UKOPA/11/0057

Gas and Pipelines Strategy

1. Sector Context

1.1 Scope

1.1.1 The gas and pipelines sector is essential in supporting the energy distribution needs of GB's industrial, commercial and domestic consumers. As the UK reserves of gas and oil decline, the sector is of growing strategic importance in both maintaining the flow of UK fuels and in facilitating the importation and storage of fuel (principally natural gas) essential to meeting the country's growing energy shortfall. Failures at some strategic parts of the onshore and offshore networks would have not only significant health and safety impacts but could impact upon our energy distribution and supply capability.

1.1.2 The sector consists of onshore and offshore pipelines and gas processing, import and storage facilities. The gas storage and import industries are currently undergoing significant expansion in reaction to the UK's energy needs.

1.1.3 This document relates to four principal types of facility

- **Offshore pipelines** - used to transfer oil and gas extracted from beneath the North Sea and other areas from offshore installations to onshore facilities;

- **Onshore pipelines -** used to transport both gas and other fluids across the country;

- **Gas importation, processing and storage –** including sub-sea pipelines, sea-going vessels carrying Liquefied Natural Gas (LNG) and processing at beach terminals and;

- **Emerging energy sources –** including biomethane generated by the anaerobic digestion of organic waste, coal-bed methane, underground coal gasification and carbon capture.

1.1.4 The pipelines and gas distribution systems considered here carry products that if released generally present a major fire and explosion hazard. As pipelines and the gas distribution system are spread across the country, potentially anyone within the general population could be exposed to risk in the event of failure. Consequently, the focus of this strategy is the prevention of fire and explosion associated with catastrophic failure. The particular exposed populations are considered in greater detail at 2.2.5.

2. Pipelines

2.1 Industry Size:

2.1.2 Offshore:

2.1.2 (a) Offshore pipelines transfer oil and gas extracted from beneath the North Sea and other areas of the UK Continental Shelf (UKCS) between offshore installations and then to onshore facilities. Offshore pipelines also connect GB to the European gas market and facilitate the international trading of natural gas. Ensuring the integrity of these pipelines is critical to both safety and meeting UK energy needs. In the future, these, or similar, pipelines are also likely to carry CO2 for sequestration in depleted oil and gas reservoirs.

2.1.2 (b) There are over 260 Production Installations. Of these approximately 120 are unattended except for maintenance and other activities. Each installation may have up to 20 ESDVs protecting gas, oil and multi-phase pipelines:

- Number of installations covered 260
- Number of fully manned installations 140
- Length of pipelines within UKCS and territorial waters 20,000km

2.1.3 Onshore**:**

2.1.3 (a) Onshore pipelines are used to transport both gas and other fluids across the country. There are over 22,000 kilometres of Major Accident Hazard Pipeline (MAHP) onshore in the UK. The major gas system is the natural gas (methane) grid that transports gas from its point of importation or generation to the consumers, including industrial, commercial and domestic premises. This network includes over 275,000km of pipework. Maintaining the integrity of onshore pipelines is essential to avoiding catastrophe and to maintaining the energy supply networks.

2.1.3 (b) The National Transmission System (NTS) is the high pressure part of National Grid's transmission system and it consists of more than 7,500 Kilometres of welded steel pipeline operating at pressures of up to 85 bar (85 times normal atmospheric pressure, over 1250 psi). The gas is pushed through the system using 26 strategically placed compressor stations. From over 140 off-take points the NTS supplies gas to industrial consumers, 40 power stations and the Local Distribution Zones which operate at lower pressures and eventually supply gas to the meter of every consumer. The major Distribution Networks are operated by four companies, Scotia Gas Networks, National Grid Gas, Northern Gas Networks and Wales & West Utilities (collectively know here as DNOs):

- Total length of gas distribution network 278,000km
- Of which National Transmission System operating at up to 85 barg 7,500km
- Of which the Local Transmission System 14,000km
- Total length of distribution system in scope of decommissioning programme 100,000km

(see http://www.nationalgrid.com/uk/Gas/About/How+Gas+is+Delivered/ and

http://www.hse.gov.uk/gas/supply/mainsreplacement/irongasmain.htm).

2.1.3 (c) In addition to the gas network, there are approximately 1,100 kilometres of MAHPs transporting ethylene and other important industrial products. Other non-MAHPs that transport gasoline and aviation fuel between storage facilities and airports, are a critical part of GB's transport, and defence infrastructure.

2.2 Industry Demographics:

2.2.1 Currently, the pipelines sector is not a coherent industry grouping. Rather, pipelines are industrial assets that facilitate the operation of a wide range of businesses. To facilitate mutual learning stakeholders will be encouraged to improve the information collation and sharing mechanisms they have developed. This will also contribute to providing public reassurance regarding standards achieved by the industry. (5.1.2)

2.2.2 Pipeline operators vary in nature and size:

- Offshore - Many offshore and other pipelines are operated by businesses whose primary focus is the exploitation of gas and oil reserves and includes many multi-national businesses.

- Onshore - Many onshore pipelines are operated by large energy businesses. This includes those that operate the gas distribution network that transports natural gas from offshore installations through storage facilities to the premises of millions of domestic and commercial users. Other pipelines are operated by companies whose primary focus is the chemical processing industry.

2.2.3 Offshore and onshore pipeline assets generally stand alone. Once constructed and commissioned, they engage very few employees. Although the companies operating pipelines may be diverse, those responsible for the pipelines are generally a speciality within the individual businesses. The large majority of those responsible for pipelines and gas processing, import and storage facilities have considerable technical expertise. Many of the organisations within which they work are sophisticated with a significant technology base. These professionals participate in a limited number of specialist groupings, which are focussed on pipeline operations. Therefore, senior managers and engineers directly responsible for pipeline safety are a discrete cohort of professionals with common skills and knowledge. (5.2.1, 5.2.2)

2.2.4 Overall, the level of leadership within the groups directly responsible for pipeline integrity is good. However, there can be tendencies within smaller companies for overall leadership relating to major accident hazards to slip. Large companies, where pipeline operation may be an ancillary activity, risk losing focus on this priority area. In all companies, the competence of the workforce and their understanding of the risks (and associated control measures) is essential to the safety of individual workers and to the avoidance of catastrophe. There can also be a tendency for the impact of leadership from the top to be diluted when activities are sub-contracted. Pressure, especially that channelled through industry and professional bodies, needs to be maintained to prevent this. (5.2.1and 5.2.2)

2.2.5 Without risk of a great deal of double counting, it is very difficult to identify a particular sector within the workforce that is especially at risk because of their direct involvement with pipelines. At most, this sector would be a few thousand employees. Rather, the focus is on protecting those engaged in other activities alongside pipelines. There are no particular health issues associated with pipeline activities.

i) Offshore, the failure of a pipeline at the installation threatens all the workforce at that installation, so the affected population here is the same as that considered within the wider Offshore Strategy that forms the earlier part of this document.
ii) Onshore, those at risk from the hazards presented by major accident pipelines include:

- People engaged in the construction, installation and maintenance of pipelines.
- Those carrying out activities such as construction work over or near pipelines.
- Employees at sites (and subject to COMAH regulations) to and from which pipelines run.
- Anyone at work and members of the public in the vicinity of major hazard pipelines, or the gas distribution system.

2.2.6 Pipelines are also relevant within the Emerging Energy Technologies including the injection of biomethane into the gas distribution networks and CO2 transportation as part of Carbon Capture and Storage strategies. (5.1.9, 5.3.1 and 5.3.2)

2.3 Regulation:

2.3.1 Effective regulation of the sector is important because failure to maintain pipeline or gas facility integrity has the potential to result in catastrophic consequences involving both the public and workers. A significant integrity failure at certain sites or pipelines would also impact severely on the ability to supply gas to UK plc. Ensuring the containment of transported fluids (e.g. oil) also contributes to environmental protection and supports the work of the COMAH Competent Authority.

2.3.2 As well as the general requirements of the Health and Safety at Work Act, the sector is subject to Offshore Installations (Safety Case) Regulations 2005, the Control of Major Accident Hazard Regulations 1999 (COMAH), the Pipelines Safety Regulations 1996 (PSR) and the Gas Safety (Management) Regulations 1996 (GSMR). Annex 1 details the mandatory duties placed on HSE by these regulations. However, in the broad view, the regulations place duties on operators and regulators to identify, control, prevent and mitigate potential major accidents. The maintenance of technical standards and the management of risk are driven via safety case regimes with specific responsibilities placed on duty holders to demonstrate their compliance and on regulators to assess, inspect and investigate. These processes are required by COMAH, GSMR and PSR and are necessary to assess existing standards and compliance. A summary of relevant legislation is at Annex 1.

2.3.3 The UK's offshore pipeline network has many interconnections with neighbouring countries. Those sections of pipeline are also subject to regulatory attention from regulators in Belgium, the Netherlands, Norway, Northern Ireland and the Republic of Ireland. HSE works with relevant national safety and energy

regulators to ensure consistent application of standards which maintain pipeline integrity along the length of these interconnectors. (5.4.3)

2.3.4 Major Accident Hazard Pipelines (MAHPs) include the high pressure gas supply transmission and distribution network and other pipelines transporting oils, chemicals and other gases. These substances are known collectively as dangerous fluids and are defined in the PSR. Special requirements applying to MAHP operators include:

- A notifications regime
- Submission of a major accident prevention document
- Arrangements for emergency plans

2.3.5 PSR Regulation 19 requires the provision of ESDVs on offshore installations and derives directly from the Cullen report into Piper Alpha. Securing compliance with this regulation remains fundamental to the offshore safety regime. Regulation of this part of the sector therefore requires attention to issues such as the design, maintenance and operation of ESDVs, risers and flexible risers and pipelines within 500m of all offshore installations. (5.1.7)

2.3.6 Under GSMR, Distribution Network Operators (DNOs) are subject to a safety case regime and are required to submit and have approved a safety case demonstrating the safe operation of their network.

2.3.7 GSMR Regulation 3 requires a gas network operator to act as the Network Emergency Coordinator (NEC). National Grid Gas currently undertakes this role. The NEC has a duty to submit a safety case setting out how they will prevent or minimise Network Gas Supply Emergencies (e.g. deal with catastrophic losses from the system, failures in gas supply etc). The NEC demonstrates compliance with its safety case by conducting emergency exercises and these are subject to inspection by HSE. The Cabinet Office Civil Contingency's Exercise Avogadro has recently highlighted this aspect of the work. This explored how the country could respond to a major interruption of the gas supply. The exercise highlighted that further work by the DNOs was required to examine how domestic users could be assisted in bringing their individual supplies safely back into action following widespread disconnections. (5.4.2)

2.3.8 There is a strong regulatory framework applicable to pipelines and associated operations. Maintaining a high level of compliance is an essential component of ensuring safety. Although general compliance is good, accidents and dangerous occurrences that may indicate significant failures to comply with requirements will be investigated and, where appropriate, enforcement action will be taken. (5.6.1)

2.3.9 Many of HSE's mandatory functions are cost recoverable. Currently the Gas and Pipelines Unit of HID recovers over 40% of its costs.

2.4 Health and Safety Issues:

2.4.1 The principal risk to which anyone working with pipelines and associated plant is exposed is death and major injury from fire and/or explosion. The mechanisms to control this risk are a sub set of the wider strategies employed to avoid all injuries from catastrophic fire and explosion affecting directly engaged employees, those

working in the vicinity and others, including members of the public. Consequently, the remainder of this strategy refers to the wider aim of avoiding catastrophe, which includes managing the risk to employees.

2.4.2 There are no known safety or health issues that are peculiar to, or particularly prevalent within, the workforce. Where employees working directly with pipelines are exposed to wider risks (e.g. falls) they are working in conditions akin to the wider offshore industry, the general chemicals sector or the engineering construction industry. The approaches taken in relation to these issues for workers in this sector are those applied to achieving worker safety in the wider industry sector.

2.4.3 There are six key elements to securing long-term pipeline safety; initial design, construction and commissioning to design, operation within design parameters, long-term maintenance, integrity review and avoiding third party damage. Issues include cathodic protection, welding quality, pipeline coating standards etc. Generally, the industry is proactive and develops many codes and standards to support these processes via stakeholder groups. The issue therefore is to ensure dutyholder and stakeholder groups keep the technical standards fresh and relevant and that they promulgate and apply them as a means of maintaining improved performance. This requires those from within the sector (duty holders and professional/technical bodies) to take the lead. In general, HSE's role will continue to be to stimulate work in particular topic areas and then to encourage promulgation and application of the developed standards as a means of driving improvement. Encouraging leadership within organisations to ensure developing standards are implemented is essential. Equally vital is supporting leadership by the professional and technical bodies to encourage their members to adopt and drive improving standards. (5.1.1, 5.1.5, 5.1.8)

2.4.4 Asset integrity is a major issue for both offshore and onshore pipelines. Put simply, as long as the hazardous fluids are contained they are generally safe. Both offshore and onshore many pipelines are being operated at the extremes of their design life. The issues posed by aging plant are covered in detail in the material on HSE's website under the Aging and Life Extension Programmes KP3 and 4. Onshore, much of the low pressure gas network is iron pipework which can be prone to failure leading to leaks and associated fires and explosions. (5.1.4, 5.1.7)

2.4.5 Whilst the industry as a whole has begun to develop and use KPIs and SPIs, their use is relatively recent and needs further support and encouragement through the inspection and investigation processes. KPIs and SPIs are important to ensure that boards and managers are able to track issues around integrity and compliance with standards.

2.4.6 Reliance on asset failure rates is not an acceptable approach to the avoidance of catastrophe, each loss of containment has major accident potential. In addition, operators must ensure that the low likelihood high consequence issues associated with gas and pipeline activities are given appropriate priority within the general consideration of their businesses, even where pipelines may be a relatively peripheral activity within the overall focus of the business. This is also of importance with regard to the gas distribution network. Managers need good condition information to make effective decisions about maintenance and replacement schedules. These processes are essential to ensuring leaders have the information

available to allow them to address issues before they arise. (5.1.1, 5.1.2, 5.1.3, 5.1.4, 5.2.1, 5.2.2,)

2.4.7 (a) Offshore - Asset integrity is a central consideration. Pipelines and the associated risers and Riser Emergency Shut Down Valves (RESDVs) are essential for the transfer of gas and oil from and between wells and offshore installations. The RESDVs are typically considered as safety critical components. Failure of any of these components could have catastrophic consequences and threaten offshore installations and all the workers thereon (for example leading to incidents similar to Piper Alpha). (5.1.6)

2.4.7 (b) An associated aspect to ensuring pipeline integrity is its contribution to protecting the marine environment.

2.4.8 (a) Onshore **-** Pipelines may pass close to populated areas and the gas distribution network covers almost all centres of population. The potential for catastrophic fire and explosion involving the public associated with failures is great.

2,4,8 (b) A significant element of the onshore risk arises from the gas distribution network. Gas is delivered by pipeline to seven shore-based reception points (beach terminals) by gas producers operating Offshore Facilities (each of these is a top tier COMAH site). After treatment, including checking the quality and the calorific value of the gas, it is transported through 278,000 kilometres of iron, steel and polyethylene mains pipeline.

2.4.8 (c) The distribution part of the network presents particular challenges. Much of the system is old and consists of cast iron pipework that is prone to failure with the consequent risks of fire and explosion. To combat this risk a replacement programme is being progressed by industry (see HSE website http://www.hse.gov.uk/gas/supply/mainsreplacement/irongasmain.htm). This requires the use of a model to identify the pipes most at risk of failure and to replace these as a priority. A rolling programme of replacement to ensure that by 2030 the total cast iron network has been decommissioned or replaced is also included. Over 100,000 kilometres of pipework are in scope of this programme. Under PSR Reg. 13A HSE is required to approve any programme of works proposed to comply with the decommissioning programme, having satisfied ourselves that any proposed programme is suitable and sufficient. This approved programme is then incorporated within the safety case for the DNO's activities. (5.1.4)

2.4.8 (d) Between 1994 and 2002, prior to the inception of the programme, there were a total of 41 major incidents and 16 deaths due to mains failures, under the programme this has fallen to 25 incidents and 4 deaths between 2002 and 2010 http://www.hse.gov.uk/pipelines/annualreport09-10.pdf (see page 18).

2.4.8 (e) The replacement programme is funded as part of the pricing mechanism agreed between Ofgem and the industry. Currently the programme lifetime cost is forecast to be approximately £21 billion. This forms a significant element within the pricing mechanism. The price mechanism is currently being reviewed by Ofgem and a review of the replacement programme is included within this review. HSE is working with Ofgem to ensure that:

- Assumptions about the costs and benefits of the programme made in 2001 remain valid
- The programme is delivering the expected safety benefits
- Necessary changes to ensure the programme remains valid are incorporated
- Work is incentivised to encourage progress and efficiency
- Reporting on performance to HSE and Ofgem is coordinated to minimise overlap. (5.4.1)

2.4.8 (f) The general integrity of the gas distribution system is essential to safe operation. HSE will work with Ofgem to ensure dutyholders gather reliable asset condition data and use this to guide their management of risk.

2.4.8 (g) Buried pipelines and the gas distribution network can be damaged by third parties, typically (but not only) land owners, farmers and construction contractors. This damage can threaten the integrity of the pipeline or network leading to fire and explosion. Several industry-run schemes are in place to provide advice to those who may encounter buried pipelines (e.g. via the Linesearch website). (5.1.5)

2.5 Production / Service Trends:

2.5.1 (a) Offshore - The extent of offshore pipeline activity is likely to follow the trends in general offshore activity. The resource demands upon industry are likely to be around maintaining asset integrity. As drilling becomes deeper, products transported within pipelines are likely to be hotter and dirtier, increasing the challenge of maintaining integrity. (5.1.7)

2.5.1 (b) As the pipeline network is used more flexibly the challenge for dutyholders to manage the pressures applied and ensure they do not exceed the capacity of vulnerable parts of the network will increase.

2.5.1 (c) The transport of CO2 as part of carbon capture technologies presents a new challenge for those designing and operating these pipelines both on and offshore. (5.1.9)

2.5.2 (a) Onshore - No major technical changes are anticipated regarding pipeline technology. The main challenge remains that of ensuring asset integrity. This is particularly so in relation to the gas distribution network and the impact this will have on risk to the general population and balancing the pressures from Ofgem for sustained cost reductions.

2.5.2 (b) Pressures on DNOs to cut costs and develop innovative approaches are likely to increase with changes to the Ofgem pricing mechanism. There is therefore likely to be need for a greater focus on ensuring that programmes for mains decommissioning remain suitable for agreement under PSR Reg. 13A from 2013. (5.1.4 and 5.4.1)

2.5.2 (c) The mains replacement programme is designed to address a similar issue to the ICL/LPG pipework problem and demonstrates that HSE remains alert to this risk in the context of gas distribution.

2.5.3 However, there may be an emerging trend towards offshore and onshore pipeline assets being sold off to smaller independent operators and for design services to be contracted out. If this trend continues, this may place greater emphasis on the importance of dealing with more of the smaller organisations via representative bodies. (5.1.3 and 5.2.3)

2.5.4 It is difficult to predict beyond 2030, but the general assumptions that gas usage for domestic heating will reduce, but there is no consensus on how and to what extent the nature of the gas distribution network will evolve.

2.6 Stakeholders and Other Influencers:

2.6.1 The offshore and onshore pipeline community is supported by a series of groupings populated by pipeline engineers keen to develop technical standards. Groups include UK Onshore Pipelines Operators' Association (UKOPA), Offshore Pipeline User Group (PLUG), the Gas Transporters Operational Safety Group (GTOSG) and the Institution of Gas Engineers and Managers (IGEM). These groups are supported by senior engineers within their sectors who are involved in the day-to-day operation of pipelines. Through engagement much valuable improvement has been achieved, for example around flexible risers. These groups are expected to continue to add value and to provide an important contribution to the development of standards. (5.2.3)

2.6.2 Further detail on the major stakeholders and key influencers is provided in Annex 2.

2.7 Political/Societal issues

2.7.1 The general sensitivities around this area relate to ensuring that HSE maintains a proportionate response to this major hazard area. The current Ofgem price review challenges the current position on funding works to remove risk from the gas distribution work.

Summary

In summary, the health and safety issues for this subsector are:

- The potential for catastrophic incidents from onshore and offshore pipelines
- That pipelines are designed, constructed, operated and maintained to appropriate standards
- Ageing infrastructure in the offshore network leading to lower asset integrity of safety critical equipment such as RESDVs
- The management of the major hazards aspects by operators for whom major accident pipelines may be peripheral to their primary business.
- Asset integrity for onshore pipelines including the iron mains replacement programme, ensuring this remains effective and that appropriate emphasis is also given to maintenance of other safety critical gas distribution assets.
- Third party damage to pipelines and gas mains.

3. Gas Importation, Processing and Storage

3.1 Industry Size:

3.1.1 As well as importation by sub-sea pipeline and processing at beach terminals, natural gas is also imported via sea going vessels. Liquefied Natural Gas (LNG) is imported and stored at three key sites around the country. Natural gas is stored in a number of facilities including LNG peak shave plants. Gas is also stored in offshore and onshore depleted gas reservoirs and onshore in salt cavities and gasholders.

3.1.2 Almost all gas import, processing and storage facilities are subject to the COMAH Regulations. There are in excess of 150 COMAH establishments, of which more than 50 are top tier:

- Total COMAH sites 106
- Total top tier COMAH sites 50
- Total top tier gasholders 9

3.1.3 These fall into the following categories:

- Beach terminals – these are gas processing facilities located at coastal sites. They receive and process gas from offshore pipelines. There are 7 beach terminals; all are top tier COMAH sites.

- LNG import terminals - LNG is imported and stored in large quantities at three terminals (all top tier COMAH). At these terminals LNG is unloaded from ships and stored onshore prior to re-gasification and injection into the National Transmission System (NTS). National Grid estimate that currently 15% of gas demand is met by LNG importation and that this is likely to rise to around 50% by 2020 (http://www.nationalgrid.com/NR/rdonlyres/9309FD4F-7BB9-4194-9BBB-B1D4707ED2B8/42212/RichardSmithNationalGrid8July.pdf).

- LNG peak shave storage plants – LNG is stored at these 3 inland top tier COMAH sites and re-gasified for injection into the NTS. The terminals are located at key points, typically at extremities of the gas network, where additional gas may be required to address short term increased gas demands.

- Salt cavity underground storage sites – this is an expanding industry, predominantly based onshore. Gas is stored for the medium and long-term to meet periods of increased demand. It is underground in man made cavities constructed by solution mining of naturally occurring salt strata. These sites can store significant quantities of natural gas (all are top tier COMAH sites). There are a number of existing operational sites and more are in the design phase.

- Depleted strata underground storage sites – this again is an expanding industry, with a number of new sites in design and construction as well as several existing operational sites. Gas is re-injected into, and stored within, the porous rock that was originally an oil or gas reservoir. These sites can

store significant quantities of natural gas (all are top tier COMAH sites) and are used for medium to long term gas storage.

- Gas holders - gas is also stored at low pressure in a number of holders prior to distribution to end users. There are approximately 100 COMAH gas holder establishments in GB, 14 which are top tier sites. These gas holders are a familiar part of the industrial landscape and are generally situated within urban areas. They generally represent Victorian technology. A failure of the relatively crude sealing arrangements has the potential to lead to a catastrophic event. Several of the holders, predominantly those in London, present an uncomfortably high off-site risk.

3.1.4 The national energy strategy is to double the gas storage capacity by 2020. (http://webarchive.nationalarchives.gov.uk/+/http://www.berr.gov.uk/energy/whitepaper/page39534.html). Apart from storage at LNG terminals this will be accommodated within salt cavity and depleted strata facilities. Currently there are five salt cavity and two depleted reservoir sites in operation, with ten under development and a further six developments (either extension of existing facilities or new facilities) proposed. For further details see National Grid Gas Transmission Ten Year Statement 2009 pages 64 to 69 (http://www.nationalgrid.com/NR/rdonlyres/E60C7955-5495-4A8A-8E80-8BB4002F602F/38866/TenYearStatement2009.pdf).

3.2 Industry Demographics:

3.2.1 The gas processing, import and storage facilities are operated almost exclusively by multi-national energy companies. Facilities include gas processing sites, termed beach terminals; here the gas arriving by pipeline from offshore installations is cleaned and processed. Gas import terminals, located at ports, import and store liquefied natural gas (LNG). Salt cavity and depleted strata underground storage facilities, predominantly but not exclusively onshore, are used to store gas in the long and medium term. Facilities also include LNG peak-shave facilities, gasoline and aviation fuel storage sites and gas holders.

3.2.2 Importation and storage is a rapidly expanding sector. It is expected that the total of LNG imported will increased by 2-300% over the next ten years. Ensuring that these crucial imports go ahead and storage capacity is available is crucial to meeting fuel demands. Maintaining safety requires the designers and developers of these installations to consider the safety of the sites. Operators need to ensure that safeguards remain in place as plant and asset usage increases. These projects continue to attract significant local concern from members of the public. It is therefore essential that there is public confidence in an effective, transparent and robust approach to the regulation of this type of installation. (5.1.8)

3.2.3 The large majority of those responsible for pipelines and gas processing, import and storage facilities have considerable technical expertise. Many of the organisations within which they work are sophisticated with a significant technological base. However, smaller operators, Independent Gas Transporters (e.g. operators of networks serving large housing developments) are growing in importance. Currently, they own 8-10% of the network (http://intranet/operational/hid_circs/administration/spc_admin_77/). These smaller

businesses must display adequate leadership through competent staff who understand the priorities will be crucial (5.2.1, 5.5.1, 5.5.2).

3.3 Regulation:

3.3.1 Effective regulation of the sector is important because failure to maintain pipeline or gas facility integrity has the potential to result in catastrophic consequences involving both the public and workers. A significant integrity failure at certain sites or pipelines would also impact severely on the ability to supply gas to UK plc. This is recognised in DECC's classification of a number of gas facilities as National Critical Infrastructure sites.

3.3.2 Almost all gas import, processing and storage facilities are regulated by COMAH. The qualifying amount of natural gas held in storage for upper and lower tier COMAH classification are 200 and 50 tonnes respectively. There are in excess of 150 COMAH establishments, of which more than 50 are top tier.

3.3.3 Technical standards of control and on-site management are assessed and improvements are driven via safety case review and inspection and investigation. These processes are required by COMAH, GSMR and PSR etc and are necessary to assess existing standards and compliance.

3.3.4 There are also specific requirements under GSMR and PSR placing duties upon operators. Annex 1 provides detail of the responsibilities placed upon HSE under these regulations.

3.3.5 Additionally, gas is imported and traded via three interconnector pipelines joining the UK to the continent and pipelines to Northern Ireland and the Republic of Ireland. Agreements are in place to assure consistent cross-border arrangements regarding pipeline standards. (5.4.3)

3.3.6 Another aspect of regulation essential to the mitigation of risk in the event of a failure at a storage site or major accident hazard pipeline is the proximity of other developments. Land Use Planning processes and provision of advice are therefore a key elements of managing the risk from high risk establishments.

3.3.7 HSE is a statutory consultee on planning applications for developments within the consultation distance of major hazard installations and pipelines. The aim is to guard against inappropriate increases in vulnerable populations in the vicinity of major accident hazard installations and pipelines. Government policy is to restrict such population growth in order to reduce the impact of any major accident. In most cases, HSE's advice is followed, but there are examples where local authorities fail to take full account of the advice. In serious cases, these decisions may place people at inadvisable risk. It is therefore important that stakeholders involved in such decisions fully understand the advice and that public opinion is included in the framing of any risk communication strategy that HSE and others adopt. (5.5.5)

3.4 Health & Safety Issues:

3.4.1 The storage of gas (and LNG) has major accident potential. A number of the gas holder sites present a significant off-site risk. Gas releases from any of these sites could result in a catastrophic explosion. The hazard from LNG storage is

particularly acute as LNG produces approximately 600 times its volume of gas should a leak occur. Ensuring operators incorporate safety into the design of new gas storage and import facilities is a key sector priority. (5.1.8)

3.4.2 Gas holders are a familiar part of the industrial landscape and are generally situated within urban areas. They generally represent Victorian technology. A failure of the relatively crude sealing arrangements could lead to a potential catastrophic event. Several of the holders, predominantly those in London, present an uncomfortably high off-site risk to people living and working in their vicinity.

3.4.3 New LNG importation and storage facilities are in place and one of these is currently being extended to increase storage capacity. Three other floating importation facilities with storage and/or re-gassification facilities are in the early stages of planning. These are all top tier COMAH sites. The focus here is for duty holders first to ensure proper consideration of safety during plant design and construction and then to ensure that as throughput increases safe operation is maintained. The COMAH safety report assessment and inspection process facilitates this, as does early engagement by the regulator during the construction and commissioning phase. (5.1.8, 5.2.2)

3.5 Production and Service Trends:

3.5.1 The sector has a significant part to play in meeting the UK's energy needs into the future. The risk profile in the sector is unlikely to diminish over the next 10 to 15 years. Some areas e.g. LNG importation will increase significantly in importance. In others, aging plant and threats to asset integrity mean the risk profile may rise. The industry therefore needs clear performance measures against which it can demonstrate that it is managing its aging assets appropriately. (5.1.1)

3.5.2 Responsibility for regulating safety at many of these sites is shared between HSE and the Maritime and Coastguard Agency (MCA). HSE deals with issues onshore once the ship and shore are connected. MCA deals with risks associated with accidents within the harbour (e.g. ship collisions leading to release of gas from a floating vessel). However, as the consequences of a release within the harbour are similar irrespective of the cause, there is increasing public pressure for better alignment between the HSE and MCA processes. Gaps in the existing system and consequent implications of failure of the UK to implement the Seveso Directive are being explored at the European Court. (5.4.4)

3.5.3 These overlaps may be further highlighted if current industry research supports the use of LNG as a fuel for ships. As LNG is a relatively clean fuel consideration is being given to its use. For this to happen, facilities to allow the unloading of LNG from ocean tankers to land storage will be required. The LNG will then be transferred to user ships. The sites will be top tier COMAH in relatively populated areas.

3.5.4 Gas storage - There are currently a significant number of projects proposed, in design or being constructed. Designers and operators will have a continued focus on these to ensure relevant good practice and the principle of inherent safety is considered during design.

3.5.5 LNG importation - Work is currently planned or underway to extend the LNG terminal importation facilities. The frequency of unloading is also likely to increase even without increased storage capacity as other sources of gas decline. The need to ensure a rigorous inspection regime will be maintained or increased.

3.5.6 LNG peak shave plants – Operators are working to provide alternative facilities that will allow two LNG peak shaving sites to be removed from the network; one has the highest societal risk amongst all of COMAH sites, the other a very high risk level. The associated alternative storage will fall under COMAH. Operators are expected to ensure design and operational safety and demonstrate this through compliance with safety report assessment and inspection processes.

3.5.7 Gas holders - Gasholders present a continuing problem. A coordinated approach is taken to reviewing revised safety reports and inspection. In addition many holders (particularly in London) are subject to development/planning pressures. Currently HSE's Economic Analysis Unit are developing a business case to feed into the wider Ofgem review to explore incentives for the removal of gas holders as part of a wider upgrading of the gas distribution network. In the meantime (5-10 years), holder operators must maintain high operational standards and seek alternative methods to meet diurnal gas storage demands. (5.1.4)

3.6 Stakeholders and Other Influencers:

3.6.1 The gas importation, processing and storage community is served by similar groupings to the offshore and onshore pipelines sector. This community is expected to continue to support the development of high technical and leadership standards amongst its members. Further detail on the major stakeholders and key influencers is provided in Annex 2.

3.7 Political / Societal Issues:

3.7.1 The siting of new hazardous installations often have political and public safety concerns associated with them, for example; LNG terminals and underground gas storage caverns, etc. There have also been several high profile re-development initiatives in urban areas adjacent to gas holders that have gone to public planning inquiries in which safety has been a major issue. (5.5.5)

Summary

In summary, the health and safety issues for this subsector are:

- Ensuring integrity at design and operation phases of this expanding area
- Ensuing safe operation of LNG importation facilities as throughput ramps up
- Managing the risks associated with aging assets, including gas holders
- Providing societal reassurance that there is a robust regime for ensuring safety at new underground gas storage sites.

4. Emerging Energy Sources

4.1 Industry Size:

4.1.1 Predicting the size of this sector is problematic. However, it is important to be responsive to developments within the sector to ensure that risks associated with emerging energy technologies are identified and assessed to ensure that new energy sources can be exploited safely.

4.1.2 Emerging technologies affect gas and pipeline activities in four main ways:

- Biomethane – This is methane generated from the anaerobic digestion of biomass. It can be injected into the gas network. The injection of biomethane may threaten safe usage if it has:
  - a high level of Oxygen giving it a low calorific value and affecting the flame characteristics in appliances
  - a high moisture content. Combined with a high Oxygen content this may cause increased internal corrosion within ferrous mains and services
  - not been filtered effectively. It may contain impurities which may interfere with the safe operation of appliances when the gas is burnt, or mask odour in the event of a leak.

- Coal-bed methane or shale gas - The methane generated by this process will contain a higher level of CO2 than network specification gas. Producers can achieve network compliance by on-site blending with sufficient quantities of network gas. Where this is not practicable, HSE may have to consider GSMR R11 exemptions to allow the gas to be blended within the network.

- Underground coal gasification - The mixture of gases and combustion products generated by this process will be at high temperatures and its safe transport by pipeline to a processing facility will present operators with technical difficulties.

- Carbon Capture - Carbon capture technologies to combat generation of combustion greenhouse gases can only be effective if, after capture, the CO2 can be transported to a safe storage site. Transport of CO2 via pipeline has technical difficulties and a major release of CO2 presents a significant risk of asphyxiation. (5.1.9)

4.2 Industry Demographics:

4.2.1 In relation to biomethane the pipeline interest is limited to gas quality issues and ensuring that the injected gas complies with GSMR. Currently, only one facility is injecting gas into the network, two others are under development. The extent to which this activity will develop is likely to depend upon tariffs decided by Ofgem, so making predictions difficult. The safety issues involved in operating the plant (principally falls and confined space issues) will be subject to initiatives relevant to agriculture and services (sewage works).

4.2.2 The coal gas and carbon capture technologies are in their infancy with minimal employment at present. The impacts of the gases on pipe technology are still

emerging. However, in order for any of these technologies to have industrial significance pipelines will play an essential part in transporting products. Pipeline designers and dutyholders will need to demonstrate that the new facilities are capable of meeting the challenges. DECC is currently funding a competition to evaluate the feasibility of a carbon capture, transport and storage process. HSE is reviewing proposals from industry as part of the competition.

4.3 Regulation:

4.3.1 Effective regulation of the sector is important because failure to maintain pipeline or gas facility integrity has the potential for catastrophic consequences involving both the public and workers.

4.3.2 As well as the general requirements of the Health and Safety at Work Act, methane is subject to Offshore Installations (Safety Case) Regulations and COMAH requirements etc in the same way as natural gas. (The requirements for specific actions arising from these regulations are covered in the wider OSD submission and the HID CI strategies.)

4.3.3 There are also specific requirements under GSMR and PSR placing duties upon operators. Annex 1 provides detail of the responsibilities placed upon HSE under these regulations

4.3.4. Where operators have been able to demonstrate that injection of biomethane into the gas distribution network is safe (there is sufficient blending with network gas and the network will remain free from moisture); HSE has granted an exemption to GSMR (see Annex 1).

4.3.5 Regulatory assessment and inspection provides a challenge to ensure that the standards of control and management are maintained and, where necessary, improved. These processes are required by COMAH, GSMR and PSR etc. See Annex 1 for a summary of relevant regulations.

4.4 Health & Safety Issues:

4.4.1 The quality of gas sourced and how it can be safely-injected into the national network are particularly problematic for plant operators. The transport by pipeline of coal-bed-generated methane presents challenges to the integrity of the pipelines. Carbon Capture and Storage (CCS) requires the transport of CO2 from point of capture to point of storage and the transport of CO2 presents particular safety issues which must be resolved before CCS can be practicable. Transport of CO2 via pipeline has technical difficulties and a major release of CO2 presents a significant toxic hazard. The development of pipelines capable of transporting products from these processes is essential to enabling development of these technologies.

4.4.2 Underground coal gasification - The mixture of gases and combustion products generated by this process will be at high temperatures and its safe transport by pipeline to a processing facility will present technical difficulties

4.5 Production and Service Trends:

4.5.1 Biomethane - The demand for exemptions associated with biomethane injection is predicted to increase once the level of the new Renewable Heat Incentive (RHI) has been set by DECC. Ofgem are also considering how innovation funding can be used to aid further pilot projects.

4.5.2 Coal-bed methane and shale gas - There is likely to be gradual growth in this source of gas production over the next 5 to 10 years. This will lead to a relatively small GSMR exemption assessment burden where on-site blending is not possible. There will also be a modest PSR inspection workload associated with the non-GSMR production pipelines.

4.5.3 Underground coal gasification – Given the pipeline integrity and gas quality challenges, it is likely that this will require relatively low level input over the next 5 to 10 years, but it may require some input to facilitate the development by industry of appropriate standards to allow projects to go ahead safely.

4.5.4 CO2 transport requires both HSE technical input, research support and possible safety case assessment. Until the change of government the intention was to reclassify CO2 as a dangerous fluid bringing CO2 pipelines into the MAHP procedures. This was to be done via a change to an EU Directive. This is now considered unlikely and although the regulatory approach to this issue is unclear, the risks from CO2 transportation is a developing area.

4.6 Stakeholders and Other Influencers:

4.6.1 The emerging energy community is served by representative groups drawn from the gas industry and the emerging and renewable energy sector. On the issue of biomethane HSE regularly engages with the GTOSG, the Energy Networks Association Biomethane working group and the Anaerobic Digestion and Biogas Association (ADBA). These groups are expected to continue to develop technical standards and to champion high standards of leadership amongst their members.

4.6.2 Further detail on the major stakeholders and key influencers is provided in Annex 2.

4.7 Political / Societal Issues:

4.7.1 Issues around the safe transport of CO2 are being explored within the current Carbon Capture and Storage project (DECC Competition). Otherwise, it is important to be in a position to anticipate and respond to developments with these technologies to ensure that risks are handled as they develop, to ensure that health and safety and HSE are not seen as inhibitors to developments in this area. (5.1.10)

Summary

In summary, the health and safety issues for this subsector are:

- Development of standards for the carriage of CO2 by pipeline
- To retain sufficient capacity, competence and flexibility to be able to respond to emerging issues.

5. Aims and Objectives

5.1 Avoiding Catastrophe

Aim: Organisations routinely provide assurance to themselves, regulators and society that they are successfully leading and managing the prevention of catastrophic incidents.

Objectives:

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5.1.1 Dutyholders adopt and embed a series of safety performance indicators (SPIs / KPIs - leading and lagging), which they use to assess and drive their performance and inform their leadership activities

5.1.2 Industry to share and publish safety performance data to drive and demonstrate safe practice.

Aim: Lessons are learnt and good practice shared among those with potential for catastrophic incidents.

Objective:

5.1.3 To ensure industry strengthens its existing systems for sharing good practice and developing standards and guidance, both within the UK and internationally.

Aim: To ensure asset integrity of onshore and offshore pipelines, associated plant and the gas distribution network.

Objectives:

5.1.4 To ensure dutyholders give appropriate priority to maintaining the integrity of pipelines and the gas distribution network.

5.1.5 To ensure dutyholders participate in, promote and develop information systems to reduce the likelihood and extent of third party damage to pipelines.

5.1.6 To ensure through inspection and enforcement the integrity of offshore pipelines and safety at the interface with the offshore installations, specifically with regard to the provision of RESDVs at all offshore platforms.

5.1.7 To support Offshore Division's Aging and Life Extension Inspection Programme to ensure offshore industry duty holders maintain their plant and equipment and ensure its long-term integrity (Key programme 4 – KP4).

5.1.8 To ensure dutyholders incorporate safety considerations in the design, construction and operation of new gas storage and LNG importation facilities.

5.1.9 To engage with emerging technology projects to ensure that dutyholders consider factors affecting pipeline safety and their potential control during the design and engineering phases.

5.2 Leadership

Aim: At Board level, pipeline operators are able to demonstrate effective leadership processes, giving appropriate priority to safety considerations and communicating this throughout their organisations so that there is clear and recognised accountability for health and safety performance.

Objectives:

5.2.1 To stimulate strong health and safety leadership by ensuring that at every annual review between pipeline operators and HSE, the operators are required to demonstrate their leadership practice against the standards set out in the Principles of Process safety Leadership (http://www.hse.gov.uk/comah/buncefield/pslgprinciples.pdf) and encouraging these duty holders to regularly champion the benefits of strong major hazards leadership

5.2.2 All industry and professional bodies act to develop and promulgate high standards of health and safety leadership amongst their members.

5.3 Healthier, Safer Workplaces

Aim: New health and safety risks from emerging technologies are recognised and effectively managed at or before their inception.

Objectives:

5.3.1 To ensure that emerging risks associated with the transport of Biogas are effectively managed so that it can be distributed safely for use as a fuel.

5.3.2 To ensure that new facilities for Carbon Capture and Storage are capable of meeting the safety challenges arising from transport of CO2 by pipeline and that appropriate industry design and management standards are developed.
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5.4 Wider issues

Aim: There is active engagement from within and beyond the system on matters affecting health and safety to minimise regulatory burdens.

Objectives:

5.4.1 To work with Ofgem to develop a pricing mechanism for gas DNOs to ensure that appropriate incentives linked to a common set of asset integrity and safety performance measures are in place.

5.4.2 To encourage the DNOs to work with DECC to develop a model for reinstating gas supplies following a major loss of supply over a wide area that balances the risks to the public from gas explosions and the risks of hypothermia amongst vulnerable individuals unable to heat their homes.

5.4.3 To ensure consistent standards are adopted in relation to interconnectors (pipelines connecting GB to Europe and Ireland) through liaison with other relevant national regulators

Aim: A consistent approach that implements the Seveso Directive principles is taken to major hazard issues at LNG terminals.

Objective:

5.4.4 To work with MCA to clarify the regulatory interfaces at LNG terminals and regasification vessels.

5.5 Increasing competence

Aim: Sector leaders, employees and contractors understand the major hazard risks and consequences, stay alert and are committed to maintaining critical controls and safe working practices.

Objectives:

5.5.1 Employees and contractors understand, take responsibility for and are competent to discharge safety critical controls and practices

5.5.2 To agree and make available a statement of the key elements of pipeline safety to all pipeline operators.

Aim: The regulator is competent to fulfil its statutory obligations within the health and safety system.

Objectives:

5.5.3 To introduce peer review processes to ensure inspector competence is reviewed regularly and that procedures are in place to ensure inspectors are equipped to intervene regarding both technical and management failings.

5.5.4 To ensure that, irrespective of discipline, inspectors are able to undertake analyses to ensure that the management failings underlying technical weaknesses are identified and remedied as part of the inspection process.

5.5.5 Local planning authorities demonstrate competence and understanding of major hazard consequences and consistently adopt HSE's advice on land use planning.

5.6 Securing Justice

Aim: To promote sustained compliance with the law

Objective:

5.6.1To investigate accidents, dangerous occurrences and complaints to ensure lessons are learnt from failures and companies and individuals failing to discharge their responsibilities are held to account.

5.7 Mandatory Objectives

Aim: To deliver regulatory responsibilities for the gas and pipelines sector.

Objectives:

M1 Assess and review offshore safety cases for the pipelines aspects as required under the Offshore Installations (Safety Case) Regulations 2005 .

M2 Receive notifications and safety reports sent to the Competent Authority under COMAH and carry out assessment under Reg. 17 of COMAH.

M3: Provide an adequate system of inspection for Top Tier COMAH sites.

M4: Duties under the Pipeline Safety Regulations (1996) to receive notifications and approvals for pipelines.

M5: Assessment and acceptance of safety cases submitted under the Gas Safety (Management) Regulations 1996 (GSMR) and granting of exemptions to requirements of GSMR .

6. Possible Interventions:

(All Sectors)

6.1 The approach regarding offshore pipelines, onshore pipelines and installation and storage is broadly similar. Technical standards of control and on-site management are assessed and improvements are driven via safety case review and inspection and investigation. These processes are required by COMAH, GSMR and PSR etc and are necessary to assess existing standards and compliance.

6.2 Many safety aspects of this sector are dependent upon technical standards, for example cathodic protection, welding quality, pipeline coating standards etc. Technical improvement is partly driven through development of standards by stakeholder groups.

6.3 To support the development of technical standards, work is continuing with the representational groups and with dutyholders to embed and enhance leadership. Whilst the industry has begun to develop and use KPIs and SPIs their use is relatively recent and needs further support and encouragement. Through the inspection and investigation processes we will stimulate dutyholders to embed these processes and ensure that they give appropriate priority to the low likelihood high consequence issues associated with gas and pipeline activities.

6.4 To encourage a closer focus on key priorities it is intended to develop a clear ranking system to be used at pipeline inspections by HSE inspectors. This system will be shared with and developed in consultation with the industry. It will ensure that operators are clear on what is expected of them and how their achievement will be judged. Their performance score will be shared with them as part of the developing risk ranking process. (5.5.2)

6.5 Given the relatively limited number of businesses to be addressed it is considered practicable to ensure that 75% of relevant organisations will have a system for Board review of SPIs and KPIs together with systems to implement improvements within five years. (5.2.1)

6.6 The joint review with Ofgem will identify necessary changes to the iron mains decommissioning programme. The price review should allow us to influence the new pricing mechanism for 2013 and ensure incentivisation of mains decommissioning. (5.4.1)

(Pipelines)

6.7 Interventions follow the same general principles as for the transmission system. Intervention plans for major pipelines and pipeline operators cover the design, construction, commissioning, operational and, if appropriate, decommissioning phases of the pipeline life cycle. We give particular attention to new pipeline operators, and those for which operating pipelines may not be a core business activity. Where necessary we extend the inspection process to include design houses and pipeline constructors and fabricators. (5.1.9)

7. Roles and Skills Required:

7.1 The unit currently consists of 10 pipeline specialists, 10 regulatory specialists, plus a human factors specialist with two FTEs of administrative support. The specialist team have all been recruited for their extensive experience working with pipelines in a senior manager or engineering role. Their specialist skills match those required for the pipeline specific aspects of the unit's work. The regulators are similarly experienced in high hazard work.

7.2 Whilst currently specialist skill levels are high and most vacancies are filled, suitable calibre pipeline specialists have proven difficult to recruit. There may be a net loss of skills as current team members take retirement.

7.3 To deal with the full range of issues encountered the unit requires support in predictive assessment, control and instrumentation, mechanical, materials and process safety expertise that is acquired from other parts of HID.

7.4 Work is in progress within the unit to ensure that, irrespective of discipline, inspectors are all able to recognise and follow through the management failings underlying technical weaknesses identified during inspection. This will ensure that leadership issues are appropriately risk ranked and recorded and that steps are taken to correct both the technical breaches and management failings. (5.5.3, 5.5.4)

8. Potential Impact/Success:

8.1 Interventions which require the engagement of industry bodies in developing approaches around leadership, or the development of standards are likely to be successful. The pipelines and storage sectors are characterised by engaged and proficient stakeholder groups. However, resource from the enforcing authority is key in focussing attention of critical control measures

8.2 The gas distribution network and the associated risks from gas holders will be affected by the Ofgem price review. The extent to which iron mains replacement will be funded and general safety performance is incentivised amongst the networks cannot be predicted. Considerable effort will be required to maintain the profile and importance of ensuring that safety remains a matter of strategic concern as the review progresses.

RESULTS AND ANALYSIS OF THE IMPACT SURVEY TO BE UPDATED AND INSERTED HERE.

Annex 1. Mandatory HSE/Competent Authority Duties

In addition to the general health and safety duties placed on the enforcing authority, the following specific mandatory duties are placed on HSE/Competent Authority as part of its regulation of the gas and pipelines sector:

Offshore Pipelines:

- *Offshore Installations (Safety Cases) Regulations 2005* –
    - Requires HSE to assess safety cases submitted by offshore installation operators under Regulation 6 and reviews under Regulations 13 and 14. SI3 provides the necessary expertise for this.

Onshore Pipelines:

- *Pipelines Safety Regulations 1996 (PSR)* -
    - Receive and approve iron mains decommissioning plans from the Gas Distribution Network operators submitted under Regulation 13A
    - For MAHPs the PSR requirements for the notification of pipelines provide for early intervention and ensuring that appropriate design standards are applied during the development of pipeline projects. This approach has been particularly effective in ensuring safety and integrity management good practice are “designed in” rather than achieved by retrospective action. In particular HSE is required to:
        - Receive notifications sent under Regulation 20, 21 and 22 for the lifecycle of MAHPs
        - Receive the major accident prevention document sent by MAHP operators under Regulation 23

- *Gas Safety (Management) Regulations 1996 (GSMR)* –
    - Acceptance (and assessment) of Safety Cases submitted by network gas conveyors under Regulation 3 and revisions and material changes under Regulation 4
    - Acceptance of the NEC’s Safety Case submitted under Regulation 3 and revisions and material changes under Regulation 4
    - Granting of Exemptions to any requirements of GSMR under Regulation 11 from the gas Distribution Network Operators, the National Transmission System operator, independent gas transporters and the NEC.

- *Control of Major Accident Hazards Regulations 1996 (COMAH)* –
    - Receipt of notifications sent to the Competent Authority (CA) under Regulation 6
    - Receipt of Safety Reports sent to the CA under Regulation 7
    - Examination of Safety Reports by CA under Regulation 17
    - The CA is also required to organise an adequate system of inspections for top tier COMAH sites under Regulation 19

Gas importation, processing and storage:

- *Control of Major Accident Hazards Regulations 1996 (COMAH)* –
  - Receipt of notifications sent to the Competent Authority (CA) under Regulation 6
  - Receipt of Safety Reports sent to the CA under Regulation 7
  - Examination of Safety Reports by CA under Regulation 17
  - The CA is also required to organise an adequate system of inspections for top tier COMAH sites under Regulation 19

- *Gas Safety (Management) Regulations 1996 (GSMR)* –
  - Acceptance (and assessment) of Safety Cases submitted by network gas conveyors under Regulation 3 and revisions and material changes under Regulation 4
  - Acceptance of the NEC's Safety Case submitted under Regulation 3 and revisions and material changes under Regulation 4
  - Granting of Exemptions to any requirements of GSMR under Regulation 11 from the gas Distribution Network Operators, the National Transmission System operator, independent gas transporters and the NEC.

Emerging Energy Sources:

- *Gas Safety (Management) Regulations 1996 (GSMR)* –
  - Granting of Exemptions to any requirements of GSMR under Regulation 11 including Safety Cases from the gas Distribution Network Operators.

Annex 2. Sector Stakeholders and other influencers

All Sectors:

- Department of Energy and Climate Change (DECC) - **High influence** – Primary OGD contact for all sectors. Regular liaison meetings held. Additional work includes EU Security of Supply (Gas) legislation; Emergency exercise Avogadro (supply restoration issues); CCS pilot project and joint approach to GSMR and biomethane.
- Office of Gas and Electricity Markets (Ofgem) - **High influence** – Primary OGD contact for gas transmission and distribution. Regular liaison meetings held. Additional joint work on gas transmission and distribution price control review. Significant collaboration on iron mains replacement programme 10-year review.
- National Grid Gas - **High influence** – Primary gas industry dutyholder and operator of national transmission system and four distribution networks. Also holds role of Network Emergency Coordinator. Continuous liaison on safety case compliance, industry standards and gas supply emergencies.
- Centrica - **High influence** – Significant gas industry dutyholder and operator of offshore gas storage (Rough) and import terminals. Also owner of British Gas brand. Ongoing contact on safety case compliance and industry standards.

Offshore Pipelines:

- Maritime and Coastguard Agency (MCA) - **High influence** -Primary OGD contact for vessel related activities (e.g. on-ship re-gasification). HSE has previously worked successfully with MCA to produce guidance for industry on the protection of pipelines from damage by surface vessels.
- Offshore Pipeline User Group (PLUG) – **High Influence** – Informal grouping of offshore pipeline operators. Highly effective in setting industry standards and propagating information.
- Oil and Gas UK – **Medium influence** - Collaboration in the continuing development of the Pipeline and Riser Loss of Containment Study (PARLOC), an important initiative in raising industry standards in this critical area. HSE also supports Oil and Gas UK in a number of Joint Industry Projects including development and improvement of standards related to un-bonded flexible pipelines.

Onshore Pipelines:

- Gas Transporters Operational Safety Group (GTOSG) - **High Influence** – Dutyholder grouping chaired by HSE. Regular meetings held to discuss operational and safety case issues. Highly effective for setting standards across the gas distribution and transmission industry. Valuable group for dissemination information.
- UK Onshore Pipelines Operators' Association (UKOPA) - **High Influence** – Stakeholder body representing the majority of UK onshore pipeline operators. Regular liaison meetings held. Valuable two-way exchange of technical information. Particularly helpful during the PSR amendments process.
- National Emergency Co-ordinator Safety Case Forum – **High influence** – Dutyholder group to ensure that developments to the NEC's safety case and responses to an emergency are agreed and implemented across the DNOs.

- Gas Industry Trades Unions (GMB/Unison) – **Medium influence** – Regular liaison meetings held to discuss operational safety and MH issues. Particularly useful as a 'sense-check' for information received via the GTOSG.
- NEC Safety Case Forum **- High Influence -** Validates the key control and cooperation issues associated with the NEC arrangements and undertakes emergency exercises.
- Gas Action Task Group **- High Influence -** A task group of the Energy Emergencies Executive Committee (E3C).

Gas importation, processing and storage:

- Gas Transporters Operational Safety Group (GTOSG) - **High Influence** – As above.
- Environment Agency (EA) Joint COMAH Competent Authority (CA) with HSE - **High Influence** – OGD partner.

Emerging Energy Sources:

- Gas Transporters Operational Safety Group (GTOSG) - **High Influence** – As above.
- Energy Networks Association (ENA) – **Medium influence** – Facilitating body responsible for hosting a range of gas industry working groups populated by the gas distribution network operators. Most recent (and ongoing) involvement is the biomethane working group.
- Anaerobic Digestion and Biogas Association (ADBA) – **Medium influence** – Recent involvement on the development of biomethane injection into the gas networks. Useful source of advance information on upcoming developments.
- Carbon Capture and Storage Association (CCSA) – **High Influence** – important industry grouping of major players in the development of CCS infrastructure.
- Underground Coal Gasification Partnership – **Medium influence** – the primary industry association for companies with UGC licenses and developing installations in the UK.
- Non-conventional Gas Association – **High Influence** – New trade body composed of major companies (e.g. Centrica) with rapidly-developing onshore gas interests.

Industry Professionals

- Institution of Gas Engineers and Managers (IGEM) – **High Influence** - Set technical and leadership standards across the industry.