications for gas reception facilities. The extent to which they are relevant may depend upon the phase of the proposed development being considered.

2.16.4 The applicant should submit an ES including an assessment of the impact of the project (see section 4.2 of EN-1).

Factors influencing site selection by applicant

2.16.5 Gas reception facilities are linked to the wider network of onshore and offshore gas supply infrastructure and this places limits and requirements on their location.

2.16.6 Gas reception terminals will receive gas piped ashore from producing fields, offshore natural gas storage facilities, and potentially LNG imports where these are regasified at sea. Modifications to existing gas reception terminals could be necessary to enhance the efficiency of the terminals or accommodate new fields and/or more complex and specialised processing equipment needed as a result of changes in gas production. For example, as the more marginal UKCS fields are developed in the future, it is likely that there will be a need to handle more toxic or inert gases, resulting in more hazardous operational activities and waste streams.

2.16.7 Because of their function, gas reception facilities are most efficiently sited near the source of incoming natural gas that needs to be processed. Factors which may therefore be relevant to their location include the location of new and existing producing fields, offshore natural gas storage facilities and LNG tanker routes. Access to the National Transmission System by pipeline will be a further factor, as will proximity to the wider network of onshore and offshore gas supply infrastructure. Developers may therefore be faced with a limited set of options for sites and these are likely to be close to existing gas reception terminals. As with all gas supply infrastructure, safety considerations including proximity to dwellings, workplaces and other buildings and facilities used by the public, will be relevant factors. Section 4.12 of EN-1 and Section 2.4 of this NPS set out how the hazardous substances regime is applied to gas storage infrastructure.

2.17 Gas Reception Facilities Impacts: Noise and Vibration

Introduction

2.17.1 Section 5.11 of EN-1 sets out the generic considerations to be given to the impacts of noise and vibration. In addition there are specific noise and vibration considerations which apply to gas reception facilities as set out below.

2.17.2 Gas reception facilities will be located in coastal regions and sources of noise will include above ground pipework, compressors (usually located in buildings) and process equipment such as heaters and inter-stage coolers. The compressors may either be electric motor or gas turbine driven. Electric motors are preferable in terms of environmental noise considerations. Where gas turbines are used, the gas turbine exhausts may be a significant source of low frequency noise unless adequately controlled. Control valves may also be a source of noise which can be radiated by the associated pipework systems.

Applicant's assessment

2.17.3 The ES should include an assessment of noise and vibration effects (see Section 5.11 of EN-1) including the specific issues outlined above, where they are relevant.

IPC decision making

2.17.4 The IPC should follow the principles for decision making set out in Section 5.11 of EN-1.

Mitigation

2.17.5 Typical noise mitigation measures for gas supply infrastructure include the use of sound attenuators on ventilation systems, acoustic lagging on pipework, multi-stage (inherently quiet) control valves, gas turbine exhaust silencers, acoustic enclosures on pumps and low-speed cooler fans.

2.18 Gas Reception Facilities Impacts: Gas Emissions

Introduction

2.18.1 There could be specific gas emission impacts which result from gas storage and supply infrastructure, for example due to the need to flare or vent gas. The most significant emissions are likely to come from gas reception facilities where flaring of gas is used to deal with a continuous stream of low volume waste gas from the processing. The venting of gas may be undertaken occasionally at facilities when there are relatively low volumes of hydrocarbon gas that need to be disposed of safely, usually associated with commissioning, decommissioning and maintenance operations.

2.18.2 The flaring or venting of gas during the operation of a facility is regulated by the Environmental Permitting Regulations (EPR) which are administered by the EA. Section 4.10 of EN-1 provides guidance on the Environmental Permitting regime. Applicants are advised to make early contact with the EA to discuss the requirements at or before the pre-application stage. DECC is responsible for ensuring that the waste of a national resource (hydrocarbons) through flaring or venting is minimised and applicants should contact DECC to check if flaring and venting consents are required from that Department.

2.18.3 The effects of gas emissions and the specific effects of flaring or venting gas should be assessed. Applicants should follow the generic considerations on these issues set out in EN-1. In particular, Section 5.2 of EN-1 provides guidance on the effects of emissions on air quality (which can have implications for human health, protected species and habitats or the wider countryside); Section 5.4 of EN-1 explains the importance of considering impacts on civil and military aviation – applicants should consider the effect of gas emissions on low flying military aircraft and the implications for siting of facilities; and Section 5.3 of EN-1 provides guidance on biodiversity– any adverse effects of gas flares, which could attract birds, should be considered.

Applicant's assessment

2.18.4 The applicant's assessment should include an assessment of gas emissions and any adverse effects due to the venting or flaring of gas. The ES should include an assessment of the effects of gas emissions on air quality in accordance with Section 5.2 of EN-1.

IPC decision making

2.18.5 The IPC should follow the principles for decision making as set out in the relevant sections of Parts 4 and 5 of EN-1.

Mitigation

2.18.6 The routine or periodic release of natural gas should be avoided as far as possible, and, where it takes place, its impacts should be minimised: as explained in 2.18.1 above, flaring is one way to do this.

2.18.7 Mitigation measures to minimise the production of waste gas and effects on air quality include the use of emission control measures, the recovery and re-use of waste gas (for example at an LNG facility by exporting it to the low pressure gas network) or by combusting the process gas to reduce greenhouse gas emissions by converting the methane to the less harmful carbon dioxide (flaring). Mitigation measures to reduce the hazards of gas flares to birds could include reducing or shielding light from the flare and/or site during high risk periods.

2.19 Gas and Oil Pipelines

Introduction

2.19.1 The gas and oil pipeline networks extend between storage and distribution facilities, and provide an important transport mechanism for natural gas, petrol, gas oil, heating oil, diesel and aviation fuel. Nationally significant pipelines are those described in section 1.8 of this NPS.

2.19.2 Many of the generic impacts set out in EN-1 are relevant to the consideration of applications for gas and oil pipelines. The extent to which they are relevant may depend upon the phase of the proposed development being considered. The applicant should identify the impacts of a proposal in accordance with paragraph 2.1.3 of this NPS.

2.19.3 The applicant should submit an ES including an assessment of the impact of the project (see section 4.2 of EN-1).

Pipeline safety

2.19.4 The principal legislation governing the safety of pipelines (Pipelines Safety Regulations 1996) requires that pipelines are designed, constructed and operated so that the risks are as low as is reasonably practicable (ALARP).

2.19.5 The HSE enforces these regulations, which place general duties on all pipeline operators and additional duties on the operators of Major Accident Hazard Pipelines. The additional duties require the pipeline operator to provide certain information to HSE at various stages in the lifecycle of a pipeline. In determining compliance, HSE expects pipeline operators to apply relevant good practice as a minimum. The IPC should seek advice from HSE about safety issues when considering an application[6].

2.19.6 In the pipeline industry there are well established standards, covering design, operation and maintenance of UK sector major accident hazard pipelines which can be used to demonstrate risks are ALARP. If a pipeline operator wishes to use other standards, recommendations or guidance then this should be discussed with the HSE and may be acceptable to the HSE, provided that the pipeline operator can demonstrate that they achieve at least the equivalent levels of safety. A gap analysis should be undertaken to confirm this[7].

Factors influencing site selection by applicant

2.19.7 The sections below include references to factors influencing site/route selection by applicants for gas and oil pipeline NSIPs. These are not a statement of Government policy, but are included to provide the IPC and others with background information on the criteria that applicants should consider when choosing a site or route.

6 Further information on the Pipelines Safety Regulations is available at: http://www.hse.gov.uk/pipelines/index.htm

7 Information on standards is available at: http://www.hse.gov.uk/pipelines/resources/pipelinestandards.htm

2.19.8 When designing the route of new pipelines applicants should research relevant constraints including proximity of existing and planned residential properties, schools and hospitals, railway crossings, major road crossings, below surface usage and proximity to environmentally sensitive areas, main river and watercourse crossings. These can be undertaken by means of desk top studies in the first instance, followed up by consulting the appropriate authority, operator, or conservation body if necessary.

2.19.9 Undetected underground cavities from mine workings, abandoned industrial sites and other activities, such as waste disposal, or other utilities' services (water, telecommunication, etc.) could have an effect on the integrity and safety of a pipeline. The effects might include collapse of underground tunnels, damage to utility services and pollution of water courses. Applicants should undertake desktop surveys to identify historic or current mine workings, underground cavities serving industrial usage, the nature of any made ground, waste sites, unexploded ordnance, utility services and any other below surface usage when assessing routes for a pipeline.

2.19.10 When choosing a pipeline route, applicants should seek to avoid or minimise adverse effects from usage below the surface. Where it is not considered practicable to select a route that avoids below surface usage, applicants should demonstrate in the ES that mitigating measures will be put in place to avoid adverse effects both on other below ground works and on the pipeline. Mitigating measures may include: protection or diversion of underground services; gas detection near landfill sites; horizontal direct drilling (HDD) techniques and rerouting. Contaminated material may need to be removed and disposed of.

2.20 Gas and Oil Pipelines Impacts: Noise and Vibration

Introduction

2.20.1 Section 5.11 of EN-1 sets out the generic considerations to be given to the impacts of noise and vibration. In addition there are specific noise and vibration considerations which apply to gas and oil pipelines during the pre-construction and construction phases. The applicant will need to identify all the noise and vibration sensitive receptors likely to be affected during these phases.

2.20.2 During the pre-construction phase there could be vibration effects from seismic surveys. During construction, tasks may include site clearance, soil movement, ground excavation, tunnelling, trenching, pipe laying and welding, and ground reinstatement. In addition, increased HGV traffic will be generated on local roads for the movement of materials. These types of noise and vibration impacts will need to be assessed.

2.20.3 The commissioning of a new pipeline can involve extensive periods of drying after hydrotesting, using air compressors, and noise mitigation may be required for this type of activity.

2.20.4 A new gas pipeline may require an above ground installation such as a gas compression station on the route of the pipeline to boost transmission line pressure. A new oil pipeline may require pumping stations. These may be located in quiet rural areas, and therefore the control of noise from these facilities is likely to be an important consideration.

Applicant's assessment

2.20.5 The ES should include an assessment of noise and vibration effects (see Section 5.11 of EN-1) including the specific issues outlined above, where they are relevant.

IPC decision making

2.20.6 The IPC should follow the principles for decision making set out in Section 5.11 of EN-1.

Mitigation

2.20.7 Noise mitigation measures for gas and oil pipelines, in particular their associated above-ground installations, include screening or enclosure of compressors and pumps. Other measures could include the use of sound attenuators on ventilation systems, acoustic lagging on pipework, multi-stage (inherently quiet) control valves, gas turbine exhaust silencers, and high efficiency low speed cooler fans, depending on the specific issues. Vibration mitigation measures could include the use of non-impact piling such as augur boring.

2.21 Gas and Oil Pipelines Impacts: Biodiversity, Landscape and Visual

Introduction

2.21.1 Sections 4.3 and 5.9 of EN-1 sets out the general principles that should be applied in the assessment of biodiversity and landscape and visual impacts. Additional considerations apply during the construction of a pipeline (which, without mitigation, can affect both landscape and ecology). These comprise the effect upon specific landscape elements within and adjacent to the pipeline route, such as grasslands, field boundaries (hedgerows, hedgebanks, drystone walls, fences), trees, woodlands, and watercourses. There will also be temporary visual impacts caused by the need to access the working corridor and to remove flora and soil. The working width of the pipeline will vary depending on the surrounding terrain. Temporary impacts could include large excavations where deep pits are needed for boring beneath rivers, roads and sensitive features.

2.21.2 Long term impacts upon the landscape for pipelines are likely to be limited, as once operational the main infrastructure is usually buried. They are likely to include:

- limitations on the ability to replant landscape features such as hedgerows or deep-rooted trees over or adjacent to the pipeline; and
- structures and indication points necessary to identify the pipeline route and provide it with service access.

Applicant's assessment

2.21.3 The ES should include an assessment of the biodiversity and landscape and visual effects of the proposed route and of the main alternative routes considered (see Section 5.9 of EN-1). The application should also include proposals for reinstatement of the pipeline route as close to its original state as possible and take into account any requirements for agreements with the landowner to access areas for aftercare and management work. Where it is unlikely to be possible to restore landscape to its original state, the applicant should set out measures to avoid, mitigate, or employ other landscape measures to compensate for, any adverse effect on the landscape.

IPC decision making

2.21.4 The IPC should follow the principles for decision making set out in Sections 4.3 and 5.9 of EN-1.

Mitigation

2.21.5 Mitigation measures to protect the landscape and ecology could include reducing the working width required for the installation of the pipeline in order to reduce the impact on the landscape where it will not be possible to fully reinstate the route.

2.21.6 In circumstances where the habitat to be crossed contains ancient woodland, trees subject to a Tree Preservation Order, or hedgerows subject to the Hedgerows Regulations 1997, the applicant should consider whether it would be feasible to use horizontal direct drilling under the ancient woodland or thrust bore under the protected tree or hedgerow and the IPC should consider requiring this, where not included in the proposal.

2.22 Gas and Oil Pipelines Impacts: Water Quality and Resources

Introduction

2.22.1 Section 5.15 of EN-1 sets out generic policy on the protection of the water environment during the construction, operation and decommissioning of a project. Section 4.10 of EN-1 sets out policy on the pollution control framework. EN-1 emphasises the need for good design and planning to ensure the efficient use of water, including water recycling.

2.22.2 Constructing pipelines creates corridors of surface clearance and excavation that can potentially affect watercourses, aquifers, water abstraction and discharge points, areas prone to flooding and ecological receptors. Pipeline impacts could include inadequate or excessive drainage, interference with groundwater flow pathways, mobilisation of contaminants already in the ground, the introduction of new pollutants, flooding, disturbance to water ecology, pollution due to silt from construction and disturbance to species and their habitats. Impacts during construction should be avoided as far as possible through route selection or mitigated if unavoidable and ground should be reinstated after construction.

Applicant's assessment

2.22.3 Where the project is likely to have effects on water resources or water quality, for example impacts on groundwater recharge or on existing surface water or groundwater abstraction points, or on associated ecological receptors, the applicant should provide an assessment of the impacts in line with Section 5.15 of EN-1 as part of the ES.

2.22.4 Where the project is likely to give rise to effects on water quality, for example through siltation or spillages, discharges from maintenance activities or the discharge of disposals such as wastewater or solvents, the applicant should provide an assessment of the impacts.

IPC decision making

2.22.5 The IPC should be satisfied that the impacts on water quality and resources are acceptable in accordance with Section 5.15 of EN-1. The IPC should liaise with the EA over the potential for the new development to result in loss or reduction of supply to any licensed abstraction or unlicensed groundwater abstraction, or any potential interference with current legitimate uses of groundwater or surface waters, taking account of the terms of any relevant environmental permits or any negative effect on a groundwater dependent ecosystem.

Mitigation

2.22.6 Mitigation measures to protect the water environment may include techniques for crossing rivers and managing surface water before and after construction, including restoring vegetation and using sustainable drainage systems to control run-off.

2.22.7 Mitigation measures to protect water quality may include:

- the avoidance of vulnerable groundwater areas or appropriate use of above ground pipeline facilities;
- use of the highest specification pipework and best practice in the storage and handling of pollutants to prevent spillage;
- careful storage of excavated material away from watercourses and facilities for the disposal of sewage and waste;
- use of sustainable drainage systems; and
- careful reinstatement of riverbanks and reed beds.

2.23 Gas and Oil Pipelines Impacts: Soil and Geology

Introduction

2.23.1 New pipelines will be installed in a variety of geological conditions. It will be important for applicants to understand the soil types and the nature of the underlying strata. Underground cavities and unstable ground conditions may present particular risks to pipeline projects. Impacts could include sterilisation of mineral resources or loss of soil quality.

Applicant's assessment

2.23.2 Applicants should assess the stability of the ground conditions associated with the pipeline route and incorporate the findings of that assessment in the ES (see Section 4.2 of EN-1) as appropriate. Desktop studies, which include known geology and previous borehole data, can form the basis of the applicant's assessment. The applicant may find it necessary to sink new boreholes along the preferred route to better understand the ground conditions present. The assessment should cover the options considered for installing the pipeline and weigh up the impacts of the means of installation. Where the applicant proposes to use horizontal directional drilling (HDD) as the means of installing a pipeline under a National or European Site and mitigating the impacts, the assessment should cover whether the geological conditions are suitable for HDD.

2.23.3 When considering any application where the pipeline goes under a designated area of geological or geomorphological interest, the applicant should submit details of alternative routes, which either bypass the designated area or reduce the length of pipeline through the designated area to the minimum possible, and the reasons why they were discounted.

2.23.4 Applicants should consult with the relevant statutory consultees at an early stage.

IPC decision making

2.23.5 The IPC should take into account the impact on and from geology and soils when considering a pipeline project. A proposal will be acceptable from the point of view of soil and geology if the applicant has proposed a route and other measures (if applicable) that either eliminates any adverse impacts on soil and geology or reduces them to an acceptable level and that the route chosen does not adversely affect the integrity of the pipeline, for example, by increasing materially the risk of fracture or impact on areas of high population. The HSE can advise on the suitability of the pipeline route and on the design of the pipeline.

2.23.6 Where the applicant has considered and discounted a route or routes on the ground that the soil is unstable and susceptible to landslip, the IPC should consult the HSE for their views on its suitability and its impact on the integrity of the pipeline.

Mitigation

2.23.7 Mitigation measures to minimise any adverse effects on soil and geology should include measures to ensure that residual impacts on the surface are minor, for example some differential vegetation growth. Mitigation measures should include appropriate treatment of soil (and in particular topsoil) during site construction and other infrastructure activity (and appropriate soil storage and reinstatement in line with the principles and practices outlined in the Code of Practice for the Sustainable Management of Soils on Construction Sites[8]. The IPC should consider what appropriate conditions should be attached to any consent.

2.23.8 Where HDD is proposed, the applicant should provide an alternative plan for installing the pipeline in the event that HDD fails. Such alternative means could include open cut, micro-tunnelling and tunnelling.

8 The Code of Practice for the Sustainable Management of Soils on Construction Sites is available at: http://www.defra.gov.uk/environment/quality/land/soil/built-environ/documents/code-of-practice.pdf

Glossary[9]

ALARP	As low as reasonably practicable
AoS	Appraisal of Sustainability
Associated Development	Development associated with the NSIP as defined in Section 115 of the Planning Act 2008
Benthic communities	Those organisms attached to, or living on, in or near, the seabed in a given area, which can include the intertidal area of the sea bed.
CLG	Department for Communities and Local Government
COMAH	Control of Major Accident Hazards
EA	Environment Agency
EN-1	Overarching NPS for Energy
ES	Environmental Statement
Generic impacts	Potential impacts of any energy infrastructure projects, the general policy for consideration of which is set out in Part 5 of EN-1
HDD	Horizontal Direct Drilling
HRA	Habitats Regulations Assessment
HSA	Hazardous Substances Authority
HSE	Health and Safety Executive
IPC	Infrastructure Planning Commission
LNG	Liquefied Natural Gas
LPAs	Local Planning Authorities
MCA	The Maritime & Coastguards Agency
Mcm	Million Cubic Metres
Mcm/d	Million Cubic Metres Per Day
MMO	Marine Management Organisation
MPS	Marine Policy Statement
NPS	National Policy Statement
NSIP	Nationally Significant Infrastructure Project
NTS	National Transmission System
SEA	Strategic Environment Assessment (under the directive of the same name)
The storage or working capacity test	= the NSIP threshold; a project would pass this test if the storage capacity on completion of the proposal is expected to be at least 43 million standard cubic metres (Mcm) of gas or higher
The maximum flow rate test	= the NSIP threshold; a project would pass this test if it has a projected delivery flow rate of at least 4.5 million standard cubic metres per day (Mcm/d)
UKCS	UK Continental Shelf

9 This glossary sets out the most frequently used terms in this NPS. There is a glossary in each of the energy NPSs. The glossary set out in EN-1 may also be useful when reading this NPS.

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