HSE

Health and Safety Executive

Consultation on Amendments to the Pipeline Safety Regulations 1996 and the Health and Safety (Fees) Regulations

This consultative document is issued by the Health and Safety Executive in compliance with its duty to consult under section 50(3) of the Health and Safety at Work etc Act 1974.

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to reach there no later than **1 March 2010**

The Executive tries to make its consultation procedure as thorough and open as possible. Responses to this consultative document will be lodged with the Health and Safety Executive's Knowledge Centre after the close of the consultation period where they can be inspected by members of the public or be copied to them on payment of the appropriate fee to cover costs.

Responses to this consultative document are invited on the basis that anyone submitting them agrees to their response being dealt with in this way. Responses, or part of them, will be withheld from the Knowledge Centre only at the express request of the person making them. In such cases, a note will be put in the index to the responses identifying those who have commented and have asked that their views, or part of them, be treated as confidential.

Many business e-mail systems now automatically append a paragraph stating the message is confidential. If you are responding to this CD by e-mail and you are content for your responses to be made publicly available, please make clear in the body of your response that you do not wish any standard confidentiality statement to apply.

CD228
Consultative Document

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Contents Page:

Page:

Consultation on Amendments to the Pipelines Safety Regulations 1996 and the Health and Safety (Fees) Regulations

Consultation by the Health and Safety Executive.

About this document

The Health and Safety Executive (HSE) has a duty to consult stakeholders on proposals for new regulations. HSE believes that this enables an open and transparent approach to decision-making, which is essential if policies and decisions are to have widespread ownership and reflect the needs and aspirations of the people they will affect. HSE then decides on the best way forward based on an interpretation and analysis of the results of the exercise.

HSE tries to make its consultation procedure as thorough and open as possible. Responses to this consultation document will be lodged in HSE's Knowledge Centre at Redgrave Court, Merton Road, Bootle, Merseyside, L20 7HS, after the close of the consultation period, where they can be inspected by members of the public and copies can be made available on payment of an appropriate fee to cover costs.

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If you reply to this consultation document in a personal capacity, rather than as a post holder of an organisation, you should be aware that information you provide may constitute ”personal data” in the terms of the Data Protection Act 1998. For the purposes of this Act, HSE is the ”data controller” and will process the data for health, safety and environmental purposes. HSE may disclose this data to any person or organisation for the purposes for which it was collected, or where the Act allows disclosure. You have the right to ask for a copy of the data and to ask for inaccurate data to be corrected. Please note that all replies will be made public unless you specifically state that you wish yours to be made confidential.

We will acknowledge all responses and give full consideration to the substance of arguments in the development of proposals; we may also contact you again if, for example, we have a query. When HSE has decided upon its recommendation to Ministers, we will let you know how the work will proceed and how the decision reached reflects the results of the consultation.

If you are reading this document on a computer screen and would prefer a printed version, it can be obtained on request by sending an email to: pipelines@hse.gsi.gov.uk or contacting **Lyndsey Bennett or Karen McDonough at: HSE, 5S.2 Redgrave Court, Merton Road, Bootle, Merseyside, L20 7HS. Tel no: 0151 951 3186/3308**

If you require a more accessible format, an Executive Summary is available in Braille, large print, audio formats (e.g. CD, audiocassette tape), or in other languages. Please contact **Lyndsey Bennett or Karen McDonough on the contact numbers or address given above:**

How to respond

- You can complete the **online questionnaire** by going to*:* http://www.hse.gov.uk/consult/condocs/cd228.htm
- Respond **on paper** – you can do this by
  - printing the online questionnaire; or
  - photocopying the questionnaire; or
  - making a written response in whatever format you wish; and

  Send your completed response to:
  Lyndsey Bennett, HSE, 5S.2, Redgrave Court, Merton Road, Bootle, Merseyside, L20 7HS.
- Responses **by email** are also welcome, and should be sent to: pipelines@hse.gsi.gov.uk

Responses must be received by no later than 1 March 2010 and a summary of the main issues raised will be produced once the consultation period has been completed.

Code of Practice on Consultation

HSE is committed to best practice in consultation and to the Government's Code of Practice on consultation, which sets out 7 criteria for consultation documents.

These are:

- When to consult. Formal consultation should take place at a stage when there is scope to influence the policy outcome.
- Duration. Consultations should normally last for at least 12 weeks with consideration given to longer timescales where feasible and sensible.
- Clarity of scope and impact. Consultation documents should be clear about the consultation process, what is being proposed, the scope to influence and the expected costs and benefits of the proposals.
- Accessibility. Consultation exercises should be designed to be accessible to and clearly targeted at, those people the exercise is intended to reach.
- The burden of consultation. Keeping the burden of the consultation to a minimum is essential if consultations are to be effective and if consultees' buy-in to the process is to be obtained.

- Responsiveness. Consultation responses should be analysed carefully and clear feedback should be provided following the consultation; and
- Capacity to consult. Officials running consultations should seek guidance in how to run an effective consultation exercise and share what they have learned from the experience.

If you believe that this document, or the consultation on these proposals, does not meet these criteria, or if you are not satisfied with the way in which this consultation exercise has been conducted, we want to know and put things right. Please contact Maureen Kirwan, HSE, 5S.3, Redgrave Court, Merton Road, Bootle, Merseyside, L20 7HS.

We aim to reply to all complaints within 10 working days. If you are not satisfied with the response, you may ask for your complaint to be passed to a more senior member of staff. Following our second response if you are still not satisfied, you can ask for your complaint to be referred to the Chief Executive.

Introduction

This Consultation Document sets out the proposals for amending the Pipelines Safety Regulations (PSR) 1996 and alert stakeholders to the amendments HSE intends to make to the Health and Safety (Fees) Regulations.

The PSR 1996 provide for the management of pipeline safety and apply to all pipelines in Great Britain, and to all pipelines in UK territorial waters and on the UK Continental Shelf. The Health and Safety (Fees) Regulations have been made under the Health and Safety at Work Act 1974. They give HSE the power to recover costs in respect to named functions, in specified areas, conferred under any of the relevant statutory provisions.

It is intended that the amendments to PSR and the Health and Safety (Fees) Regulations will come into force on the common commencement date in October 2010.

This consultation document provides an overview of the HSE's proposals and a short questionnaire for your completion. The full impact assessments for the new Regulations are available online at:
http://www.hse.gov.uk/consult/condocs/cd228.htm

The proposals set out in this document have already been discussed primarily with those most likely to be affected by their implementation. These have included:

- Pipeline operators
- those regulating the industry - Office of Gas and Electricity Markets;
- local authorities
- emergency services
- emergency planning groups

Background to the Pipelines Safety Regulations - 1996

1. The Health and Safety Executive began developing the Pipelines Safety Regulations in 1995 with the purpose of ensuring that pipelines are designed, constructed, operated, maintained and decommissioned safely, providing a means of securing pipeline integrity and thereby reducing risks.

2. The Pipelines Safety Regulations (PSR) 1996 came into force on the 11th April 1996. The regulations were introduced to provide a single legislative framework for the control of both onshore and offshore pipeline safety management in Great Britain. The Regulations impose general duties on all pipeline operators and additional duties on operators of major accident hazard pipelines (MAHP), which are those pipelines conveying prescribed dangerous fluids. In addition to this, HSE also sets out consultation distances (CDs) around major accident hazard pipelines for land use planning purposes to mitigate the risks and consequences of a major accident.

3. Among the matters considered for inclusion in PSR, were provisions to:
   - classify gasoline as a dangerous fluid;
   - clarify who the duty holder is, in respect of duties imposed on operators;
   - require co-operation between designers, constructors and operators of pipelines; and
   - give local authorities the ability to recover the costs involved in testing of emergency plans from the pipeline operators.

4. Following the formal public consultation exercise in 1995, HSE decided that the above matters required further consideration, so they were withdrawn from the proposed Regulations on the agreement that they should be provided for by way of amendments to the Regulations when further work had been completed. This allowed the main elements of PSR to come into force alongside the Gas Safety Management Regulations (GS(M)R).

5. Informal consultation relating to these proposed amendments began in October 1996, with HSE initiating the Pipeline Emergency Planning Forum (PEPF) to facilitate stakeholder discussions, resolve issues and to assist in drafting guidance to support the preparation of emergency plans. The PEPF was made up of representatives from HSE, Emergency Planning Society, industry, local authorities and the UK Onshore Pipeline Association (UKOPA).

6. By 2003, following extensive involvement and discussions with external stakeholders a draft consultation document was prepared. However in July 2004 the project to take forward the amendments to PSR was cancelled following a review of HSE's work priorities.

7. In 2005, following the Buncefield fire and explosion, the regulation of gasoline pipelines again became a matter of debate. In their official response to the HSE's[1] "Consultation Document 211 on Land Use Planning" the Buncefield Major

[1] http://www.hse.gov.uk/consult/condocs/cd211.htm

Incident Investigation Board (MIIB)[2] highlighted the anomaly that major pipelines conveying gasoline were excluded from the additional duties of PSR.

8. In 2007, HSE carried out a review of PSR, which included a review of the 2003 draft consultation document. This identified a number of areas where HSE felt changes to PSR should again be considered (see paragraph 12 below). However this review concluded that existing arrangements relating to the definition of operator, and the requirement of cooperation between designers, constructors and operators of pipelines were satisfactory.

9. In 2008, HSE initiated further discussions with external stakeholders to discuss the proposed amendments and to highlight any issues that needed to be addressed. However, the issue of placing a duty on local authorities (LA) to test their emergency pipeline plans, and to include a provision to allow them to recover their costs for their involvement in such testing, is a complex area that goes beyond PSR. Further work is required to:
   - Achieve greater consistency in relation to emergency plan requirements, and the associated charging structure, within PSR, Control of Major Accident Hazards Regulations 1999 (COMAH) and Radiation Emergency Preparedness and Public Information Regulations 2001 (REPPIR); and
   - Address stakeholder concerns. This relates to what constitutes an appropriate test of a pipeline plan and introducing a suitable charging structure.

10. Finally, HSE recognises that there are many onshore and offshore MAHPs, or sections of pipelines, which are not within the scope of existing charging schemes (e.g. related to gas safety and offshore installations). HSE feels that it would not be consistent in how it deals with its major accident hazard activities if it did not take steps to charge for its notification and enforcement functions related to these MAHPs. HSE therefore intends to amend the Health and Safety (Fees) Regulations to allow it to charge for its work on notifications and its enforcement functions in connection with onshore and offshore MAHPs not currently covered by existing major accident hazard charging schemes.

The proposals

11. Following this period of informal consultation HSE is proposing to introduce the following changes to PSR;

Part 1 – To classify gasoline as a dangerous fluid;

Part 2 – To classify carbon dioxide as a dangerous fluid;

Part 3 – To modify regulation 21 Notifications before construction;

Part 4 – To modify regulation 23 Notification in other cases ;

Part 5 – Proposed new regulation 29 Implementing emergency plans

[2] http://www.buncefieldinvestigation.gov.uk/reports/cd211.pdf

Part 6 – Other changes to Regulations and supporting guidance

Part 7 – Amendments to the Health and Safety (Fees) Regulations

12. Due to the proposed amendments to the Pipelines Safety Regulations, it has been necessary to introduce new regulations (24 and 29), and to incorporate what was regulation 13A (Iron pipelines) into the main body of the Regulations. This has subsequently led to a change to the numbering of the Regulations. A table has been produced (Annex 4) which outlines these changes. All references to regulations in this consultation document are made using the revised numbering.

13. Each proposal will now be covered in detail and HSE welcomes your feedback

Part 1
Classification of gasoline as a dangerous fluid

Issue

14. Gasoline is not included in Schedule 2 as a prescribed dangerous fluid for the purpose of these Regulations and as such gasoline pipelines do not fall within the scope of the additional duties as set out in Part III of the Regulations.

Background

15. The Pipeline Safety Regulations impose two levels of duties:
    - The lower level (general duties) applies to all pipelines as defined in the Regulations, these duties cover the design, construction, installation, operation, maintenance and decommissioning of pipelines; and
    - The higher level (additional duties) applies to pipelines conveying prescribed dangerous fluids; these duties cover notification, major accident prevention documents, emergency procedures and emergency planning.

16. Until a late stage in the development of PSR, HSE had intended that gasoline pipelines would be subject to the additional duties. However, research to assess whether the risks from gasoline pipelines justified these duties indicated that the risks were border-line. The first study by A D Little[3] looked at a representative sample of existing pipelines to determine the criteria to see which substances should attract additional duties. Gasoline emerged at the lower end of the risk scale for dangerous substances.

Decision

17. PSR was subsequently introduced with gasoline pipelines subject only to the general duties. However, due to the proposal by HSE to extend the additional duties to gasoline pipelines being challenged by external stakeholders further research was commissioned. A more detailed study by W S Atkins followed[4]. This study looked at actual incidents and their consequences, rather than risk assessments. This report confirmed that although the levels of risk were low, the potential consequences of an accident involving gasoline pipelines are very serious.

18. This report was submitted to the Advisory Committee on Dangerous Substances (ACDS) in February 2001 and a consensus was reached which recommended that gasoline should be classified as a dangerous fluid in PSR.

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[3] Arthur D Little "Risks from Gasoline pipelines in the United Kingdom" report to the UK HSE June 1996. http://www.hse.gov.uk/research/crr_pdf/1999/crr99206.pdf

[4] WS Atkins Safety and Reliability "Assessing the risk from gasoline pipelines in the UK based on a review of historical experience" HSE research report 210/1999 http://www.hse.gov.uk/research/crr_pdf/1999/crr99210.pdf

19. This was further supported by the Buncefield MIIB who had highlighted the anomaly that major pipelines carrying gasoline are not subject to additional duties under PSR.

Proposal

20. To classify gasoline as an dangerous fluid in Schedule 2 of PSR. This would extend the additional duties under PSR to gasoline pipelines.

21. HSE is required to give advice to local authorities on any planning applications for developments close to MAHPs and it will be necessary for HSE to set CDs for all pipelines when gasoline becomes a dangerous fluid. HSE will use notified particulars of the gasoline pipelines and average conditions along the pipeline routes as the basis for the risk assessments to set the CDs.

22. At present HSE have an established methodology that can be used to set CDs when gasoline becomes a dangerous fluid under PSR. This methodology is based on pool fires following a gasoline release and would set the CD at 80m. Following discussions between HSE and industry this methodology is currently under review. The results are not available at time of publication of this document, however, as soon as the outcome and impacts of the review are known, HSE will take relevant action.

Proposed regulatory change

Schedule 2: Descriptions of dangerous fluids

Gasoline: "Any petroleum derivative, other than liquefied petroleum gas, with a flashpoint between –51 °C to -40 °C and which is intended for use as a fuel in motor vehicles".

23. The aim of classifying gasoline as a dangerous fluid within Schedule 2 of PSR is to ensure that petrol conveyed by pipeline for motor vehicle use, either in its final form or the form accepted for primary distribution is covered.
24. The impact assessment for gasoline is attached at Annex 3a.

Consultation point - gasoline

1. Do you agree that gasoline should be classified as a dangerous fluid in PSR?

2. HSE has been holding discussions with industry to reach a consensus on a suitable definition of gasoline for inclusion in PSR and HSE welcomes stakeholder views on the proposed definitions suitability.

3. Are you aware of any pipelines conveying gasoline that is not intended for use as a motor fuel. If so, please provide further details.

Part 2
Classification of carbon dioxide as a dangerous fluid

Issue

25. Fossil fuels will continue to play a significant role in the energy mix for the foreseeable future – both in the UK and internationally. If we are to tackle climate change, we need to find ways to reduce emissions from fossil fuels substantially.

26. Carbon Capture and Storage (CCS) has the potential to reduce CO_2 emitted from fossil fuel power stations by up to 90 percent. CCS is a three-step process which includes:
    - capturing the CO_2 from power plants and other industrial sources;
    - transporting it, usually via pipelines, to storage points; and
    - storing it safely in geological sites such as deep saline formations or depleted oil and gas fields.

27. At present the hazard classification of CO_2 is such that it does not attract the duties normally required for major accident hazard control under the Control of Major Hazards Regulations 1999 (COMAH) and the Planning (Hazardous Substances) Regulations. CO_2 is also not included as a dangerous fluid for the purpose of PSR, which means that pipelines used for conveying CO_2 (for the purposes of CCS) would not fall within the scope of the additional MAHPs duties set out in Part III of PSR.

Background

28. HSE has been taking an active role in CCS since the Government's 2006 Energy Review, in response to which HSE prepared an Expert Report for the Energy Minister[5]. This report concluded that HSE's regulatory framework is sufficiently comprehensive and flexible to deal with new risks and hazards achieving sensible risk management and specific new regulatory controls may be required in due course, it was further concluded, if the risks merit such action (and depending on the outcomes of the Energy Review).

29. The UK has become a global leader in promoting the development of CCS and in November 2007 the Government launched a competition to install, with public funding, one of the world's first commercial scale CCS power plants in the UK by 2014.

30. In particular, HSE are working closely with DECC throughout the competition. Within the competition documents, it is clearly stated that HSE requires developers to give a health and safety compliance demonstration as if CO_2 was classified as a dangerous substance or fluid under COMAH and PSR, and assume that all relevant offshore major accident hazard regulations apply. In

[5] http://www.hse.gov.uk/consult/condocs/energyreview/energyreport.pdf

addition, the successful competitor must provide technical information to HSE throughout the project, to inform the development of appropriate health and safety standards.[6]

31. HSE recognises that other organisations, not associated with the competition, are also planning to work in the CCS industry. At the time of the April 2009 budget statement the Secretary of State for Energy and Climate Change announced that Government will promote competition for up to three further publicly funded CCS power plants that would demonstrate different capture technologies. On 23 April 2009 the Government confirmed that any new combustion power station at or over 300 MWe would have to be built Carbon Capture Ready (CCR). This means it should be designed so there are no foreseeable barriers to retrofitting CCS once it is proven.

32. HSE is committed to acting as an enabling regulator to help facilitate the uptake of this new technology. This includes the early identification of regulations which may need to be modified to accommodate CCS. This is in line with our statement in the Expert Report that new regulatory measures may be required if merited by the risks, (and once the outcomes of the Energy Review are known which, for CCS, they are). It is important that HSE now takes steps to clarify to the CCS industry the regulatory requirements for CCS. The introduction of an appropriate safety regulatory regime will also underpin public confidence in CCS technologies, which is vitally important when introducing untested technologies into the industrial environment. At the same time, HSE recognises the need to avoid introducing additional, inappropriate, regulations on existing CO_2 industries.

Decision

33. A review by HSE of emerging energy industries[7], highlighted the major accident potential of CO_2, when used for CCS. The Review highlighted that given the large scale of proposed CCS projects, there may be the potential for leakage from a pipeline in close proximity to residential areas to cause a major accident hazard due to the toxicity and asphyxiant properties of CO_2.

34. HSE is working with key stakeholders to develop a shared understanding of the risks associated with CCS in order to review whether the risks associated with the CCS process merit extending the major accident hazard regulatory regimes to these projects. However, it is difficult to make evidenced based decisions on the hazards and risks involved when there is still a great deal of uncertainty relating to the processes, and equipment, that will be adopted at each stage of the CCS process.

35. HSE (with HSL) have carried out hazard and risk assessments of the likely releases from CO_2 being transported in a pipeline with the characteristics of a typical natural gas pipeline in order to compare the risks from the two substances.

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[6] CCS Project Information Memorandum http://www.decc.gov.uk/media/viewfile.ashx?filepath=what we do/uk energy supply/energy mix/carbon capture and storage/demo_comp/file42478.pdf&filetype=4

[7] http://www.hse.gov.uk/consult/condocs/energyreview/energyreport.pdf

This work is reported in a HSL report (reference FP/09/22) and the results were published as a paper at the Institute of Chemical Engineers Hazards XXI Symposium in Manchester on 11th November. If you would like the link to the report on the HSE website when it becomes available you can request this by e-mail to pipelines@hse.gsi.gov.uk or via the contact details for this consultation listed on page 4.

36. The results of the work show that the risk from the pipeline, whilst transporting CO_2 at 16 and 33 bar absolute, were comparable to those from the same pipeline carrying natural gas at a pressure of 8 bar absolute. At this pressure, a natural gas pipeline would be classified under PSR as a MAHP and subject to Part III of PSR. Consequently, HSE has concluded that CO_2 has sufficient toxicity for pipelines transporting CO_2 to also be capable of causing a major accident hazard and that they too should be subject to the requirements of the MHAP aspects of PSR.

37. Further work was carried out to model the risks from the pipeline transporting CO_2 at 8 bar absolute to determine if a lower pressure limit exists below which the risks are not significant. The risks at 8 bar absolute were only marginally lower than those at 16 bar absolute. This suggests that the pipeline pressure at which the risks would become insignificant is much lower than 8 bar absolute and that there would be little technical justification for any particular pressure limit.

38. It is recognised that the work described above is for a single set of pipeline characteristics. Smaller pipelines at a pressure of 8 bar absolute may not generate significant risks but larger ones may have greater risks. This would be confirmed in the pipeline safety assessment that would accompany any proposed pipeline and might be reflected in the extent of the land use planning zones set for a particular pipeline.

39. This report suggests to HSE that in terms of both hazard and risk, CO_2 when transported at high pressure, for example in CCS industries, has sufficient toxicity to be regulated as a dangerous fluid under the PSR. Although HSE recognises the limitations in the current knowledge and hazard modelling available for CCS, it feels that there is sufficient evidence of the risks associated CO_2 (when used for CCS) for HSE to adopt a precautionary approach within the PSR.

40. In the PSR Schedule 2 descriptions for dangerous fluids, description 4 (which relates to toxic gases) has no pressure limit. CO_2 is toxic but not "a toxic substance" (as defined in their schedules to regulation) but it does exhibit the characteristics given in description 4.

41. Given all of the above, HSE therefore proposes that CO_2 is included as a dangerous fluid in Schedule 2 of PSR without temperature or pressure limits (in the same manner as Acrylonitrile).

42. To ensure that this proposed amendment to PSR avoids introducing additional, inappropriate, regulations on existing CO_2 industries, HSE has had some initial discussions with some of these industries. It appears that CO_2 is not generally transported cross country by pipeline (as defined under PSR) by other industries. However it is likely that vehicle transport, transport in cylinders or in pipe work

within a site will continue. HSE is seeking further clarification from industry on this point as part of this consultation. If there are no other industries transporting CO_2 by pipeline, then HSE can include CO_2 (without other defining parameters for example pressure thresholds, pipe diameter or length[8]) in PSR without having an impact on other non-CCS industries.

Proposal

43. To include carbon dioxide as a dangerous fluid in Schedule 2 of PSR. This would extend the additional major accident hazard duties under PSR to carbon dioxide pipelines.

Proposed regulatory change

Schedule 2: Descriptions of a dangerous fluid
Regulation 19 (2)

Carbon Dioxide

Relationship with other Regulations - COMAH

44. HSE's recognises the need to ensure consistency between the PSR and COMAH longer-term. Once further evidence on the hazards and risks related to CCS becomes available, and the European Commission has considered its position in relation to carbon dioxide as a major accident hazard, HSE will need to consider what if any amendments are needed to COMAH.

45. The impact assessment for carbon dioxide is attached at Annex 3b.

Consultation point – carbon dioxide

1. Based on the information available (e.g. on the CCS process and associated risks) do you agree with HSE adopting a precautionary approach and including carbon dioxide as a dangerous fluid in PSR?

2. Should further defining parameters be introduced, for example pressure thresholds, pipe diameter or length, when including CO_2 within PSR?

3. Are you aware of any other UK industries that currently transport carbon dioxide using a pipeline (as defined under PSR)?

[8] Article 31 of the CCS Directive amends the IPPC Directive to include 'pipelines with a diameter of more than 800 mm and a length of more than 40 km for the transport of carbon dioxide (CO_2) streams for the purposes of geological storage, including associated booster stations', thereby applying the same standards to CO2 pipelines as those which already apply to gas, oil and chemical pipelines.

Part 3
Regulation 21
Notification before construction

Issue

46. Currently notifications under regulation 21 of PSR do not have an expiry date, which results in consultation distances (CD) being set for an indefinite period, possibly for pipelines that are never constructed. This in turn impacts on local authority (LA) planning decisions on proposed developments within the CD corridor.

Background

47. Regulation 21 requires an operator to notify HSE of specific details (listed in Schedule 4 of PSR) in relation to a proposed new MAHP prior to its construction. The intention is that this notification should be made at the end of the concept design stage and before any major expenditure has been committed by the pipeline operator. This would normally be at least six months before the start of construction.

48. The purpose of the notification is to trigger HSE's inspection arrangements, and also provides an opportunity for HSE to have early contact with the operator in order to secure the proper construction and safe operation of a pipeline.

49. Following a notification under regulation 21 HSE will set an appropriate CD for the pipeline. The effect is to require the local authority to consult HSE before permitting any development within the CD corridor. The CDs are not set to prevent development, but designed to lessen the impact of any incidents by limiting certain types of new development at varying distances from the pipeline.

Decision

50. HSE have decided to take this opportunity whilst other amendments to PSR are being proposed to amend regulation 21 and align the notification requirements of PSR with other consent regimes and with guidelines from the Better Regulation Executive. Other regulatory regimes that currently apply to pipelines are:

- The Petroleum Act 1998[9] – under section 14(1) (a) an authorisation is required for the construction/and or use of a pipeline in "controlled waters". However under section 18 of the Act if the works authorised by a pipeline works authorisation (PWA) do not begin within three years from the date on which the PWA comes into force the pipeline operator will be notified that the authorisation has expired. If the pipeline operator still wishes to go ahead with this pipeline, a new application has to be submitted.

[9] Petroleum Act 1998 – https://www.og.decc.gov.uk/regulation/guidance/in_pipeauthor/interim4.htm

- The Pipelines Act 1962[10] – under section 1(4) pipeline operators have to apply for a "pipeline construction authorisation" which is only granted following a period of consultation. However if construction does not take place within 12 months of the application being granted the authorisation is invalid. The pipeline operator can apply for an extension but this will only be decided following a further consultation period.

Proposal

51. To introduce a three year expiry date on notifications made under regulation 21 which would have benefits for both HSE and local authorities:
    - Information on proposed pipelines held by HSE and accessible by the LA would be updated leading to improved administration around land use planning controls; and
    - Planning applications submitted to the local authorities would not be impeded by restrictions arising out of a proposal for a pipeline that is not being actively pursued.

Proposed regulatory change

Regulation 21

21. The operator shall ensure that the construction of a major accident hazard pipeline is not commenced unless his intentions in respect of the particulars specified in Schedule 4 have been notified to the Executive —

(a) no more than 3 years, and

(b) no less than 6 months, or such shorter time as the Executive may approve,

before such commencement.

Guidance

Where the construction of a pipeline does not start within 3 years of the operator's initial notification of his proposals to the HSE, that notification will become invalid. If the operator still proposes to go ahead and construct this pipeline a new notification will be required with the information listed in Schedule 4.

52. The short impact assessment for introducing an expiry date to a notification made under regulation 21 is attached at Annex 3c.

Consultation point – regulation 21

1. Do you agree with the introduction of a 3-year expiry date on notifications to construct a pipeline?

[10] Pipelines Act 1962 - http://www.opsi.gov.uk/RevisedStatutes/Acts/ukpga/1962/cukpga_19620058_en_8#sch1

Part 4
Regulation 23
Notification in other cases

Issue

53. Currently regulation 23 does not deal with the situation where an existing industrial complex is split up and the operation moves from being under the control of one operator, to that of a number of independent operators managing different chemical plants and processes.

54. When this situation occurs, the “site pipe work” connecting discrete operational units may no longer be excluded from the scope of the Regulations on the ground that it comprises “a pipeline contained wholly within the premises occupied by a single undertaking”. If this is the case and the pipe work falls within the MAHP definition, it will attract both the general and additional duties of PSR.

Background

55. The duties under regulation 23 of PSR require notification to HSE of any significant changes to the pipeline which affects the level of risk. These changes can include: changes to the operating regime; major modifications to the pipeline; changes in fluid; or the pipeline no longer being in use. The changes to be notified are set out in more detail in Schedule 5 of PSR.

Decision

56. In light of the above, HSE have decided to take the opportunity whilst proposing other amendments to PSR to amend regulation 23 in order to extend the circumstances when an operator must notify information to HSE.

Proposal

57. To amend regulation 23, to help ensure that HSE is provided with up to date information so that it can put in place the appropriate inspection arrangements.

Proposed regulatory change

Regulation 23

23— (1) Where there is a change of operator of a major accident hazard pipeline, or of his address, the operator shall notify such change to the Executive of the change within 14 days thereafter the date on which it occurs.

(a) Where, by reason of a change to the occupancy of premises, a major accident hazard pipeline (or part of such a pipeline) ceases to be excluded from the scope of these Regulations by regulation 4(2) and paragraph 3 of Schedule 1, the operator shall notify the Executive of the particulars specified in Schedule 4 within 3 months after the date on which the change occurs.

(b) Subject to paragraph (4), in the case of a major accident hazard pipeline the construction of which has commenced or has been completed, the operator shall ensure that no event of a kind described in Schedule 5 takes place until the expiration of 3 months, or such shorter time as the Executive may in that case approve, after the receipt by the Executive of the particulars specified in that Schedule in relation to such event.

(c) Where an event of a kind described in Schedule 5 takes place in an emergency, the operator shall notify to the Executive of the particulars specified in that Schedule as soon as is reasonably practicable.

Guidance

If there is a change to the status of a pipe or system of pipes previously classed as being "contained wholly within the premises occupied by a single undertaking" and therefore exempted from PSR by virtue of regulation 4(2) the HSE should be notified.

Consultation point – regulation 23

1. Do you agree with the proposed changes to regulation 23?

Part 5
Proposed new regulation 29
Implementing emergency plans

Issue

58. There is currently no requirement under PSR for a local authority which has prepared an emergency plan, to implement the plan. And, subsequently in regulation 26 there is no duty on the operator to notify the local authority and emergency services immediately if a major accident occurs or an event occurs which could reasonably be expected to lead to a major accident.

Background

59. Regulation 26 requires that the operator prepares adequate emergency procedures. The plan should cover the procedures needed to respond to all foreseeable major accidents involving a pipeline, so it should set out who does what, when and how and to what effect, in the event of an emergency.

Decision

60. In light of the above, HSE have decided to take the opportunity whilst proposing other amendments to PSR to introduce regulation 29, which imposes an explicit duty on the local authority which has prepared an emergency plan to implement the plan without delay. In order to align regulation 26 a new duty on the operator has been introduced to ensure the local authority and emergency services are notified in the circumstances specified in regulation 29.

Proposal

61. To introduce new regulation 29 and amend regulation 26.

Proposed regulatory changes

Implementing emergency plans

29. *A local authority which has prepared an emergency plan pursuant to regulation 26 shall take reasonable steps to put into effect without delay when –*

i) a major accident occurs, or

ii) an event occurs which could reasonably be expected to lead to a major accident.

Guidance

The duty to implement the emergency plan lies with the local authority, not with the actual individuals who draw up the plans. The local authority will have discharged this duty when there are systems in place to ensure there are no unreasonable de-

lays between the discovery of a major accident, or an incident that may lead to a major accident, and the activation of the emergency plans.

There should be a clear and logical decision-making system in place to ensure that, as soon as a relevant event has occurred, the plan will be initiated immediately. The plans must specify the name(s) or position(s) of the people who are authorised to initiate the plan and include the arrangements in place for the local authority to warn the emergency services of an incident which may escalate into a major accident.

To amend the regulation to include;

Proposed regulatory changes

Regulation 26(2);

The procedures shall include the provision for the local authority and the emergency services to be notified immediately in the circumstances specified in regulation 28

Consultation point – proposed regulation 29

1. Do you agree with the introduction of new regulation 29?

2. Do you agree with the proposed changes to align regulation 26 with new regulation 29?

Part 6
Other changes to Regulations and L82 guidance

62. Whilst progressing the work on the proposed amendments to PSR, HSE has also taken the opportunity to review both the Regulations generally and underlying guidance, in order to seek to improve the clarity of the text and consequently provide duty holders with a better understanding of obligations imposed. Details of the amendments proposed follow, but it is important to note that these amendments are clarifying the existing requirements on duty holders, not introducing additional requirements.

Regulation 2 Definition of Operator

63. HSE produced web-based further guidance on the definition of operator[11] to provide clarity. This will now be incorporated into 'A guide to the Pipelines Safety Regulations 1996' L82. Some minor amendments have been made to the text that follows to add further clarity:

"operator", in relation to a pipeline means -

(a) the person who is to have or (once fluid is conveyed) has control over the conveyance of fluid in the pipeline;

(b) until that person is known (should there be a case where at a material time he is not yet known) the person who is to commission or (where commissioning has started) commissions the design and construction of the pipeline;

(c) when the pipeline is no longer used, or is not for the time being used, the person last having control over the conveyance of fluid in it.

Guidance

The arrangements for operating pipeline systems are often complex. There may be different operators of different parts of a pipeline system and complex commercial arrangements between them. This can result in confusion over the identity of the pipeline operator.

Until the person who is to have control of the conveyance of fluid is known, the operator is the person who commissions the design of the pipeline or (where such work has started) the person who commissioned the design.

The operator of a pipeline is the person who has control over conveyance of fluid in that pipeline. To have control over conveyance of the fluid requires management arrangements, clear responsibilities, authority, competence and access to information to be able to make proper decisions about the safety and integrity of the pipeline. Examples of where operatorship is not conferred are -

[11] http://www.hse.gov.uk/pipelines/resources/pipelineoperator.htm

(a) ownership of a pipeline or the fluids conveyed in it does not, by itself, confer control over the conveyance of fluid in a pipeline. A person may be the pipeline operator and own neither the pipelines or the fluids;

(b) although a pipeline operator may place contracts with another person for the day-to-day operation, inspection and maintenance of a pipeline, this does not transfer operatorship. In such cases pipeline operators must ensure the safety and integrity of the pipeline, for example, through an effective audit and verification system;

(c) a company with no employees which merely holds the pipeline assets cannot be the operator.

Where the pipeline operated is a major accident hazard pipeline the following criteria will normally need to be demonstrated by the pipeline operator:

(a) all foreseeable hazards relating to the pipeline with the potential to cause a major accident have been identified and the risks arising from those hazards evaluated;

(b) the safety management system is adequate to minimise the risks of a major accident;

(c) the design and construction of a pipeline has been carried out properly to ensure that fluid will be conveyed safely;

(d) the pipeline can be operated and controlled safety, including procedures under emergency conditions;

(e) they can ensure that the pipeline integrity remains secure over time to allow continued safety conveyance of fluid; and

(f) they have sufficient control to decide what fluid to convey, and under what physical conditions.

Where there is a parent company with several subsidiaries or a joint venture with several partners, then the various parties should decide between them who will be the pipeline operator.

Where a pipeline system is operated by different operators, each operator is responsible for the safe operation of their part of the pipeline system. However, one operator may act as the ‘co-ordinating operator’ in monitoring the conveyance of fluid and may require the other operators to ensure that necessary adjustments in fluid flow, composition, condition, quality, etc. are made in order to safeguard the whole system or part of it.

For the purpose of identifying the extent of control over conveyance of fluid in a pipeline system clear boundaries should be established between the separately operated pipelines. Where practicable these should be at physical boundaries. Geographical boundaries, such as the edge of an offshore installation safety zone or a chemical plant fence line should be avoided where practicable. Examples of situations where clear physical boundaries between operators might not be practicable are:

(a) an offshore import pipeline entering Great Britain territorial waters; and

(b) offshore pipelines, within Great Britain territorial waters, feeding a beach terminal with operatorship changing along the length of the overall pipeline.

Regulation 3(3) Meaning of "pipeline"

68. This regulation defines what is meant by the term "pipeline". However, when reviewing the PSR HSE identified that regulation 3(3) is not clear in its intent. HSE have taken the opportunity to review this regulation and this work is ongoing and will be in place when the proposed amendments come into force in October 2010. Steps will be taken to consult industry on this proposal when it is ready.

Regulation 14 Iron pipelines

Background

64. Natural gas is distributed though a network of pipes made up of mainly cast iron, ductile iron, steel and polyethylene. Iron pipes (which include cast iron, spun iron and ductile iron) fail through fracture and corrosion and failures have resulted in serious gas explosions. Iron mains within 30m of buildings present the greatest hazard and are referred to as "at-risk pipelines".

65. In 2002, in view of the extent and condition of the gas distribution network, the HSE published an enforcement policy aimed at the major network operators, requiring all "at-risk" iron mains in Great Britain to be replaced with pipes made of safer materials within 30 years. Given the length of mains involved at that time, the timeframe was as short as reasonably practicable. The policy therefore consists of an agreed rate of replacement each year so that the remaining pipes can be replaced within 30 years.

66. Regulation 14 allows each operator to prepare a programme, usually annually, setting out the length of pipe that will be decommissioned in that year. In certain circumstances, the programme may cover longer periods. The programme will not identify specific locations of lengths of pipeline, but will agree the arrangements for prioritising which mains will be decommissioned in the particular programme.

67. If HSE is satisfied that a programme is suitable and sufficient for the period it relates to, it must approve it. The operator then has a duty to comply with the approved programme so far as is reasonably practicable.

68. If HSE prepares a programme itself or modifies one prepared by an operator, it must consult the operator before approving the programme. In practice, it is expected that operators will prepare programmes themselves and that HSE, if not satisfied with a programme will discuss the necessary changes with the operator and agree them. The operator would them amend the programme and resubmit

for approval. Only in exceptional circumstances would HSE prepare or amend a programme itself.

69. The operator has a duty to comply with the approved programme so far as is reasonably practicable. Operators with approved programmes are given a defence from prosecution under regulation 13 provided the requirements of regulation 14(10) are met.

Issue

70. This regulation was enacted by an amendment on 3rd November 2003 to the Regulations and sits separately from the main body of PSR.

Decision

71. The opportunity has been taken to improve the quality of the text of the regulation and the supporting guidance in order to aid understanding, although the policy intent remains the same. The new text is shown in italics below, along with the guidance to support it.

Proposed regulatory change

Iron pipelines

14 — (1) The operator may prepare a programme for the decommissioning, during a period specified in the programme, of any description of iron pipe used in a pipe-line.

Guidance

Iron pipes used to convey natural gas are manufactured from a range of materials including cast iron, spun iron and ductile iron. Iron pipes fail through fracture and corrosion and the resulting gas escapes have caused serious gas explosions. Iron pipes within 30 metres of buildings present the greatest hazard and are referred to as 'at-risk'. HSE's enforcement policy for the replacement of iron gas mains is aimed at the major gas distribution networks and requires all 'at-risk' iron pipes in Great Britain to be decommissioned within 30 years from 2002. Where iron mains are replaced following decommissioning, safer materials, usually polyethylene, are now used.

Regulation 14 allows each operator to prepare a programme which sets out the length of pipe that will be decommissioned over a specified period. Programmes usually cover a single year, although they may cover longer periods.

A programme should describe the period to which it relates, the population and length of pipe to be decommissioned and the policy and procedures used to prioritise which pipes are to be decommissioned.

HSE's enforcement policy for the replacement of iron gas mains does not include steel service pipes, which connect gas mains to a consumer's premises. However,

under regulation 13, operators have a duty to maintain service pipes in good repair. Service pipes are often replaced by the operator at the same time as the gas mains to which they connect.

There are some pipeline operators with relatively small amounts of 'at-risk' iron pipes. In these cases, it will be practicable to decommission these networks in less than 30 years.

(2) In paragraph (1), "iron" does not include steel.

Steel pipelines are not covered by regulation 14. However, steel and pipelines made from other materials still have to be maintained in good repair under regulation 13.

(3) A programme prepared under paragraph (1)—
(a) shall be submitted to the Executive for approval, and
(b) shall be approved by the Executive, with or without modification, if the Executive is satisfied that the programme or modified programme is suitable and sufficient for the period to which it relates.

If HSE is satisfied that a programme is suitable and sufficient for the period it relates to, it must approve it. Operators with approved programmes are provided with a defence from prosecution under regulation 13 provided the requirements of regulation 14(10) are met.

(4) An approval under paragraph (3)—
(a) shall be in writing;
(b) shall be notified to the operator and published in such manner as the Executive may approve, and
(c) may be withdrawn by the Executive by reasonable notice in writing at any time.

(NB approvals made under old regulation 13A of PSR 1996 will be treated as approvals under new regulation 14 of PSR 2010, therefore no transitional provision will be included in the Regulations for this)

(5) The operator may modify a programme after it has been approved under paragraph (3); in such a case, paragraphs (3) and (4) shall apply to the modified programme as they applied to the original programme.

An operator may modify a previously approved programme before the end of the approval period and re-submit it to HSE for approval. However, HSE would only expect to approve such a modification in circumstances where the operator can demonstrate that it is no longer practicable to comply with the existing approved programme.

(6) The Executive may prepare a programme for a period for which no suitable and sufficient programme has been prepared by the operator.

If the operator fails to prepare a programme HSE may do so instead. If HSE prepares a programme it must consult the operator before approving it. Only in exceptional circumstances would HSE prepare a programme itself.

(7) A programme prepared under paragraph (1) or (6) need not specify the location of any pipe to which it relates.

The programme will not identify specific locations of lengths of pipe, but will set out the arrangements for prioritising which mains will be decommissioned in that particular programme. Where a pipeline network covers an extensive area of the country, the programme may be broken down into geographical areas.

(8) The Executive shall consult the operator before it modifies a programme submitted under paragraph (3) or prepares a programme under paragraph (6).

If HSE modifies a programme prepared by an operator, it must consult the operator before approving the programme. In practice, it is expected that operators will prepare programmes themselves and that HSE, if not satisfied with a programme, will discuss the necessary changes with the operator and agree them. The operator would then amend the programme and resubmit it for approval. Only in exceptional circumstances would HSE amend a programme itself.

(9) The operator shall so far as is practicable comply with a programme approved or prepared by the Executive under this regulation.

The operator has a duty to comply with the approved programme. However, if the operator were to be prosecuted for non-compliance, it would be a defence for him to show that he complied with the programme 'so far as is practicable' and that his inability to comply was due to matters outside the operator's control. Such matters could include:

(a) an extended spell of severe weather;
(b) external events such as terrorist activity, human or animal epidemics, fuel crisis;
(c) overriding legislative requirements;
(d) industrial action;
(e) sites with archaeological or environment significance.

The approved programmes will usually allow a degree of flexibility regarding the selection of mains for decommissioning. Operators would be expected to use this flexibility to select alternative pipes where possible in order to be able to comply with the programme. However, the operator would not be able to claim that matters within his control made compliance not practicable. For example:

(a) availability of resources;
(b) network complexity;
(c) maintaining continuity of supply;
(d) liaison with third parties, for example, landowners, pressure groups.

Where operators fail to comply with their approved programme HSE will take action in line with its current enforcement policy.

(10) In any proceedings for the offence of contravening regulation 13, and without prejudice to the defence provided for in regulation 31, it shall be a defence for the person charged to prove that, at the relevant time—

(a) any pipe to which the contravention related was of a description to which a programme—

(i) approved or prepared by the Executive, and

(ii) not then due for completion,

applied, and

(b) where the proceedings arise from an event involving a failure of a pipe, the operator did not know and could not reasonably be expected to have known that the condition of the pipe was such as to require immediate attention

The Executive will specify in the approval of a programme the description of pipes to which it applies, the length of pipe which is to be decommissioned, and the period to which the programme applies. The approval will also be on condition that operators select pipes for decommissioning in accordance with the policy and procedures referred to in their programme submission. The approval will exclude any pipes which are due for decommissioning under earlier programmes. HSE will consider agreeing separate arrangements with the operator to ensure that overdue decommissioning takes place. Each approved programme will recognise that the major iron distribution networks will be decommissioned over several years and lower risk pipes will, quite properly, be left for future years.

If an operator is prosecuted for a breach of regulation 13 in connection with the failure of a pipeline then they will have a defence under regulation 14(10) providing they can prove the following:

(a) The pipe was 'of a description' to which an approved programme applied. There is no defence under this regulation for pipes made of other materials such as polyethylene and steel. There is no defence if the failure has been on an iron pipe which, for whatever reason, has not been recognised as needing replacement in this or any previous programme. For example, a pipe recorded as polyethylene on an asset register which is in reality iron, would not have formed part of an approved programme and therefore no defence applies; and

(b) The operator did not know and could not reasonably have been expected to know that there was a contravention of regulation 13 concerning the pipe that required immediate attention.

Although regulation 14(10) provides a defence to a breach of regulation 13 it does not provide operators with immunity from prosecution under other legislation. Under the Health and Safety at Work Act 1974 (HSWA) operators must still do everything reasonably practicable to ensure the health and safety of both their employees and non-employees, including the public.

Relationships with other Regulations

72. Under the Gas Safety (Management) Regulations 1996, gas network operators should describe their operational and maintenance arrangements in their safety cases. This should include the findings of their risk assessment, a description of the methodology used to identify and prioritise mains decommissioning.

Consultation point – regulation 14

1. HSE welcomes any feedback on the restructured regulation 14.

Part 7
Amendments to the Health and Safety (Fees) Regulations

Issue

73. HSE intends to amend the Health and Safety (Fees) Regulations to allow it to recover its costs for functions in relation to its notification work under the PSR and its enforcement functions in connection with onshore and offshore major accident hazard pipelines (MAHPs) not currently covered by existing major accident hazard charging schemes (e.g. related to gas safety and offshore installations). This step is being taken to ensure a consistent cost recovery approach by HSE when dealing with major accident hazard activities.

Background

74. Cost recovery regulations have been made under section 43(2) of the Health and Safety at Work etc. Act 1974 (HSWA). That provision enables regulations to be made which provide for fees to be payable for or in connection with the performance by or on behalf of certain authorities, which includes HSE, of functions conferred on the authority by or under any of the "relevant statutory provisions" (as defined in section 53 of HSWA).

75. In line with HM Treasury's Managing Public Money guidance, HSE is required to recover the full cost of any statutory functions that are charged for i.e. to break-even. Although HSE is not allowed to set any fees to deliberately achieve surpluses or deficits, there are timing issues and assumptions around costs, chargeable hours and events that happen in-year that will, inevitably, mean that the fee charged will differ from the outturn rate. HSE makes every effort possible to minimise the risk of this happening.

76. The Health and Safety (Fees) Regulations are made under section 43(2) of the HSWA. The Pipelines Safety Regulations are "relevant statutory provisions", which give HSE the power to recover costs in respect to named functions, in specified areas, conferred under any of the relevant statutory provisions. In line with HM Treasury guidance, full cost recovery is sought by HSE in such charging schemes, however, HSE will not duplicate charges where a fee is already charged under other legislation.

77. HSE estimates that there are in the region of 21,000 km of onshore natural gas pipelines conveying natural gas at or above 7 barg in Great Britain. At present HSE recovers costs associated with the assessment of safety cases, its enforcement function and exemptions for these MAHPs under the Gas Safety (Management) Regulations 1996.

78. The Offshore Installations (Safety Case) Regulations 2005 require a safety case for all installations operating, or to be operated, in British waters and in UK designated areas of the continental shelf. The safety case must address all risks arising from pipelines connected to the installation and any other pipelines with the potential to cause a major accident on the installation. HSE recovers its costs for

safety assessment and any other regulatory functions under these Regulations from the installation duty holder.

79. PSR imposes duties on onshore and offshore pipeline operators to ensure the integrity and safe operation of a pipeline system as a whole. HSE does not currently cost recover for the regulation of any pipeline under PSR, including enforcement.

80. HSE has recognised that the regulatory approach to onshore and offshore pipelines and sections of MAHP that do not fall within the scope of existing cost recovery schemes is inconsistent and seeks to remedy this.

Decision

81. HSE intends to introduce an amendment to the Health and Safety (Fees) Regulations, which will come into force in October 2010, to allow it to recover costs for its work on notifications and its enforcement functions, in connection with MAHPs not currently covered by existing cost recovery schemes. This new cost recovery scheme for MAHPs will not only ensure that a consistent approach is adopted by HSE, but it will complement the cost recovery schemes already in place under the Control of Major Accident Hazards Regulations (COMAH) 1999, the Gas Safety (Management) Regulations 1996) and the Offshore Installations (Safety Case) Regulations 2005.

82. The charges that will be introduced by HSE will be made on an 'actuals' basis. That is, the recovery of the full costs of the time spent by HSE carrying out a relevant activity in relation to a particular MAHP on any particular occasion or occasions. The way in which HSE has approached the identification of the relevant costs for inclusion in the charge out rate follows the guidance in HM Treasury's Fees and Charges Guide (link to reference). Charges will normally fall to the operator, the person who is in control of the pipeline. The current hourly charge out rates are £138 for onshore and £235 for offshore. These hourly rates are subject to annual reviews.

83. As HSE was already planning to initiate a consultation on the proposed changes to the PSR, this was seen as the most appropriate vehicle to alert stakeholders to MAHP cost recovery, and to ask them for their views on issues they would like HSE to consider when introducing this charging scheme.

Proposed Regulatory change to PSR

In order to introduce a new regulation under the Health and Safety (Fees) Regulations, PSR has been amended to include the functions under which HSE can cost recover in respect of MAHP notifications.

Assessment of notifications

24. *Any notification received by the Executive under regulation 21, 22 or 23(2)–(4) shall be assessed for the purpose of deciding whether to raise matters relating to health and safety.*

Proposed regulatory change to the Health and Safety (Fees) Regulations

84. To introduce a new regulation into the Health and Safety (Fees) Regulations which will set out the MAHP functions (assessment of notifications and enforcement of any of the relevant statutory provisions) in respect of which HSE can recover costs. HSE will take steps to remove any duplication of MAHP requirements from regulation 15 of the Health and Safety (Fees) Regulations.

85. Regulation 17 of the existing Health and Safety (Fees) Regulations, which allows for HSE to recover costs reasonably incurred in the performance of the functions named, will apply in relation to the new MAHP Regulation.

86. To support these amendments to the Health and Safety (Fees) Regulations, HSE will produce a new charging guide (or update the existing charging guide for gas transportation activities) to cover MAHP charging issues. This guide will cover:

- What work will be cost recoverable;
- What work will not be cost recoverable;
- When existing cost recovery schemes apply for gas and offshore installation;
- Basis and amount of fees;
- Who will be subject to the fee;
- Methodology used for calculating the fee;
- Administrative and financial arrangements; and
- Dispute procedures.

Regulatory change

After regulation 15, insert—

Fees payable in respect of major accident hazard pipelines

15A.—*(1) A fee shall be payable to the Executive by the operator of a major accident hazard pipeline for the performance by the Executive of any of the following functions—*

(a) assessing either—

i) particulars regarding the pipeline, notified to the Executive pursuant to regulation 21 or 23 of the 2010 Regulations, or

ii) the operator's stated intention to commence or resume using the pipeline, notified to the Executive pursuant to regulation 22 of those Regulations,

for the purpose of deciding whether to raise matters relating to health and safety and raising such matters; and

(b) assessing whether to grant an exemption under regulation 32 of the 2010 Regulations and granting any such exemption.

(2) Subject to paragraph (3), a fee shall be payable to the Executive by the operator of a major accident hazard pipeline for the performance by or on behalf of the Executive, or an inspector appointed by it, of any function conferred on the Executive or the inspector by the 1974 Act which relates to the enforcement of any of the relevant statutory provisions against one or other or both of the following—

(a) that operator in relation to that pipeline; or

(b) a contractor in relation to work carried out by him in relation to that pipeline.

(3) No fee is payable by an operator under paragraph (2) in a case where a fee is payable by him under paragraph (2) or (3) of regulation 15.

(4) For the purposes of this regulation, "the 2010 Regulations" means the Pipelines Safety Regulations 2010 and "major accident hazard pipeline" and "operator" have the same meaning as in those Regulations.

89. A short impact assessment for cost recovery is attached at Annex 3d.

Consultation point – cost recovery

1. Are there any issues you would want HSE to consider when implementing these amendments to the Health and Safety (Fees) Regulations to allow it to cost recover for its work on notifications and enforcement functions, in connection with PSR MAHPs?

STATUTORY INSTRUMENTS

2010 No.

HEALTH AND SAFETY

The Pipelines Safety Regulations 2010

Made - - - -	*2010*
Laid before Parliament	*2010*
Coming into force - -	*2010*

The Secretary of State makes the following Regulations in exercise of the powers conferred by sections 15(1), (2), (4)(a), (5)(b), (6)(b), 43(2) and (4) to (6) and 82(3)(a) of, and paragraphs 1(1) and (2),15(1) and 16 of Schedule 3 to, the Health and Safety at Work etc. Act 1974(**a**) ("the 1974 Act"). These Regulations are made for the purpose of giving effect [without modifications] to proposals submitted to the Secretary of State by the Health and Safety Executive under section 11(3) of the 1974 Act, after the carrying out by the Executive of consultations in accordance with section 50(3) of the Act(**b**).

PART 1

INTRODUCTION

Citation and commencement

1. These Regulations may be cited as the Pipelines Safety Regulations 2010 and shall come into force on 2010.

Interpretation

2. In these Regulations—

"dangerous fluid" has the meaning given by regulation 19(2);

"emergency services", in relation to a major accident hazard pipeline, means those police, fire and ambulance services who are liable to be required to respond to an emergency relating to that pipeline;

"emergency shut-down valve" means a valve which is capable of adequately blocking the flow of fluid within a pipeline at the point at which it is incorporated;

"the Executive" means the Health and Safety Executive;

(**a**) 1974 c. 37; section 15(1) was substituted by the Employment Protection Act 1975 (c. 71), Schedule 15, paragraph 6; the general purposes of Part 1 of the Health and Safety at Work etc. Act referred to in section 15(1) were extended by sections 1(1) and 2(1) of the Offshore Safety Act 1992 (1992 c. 15), and the scope of section 15 was extended by sections 1(2) and 2(2) of that Act. Section 15(4)(a) was amended by article 7 of the Legislative Reform (Health and Safety Executive) Order 2008 (S.I. 2008/960). Section 43(6) was substituted by the Employment Protection Act 1975, Schedule 15, paragraph 12, and amended by Schedule 2 to the Ministry of Agriculture, Fisheries and Food (Dissolution) Order 2002 (S.I. 2002/794).

(**b**) Section 11 was substituted by article 5 of the Legislative Reform (Health and Safety Executive) Order 2008, and section 50 was amended by article 16 of that Order.

"fluid" includes a mixture of fluids;

"gasoline" means any petroleum derivative, other than liquified petroleum gas, with a flashpoint between -51° and -40° centigrade and which is suitable for use in motor vehicles;

"local authority" means—

(a) in relation to an area in England or Wales, the fire and rescue authority for that area under Part 1 of the Fire and Rescue Services Act 2004**(a)**, and

(b) in relation to an area in Scotland, the fire and rescue authority or joint fire and rescue board for that area under Part 1 of the Fire (Scotland) Act 2005**(b)**;

"major accident" means an accident attributable to the release of a dangerous fluid from a pipeline and resulting in death or serious injury;

"major accident hazard pipeline" has the meaning given by regulation 19(1);

"operator", in relation to a pipeline means—

(a) the person who is to have or (once fluid is conveyed) has control over the conveyance of fluid in the pipeline;

(b) until that person is known (should there be a case where at a material time he is not yet known) the person who is to commission or (where commissioning has started) commissions the design and construction of the pipeline;

(c) when the pipeline is no longer used, or is not for the time being used, the person last having control over the conveyance of fluid in it;

"pipeline" has the meaning given by regulation 3.

Meaning of "pipeline"

3.—(1) Subject to the provisions of this regulation, in these Regulations "pipeline" means a pipe or system of pipes (together with any apparatus and works, of a kind described in paragraph (2), associated with it) for the conveyance of any fluid, not being—

(a) a drain or sewer;

(b) a pipe or system of pipes constituting or comprised in apparatus for heating or cooling or for domestic purposes;

(c) a pipe (not being apparatus described in paragraph (2)(e)) which is used in the control or monitoring of any plant.

(2) The apparatus and works referred to in paragraph (1) are—

(a) any apparatus for inducing or facilitating the flow of any fluid through, or through a part of, the pipe or system;

(b) any apparatus for treating or cooling any fluid which is to flow through, or through part of, the pipe or system;

(c) valves, valve chambers and similar works which are annexed to, or incorporated in the course of, the pipe or system;

(d) apparatus for supplying energy for the operation of any such apparatus or works as are mentioned in the preceding sub-paragraphs;

(e) apparatus for the transmission of information for the operation of the pipe or system;

(f) apparatus for the cathodic protection of the pipe or system, and

(g) a structure used or to be used solely for the support of a part of the pipe or system.

(3) For the purpose of paragraph (2)(c), a valve, valve chamber or similar work shall be deemed to be annexed to, or incorporated in the course of, a pipe or system where it connects the pipe or system to plant, an offshore installation, or a well.

(**a**) 2004 c.21.
(**b**) 2005 asp 5.

(4) A pipeline for supplying gas to premises shall be deemed not to include anything downstream of an emergency control.

(5) In paragraph (4)—

"emergency control" means a valve for shutting off the supply of gas in an emergency, being a valve intended for use by a consumer of gas;

"gas" has the same meaning as it has in Part 1 of the Gas Act 1986(**a**).

Application

4.—(1) Subject to paragraph (2), these Regulations shall apply—

(a) in Great Britain, and

(b) to and in relation to pipelines and activities outside Great Britain to which sections 1 to 59 and 80 to 82 of the 1974 Act apply by virtue of article 6 of the Health and Safety at Work etc. Act 1974 (Application outside Great Britain) Order 2001(**b**).

(2) These Regulations shall not apply to any pipeline or part of a pipeline of a kind which is described in Schedule 1.

(3) In the case of a pipeline to which the Pressure Systems Safety Regulations 2000(**c**) apply, nothing in these Regulations shall require the taking of any measures to the extent that they are for the preventing of danger within the meaning of those Regulations.

PART 2

GENERAL

Design of a pipeline

5. The operator shall ensure that no fluid is conveyed in a pipeline unless the pipeline has been so designed that, so far as is reasonably practicable, it can withstand—

(a) the forces arising from its operation;

(b) the fluids that may be conveyed in it, and

(c) the external forces and the chemical processes to which it may be subjected.

Safety systems

6. The operator shall ensure that no fluid is conveyed in a pipeline unless the pipeline has been provided with such safety systems as are necessary for securing that, so far as is reasonably practicable, persons are protected from risk to their health or safety.

Access for examination and maintenance

7. The operator shall ensure that no fluid is conveyed in a pipeline unless the pipeline has been so designed that, so far as is reasonably practicable, it may be examined and work of maintenance may be carried out safely.

Materials

8. The operator shall ensure that no fluid is conveyed in a pipeline unless the pipeline is composed of materials which are suitable.

(**a**) 1986 c.44.
(**b**) S.I. 2001/2127[, amended by S.I. 2009/…].
(**c**) S.I. 2000/128, to which there are amendments not relevant to these Regulations.

Construction and installation

9. The operator shall ensure that no fluid is conveyed in a pipeline (save for the purpose of testing it) unless the pipeline has been so constructed and installed that, so far as is reasonably practicable, it is sound and fit for the purpose for which it has been designed.

Work on a pipeline

10. The operator shall ensure that modification, maintenance or other work on a pipeline is carried out in such a way that the soundness and fitness for the purpose for which the pipeline is designed will not be prejudiced.

Operation of a pipeline

11. The operator shall ensure that—

(a) no fluid is conveyed in a pipeline unless the safe operating limits of the pipeline have been established, and

(b) a pipeline is not operated beyond its safe operating limits,

save for the purpose of testing it.

Arrangements for incidents and emergencies

12. The operator shall ensure that no fluid is conveyed in a pipeline unless adequate arrangements have been made for dealing with—

(a) an accidental loss of fluid from the pipeline;

(b) the discovery of a defect in or damage to it, or

(c) any emergency affecting the pipeline.

Maintenance

13. The operator shall ensure that a pipeline is maintained in an efficient state, in efficient working order and in good repair.

Iron pipelines

14.—(1) The operator may prepare a programme for the decommissioning, during a period specified in the programme, of any description of iron pipe used in a pipeline.

(2) In paragraph (1), "iron" does not include steel.

(3) A programme prepared under paragraph (1)—

(a) shall be submitted to the Executive for approval, and

(b) shall be approved by the Executive, with or without modification, if the Executive is satisfied that the programme or modified programme is suitable and sufficient for the period to which it relates.

(4) An approval under paragraph (3)—

(a) shall be in writing;

(b) shall be notified to the operator and published in such manner as the Executive may approve, and

(c) may be withdrawn by the Executive by reasonable notice in writing at any time.

(5) The operator may modify a programme after it has been approved under paragraph (3); in such a case, paragraphs (3) and (4) shall apply to the modified programme as they applied to the original programme.

(6) The Executive may prepare a programme for a period for which no suitable and sufficient programme has been prepared by the operator.

(7) A programme prepared under paragraph (1) or (6) need not specify the location of any pipe to which it relates.

(8) The Executive shall consult the operator before it modifies a programme submitted under paragraph (3) or prepares a programme under paragraph (6).

(9) The operator shall so far as is practicable comply with a programme approved or prepared by the Executive under this regulation.

(10) In any proceedings for the offence of contravening regulation 13, and without prejudice to the defence provided for in regulation 31, it shall be a defence for the person charged to prove that, at the relevant time—

(a) any pipe to which the contravention related was of a description to which a programme—

(i) approved or prepared by the Executive, and

(ii) not then due for completion,

applied, and

(b) where the proceedings arise from an event involving a failure of a pipe, the operator did not know and could not reasonably be expected to have known that the condition of the pipe was such as to require immediate attention

Decommissioning

15.—(1) The operator shall ensure that a pipeline which has ceased to be used for the conveyance of any fluid is left in a safe condition.

(2) The operator of a pipeline shall ensure that work done in discharge of the duty contained in paragraph (1) is performed safely.

Damage to a pipeline

16. No person shall cause such damage to a pipeline as may give rise to a danger to persons.

Prevention of damage to pipelines

17. For the purpose of ensuring that no damage is caused to a pipeline, the operator shall take such steps to inform persons of its existence and whereabouts as are reasonable.

Co-operation

18. Where there are different operators for different parts of a pipeline, each operator shall co-operate with the other so far as is necessary to enable the operators to comply with the requirements of these Regulations.

PART 3

MAJOR ACCIDENT HAZARD PIPELINES

Dangerous fluids

19.—(1) The provisions contained in regulations 20 to 30 shall apply in relation to a pipeline in which a dangerous fluid is being, or is to be, conveyed (in these Regulations referred to as a "major accident hazard pipeline").

(2) For the purposes of these Regulations a fluid is a dangerous fluid if it is specified in Schedule 2 or falls within a description in that Schedule.

Emergency shut-down valves

20.—(1) The operator of a major accident hazard pipeline which—

(a) is connected to an offshore installation, and

(b) has an internal diameter of 40 millimetres or more,

shall ensure that the requirements contained in Schedule 3 are complied with in relation to the pipeline.

(2) The duty holder in relation to an offshore installation to which a pipeline of the kind described in paragraph (1) is connected shall afford, or cause to be afforded, to the operator of the pipeline such facilities as he may reasonably require for the purpose of securing that the requirements contained in Schedule 3 are complied with in relation to the pipeline.

(3) In this regulation—

"duty holder", in relation to an offshore installation, means the person who is the duty holder as defined by regulation 2(1) of the 1995 Regulations in relation to that installation;

"offshore installation" has the meaning given by regulation 3 of the 1995 Regulations, and

"the 1995 Regulations" means the Offshore Installations and Pipeline Works (Management and Administration) Regulations 1995(**a**).

Notification before construction

21. The operator shall ensure that the construction of a major accident hazard pipeline is not commenced unless his intentions in respect of the particulars specified in Schedule 4 have been notified to the Executive—

(a) no more than 3 years, and

(b) no less than 6 months, or such shorter time as the Executive may approve,

before such commencement.

Notification before use

22. The operator shall ensure that no dangerous fluid is conveyed for the first time in a major accident hazard pipeline, or conveyed following a period in which the pipeline has been out of commission (other than for routine maintenance), until 14 days, or such shorter period as the Executive may in that case approve, after the receipt by the Executive of a notification of the date on which it is intended first to convey or, as the case may be, resume the conveyance of that fluid in the pipeline.

Notification in other cases

23.—(1) Where there is a change of operator of a major accident hazard pipeline, or of his address, the operator shall notify the Executive of the change within 14 days after the date on which it occurs.

(2) Where, by reason of a change to the occupancy of premises, a major accident hazard pipeline (or part of such a pipeline) ceases to be excluded from the scope of these Regulations by regulation 4(2) and paragraph 3 of Schedule 1, the operator shall notify the Executive of the particulars specified in Schedule 4 within 3 months after the date on which the change occurs.

(3) Subject to paragraph (4), in the case of a major accident hazard pipeline the construction of which has commenced or has been completed, the operator shall ensure that no event of a kind described in Schedule 5 takes place until 3 months, or such shorter time as the Executive may in that case approve, after the receipt by the Executive of the particulars specified in that Schedule in relation to such event.

(**a**) S.I. 1995/738, amended by S.I. 2002/2175; there are other amending instruments but none is relevant.

(4) Where an event of a kind described in Schedule 5 takes place in an emergency, the operator shall notify the Executive of the particulars specified in that Schedule as soon as is reasonably practicable.

Assessment of notifications

24. Any notification received by the Executive under regulation 21, 22 or 23(2)–(4) shall be assessed for the purpose of deciding whether to raise matters relating to health and safety.

Major accident prevention document

25.—(1) The operator shall, before the design of a major accident hazard pipeline is completed prepare, and subsequently review and where necessary revise as often as may be appropriate, a document relating to the pipeline containing, subject to paragraph (2), sufficient particulars to demonstrate that—

(a) all hazards relating to the pipeline with the potential to cause a major accident have been identified;

(b) the risks arising from those hazards have been evaluated;

(c) the safety management system is adequate, and

(d) he has established adequate arrangements for audit and for audit reports.

(2) Paragraph (1) shall only require the particulars in the document referred to in paragraph (1) to demonstrate the matters referred to in that paragraph to the extent that it is reasonable to expect the operator to address them at the time the document is prepared or revised.

(3) Where the document referred to in paragraph (1) describes any health and safety arrangements or procedures to be followed, the operator shall ensure that those arrangements or procedures are followed unless in the particular circumstances of the case it is not in the best interests of the health and safety of persons to follow them, and there has been insufficient time to revise or replace the document to take account of those circumstances.

(4) In this regulation—

"audit" means systematic assessment of the adequacy of the safety management system, carried out by persons who are sufficiently independent of the system (but who may be employed by the operator) to ensure that such assessment is objective, and

"safety management system" means the procedures established by the operator for ensuring that the risk of a major accident is as low as is reasonably practicable.

Emergency procedures

26.—(1) The operator shall ensure that no fluid is conveyed in a major accident hazard pipeline unless the procedures to be followed in the different circumstances in which an emergency relating to the pipeline may occur have been established and recorded.

(2) The emergency procedures shall include provision for the local authority and the emergency services to be notified immediately in the circumstances specified in regulation 29.

(3)The operator shall review and where necessary revise the record of emergency procedures as often as may be appropriate.

(4)The operator shall ensure that the emergency procedures are tested, by practice or otherwise, as often as may be appropriate.

Emergency plans in case of major accidents

27.—(1) A local authority which has been notified by the Executive that there is, or is to be, a major accident hazard pipeline in its area shall, before the pipeline is first used or within 9 months of such notification, whichever is later, and subject to paragraph (5), prepare an adequate plan detailing how an emergency relating to a possible major accident in its area will be dealt with.

(2) In preparing the plan pursuant to paragraph (1), a local authority shall consult the operator of the pipeline, the Executive and any other persons as appear to the authority to be appropriate.

(3) A local authority which has prepared a plan pursuant to paragraph (1) shall, as often as is appropriate, and in any case at least every three years, review the plan and make such revision as is appropriate.

(4) The operator of a major accident hazard pipeline shall supply to every local authority through whose area the pipeline will pass such information as it may reasonably require in preparing the plan referred to in paragraph (1).

(5) It shall be deemed to be sufficient compliance with the requirement in paragraph (1) as to the time by which a plan is to be prepared, where such time is exceeded by reason of waiting for information referred to in paragraph (4) which has been promptly required.

(6) Where a pipeline passes or is to pass through the areas of two or more local authorities, their duties under this regulation may be discharged in relation to a single plan.

Charge by a local authority for a plan

28.—(1) A local authority which prepares, reviews or revises a plan pursuant to regulation 27 may charge a fee, determined in accordance with paragraphs (2) and (3), to the operator of the pipeline to which the plan relates.

(2) The fee shall not exceed the sum of the costs reasonably incurred by the local authority in preparing, reviewing or revising the plan and, where an emergency plan covers more than one pipeline and the pipelines have different operators, the fee charged to each operator shall not exceed the proportion of such sum attributable to the part or parts of the plan relating to his pipeline.

(3) In determining the fee, no account shall be taken of costs other than the costs of discharging functions in relation to those parts of the plan which relate to the protection of health or safety of persons.

(4) When requiring payment the local authority shall send or give to the operator of the pipeline a detailed statement of the work done and costs incurred, including the date of any visit to any place and the period to which the statement relates; and the fee, which shall be recoverable only as a civil debt, shall become payable one month after the statement has been sent or given.

Implementing emergency plans

29. A local authority which has prepared an emergency plan pursuant to regulation 27 shall take reasonable steps to put it into effect without delay when—

(a) a major accident occurs, or

(b) an event occurs which could reasonably be expected to lead to a major accident.

Transitional provisions

30. The transitional provisions in Schedule 6 shall apply in the case of a pipeline in which gasoline or carbon dioxide is or is to be conveyed.

PART 4

MISCELLANEOUS

Defence

31.—(1) In any proceedings for an offence for a contravention of any of the provisions of these Regulations it shall, subject to paragraphs (2) and (3), be a defence for the person charged to prove—

(a) that the commission of the offence was due to the act or default of another person not being one of his employees ("the other person"); and

(b) that he took all reasonable precautions and exercised all due diligence to avoid the commission of the offence.

(2) The person charged shall not, without leave of the court, be entitled to rely on the defence in paragraph (1) unless, within a period ending seven clear days—

(a) before the hearing to determine mode of trial, where the proceedings are in England or Wales; or

(b) before the intermediate diet, where the proceedings are summary proceedings in Scotland, or

(c) before the first diet, where the proceedings are solemn proceedings in Scotland,

he has served on the prosecutor a notice in writing giving such information identifying or assisting in the identification of the other person as was then in his possession.

(3) For the purpose of enabling the other person to be charged with and convicted of the offence by virtue of section 36 of the 1974 Act, a person who establishes a defence under this regulation shall nevertheless be treated for the purposes of that section as having committed the offence.

Certificates of exemption

32.—(1) Subject to paragraph (2) and to any of the provisions imposed by the [Communities][EU] in respect of the encouragement of improvements in the safety and health of workers at work, the Executive may, by a certificate in writing, exempt any person, pipeline or class of persons or pipelines from any requirement or prohibition imposed by these Regulations and any such exemption may be granted subject to conditions and with or without limit of time and may be revoked by a certificate in writing at any time.

(2)The Executive shall not grant such exemption unless, having regard to the circumstances of the case and, in particular, to—

(a) the conditions, if any, which it proposes to attach to the exemption; and

(b) any other requirements imposed by or under any enactments which apply to the case,

it is satisfied that the health and safety of persons who are likely to be affected by the exemption will not be prejudiced in consequence of it.

Revocation of instruments

33. The Pipelines Safety Regulations 1996(**a**) and the Pipelines Safety (Amendment) Regulations 2003(**b**) are revoked.

Signatory text

Name
Address — Parliamentary Under Secretary of State
Date — Department

(**a**) S.I. 1996/825, amended by S.I. 2003/2563.
(**b**) S.I. 2003/2563.

SCHEDULE 1

Regulation 4(2)

PIPELINES TO WHICH THESE REGULATIONS DO NOT APPLY

1. A pipeline for the conveyance of air, water vapour or steam.

2. A pipeline for the conveyance of water, other than for the purpose of injecting water into an underwater well or reservoir containing mineral resources.

3. A pipeline contained wholly within premises occupied by a single undertaking.

4. A pipeline which is contained wholly within land which constitutes a railway asset within the meaning given by section 6(2) of the Railways Act 1993(**a**).

5. A pipeline contained wholly within a caravan site within the meaning given by section 1(4) of the Caravan Sites and Control of Development Act 1960(**b**).

SCHEDULE 2

Regulation 19(2)

DANGEROUS FLUIDS

1. A fluid which—

(a) is flammable in air;

(b) has a boiling point below 5°C at 1 bar absolute, and

(c) is or is to be conveyed in a pipeline as a liquid.

2. A fluid which is flammable in air and is or is to be conveyed in a pipeline as a gas at above 8 bar absolute.

3. A liquid which has a vapour pressure greater than 1.5 bar absolute when in equilibrium with its vapour at either the actual temperature of the liquid or at 20°C.

4. A toxic or very toxic fluid which—

(a) is a gas at 20°C and 1 bar absolute, and

(b) is, or is to be, conveyed as a liquid or a gas.

5. A toxic fluid which—

(a) at 20°C has a saturated vapour pressure greater than 0.4 bar, and

(b) is, or is to be, conveyed in the pipeline as a liquid.

6. A very toxic fluid which—

(a) at 20°C has a saturated vapour pressure greater than 0.001 bar, or

(b) is, or is to be, conveyed in the pipeline as a liquid at a pressure greater than 4.5 bar absolute.

7. An oxidising fluid which is, or is to be, conveyed as a liquid.

8. A fluid which reacts violently with water.

9. Acrylonitrile.

10. Carbon dioxide.

(**a**) 1993 c. 43.

(**b**) 1960 c. 62. The meaning of "caravan" for the purposes of Part 1 of the 1960 Act, including the definition of "caravan site" in section 1(4), was modified by the Caravan Sites Act 1968 (c. 52), section 13(1) and (2).

11. Gasoline.

For the purposes of this Schedule—

(a) a liquid is oxidising, and

(b) a fluid is toxic or very toxic, or reacts violently with water,

if it has been, or is liable to be classified, pursuant to regulation 4 of the Chemicals (Hazard Information and Packaging for Supply) Regulations 2009(**a**) as, as the case may be, oxidising, toxic, very toxic or as reacting violently with water.

SCHEDULE 3

Regulation 20(1)

REQUIREMENTS FOR EMERGENCY SHUT-DOWN VALVES ON CERTAIN MAJOR ACCIDENT HAZARD PIPELINES CONNECTED TO OFFSHORE INSTALLATIONS

1. An emergency shut-down valve shall be incorporated in the riser of a pipeline—

(a) in a position in which it can be safely inspected, maintained and tested, and

(b) so far as this is consistent with sub-paragraph (a), as far down the riser as is reasonably practicable;

and such valve shall comply with the remaining paragraphs of this Schedule.

2. An emergency shut-down valve shall be held open by an electrical, hydraulic or other signal to the mechanism for actuating the valve on the failure of which signal the valve shall automatically close.

3.An emergency shut-down valve shall also be capable of being closed both—

(a) by a person positioned by it, and

(b) automatically by the operation of the emergency shut-down system of the offshore installation to which the pipeline is connected,

or, while relevant work of examination or maintenance is being carried out, by one of those means.

4. If the pipeline is designed to allow for the passage of equipment for inspecting, maintaining or testing the pipeline, the emergency shut-down valve shall also be designed to allow for such passage.

5. An emergency shut-down valve and its actuating mechanism shall so far as is reasonably practicable be protected from damage arising from fire explosion or impact.

6. An emergency shut-down valve shall be maintained in an efficient state, in efficient working order and in good repair.

7. After an emergency shut-down valve has operated so as to block the flow of fluid within the pipeline it shall not be re-opened so as to permit the flow of fluid until steps have been taken to ensure that it is safe to do so.

In this Schedule "emergency shut-down system" means the system comprising mechanical, electrical, electronic, pneumatic, hydraulic or other arrangements by which the plant on an offshore installation is automatically shut down in the event of an emergency.

(**a**) 2009/716.

SCHEDULE 4

Regulations 21 and 23(2)

PARTICULARS TO BE INCLUDED IN NOTIFICATION RELATING TO A MAJOR ACCIDENT HAZARD PIPELINE

1. The name and address of the operator of the pipeline.

2. The route of the pipeline in the form of maps or drawings.

3. The route of the riser on any offshore installation, in the form of drawings.

4. The length, diameter and wall thickness of the pipeline.

5. The materials used in the construction of the pipeline.

6. The fluid to be conveyed and such of its properties as are relevant to health and safety.

7. The safe operating limits of the pipeline.

8. The temperature, pressure and maximum rate of flow of the fluid conveyed.

SCHEDULE 5

Regulation 23(3) and (4)

PARTICULARS TO BE NOTIFIED BEFORE CERTAIN EVENTS RELATING TO MAJOR ACCIDENT HAZARD PIPELINES

1. In relation to a change to the route or position of a pipeline, particulars in the form of maps or drawings of the new route or position.

2. In relation to a change to the safe operating limits of a pipeline, particulars of such change.

3. In relation to the start of major modification or major remedial work to a pipeline, particulars of such work.

4. In relation to the conveyance of new fluid, particulars of—

(a) such of its properties as are relevant to the health or safety of persons, and

(b) the intended or (if, in a case to which regulation 23(4) applies, conveyance has started) actual temperature, pressure and maximum rate of flow in the pipeline.

5. In relation to the start of decommissioning or dismantlement of the pipeline, particulars of the steps to be taken or (in a case to which regulation 23(4) applies, decommissioning or dismantlement has started) taken in connection with such decommissioning or dismantlement.

SCHEDULE 6

Regulation 30

TRANSITIONAL PROVISIONS APPLICABLE IN THE CASE OF GASOLINE AND CARBON DIOXIDE PIPELINES

1. In the case of a pipeline, the construction of which is commenced within 6 months after the coming into force of these Regulations, it shall be sufficient compliance with regulation 21 if the particulars specified in Schedule 4 are notified to the Executive within 3 months after the coming into force of these Regulations.

2. In the case of a pipeline the construction of which was commenced (whether or not it was completed) before the coming into force of these Regulations, the particulars specified in Schedule 4 shall be notified to the Executive within 6 months after such coming into force.

3. In the case of a pipeline the design of which was completed before the coming into force of these Regulations or within 12 months after such coming into force, regulation 25 shall have effect as if, for the words "before the design of a major accident hazard pipeline is completed" in paragraph (1) of that regulation, there were substituted the words "within 12 months after the coming into force of these Regulations".

4. In the case of a pipeline which was first used before the coming into force of these Regulations it shall be sufficient compliance with the requirement in regulation 26(1) if the matters referred to in that provision are recorded within 6 months after the coming into force of these Regulations.

5. Where a local authority receives a notification of the kind referred to in paragraph (1) of regulation 27 within 6 months after the coming into force of these Regulations, that regulation shall have effect in relation to the pipeline to which the notification relates as if the reference in that paragraph to 9 months were a reference to 18 months.

In this Schedule, references to a pipeline are to a pipeline in which gasoline or carbon dioxide is or is to be conveyed.

Annex 2

Amendments to the Pipelines Safety Regulations	
Amendment	*Comment*
Amendment to Regulation 2: Interpretation	
To introduce definition for "emergency services" – *"emergency services" in relation to a major hazard pipeline, means those police, fire and ambulance services who are liable to be required to respond to an emergency relating to that pipeline*	No comment
To introduce definition for "gasoline" – *Gasoline: Any petroleum derivative, other than liquefied petroleum gas, with a flashpoint between -51° and - 40° centigrade and which is intended for use in motor vehicles*	This definition has been introduced to reflect the introduction of gasoline as a dangerous fluid under PSR
For the definition of "local authority", substitute – *(a) in relation to an area in England or Wales, the fire and rescue authority for that area under Part 1 of the Fire and Rescue Services Act 2004, and* (b) *in relation to an area in Scotland, the fire and rescue authority or joint fire and rescue board for that area under Part 1 of the Fire (Scotland) Act 2005*	This amendment is to update the definitions to take account of revised legislation since PSR was introduced.
For the definition of "major accident", substitute - *"major accident" means an accident attributable to the release of a dangerous fluid from a pipeline and resulting in death or serious injury*	No comment
Amendment to Regulation 4: Application	
For sub-paragraph 4(1)(b) substitute – *(b) to and in relation to pipelines and activities outside Great Britain to*	Amended to reflect current legislation

which sections 1 to 59 and 80 to 82 of the 1974 Act apply by virtue of article 6 of the Health and Safety at Work etc. Act 1974 (Application outside Great Britain) Order 2001.	
For sub-paragraph 4(3) substitute – *(3) In the case of a pipeline to which the Pressure Systems Safety Regulations 2000 apply, nothing in these Regulations shall require the taking of any measures to the extent that they are for the preventing of danger within the meaning of those Regulations.*	Amended to reflect current legislation
Regulation: 14 iron pipelines	
This was previously regulation 13A	HSE has taken the opportunity to incorporate this regulation into the main body of the Regulations
Regulation 20: Emergency shut-down valves	
Insert at 20(3) – "offshore installation" has the meaning given by regulation 3 of the 1995 Regulations, and "the 1995 Regulations" means the Offshore Installations and Pipeline Works Management and Administration) Regulations 1995.	No comment
Regulation 21: Notification before construction	
Substitute – *The operator shall ensure that the construction of a major accident hazard pipeline is not commenced unless his intentions in respect of the particulars specified in Schedule 4 have been notified to the Executive –* *(a) no more than 3 years, and* *(b) no less than 6 months, or such shorter time as the Executive may*	HSE has introduced an expiry date on notifications made under regulation 21

approve, *before such commencement.*	
Regulation 23: Notification in other cases	
Substitute - *(1) Where there is a change of operator of a major accident hazard pipeline, or of his address, the operator shall notify such the Executive of the change within 14 days after the date on which it occurs.* (2) *Where, by reason of a change to the occupancy of premises, a major accident hazard pipeline (or part of such a pipeline) ceases to be excluded from the scope of these Regulations by regulation 4(2) and paragraph 3 of Schedule 1; the operator shall notify the Executive of the particulars specified in Schedule 4 within 3 months after the due date on which the change occurs.*	HSE has amended this regulation to address a change in circumstances in the industry
Regulation 24: Assessment of notifications	
Introduce – *Any notification received by the Executive under regulation 21, 22 or 23(2)-(4) shall be assessed for the purpose of deciding whether to raise matters relating to health and safety.*	This regulation is necessary for the introduction of PSR cost recovery
Regulation 26: Emergency procedures	
Substitute – *(1) The operator shall ensure that no fluid is conveyed in a major accident hazard pipeline unless the procedures to be followed in the different circumstances in which an emergency relating to the pipeline may occur have been established and recorded –*	This regulation has been aligned with new regulation 29 Implementing emergency plans

(2) The emergency procedures that shall include provision for the local authority and the emergency services to be notified immediately in the circumstances specified in regulation 28.	
Regulation 29:Implementing the emergency plan	
Introduce - *A local authority which has prepared an emergency plan pursuant to regulation 26 shall take reasonable steps to put into effect without delay when –* *(a) a major accident occurs, or* *(b) an event occurs which could reasonably be expected to lead to a major accident.*	No comment
Regulation 30: Transitional provisions	
Substitute – *The transitional provisions in Schedule 6 shall apply in the case of a pipeline in which gasoline or carbon dioxide is or is to be conveyed.*	This regulation has been amended to reflect the introduction of carbon dioxide and gasoline as dangerous fluids under PSR
Regulation 31: Defence	
Substitute – *(3) The person charged shall not, without leave of the court, be entitled to rely on the defence in paragraph (1) unless, within a period ending seven clear days –* *(a) before the hearing to determine mode of trial, where the proceedings are in England or Wales; or* *(b) before the intermediate diet, where the proceedings are summary proceedings in Scotland, or*	No comment

(c) before the first diet, where the proceedings are solemn proceedings in Scotland, *he has served on the prosecutor a notice in writing giving such information indentifying or assisting in the identification of the other person as was then in his possession.*	
Regulation 32: Revocation of instruments	
Substitute – *The Pipelines Safety Regulations 1996 and the Pipelines Safety (Amendment) Regulations 2003 are revoked.*	No comment
Schedule 2: Dangerous fluids	
Introduce – *10. Carbon dioxide* *11. Gasoline*	This is necessary due to the inclusion of carbon dioxide and gasoline as dangerous fluids under PSR

Summary: Intervention & Options

Department /Agency:	Title:	
Health and Safety Executive	Impact Assessment of classifying gasoline as a dangerous fluid	
Stage: Consultation	**Version:** Final draft	**Date: August 2009**
Related Publications:		

Available to view or download at:

http://www.

Contact for enquiries: Karen McDonough **Telephone: 0151 951 3308**

What is the problem under consideration? Why is government intervention necessary?

Gasoline pipelines are not classified as major accident hazard pipelines and are therefore not within the scope of the additional duties as set out in Part III of the Pipeline Safety Regulations (PSR) 1996. Research demonstrates that gasoline pipelines have major accident hazard potential. Following the Buncefield incident the Major Incident Investigation Board have expressed concern at the anonomly that gasoline pipelines are still not within the scope of the additional duties of PSR.

What are the policy objectives and the intended effects?

1) To apply the more prescriptive, major accident hazard requirements of PSR to gasoline pipelines including emergency shut-down valves, notification, major accident prevention documents and local authority emergency plans;

2) To apply land use planning (LUP) controls around gasoline pipelines to manage the residual risks;

3) To update the guidance "Guide to the Pipelines Safety Regulations 1996" L82, in line with the amendments to PSR, to ensure that both pipeline operators and others involved with pipeline activities or who may be affected by the Regulations understand what the regulations require and the new duties that are required of them

What policy options have been considered? Please justify any preferred option.

The following regulatory options are being considered:

i) no change

ii) define a new dangerous fluid, referred to as ‘flammable liquids’ and categorised by reference to flashpoint. This will mean that gasoline pipelines will attract the full PSR duties as major accident hazard pipelines

iii) same as option ii) but also extending land use planning controls to qualifying pipelines

When will the policy be reviewed to establish the actual costs and benefits and the achievement of the desired effects?

The policy will be reviewed within five years of implementation.

Ministerial Sign-off For SELECT STAGE Impact Assessments:

I have read the Impact Assessment and I am satisfied that, given the available evidence, it represents a reasonable view of the likely costs, benefits and impact of the leading options.

Signed by the responsible Minister:

.....Date:

Summary: Analysis & Evidence

Policy Option: 1	Description: No change to PSR

COSTS

ANNUAL COSTS	Description and scale of **key monetised costs** by 'main affected groups'
One-off (Transition) **Yrs**	There are no costs associated with this option
£ Nil	
Average Annual Cost (excluding one-off)	
£ Nil	**Total Cost** (PV) **£ Nil**

Other **key non-monetised costs** by 'main affected groups'

BENEFITS

ANNUAL BENEFITS	Description and scale of **key monetised benefits** by 'main affected groups'
One-off **Yrs**	There are no benefits associated with this option
£ Nil	
Average Annual Benefit (excluding one-off)	
£ Nil	**Total Benefit** (PV) **£ Nil**

Other **key non-monetised benefits** by 'main affected groups'

Key Assumptions/Sensitivities/Risks
Not applicable

Price Base Year 2009	Time Period Years 40	**Net Benefit Range** (NPV) **£ Nil**	**NET BENEFIT** (NPV Best estimate) **£ Nil**

What is the geographic coverage of the policy/option?				Great Britain	
On what date will the policy be implemented?				October 2010	
Which organisation(s) will enforce the policy?				HSE	
What is the total annual cost of enforcement for these organisations?				£ Nil	
Does enforcement comply with Hampton principles?				Yes	
Will implementation go beyond minimum EU requirements?				Na	
What is the value of the proposed offsetting measure per year?				£ N/a	
What is the value of changes in greenhouse gas emissions?				£ N/a	
Will the proposal have a significant impact on competition?				No	
Annual cost (£-£) per organisation (excluding one-off)	Micro **N/a**	Small **N/a**	Medium **N/a**	Large	
Are any of these organisations exempt?	N/a	N/a	N/A	N/A	

Impact on Admin Burdens Baseline (2005 Prices) (Increase - Decrease)

Increase of £ Nil Decrease of £ Nil **Net Impact** **£Nil**

Key: **Annual costs and benefits: Constant Prices** **(Net) Present Value**

Summary: Analysis & Evidence

Policy Option: 2	Description: Amend PSR to include gasoline as a dangerous fluid

COSTS

ANNUAL COSTS	
One-off (Transition)	**Yrs**
£ 0.5m	1
Average Annual Cost (excluding one-off)	
£ 0.07m	

Description and scale of **key monetised costs** by 'main affected groups'

Total costs of £2m including: familiarisation costs; yearly notification of any changes in operating fluids / limits; initial one off preparation of MAPDs; 5 yearly reviews of MAPDs; yearly MAPD audits; and preparation of emergency plans.

Total Cost (PV)	**£2.0m**

Other **key non-monetised costs** by 'main affected groups'

BENEFITS

ANNUAL BENEFITS	
One-off	**Yrs**
£ Nil	
Average Annual Benefit (excluding one-off)	
£ 0.2m - £0.4m	

Description and scale of **key monetised benefits** by 'main affected groups' A reduced expected value of fatalities and injuries of between £0.6m and £1.1m due to the assumed reduction in the risk of a gasoline incident. Cost savings of between £3.8 m and £7.5m due to reduced expected cost of clean up, property damage and business interruption.

Total Benefit (PV)	**£ 4.4m - £8.6m**

Other **key non-monetised benefits** by 'main affected groups'

Key Assumptions/Sensitivities/Risks

See Annex 1 for comprehensive list.

Price Base Year 2009	Time Period Years 40	**Net Benefit Range** (NPV) **£4.4m – £8.6m**	**NET BENEFIT** (NPV Best estimate) **£ 6.5m (average)**

What is the geographic coverage of the policy/option?			Great Britain	
On what date will the policy be implemented?			October 2010	
Which organisation(s) will enforce the policy?			HSE	
What is the total annual cost of enforcement for these organisations?			£	
Does enforcement comply with Hampton principles?			Yes	
Will implementation go beyond minimum EU requirements?			Yes/No	
What is the value of the proposed offsetting measure per year?			Na	
What is the value of changes in greenhouse gas emissions?			Na	
Will the proposal have a significant impact on competition?			No	
Annual cost (£-£) per organisation (excluding one-off) Assuming 10 operators, each being large	Micro **Na**	Small Na	Medium **Na**	Large £1,000
Are any of these organisations exempt?	No	No	N/A	N/A

Impact on Admin Burdens Baseline (2005 Prices) (Increase - Decrease)

Increase of £2.0m Decrease of £ Nil **Net Impact** £ 2.0m

Key: **Annual costs and benefits: Constant Prices** **(Net) Present Value**

Summary: Analysis & Evidence

Policy Option: 3	Description: Amend PSR to include gasoline as a dangerous fluid and implement land use planning restrictions

COSTS

ANNUAL COSTS	
One-off (Transition)	**Yrs**
£ 0.5m	1
Average Annual Cost (excluding one-off)	
£ 0.07m	

Description and scale of **key monetised costs** by 'main affected groups' Total costs of option 2 including: familiarisation costs; yearly notification of any changes in operating fluids / limits; initial one off preparation of MAPDs; 5 yearly reviews of MAPDs; yearly MAPD audits; and preparation of emergency plans. Additional costs of £91,000 associated with land use planning

Total Cost (PV) **£ 2.1m**

Other **key non-monetised costs** by 'main affected groups'

BENEFITS

ANNUAL BENEFITS	
One-off	**Yrs**
£ Nil	
Average Annual Benefit (excluding one-off)	
£0.2m - £0.4m	

Description and scale of **key monetised benefits** by 'main affected groups' Health and safety benefits and cost savings associated with clean up, property damage and business disruption as in option 2. Additional savings arising from the avoided property damage and other damage associated with LUP restrictions of £0.3m - £0.6m.

Total Benefit (PV) **£4.7m - £9.2m**

Other **key non-monetised benefits** by 'main affected groups'

Key Assumptions/Sensitivities/Risks

See Annex 1 for comprehensive list

Price Base Year 2009	Time Period Years 40	**Net Benefit Range** (NPV) **£ 4.7m - £9.2m**	**NET BENEFIT** (NPV Best estimate) **£ 7.0m (average)**

What is the geographic coverage of the policy/option?				Great Britain	
On what date will the policy be implemented?				October 2010	
Which organisation(s) will enforce the policy?				HSE	
What is the total annual cost of enforcement for these organisations?				£	
Does enforcement comply with Hampton principles?				Yes	
Will implementation go beyond minimum EU requirements?				No	
What is the value of the proposed offsetting measure per year?				N/a	
What is the value of changes in greenhouse gas emissions?				N/a	
Will the proposal have a significant impact on competition?				No	
Annual cost (£-£) per organisation (excluding one-off) As option 2	Micro **N/a**	Small **N/a**	Medium	Large **£1,000**	
Are any of these organisations exempt?	No	No	N/A	N/A	

Impact on Admin Burdens Baseline (2005 Prices) (Increase - Decrease)

Increase of £ 2.0m Decrease of £ Nil **Net Impact** £ 2.0m

Key: **Annual costs and benefits: Constant Prices** **(Net) Present Value**

Evidence Base (for summary sheets)

[Use this space (with a recommended maximum of 30 pages) to set out the evidence, analysis and detailed narrative from which you have generated your policy options or proposal. Ensure that the information is organised in such a way as to explain clearly the summary information on the preceding pages of this form.]

Extension of pipeline safety regulations (1996) to include gasoline pipelines as a dangerous fluid

1. This Impact Assessment considers proposed changes to the regulations that apply to gasoline pipelines under the Pipeline Safety Regulations (PSR) 1996.

Purpose and intended effects

Issue

2. Gasoline is not a prescribed dangerous fluid for the purposes of the Pipeline Safety Regulations 1996 and therefore a number of specific additional duties currently do not apply to gasoline pipelines.

Objectives

3. The objective of this extension of the PSR regulations is to reduce the risks of gasoline pipeline accidents, and to reduce the impact of accidents that may arise from gasoline pipelines. The intended effect is to achieve the appropriate balance between limiting the risk of an accident affecting people in the vicinity of the gasoline pipeline, the benefits provided by gasoline pipelines, and the benefits of developing land around such sites.

Background

4. The Health and Safety Executive is considering taking forward amendments to the Pipeline Safety Regulations (PSR) 1996. The aim is that amended regulations can be ready for implementation in October 2010.

5. The Pipelines Safety Regulations 1996 (PSR), which came into force on 11 April 1996, impose 2 levels of duties;

    - The lower level (general duties) applies to all pipelines as defined in the regulations. These cover design, construction/installation, operation, maintenance and decommissioning of the pipeline.
    - The higher level (additional duties) imposes additional duties for notification, major accident prevention documents, emergency procedures and emergency planning – these apply to pipelines carrying prescribed dangerous fluids.

6. Gasoline pipelines are included under general duties and are excluded from the additional duties for pipelines conveying fluids with a major accident hazard potential. Under general duties there are no requirements to produce an emergency plan or land use planning zones around gasoline pipelines.

7. At the time of implementation of the Pipeline Safety Regulations, HSE initially proposed to include gasoline among the list of substances which would require notification under the new regulations, but decided that gasoline should be removed from this list until further research into the risks of gasoline pipelines had been conducted.

8. Two research projects[1] were carried out to assess the risks associated with different pipelines and have concluded that the risks associated with pipelines conveying gasoline justify the additional duties under PSR. The report into this work was accepted by the Advisory Committee on Dangerous Substances (ACDS) in February 2001, and a consensus was reached recommending the inclusions of gasoline as a dangerous fluid in PSR with the application of the land use planning provisions. It was concluded that non-topographical quantified risk assessment should be used to calculate consultation distances.

9. A number of options for amending PSR were considered including regulating gasoline pipelines without the application of land-use planning controls. The preferred option identified by ACDS was to include gasoline as a dangerous fluid in PSR with the application of the land use planning provisions. This is represented by option 3 described below.

10. By 2003 a draft consultation document, including a Regulatory Impact Assessment, had been prepared by HSE for the amendment of PSR, but the project was cancelled in July 2004 following the outcome of the 2002 spending review and HSE's subsequent sun setting project. At the time, the justification for this decision was that the work should be suspended until the European Commission produced a pipeline directive.

11. Following the Buncefield Incident in December 2005 the regulation of gasoline pipelines has again become a matter of debate. The Buncefield Major Incident Investigation Board indicated in its 'Recommendations on the design and operation of fuel storage sites' report that gasoline pipelines should be subject to the requirements of major hazard legislation. In their response to HSE consultation document 211 on land use planning, they noted the anomaly that major pipelines carrying gasoline are excluded from the additional duties of PSR. Therefore there are no requirements to produce an off site emergency plan or for land use planning zones around gasoline pipelines.

Rationale for Government Intervention

12. The risk of a pipeline accident cannot be reduced to zero and so there is a residual risk to people who live in the vicinity of such pipelines. Information regarding pipelines and the level of risk associated with them is complex and difficult to understand and it is unlikely that individuals can fully access or interpret all relevant information and hence make informed decisions about such risks. Whilst risk may seem to be small, the consequences of a failure can be catastrophic and so reducing the risk of this failure to a tolerable level requires government intervention.

Options

Option one – No change to PSR

13. Option 1 would involve the following.

14. No change to PSR so that gasoline would continue to not be included as a dangerous fluid. Gasoline pipelines remain under general duties where there are no requirements to produce an emergency plan and there are no requirements for land use planning zones (consultation distances) around gasoline pipelines.

[1] Arther D Little "Risks from gasoline pipelines in the United Kingdom" report to the UK HSE, June 1996 and WS Atkins Safety and Reliability " Assessing the risk from gasoline pipelines in the UK based on a review of historical experience" HSE report 210/1999, HSE Books. A third paper was produced by HSE: 'Methodology for gasoline pipelines and reconsideration of appropriate land use planning distances.' MHAU/AS/347. March 1999. This corrected a number of apparent errors in the W.A Atkins report.

15. This option which would involve leaving the current PSR in place with no amendments and so is the baseline against which other options can be compared. This option therefore has no additional cost or benefit implications

Option two – Amend PSR to include gasoline as a dangerous fluid and decouple from LUP requirements

16. This option would involve extending the current PSR to include gasoline as a dangerous fluid. Under this option additional duties under Regulations 18 – 25 of the Regulations would apply to gasoline pipelines. This would involve application of more prescriptive requirements to gasoline pipelines including notification, major accident prevention documents, emergency procedures and local authority emergency plans.

Option three - Amend PSR to include gasoline as a dangerous fluid and implement Land Use Planning restrictions

17. Option three is a combination of option two and additional land use planning restrictions, which would consist of the following:

- Land use planning controls (consultation distances) around gasoline pipelines to manage residual risks from gasoline pipelines.
- Arrangements for notifications for new major hazard pipelines:
- A requirement to ensure that information provided is sufficient to set consultation zones and maintain an adequate data base for land use planning purposes

COSTS and BENEFITS

Data sources and assumptions

Technical assumptions

18. This section presents an assessment of the costs and benefits of the options that are outlined above.

19. Some of the costs to organisations of carrying out new duties are opportunity costs[2]. It is assumed that the loss of output due to employees spending time on a certain activity is equal to the cost of employees' time allocated to these additional duties, based on the number of hours allocated to the duty and the average earnings for the employees that would undertake the duty.

20. Costs have been discounted over a period of forty years and expressed in present value terms[3]. This period of time has been used because pipelines are usually designed to last approximately forty years. No new gasoline pipelines are being planned at present and it is assumed that no new pipelines will be constructed during the appraisal period considered in this Impact Assessment. It is also assumed that owners keep their pipelines in good repair and will upgrade them regularly to compensate for any deterioration and decline in capacity that would otherwise occur. The stock of pipelines is therefore taken to be constant throughout the period.

21. A discount rate of 3.5% is applied for costs and benefits, and a 1.5% rate applied to health and safety benefits in line with HM Treasury guidelines.

[2] 'Opportunity cost' is the cost which results from undertaking an activity instead of the next best alternative.
[3] The present value is the future value expressed in present terms by discounting. It is based on the social time preference rate, being the value that society attaches to present rather than future consumption. See Treasury guidance in the Greenbook available at: http://www.hm-treasury.gov.uk/d/Green_Book2_03.pdf

Methods of calculating risk

22. Assumptions used in the calculation of risk are detailed in Annex 1.

23. The main risk calculations that are directly used in the cost and benefit calculations in this IA are highlighted here:

24. Estimates of individual risk have been calculated over a consultation distance of 80m as follows:

- Individual risk in urban areas averaged over whole consultation distance = $2*10^{-6}$
- Individual risk in rural areas averaged over whole consultation distance = $3*10^{-7}$
- Overall average individual risk approximately $5*10^{-7}$

25. Multiplying the calculated individual risk by the population within proximity of gasoline pipelines for both rural and urban areas (being 50,593 and 9,206 respectively) gives an estimation of the expected number of fatalities per year. Population estimates provided by HSL scientists include both resident and transient populations.

26. Analysis of past accident reports also indicates that each fatality from a gasoline pipeline leak ignition can be associated with four significant injuries. The expected number of injuries is therefore obtained by multiplying the expected number of fatalities by 4.

27. The calculated estimates are given in the table below.

	Total Population in zone	**Expected No. of fatalities per year**	**Expected No. of injuries per year**	**Expected fatalities over 40 yr period**	**Expected injuries over 40 yr period**
Urban	**50593**	**0.1012**	**0.405**	**4.05**	**16.19**
Rural	**9206**	**0.0028**	**0.011**	**0.11**	**0.44**

28. Recent estimates of the risk of pipeline failure have been provided by HSL[4]. These are based on historical failure data collected by CONCAWE (Conservation of Clean Air and Water in Europe)[5], being over 35 years of performance data for Western European cross country oil pipelines. Failure rates provided are based on the ratio of the number of observed failures to the overall population of pipelines, see Annex 1.

29. These updated estimates recommend that a failure rate of 0.263 events per 1000km years is used (0.207 rural and 0.767 suburban).

30. Research on previous evidence of the scale of loss incurred following high cost chemical/petrochemical accidents finds a lack of reliable data in the public domain. Published costs tend not to include unobserved cost. An analysis of 119 events at petrochemical, chemical and refinery sites were on average 2.7 times the commercial property damages. There is no reason to believe that this proportion would be different for a major incident involving gasoline pipelines.

[4] Advice provided by Kate Nash of the Health and Safety Laboratory in July 2008 to the Health and Safety Executive.
[5] Concawe report number 7/08. Performance of European cross – country pipelines. Available at: http://www.concawe.be/DocShareNoFrame/docs/2/MFAMCPDCHLDPELAMHMLNJKIIVEVCBW939YBDC3B6ENE3/CEnet/docs/DLS/Rpt_08-7-2008-03666-01-E.pdf

Benefits

Option one – No change to PSR

31. This option provides the baseline for analysis of costs and benefits in this impact assessment, and therefore there are assumed to be no additional benefits associated with this option.

Option two – Amend PSR to include gasoline as a dangerous fluid and decouple from LUP requirements

32. By classifying gasoline as a dangerous fluid the additional duties under PSR for Major Accident Pipelines will become applicable for gasoline. These additional duties include provisions regarding emergency shut down valves, notification before construction and use of pipelines, production of a Major Accident Prevention Document and emergency procedures and emergency plans. Such duties are designed to reduce the risk of a catastrophic event and reduce the associated costs of loss of fatalities and injuries, i.e. bring health and safety benefits. The costs of damage to property and infrastructure, and disruption to economic activity will also be reduced, being cost savings and so are discussed in the next section.

Option three - Amend PSR to include gasoline as a dangerous fluid and implement Land Use Planning restrictions

33. As with option 2, with additional benefits associated with Land Use Planning restrictions. In urban areas, LUP restrictions will mean fewer properties in the vicinity of the pipeline and so in the event of an incident to cost of damage to properties is likely to be less.

1) Health and safety benefits – options 2 and 3

34. The expected cost of fatal and major injuries associated with a gasoline incident has been calculated. This is based on the expected number of fatalities / injuries per year (see paragraph 26) and the HSE estimated cost of a fatality / injury of £1.5m and £40,500 respectively.[6]

35. The total expected cost of injuries and deaths in urban areas due to gasoline incidents has been estimated as £5 million over a 40 year appraisal period. This estimate has then been compared with cost estimates over the same period when the level of risk is reduced by 10% and 20% (assumed to be a consequence of classifying gasoline as dangerous). When the risk falls by 10% the total expected costs of fatalities and major injuries over the period is estimated to be £4.5 million, and so the health and safety benefit of classifying gasoline as a dangerous fluid is £500,000. If the risk is reduced to 20% then the total expected cost of fatal and major injuries over the 40 year period is £4 million and so the benefit of classifying gasoline as a dangerous fluid is £1 million.

36. The same methodology has been applied for rural areas. The total expected cost of fatalities and major injuries in rural areas is calculated as £223,000 over the 40 year appraisal period. If individual risk was reduced by 10% then the total cost would be £124,000 over the appraisal period being a saving of £105,000. If the risk was reduced by 20% then the total cost would be £110,000, being a saving of £120,000 over the appraisal period. The following table summarises these potential benefits applicable to options 2 and 3.

[6] See the HSE Economic Analysis Unit Appraisal Values, available at: http://www.hse.gov.uk/economics/eauappraisal.htm

Total Health and Safety Benefits

	Costs Avoided	Benefits of 10% reduction in risk £m	Benefits of 20% reduction in risk £m
Option 1		Nil	Nil
Option 2 & 3	Death and injury	0.6	1.1
Total		**0.6**	**1.1**

2) Cost Savings

Business Interruption and clean up costs – option 2 and 3

37. There will also be costs associated with business interruption and clean up costs after an ignition incident. A case study example has been used to try to ascertain what might be the clean up and response costs of a major incident. The Buncefield Incident of 11th December 2005 cost £894m overall.[7] This was a major incident and included the site operators compensation claims, aviation costs, Competent Authority and Government response, emergency response and environmental impact.

38. The Buncefield incident occurred in an urban area and so is only representative of the costs of incidents in urban areas and due to its size, is not representative of the average incident that would be expected to occur. It is assumed that the average total cost of cleaning up, damage and business interruption due to an incident might be 10% of the costs associated with Buncefield, i.e £89m.

39. The expected number of incidents in urban areas can be calculated using the formula: percentage of pipelines in urban areas * total length of pipeline/1000km * risk of incident / 1000km yrs * probability of incident being an ignition event = 0.1*4.5*0.767*0.05 = 0.017 (see annex 1 for assumptions). The expected clean up costs associated with ignition incidents is therefore £1.5m per annum with a present value of £32.7m over the 40 year appraisal period.

40. By classifying gasoline as a dangerous fluid under PSR 1996 it is hoped that the risk of an ignition incident will be reduced. Two scenarios have been modelled, based on an assumption that risk may be reduced by 10% and secondly that risk may be reduced by 20%. Under the scenario of risk being reduced by 10% the expected number of ignition events in urban areas will decrease to 0.015 per annum. This will equate to a present value of the cost of an incident of £29.5m over the 40 year appraisal period and so a cost saving of £3.3m over the appraisal period.

41. If instead the risk is reduced by 20% the expected number of ignition events per annum in urban areas will be 0.014 and the total present value of the cost of incidents over the 40 year period will be £26.2m being a cost saving of £6.5m.

[7] See chapter 3 of the Buncefield Incident 11 December 2005: The final report of the Major Incident Investigation Board. Available at: http://www.buncefieldinvestigation.gov.uk/reports/volume1.pdf

42. In summary, in urban areas over the 40 year appraisal period, the present value of the total cost savings could range between £3.3m and £6.5m.

43. The same methodology can be applied to rural areas, but the expected cost of an incident is assumed to be much lower. In a rural area it is fair to assume that property damage will be small but environmental costs on the other hand might be much larger. Instead of 10% of the costs of Buncefield it is assumed that costs may be an order of magnitude less, or 1%, i.e. £9m.

44. The expected number of ignition events in a rural area is calculated using the methodology explained above, adjusting the risk of an incident per 1000 km yrs to 0.207 for rural areas. The expected number of ignition events per year is therefore 0.25 (given there is assumed to be 9 times more pipeline in rural areas). The expected cost of an ignition event is calculated as £220,000 per annum or a present value of £4.8m over the 40 year appraisal period.

45. Again, if the classification of gasoline as a dangerous fluid under PSR 1996 should reduce the risk of an incident by 10% then the costs would be £4.3m over the appraisal period, being a cost saving of £477,000.

46. If the risk is reduced by 20% then the costs will be £3.8m over the appraisal being a cost saving of £955,000.

47. The total cost savings of clean up, property and business interruption costs in both rural and urban areas is therefore between £3.8m and £7.5m over the 40 year appraisal period.

Option 3 only - Land use planning restrictions

48. Although proposals introducing land use planning will not prevent direct losses to gasoline pipeline operators, land use planning can be expected to reduce human costs and property damage from ignited gasoline. Land use planning restrictions that result in less development in the vicinity of gasoline pipelines can also be expected to reduce building damage, accident recovery, and clean up costs. We also consider the costs of losses from an event which does not result in an ignition. These will result in environmental damage, business loss and require mitigation.

49. Cost estimates for damage above have been based on a percentage of the costs of the Buncefield incident, depending on whether the incident occurs in rural or urban areas. Obviously land use planning zones would reduce the damage costs to property that are caused by incidents in urban zones. Other significant costs of leakages in urban (or `semi-urban') areas would be in evacuation and local business interruption. This would be mitigated (but not prevented) to some extent by LUP controls. The other costs of an incident, such as investigation costs, emergency response and business interruption would not be reduced by LUP.

50. The expected costs of damage to property has been estimated as between £8,600 and £17,200 per annum, based on the assumption that between 10 and 20 properties might be damaged in an incident, the average loss in value of a property might be £50,000 and the expected number of ignition events in urban areas is 0.017 per annum (see paragraph 36).

51. Given that LUP will also likely reduce the costs of leakage, we have assumed that the total cost savings per annum will be approximately double the estimated property costs. Thus, it has been assumed that LUP restrictions would reduce costs by £17,200 - £34,300 per annum in urban areas and between £366,000 and £733,000 over a 40 year appraisal period. It is assumed that any cost savings would be negligible in rural areas as the density of properties around the pipelines will be low.

52. This estimate is only illustrative as the cost can be expected to vary considerably for specific incidents depending on the industrial, commercial, and residential structure of the area surrounding the pipeline. This would be the situation without classifying gasoline as a dangerous fluid (i.e. the base line situation, and then implementing land use planning controls).

53. If however land use planning is introduced alongside the classification of gasoline as a dangerous fluid, the cost saving associated with land use planning will be reduced because the actual risk of an incident will have reduced due to the intervention. Thus, if it is assumed that classifying gasoline as a dangerous substance reduces the risk by 10% then the land use planning cost savings will in fact be between £330,000 and £659,000. If instead it is assumed that classifying gasoline as a dangerous substance reduces the risk by 20% then the cost savings due to land use planning will decrease to between £293,000 and £586,000

Total Cost savings

	Costs avoided		**Benefits of 10% reduction in risk £m**	**Benefits of 20% reduction in risk £m**
OPTION 1			Nil	Nil
OPTION 2	Clean up costs		3.8	7.5
	TOTAL		**3.8**	**7.5**
OPTION 3	Clean up costs		3.8	7.5
	Land use planning	Min	0.33	0.29
		Max	0.66	0.59
	Total	**Min**	**4.0**	**7.8**
		Max	**4.4**	**8.0**

Costs

Business sectors affected

54. Where applicable, costing methodology has been taken from the original impact assessment performed in 1999/00 and updated using the GDP deflator. Using the HM Treasury GDP deflator series, 2007/08 prices are calculated to be higher than 1999/00 prices by a ratio of 1.22.

Option 1 – do nothing

55. Option 1 is the baseline for the analysis presented in this Impact Assessment, and there are no additional cost implications associated with this option

Option 2 - Amend PSR to include gasoline as a dangerous fluid

56. There would be no cost implications from general regulations (5 – 17) as these already apply to gasoline pipelines.

57. The additional costs of this option apply under additional duties in Regulations 20- 25. This is considered below.

Regulation 20 – Notification before construction

58. This applies to new pipelines only. It is considered to be unlikely that any new gasoline pipelines will be constructed over the next 40 years so no additional costs should be incurred.

Regulation 21 – Notification before use

59. HSE must be notified and have 14 days to act before fluids can be conveyed in pipelines that have not been in regular use. It is assumed that there will on average be one notification a year and that this will take about 30 minutes of the time of a safety engineer. Total cost of this notification is therefore negligible.

Regulation 22 – Notification in other cases

60. HSE must be notified about any changes in the operator within fourteen days. The operator will already be notifying customers and others of the change and therefore this is assumed a marginal cost and has been excluded.

61. Notification is also required when there are major modifications or changes in the operating limits or fluid being transported in the pipeline (all gasoline pipelines in the country are operated as multi-product pipelines conveying gasoline approximately 40% of the time) it has been assumed that this will occur about twice a year and that each notification will cost about £24 (£48 in total per year). The present value of regulations 21 and 22 over forty years is about £1000.

Regulation 23 – Major Accident Prevention Document

62. A new "Major Hazard Prevention Document" (MHPD) will have to be prepared and revised as often as necessary. The document has to include details of the operator's health and safety policy for persons who may be affected by the pipeline. It must also detail all hazards with the potential to cause a major accident, the appropriate risk assessments, details of steps taken to reduce risks to the lowest practicable level, details of the safety management system and audit procedures for the safety management system.

63. The MAPD is not dissimilar to documents required under other regulations. Much of the preparatory work for these documents will have already been done. The major task will be assembling the information together. Experience with MAPD documents already prepared under the regulation suggests a typical cost of preparation in the order of £6,000. The total cost of preparing a major accident prevention policy (MAPP) is assumed to be in the range of £30,000 - £100,000, depending on the size and classification of the site. One large pipeline operator has reported that pipeline failure is just one of 35 scenarios already identified under the regulations preceding COMAH and carried forward under the new regime. This would suggest that the additional costs of including a new scenario concerning gasoline pipelines should require work costing a total of no more than £6,000 per MAPD document.

64. The total one off cost of preparing MAPD's will be £60,000 to ten operators[8]. It is assumed there will be no net addition to the number of operators and that, if there are any changes in ownership, it is possible to transfer the MAPD at minimal cost.

[8] This is an estimate of the number of the largest pipeline operators. Even if the actual number of operators was 100% greater than this, i.e. 20, the total cost would be only £60,000 more than calculated so immaterial.

65. MAPDs will need to be periodically reviewed; it is assumed they will be reviewed every five years at a cost of one fifth of the initial cost. This amounts to £12,000 each time the MAPD'S are reviewed. Over a period of 40 years, the present value of the costs of reviewing the MAPDs will be £43k.

66. Over a period of 40 years, the total cost of initial preparation and five yearly reviews is about £103k over forty years.

67. Regulation 23 also requires adequate arrangements for audit and for making reports on the audit. It is assumed an audit is undertaken each year and that it takes one person one week for the four major gasoline pipeline companies at a resource cost of £1,500 per audit. (Allowing for the possible appointment of external management auditors in some cases) The remaining six companies are assumed to incur audit costs between them equal to those of one major operator. In present value terms over the 40 year appraisal period the total costs of safety management audits are £160k.

Regulation 24 – Emergency Procedures

68. Emergency arrangements must be in place before the pipeline is in use. These should be revised as often as appropriate. All operators already have extensive procedures in place; this requirement should not result in significant additional cost.

69. The regulation will now make it explicit that: 'The emergency procedures shall include provision for the local authority and the emergency services to be notified immediately in the circumstances specified in regulation 28[9].'

70. In other words in order for the emergency plan to be initiated when a major accident occurs, or an event that could reasonably be expected to lead to a major accident, the local authority should take steps to put the emergency plan into effect without delay and the operator shall include a provision in their emergency procedures for the local authority and emergency services to be notified immediately should the circumstances specified above occur.

71. In practice this will already be occurring and so although this change will make the operators requirements more explicit, it is not anticipated that there will be additional costs associated with this slight amendment.

Regulation 25 – Preparation for Emergency Plans in case of major accidents

72. Every local authority (LA) which has a pipe line passing through it, must be notified that a major hazard pipe line is to be constructed – they must be provided with information about the pipe line carrying a dangerous fluid.

73. The local authority is required to prepare an Emergency Plan setting out how it proposes to deal with the possibility of major accidents. This must be revised at least once every three years. It is expected that every LA will build upon plans it (or other LA's) already have in place. It is not expected that this cost will be as great as the costs of drawing up the MAPD. It has been assumed that the plan will take 20 days of work by a Business and Public Service Professional[10] and so the cost per LA is calculated as £4,000. The Health and Safety Laboratory (HSL) have advised that the total number of local authorities in the UK with a pipeline running through them is 100, plus 3 LAs with the 80m buffer zone around the

[9] Under regulation 28. the local authority who is the owner of the emergency plan has a duty to put the plan in effect without delay.

[10] Using the ASHE 2008 gross hourly wage rate for Business and Public Service Professionals of £20.39 and grossed up to reflect the true economic cost of employment to £26.51.

pipeline within their boundaries. The total number of LAs affected is therefore 103. Assuming these are all required to produce such a plan, the present value of the total one off cost in year 1 is therefore £400,000.

74. Under regulation 25 plans must also be revised every 3 years. The cost of this is assumed to be approximately half of the initial preparation costs, i.e. £2,000 per LA. Over a 40 year appraisal period, the total cost of reviewing the plans to all 103 LAs is £1.3m.

75. In total therefore, the cost of regulation 25 to the local authorities will be £1.7m

Consultation and familiarisation

76. There will be a need for managers in industry to familiarise themselves with the proposed regulations once they are introduced. It is assumed that there will be 3 science and technology professionals per pipeline operator who are required to familiarise themselves with the changes to the regulations, and 10 others from smaller pipeline operators. Assuming this takes 1 hour per person, the total cost to industry of familiarisation will be £1,000 which is insignificant.

77. Similarly, local authorities will have to familiarise themselves with their requirements to produce Emergency Plans. Given that the relevant staff will have the background knowledge from plans produced for other regulations, the familiarisation process may not take that long. Thus, it is anticipated that it will take one Business and Public Professional half an hour to read up on their requirements for each LA. The familiarisation costs for LAs is therefore calculated as £5,400 again being insignificant.

78. Total cost of Option 2

Cost	Total present value £'000
Familiarisation	6
Notification	1
MAPD – Initial preparation	60
MAPD – 5 yearly reviews	43
MAPD – yearly audit	160
Emergency plans – reviewing and revising	1,700
TOTAL	**2,000**

Option three – Implement Land Use Planning (LUP) Restrictions

79. HSE is a statutory consultee on the route of major accident hazard pipelines and, under option 3, would provide advice on the routing of any new gasoline pipeline. HSE would also be required to set LUP consultation distances (CD) around gasoline pipelines and would in future advise local planning authorities on developments in the vicinity of gasoline pipelines.

80. Currently no new gasoline pipelines are under construction and neither are there any new gasoline pipelines being planned for construction.

81. The land use planning restrictions will impose additional costs for future development proposals near existing pipelines through restrictions on development. HSE will not apply

advice retrospectively, so there will be no alterations where developments previously existed. Compensation clauses covering restrictions in land development that are normally incorporated in contracts drawn up between pipeline operators and land owners would affect both applications for development where there are existing buildings and where there are no existing buildings.

82. The value of land affected depends on the uses to which it has or can be put – it depends on buildings already on the land and what buildings would otherwise be permitted. Land for residential or industrial development typically has a value several times greater than agricultural land. The difference between its value with permission for a specified use of development and its value without that permission is its development value

Number and nature of land use applications

83. Using previous HSE records of application of land use planning controls to existing major hazard pipelines as a guide, the likely action on the 30 cases referred to HSE can be determined. In a trawl of 6625 decisions, 14% are shown as “advised against” the remainder being shown as “not advised against” (56%) or “special reply” (30%).

84. The HSE’s approach to land use planning around major hazard sites is based on the designation of three zones (inner, middle, and outer) which are designated as the Consultation Distance. The boundary of each zone of the Consultation Distance is designated by HSE based on an assessment of the specific risk of harm based on the population that would be exposed. HSE land use planning advice is largely provided via the PADHI+ decision matrix. Whether a development is advised against broadly depends on the location of the development and the characteristics of the development. For example, a development such as housing might be advised against in the inner zone but might not be advised against in the outer zone. A non-sensitive commercial development might not be advised against in the inner zone.

85. Since gasoline pipelines have not in the past been classified as major accident hazards, the “inner zone” or restriction was only three metres wide on either side of the pipeline and it was assumed that no future development applications would be made along this narrow zone. In practice, there will be no change for commercial development which will continue to be considered low risk. Since 1996 (when PSR repealed controls under the Pipelines Act 1962) there is no longer formal control for housing and sensitive developments near non-PSR pipelines. The issue is whether any planning applications will be made for developments where the public is present in significant numbers for only part of the day and where emergency action may be difficult to co-ordinate (e.g. large scale retail developments and housing).

86. With the application of major hazard land use planning restrictions, differences from current practice will arise over planning applications for housing and large scale retail, community and leisure developments, which might be advised against in the middle zone but not the outer zone. Given the application of the PSR regulations to date, and the research on the risks from gasoline pipelines detailed above, it is assumed that between 10% and 20% of referred applications would be advised against. Changes to the location or design of the development would then be required before the development is assessed again against the PADHI+ system.

Action taken for applications that are “Advised Against” by HSE

87. Compensation clauses covering restrictions in land development are normally incorporated in contracts drawn up between pipeline operators and landowners. An extract from a Pipeline Deed of Grant, for example, states that “the Grantor shall give written notice to the Company stating whether or not he requires the diversion of the pipeline (for the

development to occur) and the Company will pay to the Grantor compensation for the loss of value of any of the land of the Grantor by reason of the restriction of development of the pipelines".

88. Compensation will only be a relevant consideration if planning permission is refused, or withdrawn where there are existing permitted development rights. However, HSE has no record of compensation ever having actually been paid with respect to pipelines already under PSR. In practice, a range of other measures can be (and have been) adopted.

89. Firstly, and most commonly, the development can be modified so that the features giving rise to concern are sufficiently changed. It cannot be assumed that no development will take place on land where a proposal has been rejected by the LPA on the basis of HSE advice. Other less sensitive schemes may be devised, and the actual loss in development potential will be the difference between the value of the original development if it had been allowed to proceed, and the next best use to which the land could have been put. If there are no other alternative uses, the loss of development value will be the full value of the development foregone; if the next best use of the land has a similar value to the development foregone, there will be no loss of development value.

90. With no previous record of land use planning decisions in this area, it is uncertain whether developers will change the type of planning application to reflect the changed circumstances and, if their application is rejected, whether they will then resubmit with the next best alternative likely to be acceptable to HSE. The developments will vary in size and value depending on type and location and on any existing buildings.

91. Secondly, action can be taken to minimise the risk so that the original development can go ahead as planned. There are several ways of minimising the risk from pipelines carrying hazardous substances, including:

    -Ensure (or increase) pipeline integrity. This reduces risk by reducing the failure rate.
    -Mitigate the consequences of failure, for example, by diverting the pipeline.
    -Mitigate consequences of failure by land use planning.

92. Which option (if any) is adopted depends on the nature of the particular development. With respect to consequence mitigation by moving the pipeline, this has been done in the past with respect to large scale developments, and may well be done in the future. Occasional large scale developments where parties agree to mitigate the consequence in this way would be unlikely to require further action by HSE.

93. There are two methods of mitigation: either thickening the wall of the pipeline or diverting the pipeline away from developed areas. If either of these two options is considered feasible, then the operator would be expected to put it into place only after carrying out a detailed risk assessment (supplemented by cost benefit analysis) to show that the additional mitigation measures are not disproportionate to the achieved reduction in risk. If the costs are disproportionate, then the remaining alternative is the use of land use planning, which is discussed below.

94. It should be noted that these mitigation measures could cost more to implement than the cost of land use planning restrictions. It might be expected that they would be undertaken if the commercial return made the action worthwhile (including the commercial benefit of avoiding land use planning restrictions). It is therefore assumed that the costs of land use planning restrictions represent the additional cost to society of these proposals.

Resource costs to society

95. The cost of land use restrictions has been examined in published research commissioned for the Department for Transport on public safety zones around domestic airports,, in a research study undertaken for National Air Traffic Services in relation to the Heathrow Terminal 5 planning application by AW Evans et al "Third Party Risk near Airports and Public Safety Zone Policy", NATS, 1997.

96. If developers are denied planning permission near gasoline pipelines, they will almost certainly look elsewhere. Development is assumed to take place at the next best alternative site. Since land is practically fixed in supply, the depression in the price of sites near the gasoline pipeline is likely to be offset by an increase in the value of other alternative sites. We assume that the alternative sites are not quite as suitable as the rejected sites, (otherwise they would have been chosen initially), so there is some overall loss in development value.

97. It is assumed, in line with the Department for Transport research on public safety zones around domestic airports, that the opportunity cost of inhibiting land development is a portion of the land development potential (10%). Limitations to this assumption are recognised, which takes a narrow view of the costs of land use planning restrictions. Further research is currently being conducted by HSE to examine in more detail the economic costs of land use planning restrictions around major hazard sites.

98. This opportunity cost is applied to the difference in the price of land. This is because any LUP restriction may reduce the supply of land available for one purpose (eg a housing development), but consequently displace development to alternative locations. The effect of applying LUP would be to cause a marginal fall to the price of land for which development is restricted, but an offsetting increase in the price of alternative land that is suitable for development.

99. Because of the relatively smaller size of the areas affected by pipeline restrictions compared to public safety zones in any given area, there is more likely to be alternative land in the immediate vicinity that could be used for development. We therefore assume that the net loss in development value is 5% of the fall in development value of the rejected proposals, and that this is reflected fully in land prices. Land for which housing development is restricted may be suitable for alternative development such as industrial development or agricultural use. For the purposes of this analysis, it is assumed that land on which housing development is advised against would instead be applied to agricultural use.

100. The average price of housing development land for small sites and farm land is £2,870,000 per hectare and £10,700 per hectare respectively[11], or £287 and £1.07 per m^2.

101. Assuming that if development is advised against, the land will be used for its second best use, the *maximum* fall in land development value will be approximately £286 per m^2. 5% (the assumed net loss in development value) is approximately £14 per m^2.

102. We can estimate a rough cost of Land use planning restrictions. If each planning application affects 100 m^2 around gasoline pipelines then each application advised against and subject to land use planning restrictions costs society £1400. Assuming half of the applications advised against each year are subject to land use planning restrictions (i.e. a maximum of 3), then there is an annual cost of £4200. In present value terms over a period of 40 years this is £92k. The actual cost will depend specifically on the percentage of applications advised against, which may differ from the assumptions in this calculation.

[11]Per Hectare prices taken from "Land Use Planning around Large Scale Petrol Storage Sites" Regulatory Impact Assessment (HSE 2007).

103. Total cost of Option 3

Cost	Total present value £'000
Familiarisation	6
Notification	1
MAPD – Initial preparation	60
MAPD – 5 yearly reviews	43
MAPD – yearly audit	160
Emergency plans – reviewing and revising	1,700
Land Use planning	92
TOTAL	**2,100**

Costs to HSE

104. There will be some additional costs to HSE. Pipeline inspectors will have to process notifications, notify local authorities and consult on emergency plans, inspect operating pipelines including MAPDs,

105. The inspection of operating pipelines will fall within the current work programme for HID and so there wont be any additional costs to HSE associated with this.

106. It is not expected that there will be any new gasoline pipelines constructed and so there is not expected to be a cost of processing notifications.

107. There will be costs to HSE associated with notifying local authorities and consulting on emergency plans, but these are not expected to be significant. No extra resource will be required for the duties and so no further analysis of these costs has been performed.

Impact on small and medium sized businesses

108. No SMEs are expected to be disproportionately affected by these proposals.

Balance of resource costs and benefits

109. The balance of costs and benefits can be compared with the value of risk reduction, which is *equivalent to* a "value of preventing a fatality" (VPF) of £1,500,000[12] from the HSE economic analysis unit (EAU) appraisal values. The EAU appraisal values can be used to estimate the benefits of proposed measures which aim to improve safety, and to compare such benefits with the cost of government intervention. The prevention and mitigation of an accident leads to a reduction in costs to society, the EAU appraisal values are used to inform estimates of the size of such reductions in cost.

110. The actual value of the benefits of these amendments is subject to significant uncertainty. A review of the historical evidence suggests that preventing all fatality risk is unfeasible. For example, there are examples of gas and gasoline pipeline ruptures from ground disturbance during isolated construction work that have resulted in immediate ignition and death to the

[12] http://www.hse.gov.uk/economics/eauappraisal.htm

worker concerned. On the other hand, there are many multiple fatality events which could have been almost entirely mitigated by adequate emergency response. Preventing ignition or mitigating a spreading fire early could also realise significant loss prevention. We would also expect the frequency of un ignited releases to fall.

111. The actual costs of land use planning restrictions will depend on the specific development proposals that become subject to LUP Land use planning can only be considered on a case by case basis. This suggests that the requirement to refer all developments for consideration of LUP is sensible. Detailed consideration would be required to estimate the cost of restricting any specific development, although it could be expected, based on records of land use planning restrictions around major hazard sites, that a proportion of developments could be excluded from LUP after the referral process.

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Competition assessment

112. No significant economic impact on competition

Small firms Impact test

113. No significant economic impact on SMEs.

Other tests

114. No Significant or economic impact on legal aid, sustainable development, carbon assessment, Health impact assessment, race equality, disability equality, gender equality, , Human rights or rural proofing.

Uncertainties

115. There are uncertainties with regard to cost and risk in the analysis. These are detailed through the text. There has been discussion with industry representatives and HSE specialists on the assumptions underlying these calculations.

116. HSE will be monitoring the number and type of land-use planning cases received, which involve gasoline pipelines and this will be recorded in the database. Then this can be reviewed after a sufficient number have been received, to ensure the system is working correctly.

117. This Impact Assessment is carried out on an individual risk based approach. It is noted however that a societal risk based approach may be more appropriate. This would require further research to identify how societal risk should be applied to this analysis.

Specific Impact Tests: Checklist

Use the table below to demonstrate how broadly you have considered the potential impacts of your policy options.

Ensure that the results of any tests that impact on the cost-benefit analysis are contained within the main evidence base; other results may be annexed.

Type of testing undertaken	*Results in Evidence Base?*	*Results annexed?*
Competition Assessment	Yes	No
Small Firms Impact Test	Yes	No
Legal Aid	No	No
Sustainable Development	No	No
Carbon Assessment	Yes	No
Other Environment	No	No
Health Impact Assessment	No	No
Race Equality	Yes	No
Disability Equality	Yes	No
Gender Equality	Yes	No
Human Rights	Yes	No
Rural Proofing	No	No

Annexes

Annex 1

List of assumptions for comment

- Risk of an incident = 0.263 events per 1000 km yrs (being 0.207 events per 1000km yrs for rural and 0.767 events per 1000 km yrs for urban). (Kate Nash of HSL dated 23rd July 2008.
- Total length of pipeline in UK = 4,473 km (per HSE calculations in 2007 from Linewatch website: www.linewatch.co.uk/network.htm)
- Expected number of ignition events in rural areas = 3% (HSE assumption per original IA, see Annex 2)
- Expected number of ignition events in urban areas = 5% (HSE assumption per original IA, see Annex 2)
- Location of pipelines = 10% urban and 90% rural. Advice provided by Kate Nash of HSL (2008): total length of underground pipeline between 1988 and 2005 = 391,000 km yrs. Suburban length = 39100 km yrs (10%); rural length = 351,900 km yrs (90%).
- Consultation distance = 80m.
- Individual risk: $2*10^{-6}$ (urban), $3*10^{-7}$ (rural), $5*10^{-7}$ (average). HSE calculations see Annex 2 and based on W. S Atkins research report CRS 210/1999.
- Total population in zone = 50,593 (urban) and 9,206 (rural). (HSL advice included in 2002 IA, no further evidence of these estimates)
- Expected number of residential properties damaged in the average incident in urban areas = between 10 and 20 (best estimate by Economics Analysis Unit)
- Average damage to residential property = £150k (best estimate by Economics Analysis Unit)
- Expected reduction in the risk of an incident due to classifying gasoline as a dangerous fluid = between 10 and 20% (best estimate by Economics Analysis Unit for benefit calculations)
- Average cost of clean up for the average incident (including business interruption costs) = 10% of the Buncefield economic cost = 10% x £894m = £89m
- Population density in rural areas is 250 / km^2 and 5000/km^2 in urban areas per W.S Atkins 1999. CRS 210/1999: Assessing the risk from gasoline pipelines in the UK.

Summary: Intervention & Options

Department /Agency:	Title:	
Health and Safety Executive	**Impact Assessment of classifying carbon dioxide as a dangerous fluid**	
Stage: Consultation	**Version:** Draft V1	**Date: October 2009**
Related Publications:		

Available to view or download at:

http://www.

Contact for enquiries: Karen McDonough **Telephone: 0151 951 3308**

What is the problem under consideration? Why is government intervention necessary?

CO_2 is not currently defined as a dangerous fluid under the Pipelines Safety Regulations (PSR). Therefore, CO_2 pipelines would not fall under the scope of additional duties for major accident hazard pipelines (MAHP) as set out in Part III of PSR. However research by HSL recommends that in terms of risk, CO_2 has sufficient toxicity to be included as a dangerous fluid in PSR. As the operators of a pipeline are answerable to their shareholders rather than the general public, they cannot be expected to put in place additional risk reduction measures to protect the public unless there is a legal imperative to do so.

The rational for intervening now rather than waiting for the demonstration projects to be in place is to:

a) use the demonstration projects to test the effectiveness of the regulations
b) provide industry with some certainty around the regulations that will apply, so that future projects can be planned and necessary investments sought
c) support the government requirements for CCR
d) underpin public confidence in CO_2 transport by pipeline.

What are the policy objectives and the intended effects?

The policy objectives are to apply:

i) The more prescriptive, major hazard accident requirements of PSR to CO_2 pipelines used for Carbon Capture and Storage (CCS) including emergency shut-down valves, notification, major accident prevent documents and local authority emergency plans; and
ii) Land Use Planning (LUP) controls around CO_2 pipelines. The introduction of which will provide a mechanism to ensure that the risks can be considered in a consistent and transparent way when making decisions about land use in the vicinity of pipelines.

By extending the major accident hazard aspects of PSR to include pipelines conveying CO_2, would ensure that HSE maintains a consistent regulatory approach for all major accident hazard pipelines.

What policy options have been considered? Please justify any preferred option.

The following regulatory options have been considered:

i) No change
ii) To define CO_2 as dangerous fluid and decouple from LUP requirements
iii) The same as option ii) but also extending the land use planning controls to qualifying pipelines

Non-regulatory options have been discounted as they allow discretion on implementation.

When will the policy be reviewed to establish the actual costs and benefits and the achievement of the desired effects?

The policy will be reviewed within five years of implementation.

Ministerial Sign-off For SELECT STAGE Impact Assessments:

I have read the Impact Assessment and I am satisfied that, given the available evidence, it represents a reasonable view of the likely costs, benefits and impact of the leading options.

Signed by the responsible Minister:

.....Date:

Summary: Analysis & Evidence

Policy Option: 1	Description: No change to PSR

COSTS

ANNUAL COSTS	Description and scale of **key monetised costs** by 'main affected groups'
One-off (Transition) **Yrs**	There are no costs associated with this option
£ Nil	
Average Annual Cost (excluding one-off)	
£ Nil	**Total Cost** (PV) **£ Nil**

Other **key non-monetised costs** by 'main affected groups'

BENEFITS

ANNUAL BENEFITS	Description and scale of **key monetised benefits** by 'main affected groups'
One-off **Yrs**	There are no benefits associated with this option
£ Nil	
Average Annual Benefit (excluding one-off)	
£ Nil	**Total Benefit** (PV) **£ Nil**

Other **key non-monetised benefits** by 'main affected groups'

Key Assumptions/Sensitivities/Risks
Not applicable

Price Base Year 2009	Time Period Years 20	**Net Benefit Range** (NPV) **£ Nil**	**NET BENEFIT** (NPV Best estimate) **£ Nil**

What is the geographic coverage of the policy/option?				Great Britain	
On what date will the policy be implemented?				October 2010	
Which organisation(s) will enforce the policy?				HSE	
What is the total annual cost of enforcement for these organisations?				£ Nil	
Does enforcement comply with Hampton principles?				Yes	
Will implementation go beyond minimum EU requirements?				Na	
What is the value of the proposed offsetting measure per year?				£ N/a	
What is the value of changes in greenhouse gas emissions?				£ N/a	
Will the proposal have a significant impact on competition?				No	
Annual cost (£-£) per organisation (excluding one-off)	Micro **N/a**	Small **N/a**	Medium **N/a**	Large	
Are any of these organisations exempt?	N/a	N/a	N/A	N/A	

Impact on Admin Burdens Baseline (2005 Prices) (Increase - Decrease)

Increase of £ Nil Decrease of £ Nil **Net Impact** **£Nil**

Key: **Annual costs and benefits: Constant Prices** **(Net) Present Value**

Summary: Analysis & Evidence

Policy Option: 2	Description: Amend PSR to include CO_2 as a dangerous fluid and decouple from LUP requirements

COSTS

ANNUAL COSTS	
One-off (Transition)	**Yrs**
£ 31,000 - £62,000	1
Average Annual Cost (excluding one-off)	
£ 6,000 - £12,000	

Description and scale of **key monetised costs** by 'main affected groups'

Total costs include initial one off preparation of MAPDs; 5 yearly reviews of MAPDs; yearly MAPD audits; and preparation of emergency plans.

Total Cost (PV) **£120,000 - £239,000**

Other **key non-monetised costs** by 'main affected groups'

BENEFITS

ANNUAL BENEFITS	
One-off	**Yrs**
£ Nil	
Average Annual Benefit (excluding one-off)	
£23- £48,000	

Description and scale of **key monetised benefits** by 'main affected groups' A reduction in clean up costs of between £7 and £13,000. Reduced cost of fatal and major injuries of between £350,000 and £660,000.

Total Benefit (PV) **£ 356,000 - £660,000**

Other **key non-monetised benefits** by 'main affected groups'

Key Assumptions/Sensitivities/Risks

See Annex 1 for comprehensive list.

Price Base Year 2009	Time Period Years 20	**Net Benefit Range** (NPV) **£356 - £660,000**	**NET BENEFIT** (NPV Best estimate) **£ 507,000 (average)**

What is the geographic coverage of the policy/option?				Great Britain	
On what date will the policy be implemented?				October 2010	
Which organisation(s) will enforce the policy?				HSE	
What is the total annual cost of enforcement for these organisations?				£	
Does enforcement comply with Hampton principles?				Yes	
Will implementation go beyond minimum EU requirements?				Yes/No	
What is the value of the proposed offsetting measure per year?				Na	
What is the value of changes in greenhouse gas emissions?				Na	
Will the proposal have a significant impact on competition?				No	
Annual cost (£-£) per organisation (excluding one-off) Assuming 10 operators, each being large	Micro **Na**	Small Na	Medium **Na**	Large £1,000	
Are any of these organisations exempt?	No	No	N/A	N/A	

Impact on Admin Burdens Baseline (2005 Prices) (Increase - Decrease)

Increase of £120 -239k Decrease of £ Nil **Net Impact** **£** 120 – £239k

Key: **Annual costs and benefits: Constant Prices** **(Net) Present Value**

Summary: Analysis & Evidence

Policy Option: 3	Description: Amend PSR to include CO_2 as a dangerous fluid and implement land use planning restrictions

COSTS

ANNUAL COSTS	
One-off (Transition)	**Yrs**
£ 376 – 407,000	1
Average Annual Cost (excluding one-off)	
£ 6 – £12,000	

Description and scale of **key monetised costs** by 'main affected groups' Total costs of option 2 including plus land use planning costs of £345,000

Total Cost (PV) **£465 - £584,000**

Other **key non-monetised costs** by 'main affected groups'

BENEFITS

ANNUAL BENEFITS	
One-off	**Yrs**
£ Nil	
Average Annual Benefit (excluding one-off)	
£29 – £54,000	

Description and scale of **key monetised benefits** by 'main affected groups' Total benefits of option 3 plus land use planning benefits of between £87,000 - £161,000

Total Benefit (PV) **£443 - £821,000**

Other **key non-monetised benefits** by 'main affected groups'

Key Assumptions/Sensitivities/Risks

See Annex 1 for comprehensive list

Price Base Year 2009	Time Period Years 20	**Net Benefit Range** (NPV) **£ 443 - £821,000**	**NET BENEFIT** (NPV Best estimate) **£ 632,000 (average)**

What is the geographic coverage of the policy/option?				Great Britain	
On what date will the policy be implemented?				October 2010	
Which organisation(s) will enforce the policy?				HSE	
What is the total annual cost of enforcement for these organisations?				£	
Does enforcement comply with Hampton principles?				Yes	
Will implementation go beyond minimum EU requirements?				No	
What is the value of the proposed offsetting measure per year?				N/a	
What is the value of changes in greenhouse gas emissions?				N/a	
Will the proposal have a significant impact on competition?				No	
Annual cost (£-£) per organisation (excluding one-off) As option 2	Micro **N/a**	Small **N/a**	Medium	Large **£1,000**	
Are any of these organisations exempt?	No	No	N/A	N/A	

Impact on Admin Burdens Baseline (2005 Prices) (Increase - Decrease)

Increase of £ 120 - £239k Decrease of £ Nil **Net Impact** £120 - £239k

Key: **Annual costs and benefits: Constant Prices** **(Net) Present Value**

Evidence Base (for summary sheets)

[Use this space (with a recommended maximum of 30 pages) to set out the evidence, analysis and detailed narrative from which you have generated your policy options or proposal. Ensure that the information is organised in such a way as to explain clearly the summary information on the preceding pages of this form.]

Extension of Pipeline Safety Regulations – 1996 to include Carbon Dioxide as a dangerous fluid.

1. This paper sets out the initial rationale, considerations and impact assessment for proposed changes under the Pipeline Safety Regulations (PSR)

Purpose and intended effects

Issue

2. Carbon dioxide is not a prescribed dangerous fluid for PSR purposes and therefore PSR's additional duties would not apply to pipelines carrying CO_2.

Objectives

3. The object of the extension to the PSR regulations is to:

   I. Reduce the risk associated with CO_2 pipelines,

   II. Mitigate against the risks associated within the vicinity CO_2 pipelines.

4. The intended effect is to achieve the appropriate balance between limiting the risk of an accident affecting people in the vicinity of the CO_2 pipeline and the benefits of developing around such sites.

Background

5. HID Policy Team is taking forward the amendments to the Pipeline Safety Regulations (PSR). The aim is that the amended regulations will be ready for implementation in October 2010.

6. The Pipeline Safety Regulations came into force on the 11th April 1996 and impose two levels of duties;

7. The lower level (general duties) applies to all pipelines as defined in the regulations. These cover design, construction/installation, operation, maintenance and decommissioning of the pipeline.

8. The higher level (additional duties) cover emergency shut-down valves, notification, major accident prevention documents, emergency procedures and emergency planning – these apply to pipelines carrying prescribed dangerous fluids.

9. Carbon dioxide (CO_2) is considered to be the main cause of global warming and experts agree that a range of actions will have to be taken in order to reduce the amount of CO_2 entering the atmosphere. Part of the solution could be to capture CO_2 produced by industrial processes and store it deep underground – which would be known as Carbon Capture and Storage (CCS).

10. CCS is an emerging industry and the hazard classification of CO_2 is such that is does not specifically attract the duties of major hazard legislation normally required to control those activities.

11. It is currently not defined as a dangerous fluid under the Pipelines Safety Regulations (PSR). Pipelines used for the transport of CO_2 would be included under the general duties, but excluded from the additional duties which apply to pipelines conveying fluids

with a major accident hazard potential. Furthermore under the general duties there would be no requirement to produce an emergency plan or land use planning zones around CO_2 pipelines.

12. In 2006 a review carried out by HSE of emerging energy industries highlighted the major accident potential of CO_2 when used for CCS. Since this review a HSL research project which compared the risks form carbon dioxide and natural gas pipelines has recommended that "on the whole, in terms of risk, CO_2 used for CCS has sufficient toxicity to be included as a dangerous fluid within PSR.

13. HSE is working with others and contributing its expertise to enable the safe introduction of this new industrial process to ensure that all reasonably practicable control measures to mitigate against a major hazard incident are put in place by the operator. The consideration of health and safety issues will compliment its effective introduction.

14. The key challenge is obtaining a consensus on the major accident potential of CO_2 defining the qualifying criteria so that existing industries are not adversely affected. Following industry advice, HSE has concluded that the only industry that will convey CO_2 in pipelines and therefore fall under PSR will be Carbon, Capture and Storage (CCS). Therefore for the purposes of this IA, including CO_2 as a MAHP pipeline in PSR is assumed to relate to CCS only.

15. As the processes have yet to be demonstrated together at commercial scale on power generation, in 2007 the Government launched a competition to develop the UK's first full-scale demonstration of CCS.

16. HSE is working closely with BIS (formerly BERR) throughout the competition. Within the competition documents, it is clearly stated that HSE requires developers to give a health and safety compliance demonstration as if CO2 was classified as a dangerous substance or fluid under COMAH and PSR, and (for offshore installations) as if all relevant offshore regulations applied, in order to satisfy the requirements of the Health and Safety at Work etc. Act 1974. In addition, the successful competitor must provide technical information to HSE throughout the project, to inform the development of appropriate health and safety standards.

Rationale for Government Intervention

17. The risk of a pipeline accident cannot be reduced to zero and so there is a residual risk to people who live in the vicinity of such pipelines. Information regarding pipelines and the level of risk associated with them is complex and difficult to understand and it is unlikely that individuals can fully access or interpret all relevant information and hence make informed decisions about such risks. Whilst risk may seem to be small, the consequences of a failure can be catastrophic and so reducing the expected value of this failure to a tolerable level requires government intervention.

18. It is also likely that people may benefit from the "reassurance value" provided by government managing these risks.

Options

Option One – No change to PSR

19. No change to amend PSR to include CO_2 as a dangerous fluid. Assume that current restrictions under general duties reduce risk to sufficient enough level. CO_2 pipelines would remain under the general duties where there are no requirements to produce an emergency plan or land use planning zones around CO_2 pipelines.

Option Two – Amend PSR to include CO_2 as a dangerous fluid and decouple from LUP requirements

20. Extend current PSR regulation to include CO_2 as a dangerous fluid. Under this option additional duties under Regulations 18- 25 would apply including the application of more prescriptive requirements to CO_2 pipelines including notification of major incident prevention documents, emergency procedures and local authority emergency plans

Option Three – Amend PSR to include CO_2 as a dangerous fluid and implement Land Use Planning restrictions

21. Option three is a combination of options two and Land Use Planning (LUP) restrictions, including: land use planning controls around CO_2 pipelines to manage residual risk; arrangements for notifications for new major hazard pipelines; ensuring that information is provided to set up consultation zones; and maintaining an adequate database for LUP zones

COSTS and BENEFITS

Data sources and assumptions

Technical assumptions

22. This section presents an assessment of the costs and benefits of the options that are outlined above.

23. Costs have been discounted over a period of twenty years from 2010 to 2030 and expressed in present value terms[1]. This period of time has been used based on expectations of how the CCS industry might grow in the future. According to McKinsey (2008), initial demonstration projects will be deployed around 2010 – 2015. The next phase of CCS in Europe is expected between 2015 and 2030, with an estimated 20 – 25 projects being rolled out across Europe. Further predictions beyond this time are not generally available and beyond 2030 there are too many uncertainties to inform the appraisal.

24. A discount rate of 3.5% is applied for costs and benefits, and a 1.5% rate applied to health and safety benefits in line with HM Treasury guidelines.

Methods of calculating risk

25. Risk assumptions are detailed in Annex 1.

26. There is no conclusive evidence of the actual risk associated with the transport of gaseous, dense phase or supercritical CO_2. However, Wilday and Shuter (2009) note that results show that CO_2 can give rise to similar hazard ranges and hazard foot print areas to natural gas at 7 barg and therefore CO_2 has sufficient toxicity to be included in PSR.

27. HSL calculate the following estimates of individual risk for natural gas, and so these assumptions have been deemed to apply to CO_2.

- Individual risk in urban areas averaged over whole consultation distance = $2*10^{-6}$
- Individual risk in rural areas averaged over whole consultation distance = $3*10^{-7}$

[1] The present value is the future value expressed in present terms by discounting. It is based on the social time preference rate, being the value that society attaches to present rather than future consumption. See Treasury guidance in the Greenbook available at: http://www.hm-treasury.gov.uk/d/Green_Book2_03.pdf

- Overall average individual risk approximately $5*10^{-7}$

28. Estimates of the population in the vicinity of pipelines have been provided by HSL for the purpose of the Impact Assessment which considers classifying gasoline as a dangerous fluid. In the absence of any better estimates of at-risk populations, the same estimates have been used here, see Annex 1 At present, estimates for both rural and urban areas have been made, although it is thought likely that the pipelines will not pass through as much urban area as gasoline pipelines do.

29. For comparative purposes, an estimate of the likely number of fatalities expected in both rural and urban areas has been produced, based on the assumption that the risk of CO_2 pipeline failure and the risk to individuals is the same as for gasoline for similar population distributions. Although liquid carrying pipelines are noted to possess a high failure frequency prediction for CO_2 pipelines transporting natural gas there is significant uncertainty in the failure prediction for CO_2 pipelines transporting gaseous, dense phase or supercritical CO_2. HSE advocates a "cautious best estimate" approach where significant uncertainty exists in risk assessment and where optimistic inputs are utilised in such assessment it is expected that the level of certainty and precision of failure rate data withstands the appropriate level of scrutiny. On this basis, it cannot be assumed that change of use of a gasoline, or natural gas pipeline to CO_2 operations will allow an assessment to carry over the failure frequencies from its previous duty. At present, there is a significant research effort (and additional proposals) to determine the failure mode and frequency for CO_2 pipeline failure rates.

30. Historical records of incidents associated with gasoline show that each fatality from a gasoline pipeline leak ignition can be associated with four significant injuries. If this assumption is applied to CO_2 then given weighting factors common to this type of analysis we assume each fatality is equivalent to 1.4 "equivalent fatalities".

31. The calculated estimates are given in the table below.

	Total Population in zone	Expected No. of fatalities	Expected No. of injuries	Expected fatalities over 40 yr period	Expected injuries over 40 yr period
Urban	50593	0.1012	0.405	4.05	16.19
Rural	9206	0.0028	0.011	0.11	0.44

32. As well as individual risk the number of likely incidents per year can be obtained from analysis of pipeline failure rates. As noted, there is limited data available on risks from CO_2 and it has been estimated that CO_2 presents a similar hazard as gasoline. Recent estimates of the risk of pipeline failure have been provided by HSL[2], see Annex 1. These are based on historical failure data collected by CONCAWE (Conservation of Clean Air and Water in Europe)[3], being over 35 years of performance data for Western European cross country oil pipelines. Failure rates provided are based on the ratio of the number of observed failures to the overall population of pipelines

[2] Advice provided by Kate Nash of the Health and Safety Laboratory in July 2008 to the Health and Safety Executive.
[3] Concawe report number 7/08. Performance of European cross – country pipelines. Available at: http://www.concawe.be/DocShareNoFrame/docs/2/MFAMCPDCHLDPELAMHMLNJKIIVEVCBW939YBDC3B6ENE3/CEnet/docs/DLS/Rpt_08-7-2008-03666-01-E.pdf

33. These updated estimates recommend that a failure rate of 0.263 events per 1000km years is used (0.207 rural and 0.767 suburban). As noted, in the absence of evidence, these failure rates are assumed to be a reasonable proxy for CO_2 pipelines.

Benefits

Option one – No change to PSR

34. There are no benefits associated with this option

Option two – Amend PSR to include CO2 as a dangerous fluid and decouple from LUP requirements

35. Benefits from intervention under option 2 are the costs saved from a reduction in risk of a CO_2 pipeline accident (see below).

Option three - Amend PSR to include CO2 as a dangerous fluid and implement Land Use Planning restrictions

36. Option 3 encompasses the benefits of option 2, and also the benefits of reducing the residual risks of an accident via land use planning restrictions.

37. By classifying CO_2 as a dangerous fluid (as per option 2 and option 3), the additional duties under PSR for Major Accident Pipelines will become applicable for CO_2. These additional duties include provisions regarding emergency shut down valves, notification before construction and use of pipelines, production of a Major Accident Prevention Document and emergency procedures and emergency plans. Such duties are designed to reduce the expected value of a catastrophic event and as such reduce the costs associated with property and infrastructure damage as well as reduce the risk of suffering loss of human life and injury.

1) Property damage

38. Unlike with gasoline, CO_2 causes harm through its toxicity rather than due to it being flammable. Therefore, the damage associated with an incident that results in a loss of containment of CO_2 will be largely due to damage to living organisms such as people in the locality and flora and fauna. The costs to people are discussed further below, but it is not possible to quantify the costs to the environment at present. It is not anticipated that there will be significant property damage.

2) Business Interruption and clean up costs

39. There is no previous experience of incidents involving CO_2 escapes in the UK. However, there is some international experience. For instance in 1998 there was a significant escape of naturally occurring CO_2 in Nagylengyel in west of Hungary. This involved the evacuation of 5,000 people in the first instance. There were no reports of fatalities or injuries, but involved local soil damage, damage to local flora and fauna and the evacuation of three towns in the end. Similarly in Monchengladbach, Germany, there was a release of CO2 in August 2008 from a storage tank that formed part of a sprinkler system.

40. There are no cost estimates available for either of these examples of CO2 pipeline failures, but it is evident that they will include business interruption and clean up costs. The impact assessment for classifying gasoline as a dangerous fluid uses the Buncefield Incident of 11th December 2005 as an illustration of potential costs, which had an overall cost impact of £894m.[4] This was a major incident and included the site operators compensation claims, aviation costs, Competent Authority and Government response, Emergency Response and Environmental Impact. Most incidents would not cost nearly as much as this to clean up and there would likely be less costs associated with CO_2 leakages as the CO_2 cloud would eventually dissipate and not have to be physically cleaned up. The gasoline impact assessment assumed that average costs of clean up and business disruption might be 10% of this total ie approx £89m. For the reasons given, the average cost of a major CO2 escape is not thought to be this large, perhaps being only 2% of the cost of Buncefield, i.e. £17.88m

41. Given the expected number of incidents that lead to a loss in containment (in both urban and rural areas) is calculated to be 2.6×10^{-4} [5] pa the total expected cost of clean up and business disruption is calculated as £4k per annum. Given the assumption that the intervention will reduce risk by between 10 and 20% then the savings per year could be between £7k and £13k over the 20 year appraisal period.

3) Cost of fatalities and injuries

42. The expected cost of fatal and major injuries associated with a CO_2 incident has been calculated. This is based on the individual risk, the total population and the cost of a fatal injury. The number of major injuries is assumed to be 4 times the number of fatals.

43. The total cost calculated in urban areas of £2.9m over a 20 year appraisal period has then been compared with cost estimates over the same period but at a reduced risk of first 10% and then 20%. At a risk that is 10% lower, the total expected costs of fatals and majors over the period is £2.6m, and so the cost saving or the benefit of classifying CO_2 as a dangerous fluid is £290k. If the risk is reduced to 20% then the total expected cost of fatal and major injuries over the 20 year period is £2m and so the benefit of classifying CO_2 as a dangerous fluid is £580k.

44. The same methodology has been applied for rural areas. The total expected cost of fatalities and injuries in rural areas is calculated as £131k over the 20 year appraisal period. If the risk was reduced by 10% then the total cost would be £71k over the appraisal period, a benefit saving of £60k. If the risk was reduced by 20% then the total cost would be £63k, being a saving of £68k over the appraisal period. The following table summarises these potential benefits for both options 1 and 2.

	Expected cost of fatalities and injuries £'000	**Cost saving from 10% risk reduction £'000**	**Cost saving from 20% risk reduction**
Urban	2,900	290	580
Rural	130	60	68
Total	3,030	350	650

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[4] See chapter 3 of the Buncefield Incident 11 December 2005: The final report of the Major Incident Investigation Board. Available at: http://www.buncefieldinvestigation.gov.uk/reports/volume1.pdf

[5] This estimate is based on the risk of an accident per 100km yrs, the expected length of the pipeline, the average assumed number of incidents where containment is lost between urban and rural, i.e. 0.263*0.025*((0.05+0.03)/2)

Additional Benefits of Option 3 – Land use planning restrictions

45. Although proposals introducing land use planning will not prevent direct losses to Carbon Capture and Storage (CCS) operators, land use planning can be expected to reduce human costs and evacuation costs should an incident occur.

46. For the purposes of the gasoline impact assessment, it was assumed that land use planning would save between £100k - £200k per incident in urban areas. This is based on assumptions about clean up costs following an ignition event.

47. However, when land use planning is applied to CO_2 pipelines, the benefits are harder to quantify. Whilst it may reduce the number of people in the vicinity of the pipeline should a loss of containment occur, the CO_2 cloud may spread and so it is harder to estimate the population of people and area of flora and fauna that would be affected or how this might be reduced by LUP.

48. Given the main benefit of land use planning in relation to CO_2 is to reduce the human population likely to be affected by an incident, it is the human costs of fatal and major injuries that will be reduced. In Option 2 the reduction in the human costs of fatals and major injuries is estimated as between £350 and £650k. It is possible that land use planning will reduce the population exposed to the risk by 25% (best estimate). If this is the case then the total human cost savings will increase by 25%. The additional cost savings associated with land use planning based on the assumption is therefore between £87k and £161k.

Total Benefits

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	Costs avoided		**Benefits of 10% reduction in risk £'000**	**Benefits of 20% reduction in risk £'000**
OPTION 1			Nil	Nil
OPTION 2	Clean up costs		7	13
	Death and injury		350	646
	Total		**356**	**659**
OPTION 3	As above		356	659
	Land use planning		87	161
	Total		**443**	**821**

Costs

Business sectors affected

49. Costing methodology has been taken from the impact assessment for classifying gasoline as a dangerous fluid, in the absence of available evidence and data.

Option 1 – do nothing

50. Option 1 is the baseline for the analysis presented in this Impact Assessment, and there are no additional cost implications associated with this option

Option 2 - Amend PSR to include gasoline as a dangerous fluid

51. There would be no cost implications from general regulations (5 – 17) as these are currently applicable to all pipelines carrying any fluid. So these general duties are not a consequence of the proposed classification of CO_2 as a dangerous fluid. This classification will however make CO_2 subject to the additional duties under PSR, i.e Regulations 20- 25. The costs of this are considered below:

Regulation 20 – Notification before construction

52. According to McKinsey (2008), there may be between 20 – 25 CCS projects in Europe over the period 2010 – 2030. It has been assumed in the benefits section above, that there will be between 2 and 4 demonstration CCS projects in the UK see annex 1. If these projects must be notified to the regulator before construction, this will create a cost in terms of the time required to perform this notification. However, given there will only be a relatively small number of projects the costs of this notification to the industry will be negligible.

Regulation 21 – Notification before use

53. HSE must be notified and have 14 days to act before fluids can be conveyed in pipelines that have not been in regular use. Again, given the small number of CCS operators anticipated in UK, the cost of this will be negligible.

Regulation 22 – Notification in other cases

54. HSE must be notified about any changes in the operator within fourteen days. The operator will already be notifying customers and others of the change and therefore this is assumed a marginal cost and has been excluded.

55. Notification is also required when there are major modifications or changes in the operating limits or fluid being transported in the pipeline. While this was relevant for the transportation of gasoline, as gasoline pipelines are frequently used to carry other fluids, it is not likely that CO_2 pipelines will be used for any other purpose. Whilst there may be changes in operating limits there is no historical record of how frequently this might occur. Given the small number of CCS operators that are anticipated in the UK, this cost is therefore assumed to be negligible.

Regulation 23 – Major Accident Prevention Document

56. A new “Major Hazard Prevention Document” (MHPD) will have to be prepared and revised as often as necessary. The document has to include details of the operator’s health and safety policy for persons who may be affected by the pipeline. It must also detail all hazards with the potential to cause a major accident, the appropriate risk assessments, details of steps taken to reduce risks to the lowest practicable level, details of the safety management system and audit procedures for the safety management system.

57. The MAPD is not dissimilar to documents required under other regulations. Much of the preparatory work for these documents will have already been done under COMAH. The major task will be assembling the information together. Experience with MAPD

documents already prepared under the regulation suggests a typical cost of preparation in the order of £6,000.

58. Given the assumption that there will be two to four CCS operators, the total one off cost of preparing MAPD's will be between £12k and £24k. These costs will not all occur in the first year of operation, but at different time periods over the first 20 years. The difference that this will make to the final cost calculation is negligible and so it has been assumed that the full costs occur in year 1. The present value of these costs is between £12k and £23k

59. It is assumed there will be no net addition to the number of operators and that, if there are any changes in ownership, it is possible to transfer the MAPD at minimal cost.

60. MAPDs will need to be periodically reviewed; it is assumed they will be reviewed every five years at a cost of one fifth of the initial cost. This amounts to £1,200 for each MAPD per review. Over a period of 20 years, the present value of the costs of reviewing the MAPDs will be between £5k and £10k.

61. Over a period of 20 years, the total cost of initial preparation and five yearly reviews is between £17k and £33k.

62. Regulation 23 also requires adequate arrangements for audit and for making reports on the audit. It is assumed an audit is undertaken each year and that it takes one person one week for the CCS operators at a resource cost of £1,500 per audit. (Allowing for the possible appointment of external management auditors in some cases). In present value terms, total costs of safety management audits are between £43k and £85k.

Regulation 24 – Emergency Procedures

63. Emergency arrangements must be in place before the pipeline is in use. These should be revised as often as appropriate. Operators will have to have extensive procedures in place regardless of PSR and so this requirement should not result in significant additional cost.

64. The regulation will now make it explicit that: 'The emergency procedures shall include provision for the local authority and the emergency services to be notified immediately in the circumstances specified in regulation 28[6].'

65. In other words, in order for the emergency plan to be initiated when a major accident occurs, or an event that could reasonably be expected to lead to a major accident, the local authority should take steps to put the emergency plan into effect without delay and the operator shall include a provision in their emergency procedures for the local authority and emergency services to be notified immediately should the circumstances specified above occur.

66. In practice this would happen regardless of this small addition to the regulations and so it is not anticipated that this will result in additional costs.

Regulation 25 – Preparation for Emergency Plans in case of major accidents and possibility of future charging by a local authority for testing a plan

[6] Under regulation 28. the local authority who is the owner of the emergency plan has a duty to put the plan in effect without delay.

67. Every local authority (LA) which has a pipe line passing through it, must be notified that a major hazard pipe line is to be constructed – they must be provided with information about the pipe line carrying a dangerous fluid.

68. The local authority is required to prepare an Emergency Plan setting out how it proposes to deal with the possibility of major accidents. This must be revised at least once every three years. It is expected that every LA will build upon plans it (or other LA's) already have in place. It is not expected that this cost will be as great as the costs of drawing up the MAPD. For gasoline an allowance of £4,000 per LA was estimated, representing twenty days of middle management time at full economic cost. This has been revised to £2,000 for CO_2. It is not certain how many LAs the CO_2 pipelines will pass through, but it will not be as many as for gasoline (being 103). If 10 LAs were required to produce MAPDs then the one off cost in year 1 would be between £19,000 and £39,000

69. It is assumed that plans will be revised at least once every three years, at an assumed cost of £2,000 (approximately 20 hours middle management time at full economic cost) for gasoline, and again this is revised downwards to £1,000 for CO_2. In present value terms over the appraisal period, the costs of the revisions are between £41,000 (for 10 LAs) and £82,000 (for 20 LAs).

70. The total present value of the cost of regulation 25 is between £60,000 and £121,000.

71. Total cost of Option 2

Cost	Min Total present value £'000	Max Total present value £'000
MAPD – Initial preparation	12	23
MAPD – 5 yearly reviews	5	10
MAPD – yearly audit	43	85
Emergency plans – reviewing and revising	60	121
TOTAL	120	239

Option three – Implement Land Use Planning (LUP) Restrictions

72. HSE is a statutory consultee on the route of major accident hazard pipelines and, under option 3, would provide advice on the routing of any CO_2 pipeline. HSE would also be required to set LUP consultation distances (CD) around CO_2 pipelines and would in future advise local planning authorities on developments in the vicinity of gasoline pipelines.

73. The land use planning restrictions will impose additional costs for future development proposals near existing pipelines through restrictions on development. Compensation clauses covering restrictions in land development that are normally incorporated in contracts drawn up between pipeline operators and land owners would affect both applications for development where there are existing buildings and where there are no existing buildings.

74. The value of land affected depends on the uses to which it has or can be put – it depends on buildings already on the land and what buildings would otherwise be permitted. Land for residential or industrial development typically has a value several

times greater than agricultural land. The difference between its value with permission for a specified use of development and its value without that permission is its development value

Number and nature of land use applications

75. The HSE's approach to land use planning around major hazard sites is based on the designation of zones, generally three (inner, middle, and outer), which are designated as the Consultation Distance policy. The boundary of each zone of the Consultation Distance is designated by HSE based on an assessment of the specific risk of harm based on the nature of the population that would be exposed. Whether a development is advised against depends on the location of the development and the characteristics of the development. For example, a development such as housing would generally be advised against in the inner zone but may not be advised against in the outer zone. A single storey low density industrial development may not be advised against in the inner zone eg a commercial development is considered low risk.

76. More sensitive developments, such as housing and large scale retail, community and leisure developments might be advised against in the middle zone but not the outer zone.

77. In the case of CO_2 it is anticipated that there will only be between 2 and 4 applications in the next 20 year period. It is also unlikely that these will relate to land that is prime land for development purposes, given that the pipelines will be travelling from the CCS plant to the storage facility at the coast. The cost of land use planning regulations are calculated based on the reduction in the value of the land, which is estimated to be the difference between the development value of the land for housing and the value of agricultural land.

78. The difference between the development value (£287/m^2) and the agricultural value (£1.07m^2) is £286/$m^{27.}$ It is assumed that the actual drop in value of the land will only be 5% of this total due to the likely availability of other land in close proximity. Thus, the actual estimated loss in value of land due to LUP is £14/m^2.

79. With a length of pipeline of between 20 – 30km and a buffer zone estimated to be 1km around the pipe, the total area of land that might be subject to land use planning restrictions is 25,000m^2. This would equate to a loss of value in the land of £357,000

80. This loss would be a one off loss achieved when the planning application was made. In line with the other assumptions in this impact assessment and for prudence (i.e to maximise the cost by bringing them forwards to as soon as possible), it is assumed that all planning applications for this length of pipeline will occur in 2010/2011, i.e. year 1. Expressed in present value terms, the total value of the loss in land is £345k.

81. Total cost of Option 3

Cost	Min Total present value £'000	Max Total present value £'000
MAPD – Initial preparation	12	23
MAPD – 5 yearly reviews	5	10
MAPD – yearly audit	43	85

[7] Per Hectare prices taken from "Land Use Planning around Large Scale Petrol Storage Sites" Regulatory Impact Assessment (HSE 2007).

Emergency plans – reviewing and revising	60	121
Land Use planning	345	345
TOTAL	465	584

Costs to HSE

82. There will be some additional costs to HSE. Pipeline inspectors will have to process notifications, notify local authorities and consult on emergency plans, inspect operating pipelines including MAPDs, etc. We cannot estimate the scale of these additional costs at present.

Consultation and familiarisation

83. There will be a need for managers to familiarise themselves with the proposed regulations once they are introduced. The CCS operators will have a lot of regulations to familiarise themselves with in relation to CCS and so the additional requirements under PSR will not make a material difference to this total.

Impact on small and medium sized businesses

84. No SMEs are expected to be affected by these proposals.

Balance of resource costs and benefits

85. The balance of costs and benefits can be compared with the value of risk reduction, which is *equivalent to* a "value of preventing a fatality" (VPF) of £1,500,000[8] from the HSE economic analysis unit (EAU) appraisal values. The EAU appraisal values can be used to estimate the benefits of proposed measures which aim to improve safety, and to compare such benefits with the cost of government intervention. The prevention and mitigation of an accident leads to a reduction in costs to society, the EAU appraisal values are used to inform estimates of the size of such reductions in cost.

86. The actual value of the benefits of these amendments is subject to significant uncertainty. A review of the historical evidence suggests that preventing all fatality risk is unfeasible and the benefit calculations depend on the risk estimates used here.

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Competition assessment

87. No significant economic impact on competition

Small firms Impact test

88. No significant economic impact on SMEs.

Other tests

89. No Significant or economic impact on legal aid, sustainable development, carbon assessment, Health impact assessment, race equality, disability equality, gender equality, , Human rights or rural proofing.

[8] http://www.hse.gov.uk/economics/eauappraisal.htm

Uncertainties

90. There are uncertainties with regard to cost and risk in the analysis. These are detailed through the text. There has been discussion with industry representatives on the assumptions underlying these calculations.

91. This Impact Assessment is carried out on an individual risk based approach. It is noted however that a societal risk based approach may be more appropriate. This would require further research to identify how societal risk should be applied to this analysis.

Specific Impact Tests: Checklist

Use the table below to demonstrate how broadly you have considered the potential impacts of your policy options.

Ensure that the results of any tests that impact on the cost-benefit analysis are contained within the main evidence base; other results may be annexed.

Type of testing undertaken	*Results in Evidence Base?*	*Results annexed?*
Competition Assessment	**Yes**	**Yes/No**
Small Firms Impact Test	**Yes**	**Yes/No**
Legal Aid	**Yes**	**Yes/No**
Sustainable Development	**Yes**	**Yes/No**
Carbon Assessment	**Yes**	**Yes/No**
Other Environment	**Yes**	**Yes/No**
Health Impact Assessment	**Yes**	**Yes/No**
Race Equality	**Yes**	**Yes/No**
Disability Equality	**Yes**	**Yes/No**
Gender Equality	**Yes**	**Yes/No**
Human Rights	**Yes**	**Yes/No**
Rural Proofing	**Yes**	**Yes/No**

Annexes

Annex 1

Assumptions used in Benefits calculations

1. CO_2 levels in air of between 7% and 10% are a danger to human health (Wilday and Shuter 2009)

2. A major loss of containment of CO_2 could result in: asphyxiation of personnel in the vicinity; cryogenic burns; embrittlement of neighbouring plant; toxic contamination (Wilday and Shuter 2009)

3. There will be between two and four CCS demonstration projects Four new coal fired power stations will be built, but only if they are fitted with CCS technology. Plants might be located in parts of Kent and Essex, Humberside, Teeside, Firth of Forth and Merseyside. (Wilday and Shuter, 2009).

4. Given the lack of operating experience for CO2 pipelines, a cautious approach to assigning failure rates is recommended. (Wilday and Shuter, 2009).

5. It is assumed that risks from CO_2 are roughly comparable to those from natural gas. Analysis by the EC would suggest that the risk of transporting CO_2 via pipelines is no higher than the risks associated with pipeline transport of natural gas. Co2 can give rise to similar hazard ranges and hazard footprint areas to natural gas at 7 barg. (Wilday and Shuter, 2009)

6. A concentration of 10% Co_2 for 15 minutes is taken as a conservative estimate exposure conditions that would cause 15% mortality in human populations (Wilday and Shuter, 2009).

7. The CCR applicants must plan for a 1km wide corridor for the first 10km from the combustion plant and thereafter, given the greater availability of alternatives, for a 10km corridor to the points on the coast where the pipeline will go offshore of on board a ship (DECC 2009).

8. CO2 in pipelines expected to be transported at pressures of 40 – 100 bar.

9. Number of CCS projects in Europe is assumed to be between 20 and 25 (per McKinsey 2008), and total distance for transport assumed to be 200km onshore and 300km for offshore. Assuming the UK might represent 10% of this total in Europe, the assumed length of onshore pipeline to be used in this analysis is estimated to be between 20 and 30km and the number of projects between 2 and 3.

10. Assumptions used in Impact Assessment for classifying gasoline as a dangerous fluid that are being used for CO_2 in the absence of other available information:

    - HSL calculate the following estimates of individual risk for natural gas, and so these assumptions have been deemed to apply to CO_2:

        - Individual risk in urban areas averaged over whole consulation distance = $2*10^{-6}$
        - Individual risk in rural areas averaged over whole consultation distance = $3*10^{-7}$
        - Overall average individual risk approximately $5*10^{-7}$

    - Risk of an incident = 0.263 events per 1000 km yrs (being 0.207 events per 1000km yrs for rural and 0.767 events per 1000 km yrs for urban). Advice from Kate Nash of HSL to HSE in July 2008
    - Population affected in urban areas = 50,593 and population affected in rural areas = 9,206 (HSL estimates).
    - Expected number of incidents that lead to a loss in containment = 5% rural areas (HSE assumption per original IA for gasoline ignition)
    - Expected number of incidents that lead to a loss in containment = 3% rural areas (HSE assumption per original IA for gasoline ignition)
    - % of pipelines in urban areas = 10% (W.S Atkins (1998), Assessing the risk from gasoline pipelines in the UK based on a review of historical experience. Research report 210/1999)
    - % of pipelines in rural areas = 90% (see source above).
    - Expected reduction in the risk of an incident due to classifying CO_2 as a dangerous fluid = between 10 and 20% (best estimate)
    - Average cost of clean up for the average incident (including business interruption costs) = 2% of the Buncefield economic cost = 0.02% x £894m = £18m
    - Population density in rural areas = 250 / km2 and 5000/km2 in urban areas per W.S Atkins 1999.

References

DECC 2009. Guidance on Carbon Capture Readiness and Applications under Section 36 of the Electricity Act 1989.

McKinsey and Company (2008). Carbon capture and storage: Assessing the economics. Available at: http://www.mckinsey.com/clientservice/ccsi/pdf/ccs_assessing_the_economics.pdf

Wilday and McGillivray 2008. 'Comparison of risks from carbon dioxide and natural gas pipelines,' FP/08. Health and Safety laboratory.

Wilday and Shuter, 2009. 'Carbon capture and storage (CCS) Knowledge Management. FP/09/19 Health and Safety Laboratory.

SHORT IMPACT ASSESSMENT

Description of the intervention:	To introduce an expiry date on notifications submitted to HSE under regulation 21 (Notification before construction) of the Pipelines Safety Regulations. The current regulation requires the operator to notify the Health and Safety Executive (HSE) of construction of a pipeline before commencement. If construction of a pipeline does not start within three years of the operator's initial notification of their proposals to HSE, that notification will become invalid. If the operator still proposes to construct the pipeline, a new notification will be required.
Objectives:	HSE are proposing to take this opportunity whilst other amendments to PSR are being progressed to amend regulation 21 so that it aligns the notification requirements of PSR with other consent regimes and in line with guidelines from the Better Regulation Executive.
Calculation of costs:	Pipeline operators are currently required to prepare information to notify HSE before construction of a pipeline goes ahead. By introducing an expiry date on the notification period, any operator still proposes to construct a pipeline after the three-year period has elapsed will be required to re-notify HSE and so prepare more information. There will potentially be associated costs to the pipeline operators of performing the re-notification; to the regulator in monitoring the re-notification process; and to the local planning authorities. ***To the operators*** HSE maintain a database of PSR notifications. From this database it has been calculated that on average there are 23 regulation 21 notifications per annum. It has been estimated that 25% of these notifications will expire each year (approximately 6) and of these only 50% will be re-notified to HSE, i.e. it is assumed there will be 3 re-notifications per annum. It is anticipated that should the operator be required to re-notify, it will take one day. This takes into account: i) collection and preparation of pipeline information by construction team = 0.5 day; and ii) processing data, adding to PSR database, production of 1:50,000 route maps and HSE covering letter = 0.5 day (*Estimates provided by National Grid*). Assuming that these duties will be performed by 'Science and Technology' experts, the true economic cost of this time will be £25 per hour[1].

[1] Taken from the Annual Survey of Hours and Earnings (ASHE) 2008, with gross annual wage for a science and technology expert being £19.24 per hour. See http://www.statistics.gov.uk/downloads/theme_labour/ASHE_2008/tab2_5a.xls . The true economic cost reflects the additional costs of employing a person, including national insurance and pension contributions and relative proportion of fixed overheads. The true economic cost is 30% greater than the gross hourly wage, i.e. £25 per hour.

	The total opportunity cost to operators of performing 3 re-notifications per year, given that each will take one day of time at a cost of £25 per hour is £560 per year. Over a 40 year appraisal period (which is the expected lifetime of a gasoline pipeline) the total present value[2] of the cost is £12,000. *Sensitivity analysis* The above cost is insignificant. To show what would happen to the costs if the assumptions used were to change, some sensitivity analysis has been performed: The maximum number of re-notifications possible would be equal to the average number of notifications per year, i.e. 23. Assuming that the re-notifications just took one day each, the total present value of the costs over 40 years would be £90,000. If instead there were 23 re-notifications per year but the total time taken was 5 days for each (being the maximum time estimated by UKOPA) then the total cost would be £460,000 over 40 years. The above estimates are the extremes and not thought to be very likely. If HSE should introduce cost recovery for PSR then it is even more likely that operators will only notify proposals that they are certain will be developed, due to having to pay for the notification. Consequently, the £12,000 estimate based on 3 re-notifications per year seems reasonable. ***To the regulator*** There will be a minimal cost to HSE for monitoring the notifications database and introducing a system to monitor those that will expire after three years. The notifications would be captured in a similar way to that which occurs now, and no significant changes would be required to the system. HSE would be required to monitor the database on a monthly basis and issue a letter to those operator's with a notification that is about to expire. It is estimated to take 30 minutes to draft a template for this letter, and subsequently 15 minutes for each letter issued. With just 3 re-notifications per year, the total cost would therefore be negligible. Even at the extreme with 23 re-notifications per year, this would involve a total of less than 1 man day of work per year and negligible costs. ***Cost to LAs*** It is understood that planning permission has a finite period and so LAs are already incurring the costs of applications which expire and have to be re-notified. It is not therefore anticipated that amending regulation 21 to give an expiry date will have any significant effect on LAs.
Impact on industry (including any effect on the Admin	As explained, it is estimated that the likely cost to industry over a 40 year appraisal period will be £12,000.

[2] The present value means the future value expressed in present terms by means of discounting.

Burdens Baseline):	A sensitivity analysis, described above and altering the number of notifications per year and the length of time it takes industry to notify, gives possible estimates of up to £460,000 over 40 years. The assumptions behind the upper range of the estimates are not thought to be realistic, but even if they are borne out in the evidence, spread between each of the pipeline operators the costs would not be significant.
Benefits (quantified where possible):	This will prove beneficial for both HSE and local authorities, as information on proposed pipelines held by HSE and accessible by the LA will be updated leading to improved administration around land use planning controls. Whilst this improvement in efficiency can be described, it has not been possible to quantify. The amendments will also mean that planning applications submitted to the local authorities will not be impeded by restrictions arising out of a proposal for a pipeline that is not being actively used. Again, it is not possible to quantify the effect of this benefit given that there is a whole spectrum of possible uses that the land could be otherwise put. It is not thought that there will be much land freed up for development due to notifications that expire but that are not re-notified. Any benefits are therefore expected to be small.
Consultation:	Economic Analysis Unit and Policy Capability Team have been consulted on this SIA. HSE will be consulting on this amendment to PSR as part of wider amendments being progressed in December 2009.
Chief Economist's comments:	I am satisfied that the benefits of this intervention will be unquantifiable but real and that the costs will be very small – even looking at the upper end of the sensitivity analysis. I also note that if operators respond to incentives by only notifying proposals that they are sure will be developed, then the costs could be even less than estimated.
Recommendation:	That on grounds of proportionality a full impact assessment is not produced.

Signed:……Alan Spence…….. **Date:** …22 October 2009
HSE's Chief Economist

SHORT IMPACT ASSESSMENT

Description of the intervention:
A Statutory Instrument amending the Health and Safety (Fees) Regulations 2009, designed to allow HSE to charge for its work on notifications and its enforcement functions in connection with major accident hazard pipelines (as defined under the Pipelines Safety Regulations) that are not currently covered by existing charging schemes.

Objectives:
(i) To enable HSE to cost recover against specified activities associated with major accident hazard pipelines that are not currently covered by existing charging schemes from October 2010.

This will involve:

- Bringing all major accident hazard pipelines, as defined in the Pipeline Safety Regulations, within scope of the Fees Regulations;
- Introducing Regulations that allow HSE to cost recover for its work on notifications and its enforcement functions in connection with these major accident hazard pipelines;
- Ensuring equivalent provisions for charging both persons and contractors.

Calculation of costs:
To HSE:
It is estimated that it will cost HSE £20,000 to take forward work to modify the Health and Safety (Fees) Regulations, alert stakeholders to this policy change and to update administrative systems (e.g. revise the current charging guides).

To Industry:
The current cost recovery rate is £138 per inspection hour onshore and £235 per inspection hour offshore. It is estimated that HSE use between 720 and 1500 inspection hours a year on its major accident hazard pipeline notification work and related enforcement activities. It is estimated that 50% of this inspection time will be spent on offshore activities and 50% on onshore activities.

Based on these estimates, it has been calculated that the total costs to industry of the inspections range between £134,000 and £280,000 per annum. The present value of the cost to industry of the statutory instrument over a 10 year appraisal period is therefore calculated as between £1.1m and £2.3m.

N.B These inspection costs are currently being incurred by HSE and the effect of the statutory instrument will be to transfer the costs to industry.

Impact on industry (including any effect on the Admin Burdens Baseline):

HSE estimates that there are in the region of 21,000 km of natural gas pipelines across the UK. HSE already charges for its assessment (e.g. of a safety case) and enforcement functions related to major accident hazard pipelines conducted under the Gas Safety (Management) Regulations 1996. Included within this charging scheme, is the cost recovery of assessment and enforcement functions in connection with duties under the Pipeline Safety Regulations (PSR) 1996. HSE also currently charges for its work on notifications and its enforcement functions related to offshore major accident hazard pipelines, within 500m radius around an installation, conducted under the Offshore Installations (Safety Case) Regulations 2005.

HSE recognises that there are many more onshore or offshore pipelines, or sections of major accident hazard pipeline that are not within the scope of existing charging schemes. HSE feels that it would not be consistent in how it deals with its major accident hazard activities if it did not take steps to charge for its work on notifications and its enforcement functions related to these major accident hazard pipelines.

As calculated above, the total costs recovered from industry per annum range between £134,000 and £280,000. The present value of the additional cost to industry of the statutory instrument over a 10 year appraisal period is therefore calculated as between £1.1m and £2.3m.

Benefits (quantified where possible):

These amendments will ensure that a consistent and equitable approach is taken to the recovery of costs by HSE in its major hazard activities, and the information gathered will facilitate prioritisation of HSE's activities on the basis of risk.

The amendments will also mean that HSE will recover all costs from industry associated with its work on notifications and its enforcement of major accident hazard pipelines. The total benefit to HSE is therefore between £1.1m and £2.3m over the 10 year appraisal period.

In addition, there will be efficiency gains from using the HSE resources used to administer the Gas Safety Management Regulations and offshore charging regimes to administer the major accident hazard pipeline charging scheme.

Consultation: Economics Analysis Unit and Policy Capability Team.

HSE will inform stakeholders of the planned changes to the Fees Regulations, and obtain their views, via the consultation package being prepared on proposed changes to the Pipeline Safety Regulations. This consultation is planned from December 2009 to February 2010.

Chief Economist's comments: I am satisfied that the costs and benefits of this intervention have been described and where possible estimated. There will be a relatively small transfer of costs currently incurred by HSE to industry; a further potential benefit is that by bringing greater consistency to HSE's charging policy, the intervention will help to ensure a 'level playing field' between operators of different major accident hazard pipelines.
Recommendation: That on grounds of proportionality, a full impact assessment is not produced.

Signed:…Alan Spence…….. **Date:** …22 October 2009….
HSE's Chief Economist

Annex 4

Revised numbering of Regulations

Current Regulation	New Regulation
Regulation 13A has been incorporated into the main body of PSR and subsequently affects the numbering from here within	
Regulation 13A Iron pipelines	Regulation 14 Iron pipelines
Regulation 14 Decommissioning	Regulation 15 Decommissioning
Regulation 15 Damage to pipeline	Regulation 16 Damage to pipeline
Regulation 16 Prevention of damage to pipeline	Regulation 17 Prevention of damage to pipeline
Regulation 17 Co-operation	Regulation 18 Co-operation
Regulation 18 Dangerous fluids	Regulation 19 Dangerous fluids
Regulation 19 Emergency shut-down valves	Regulation 20 Emergency shut-down valves
Regulation 20 Notification before construction	Regulation 21 Notification before construction
Regulation 21 Notification before use	Regulation 22 Notification before use
Regulation 22 Notification in other cases	Regulation 23 Notification in other cases
	Regulation 24 Assessment of notifications (new)
Regulation 23 Major accident prevention document	Regulation 25 Major accident prevention document
Regulation 24 Emergency procedures	Regulation 26 Emergency procedures
Regulation 25 Emergency plans in case of major accidents	Regulation 27 Emergency plans in case of major accidents
Regulation 26 Charge by a local authority for a plan	Regulation 28 Charge by a local authority for a plan
	Regulation 29 Implementing emergency plans (new)
Regulation 27 Transitional provision	Regulation 30 Transitional provisions
Regulation 28 Defence	Regulation 31 Defence
Regulation 29 Certificates of exemption	Regulation 32 Certificates of exemption
Regulation 30 Repeal of provisions of the Pipelines Act 1962	Spent
Regulation 31 Revocation and modification of instruments	Regulation 33 Revocation of instruments

Annex 5

Glossary of terms

ACDS	–	Advisory Committee on Dangerous Substances
CD	–	Consultation distances
CO2	–	Carbon dioxide
CCS	–	Carbon Capture and Storage
CCR	–	Carbon Capture Ready
COMAH	–	Control of Major Accident Hazards Regulations 1999
DECC	–	Department of Energy and Climate Change
GSMR	–	Gas Safety Management Regulations 1996
HSL	–	Health and Safety Laboratory
HSWA	–	Health and Safety at Work Etc. Act 1974
LA	–	Local Authority
LPG	-	Liquid Petroleum Gas
LUP	–	Land Use Planning
MAHP	–	Major accident hazard pipelines
MIIB	–	Major Incident Investigation Board
PEPF	–	Pipeline Emergency Planning Forum
PWA	–	Pipeline Works Authorisation
PSR	–	Pipelines Safety Regulations
UKOPA	–	United Kingdom Onshore Pipeline Association

Annex 6

References

1 *Page 8* Consultation Document 211 on Land Use Planning
http://www.hse.gov.uk/consult/condocs/cd211.htm

2 *Page 8* Buncefield Major Incident Investigation Board (MIIB) report
http://www.buncefiledinvestigation.gov.uk/reports/cd211.pdf

3 *Page 10* Arthur D Little "Risks from Gasoline pipelines in the United Kingdom" report to the UK HSE June 1996.
http://www.hse.gov.uk/research/crr_pdf/1999/crr99206.pdf

4 *Page 10* WS Atkins Safety and Reliability "Assessing the risk from gasoline pipelines in the UK based on a review of historical experience" HSE research report 210/1999 http://www.hse.gov.uk/research/crr_pdf/1999/crr99210.pdf

5 *Page 12* Expert Report for the Energy Minister
http://www.hse.gov.uk/consult/condocs/energyreview/energyreport.pdf

6 *Page 13* CCS Project Information Memorandum
http://www.decc.gov.uk/media/viewfile.ashx?filepath=what we do/uk energy supply/energy mix/carbon capture and storage/demo_comp/file42478.pdf&filetype=4

7 *Page 13* (as 5)

8 *Page 15* Article 31 of the CCS Directive amends the IPPC Directive to include 'pipelines with a diameter of more than 800 mm and a length of more than 40 km for the transport of carbon dioxide (CO_2) streams for the purposes of geological storage, including associated booster stations', thereby applying the same standards to CO2 pipelines as those which already apply to gas, oil and chemical pipelines.

9 *Page 16* Petroleum Act 1998
https://www.og.decc.gov.uk/regulation/guidance/in_pipeauthor/interim4.htm

10 *Page 17* Pipelines Act 1962
http://www.opsi.gov.uk/RevisedStatutes/Acts/ukpga/1962/cukpga_19620058_en_8#sch1

11 *Page 22* Definition of a pipeline operator (current web-based guidance)
http://www.hse.gov.uk/pipelines/resources/pipelineoperator.htm

Annex 7

List of all organisations and individuals to whom this Consultation Document has been sent

National Government

All relevant government departments and agencies

Local Government

All local government associations and representatives from the emergency services

Representatives of Workers

Trades Union Congress contacts plus a wide range of trade unions representing all sectors

Employer's organisations (including small firms)

British Chemical Engineering Contractors Association
Chemical Industries Association
Confederation of British Industry
Consumers association
Federation of Small Businesses
Institute of Directors
Institute of Gas Engineers and Managers
International Association of Oil and Gas Producers
MPA Cement
Offshore Contractors Association
Scottish Enterprise
Small Business Service
Union of Independent Companies
UK Offshore Operators Association
UK Onshore Pipeline Association

Other organisations

Association of Chief Police Officers in Scotland
Association of London Government (ALG)
Association of Police Authorities
BP
British Energy
British Geological Survey
British Safety Council
British Safety Industry Federation
British Standards Institute
Carbon Capture and Storage Association
Country Landowners Association
Countryside Commission
Countryside Commission for Wales
DNV
Emergency Planning Association
Energywatch
Institute of Directors
Institute of Gas Engineers
Lloyds Regsiter
Occupational Health Advisory Committee
Institute of Occupational Safety and Health
Offshore Oil and Gas Industry All Parliamentary Group
National Physical Laboratory
OFGEM
Pipeline Industry Guild (PIG)
Royal Society for the Prevention of Accidents (RoSPA)
Scottish Centre for Carbon Storage
Society of British Gas Industries
The Crown Estate Commissioners
The Oil and Pipelines Agency
Zurich

Industry

Air Products Ltd
Aker Clean Carbon
Allens & Overy
Alstom
AMEC
Anthony Veder
Amerada Hess
Arup
ATP Oil and Gas (UK) Ltd
BG Group
BOC Gases
BPA
BP
Calix

Camco International
Chevron
Clean Energy Systems
Climate Change Capital
CMS Cameron McKenna
CO2 DeepStore
CO2Sense Ltd (Yorkshire)
Conoco Phillips
Corus
Denby Resources
Doosan Bobcock
Drax Power
East Midlands Pipelines Ltd
EDF Energy
EEDA
EON UK
ERM
ESB
ES Pipelines Ltd
Esso Petroleum Co. Ltd
Fluor
GDF Suez
General Electric International
GTC Pipelines Ltd
Herbert Smith
Howden Group
Hydrogen Enery
HTC Purenergy
Ingen
Linklaters
Maersk Oil & Gas
Marathon Oil
Masdar
Mitsuibishi Heavy Industries
Mitsuibishi Corporation
MMI Engineering
Mobil North Sea Ltd
Mowlem Energy Ltd
National Grid plc
Nexen Exploration
Northern Gas Networks
Norton Rose
Pipeline Integrity Engineers Ltd
PowerFuel
Poyry Energy Consulting
Progressive Energy
PWC
Reliance Industries Limited
Renew
Rhead Group
Rio Tinto
RPS
RWE
SABIC UK Petrochemicals
Sasol
Schlumberger
Scotia Gas Networks
Scottish & Southern
Scottish Power Gas Ltd
Senergy
Shell
Siemens
SLR Consulting Ireland (formerly CSA Group)
IM Skaugen
Shell UK Oil Products Ltd
Southern Gas Networks
SSE Pipelines Ltd
Statoil
The Gas Transportation Co Ltd
Total (UK) Ltd
Transco
Tullow Oil UK Ltd
Unipen Ltd
Utility Grid Installations Ltd
Venture Production (NSD)
Wales & West Utilities Limited

We have tried to make this list comprehensive and relevant, whilst focussing on the organisations that we believe will have an active interest in the issues explored in this Consultative Document. If there is an organisation that you think we have overlooked and would like us to consult directly please let us know by using the contact details on the front of this Consultative Document

HSE

Health and Safety Executive

Consultation on Amendments to the Pipeline Safety Regulations 1996 and the Health and Safety (Fees) Regulations

The full text of this and other Consultative Documents can be viewed and downloaded from the Health and Safety Executive web site on the internet: **www.hse.gov.uk/consult/index.htm**

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