

Analysis of responses to the consultation on proposed amendments to the pipelines

Safety Regulations 1996 and the Health And Safety (Fees) Regulations

7 December to 1 March 2010

Summary

The consultation sought views on:

- the classification of gasoline and carbon dioxide as dangerous fluids under the Pipelines Safety Regulations (PSR);
- provision for a 3-year expiry date on notifications to construct a major accident hazard pipeline;
- a new requirement under 'notification in other cases' to notify HSE where an existing industrial complex is split up with the result that a pipeline ceases to be exempt from PSR;
- the introduction of a duty on local authorities to implement their pipeline emergency plan; and
- changes to regulation 2, 3 and 13A to improve clarity of text and provide duty holders with a better understanding of obligations imposed.

This consultation also allowed HSE to share with stakeholders the new cost recovery regime for major hazard accident pipelines, as defined under PSR.

Current situation

Following the election, the Coalition Government introduced a new approach to regulation. This resulted in HSE and other government departments reviewing proposed regulatory measures to ensure they fit within the new rules and processes, which delayed issuing our response to the consultation. We have now completed this review for PSR and this has led to a number of changes to our proposed amendments. Details of the changes are covered below. It is also important to note that these amendments will be implemented, subject to Ministerial clearance, in April 2011 and not October 2010 as suggested in the consultation document.

The consultation exercise

Consultation on these proposals began on 7 December 2009 and ended on 1 March 2010. In addition to making the CD available to any party via the HSE website, over 100 stakeholder organisations in the pipeline industry and other relevant sectors were approached directly for a response. All key stakeholders responded to the consultation.

An analysis of the responses to each question raised in the consultation document (CD) is set out in the following document. The numbers and percentages included relate to the 29 consultees who responded to the questions in the CD. Not all respondents addressed all of the questions set in the consultation.

HSE would like to thank stakeholders for their responses, and for their continued support in developing the proposed amendments.

The first two questions of the consultation asked respondents what type of organisation they represented and in which capacity they were responding, i.e. employer, employee, trade union

official etc. The responses were made up of the following: pipeline operators (11); consultants (2); trade associations (5); national government (4); local government (2); academic (1); and other (4).

18 respondents agreed to their responses being made public, whilst 11 wished theirs to be confidential. The list of publicly available responses can be accessed through HSE's Knowledge Centre by email KnowledgeCentre@hse.gsi.gov.uk or telephone 0151 951 3674.

There are two annexes to this document:

- **Annex 1** - An opportunity to comment on the modified proposed amendments to PSR following consultation; and
- **Annex 2** – Revised impact assessment for the classification of gasoline as a dangerous fluid in PSR

Responses to the consultation

Stakeholders raised concerns about certain aspects of the proposed amendments to PSR. HSE has considered the responses and working with technical experts, lawyers and stakeholders, has refined the original PSR proposals in order to address the concerns, which related to:

- Definition of gasoline – respondents asked for clarity on what is and isn't brought into the scope of PSR; and
- Impact Assessment (IA) for the classification of gasoline as a dangerous fluid – at the time of the consultation a review of the methodology used for setting consultation distances (CDs) around gasoline pipelines was underway and stakeholders raised the concern that the IA could not fully address the cost implications to industry until this review was completed. This review has now been completed and the revised IA is attached at Annex 2.

Annex 1 outlines the areas where HSE is seeking further comments from stakeholders. **Responses are welcome by no later than Friday 8th October 2010.**

The analysis that follows details each question from the consultation document and provides an overview of stakeholder comments along with the HSE response.

CLASSIFICATION OF GASOLINE AS A DANGEROUS FLUID

Q3: Do you agree that gasoline should be included as a dangerous fluid in PSR?

Number of responses = 11 (38%)

Number agreed = 10 (91% of respondents)

Number disagreed = 1 (9% of respondents)

Comments: Although stakeholders agreed in principle with this proposal, concerns were raised about the methodology for setting consultation distances around pipelines. At the time of the consultation this methodology was under review by HSE and stakeholders believed the full cost implications to industry could not be determined until the results of this review were known.

HSE response

HSE are pleased to confirm that this review is complete and our economists have prepared a revised impact assessment which is attached at Annex 2.

Stakeholders have an opportunity to comment on the revised impact assessment details of which are outlined in **Annex 1**.

Concerns were also expressed about pipelines that convey other fluids with similar properties to gasoline. The Process Safety Leadership Group (PSLG) was set up to translate the lessons learned from the Buncefield incident into effective and practical guidance that industry could

implement quickly. PSLG has indicated that there is a potential for substances with similar physical properties to gasoline to behave in a similar way in the event of a loss of primary containment following overfilling. However this work is still ongoing. HSE has decided to take the appropriate action in relation to PSR when this work has been concluded.

Q4: 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. Please provide comments you wish to make.

Number of responses = 8 (28%)

Comments: The majority of views suggested the proposed definition was not suitable on the basis that it needed to provide clarity around what is and isn't brought into the scope of PSR.

HSE response

To address stakeholder concerns, HSE has produced a revised definition for classifying gasoline as a dangerous fluid for the purposes of PSR. This has been agreed by the relevant HSE technical experts and lawyers; it conforms to the Buncefield recommendation; it brings only gasoline within the scope of PSR; and has the flexibility to deal with future changes and developments in gasoline.

Stakeholders have an opportunity to comment on the revised definition of gasoline, details of which are outlined in **Annex 1**.

Q5. Are you aware of any pipelines conveying gasoline that is not intended for use as a motor fuel?

Number of responses = 11 (38%)

Number not aware = 10 (91% of respondents)

Number aware = 1 (9% of respondents)

Comments: One respondent believed that there are pipelines conveying gasoline that is not intended for use as a motor fuel but could not provide further details in support of this comment.

CLASSIFICATION OF CARBON DIOXIDE AS A DANGEROUS FLUID

Q6: 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?

Number of responses = 16 (55%)

Number agreed = 13 (81% of respondents)

Number disagreed = 3 (19% of respondents)

Comments: There was general agreement with this proposal, particularly to HSE adopting a precautionary approach until the understanding of the hazards and risks of dense phase CO₂ pipelines are fully understood. However, stakeholders did raise concerns about using the current science base to justify the inclusion of CO₂ as a dangerous fluid; defining a CO₂ pipeline within PSR; and the setting of consultation distances for CO₂ pipelines.

HSE response

HSE welcomes the responses received from stakeholders and has considered stakeholders views in line with the government's new policy on regulation. HSE believes it is too early in the process of developing this new technology to legislate in this area and consequently has taken the decision to postpone this amendment. HSE will continue to work with industry and will review this decision as the science and evidence base develops.

Q7: Should further defining parameters be introduced, for example pressure thresholds, pipe diameter or length, when including CO₂ within PSR?

Number of responses = 12 (41%)

Number agreed = 9 (75% of respondents)

Number disagreed = 3 (25% of respondents)

Comments: There was general agreement that defining parameters are required. Stakeholders raised concerns regarding the reference to industrial source, e.g. CCS, and believed this was irrelevant as the level of risk is due to the properties of CO₂ and not its source. It was clear from stakeholder views that defining by inventory and concentration would be a suitable approach.

HSE response

HSE will be undertaking a review of this issue when we are in a position to move forward with this amendment. This will ensure that account is taken of the most up to date information and stakeholder views.

Q8: Are you aware of any other UK industries that transport carbon dioxide using a pipeline (as defined under PSR)?

Number of responses = 14 (48%)

Number aware = 4 (29% of respondents)

Number not aware = 10 (71% of respondents)

Comments: The consultation exercise identified that although there are other UK industries that transport CO₂ by pipeline, such as horticulture and brewing, the carbon dioxide is transported at low pressures. Stakeholders commented that they would not want to see these industries being brought into the scope of PSR.

REGULATION 21 NOTIFICATION BEFORE CONSTRUCTION

Q9: Do you agree with the introduction of a 3-year expiry date on notifications to construct a pipeline?

Number of responses = 14 (48%)

Number agreed = 9 (64% of respondents)

Number disagreed = 5 (36% of respondents)

Comments: There was general agreement with the principle of an expiry date for notification to construct a pipeline, even from those who disagreed with the proposal in the questionnaire. The concerns raised related to the 3-year period HSE had proposed with stakeholders suggesting an increased 5-year expiry date which would align with the Town and Country Planning Acts, the Public Gas Transporter Pipe-line Works (Environmental Impact Assessment) Regulations 1999, as well as construction timelines for power stations.

HSE response

As part of the review of proposed regulatory measures, it was necessary to consider only essential amendments to regulations. HSE has therefore taken the decision to remove this proposal from the amendments to be taken forward for implementation in April 2011.

REGULATION 23 NOTIFICATION IN OTHER CASES

Q10: Do you agree with the proposed changes to regulation 23?

Number of responses = 11 (38%)

Number agreed = 8 (73% of respondents)

Number disagreed = 3 (27% of respondents)

Comments: This question sought views on the introduction of a requirement to notify HSE when an existing industrial complex is split up and the operation undertaken ceases to be under the control of one operator, to that of a number of operators managing different chemical plants and processes. There was general agreement with this proposal. The only concerns that were raised related to the requirement for the operator to prepare a major accident prevention document (MAPD) and for the local authority to prepare an emergency plan for what is likely to be a very short pipeline.

HSE response

HSE has considered this view and feel this requirement is acceptable in terms of the risk a major accident hazard pipeline presents without emergency pipeline plans/MAPDs in place. The length of the pipeline is inconsequential as HSE would expect the same requirements for a short pipeline that was not connecting two installations.

This proposed amendment has necessitated making further amendments to regulation 25 'Major accident prevention document' and regulation 26 'Emergency procedures'.

Stakeholders have an opportunity to comment on the new provisions, details of which are outlined in **Annex 1**.

PROPOSED REGULATION 29 IMPLEMENTING EMERGENCY PLANS

Q11: Do you agree with the introduction of regulation 29?

Number of responses = 14 (48%)

Number agreed = 12 (86% of respondents)

Number disagreed = 2 (14% of respondents)

Comments: This question asked if stakeholders agreed with the introduction of a new regulation which would place a duty on a local authority which has prepared an emergency pipeline plan to implement the plan if a major accident occurs or an event occurs which could reasonably be expected to lead to a major accident. Although the majority of stakeholders did not disagree with this proposal, they were concerned with the words "immediately" and "without delay" in the regulation and supporting guidance. It was also felt that the operator needed a suitable timescale to assess the potential situation before the need for mobilising the emergency response.

HSE response

As part of the review of proposed regulatory measures, it was necessary to consider only essential amendments to regulations. HSE has therefore taken the decision to remove this proposal from the amendments to be taken forward for implementation in April 2011.

Q12: Do you agree with the proposed changes to align regulation 26 with the new regulation 29?

Number of responses = 14 (48%)

Number agreed = 10 (71% of respondents)

Number disagreed = 4 (29% of respondents)

Comments: This question asked if stakeholders agreed with including a provision in regulation 26 for the operator to notify the local authority and emergency services in the circumstances specified in regulation 29. The same concerns were raised in response to this as with question 11 in respect to the words "immediately" and "without delay".

HSE response

As part of the review of proposed regulatory measures, it was necessary to consider only essential amendments to regulations. HSE has therefore taken the decision to remove this proposal from the amendments to be taken forward for implementation in April 2011.

RESTRUCTURED REGULATION 14 IRON PIPELINES

Q13: HSE welcomes any feedback on the restructured regulation 14. Please provide comments if you wish.

Number of responses = 6 (21%)

Comments: Stakeholders expressed their concern at the revised drafting of regulation 14(10) as they were of the view that it significantly extended the scope for bringing a prosecution.

HSE response

As this was not the intention of the redrafting exercise, HSE has taken the decision to revert back to the original text.

COST RECOVERY

Q14: 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?

Number of responses = 11 (38%)

Comments: There were three main issues that featured throughout stakeholders responses: transparency of costs; the effect cost recovery has on the relationship between the operator and the regulator; and the view that HSE should consider a phased approach to cost recovery during the early stages of CCS development to alleviate the costs to industry, in order to make the CCS projects commercially viable.

HSE response

HSE has a clear and transparent cost recovery regime which is well established. This amendment to the Health and Safety (Fees) Regulations will simply extend this regime to cover PSR cost recoverable activities.

Although concerns are valid regarding the effect cost recovery has on the relationship between the operator and the regulator, HSE actively addresses these concerns in other cost recovery regimes and will endeavour to do so for PSR.

Treasury guidance is clear that government bodies should seek to recover full economic costs of the provision of their services and there is no discretion to seek to recover less than the costs incurred even for a limited period. HSE will seek to recover costs that are reasonably incurred in the course of the duty and sufficiently referable to the job/customer. However, in light of the decision to postpone the inclusion of CO₂ as a dangerous fluid under PSR, HSE will ensure guidance is in place which will provide an outline of indicative costs for various scenarios involving CO₂ pipelines when this amendment is taken forward in the future. This guidance will then allow industry to build PSR costs into their financial planning.

Q15: Is there anything you particularly like or dislike about this consultation?

Although stakeholders did make entries under this question, they were intended as additional comments and should have been submitted under question 16.

Q16: Are there any further comments you would like to make on the issues raised in this consultation document that you have not already responded to in this questionnaire?

Number of responses = 12 (41%)

Comments: The views covered in this part were mostly in reference to carbon dioxide and the impact assessment for including carbon dioxide as a dangerous fluid under PSR.

HSE response

These views have been addressed under questions 6-8.

Stakeholders also raised concerns about the impact assessment for including gasoline as a dangerous fluid under PSR not accounting for compensation and mitigation costs to operators.

HSE response

HSE Economists have been able to obtain further information about these costs and have amended the impact assessment accordingly.

Stakeholders have an opportunity to comment on the revised impact assessment details of which are outlined in **Annex 1**.

Stakeholders raised issues about Part 6 of the consultation, which dealt with other changes to the Regulations and supporting guidance. The concerns related to two issues; definition of “operator” (regulation 2); and meaning of a “pipeline” (regulation 3).

Definition of operator

HSE had produced further web-based guidance for the definition of operator and took the opportunity whilst PSR was under review to incorporate this guidance into L82 ‘A guide to the Pipelines Safety Regulations’. However, some minor amendments were made to the guidance to improve clarity and stakeholders were given the opportunity to comment.

HSE response

In light of stakeholder's comments, HSE has made several amendments to the guidance:

- Paragraph (c) (Page 23 of CD) has been removed "a company with no employees which merely holds the pipeline assets can not be the operator"
- Paragraphs (a)-(f) (Page 23 of CD) have been removed, these dealt with the criteria that would normally need to be demonstrated by the pipeline operator if the pipeline operated is major accident hazard pipeline.

Stakeholders raised concerns about the definition of operator; however, this was not part of the proposals to amend PSR and HSE feels this provision remains suitable.

Regulation 3(3)

HSE identified that paragraph (3) of regulation 3 was not clear in its intent and were taking the opportunity to review this regulation at the time of consultation. Several stakeholders commented that they would want to be involved in any review.

HSE response

After consulting with stakeholders and not receiving any objections, HSE has now taken the decision to remove paragraph (3) in its entirety as we believe it is not required for the purposes of this regulation. HSE has also taken the opportunity to amend the supporting guidance in 'A guide to the Pipelines Safety Regulations' (L82) to add clarity at paragraphs:

"17) Figures 1 to 7 give examples of different interfaces and illustrate the limits of pipelines covered by these Regulations in particular cases.

18) Regulation 3(2) (c) includes valves, valve chambers and similar works within the meaning of a pipeline and this should be taken into account in interpreting the interface between plant, an offshore installation or a well and the pipeline."

The revised version of L82 will be available prior to the new Regulations coming into force.

PROPOSED AMENDMENTS TO THE PIPELINE SAFETY REGULATIONS

Following analysis of consultation responses, HSE have made refinements to some of the proposed amendments and the impact assessment in relation to classifying gasoline as a dangerous fluid in PSR. HSE would like to give stakeholders the opportunity to provide comments on the following areas:

CLASSIFICATION OF GASOLINE AS A DANGEROUS FLUID

Definition of gasoline

1. Responses from stakeholders demonstrated that there is broad agreement to gasoline being classified as a dangerous fluid and included in Schedule 2 of PSR. However, stakeholders felt that the previous proposed definition was not suitable as it did not provide clarity about what is and isn't included in the scope of PSR. The narrow scope of the Buncefield recommendation has made producing a definition of gasoline extremely challenging. HSE has now modified the original gasoline definition after considering the consultation responses and further discussion with HSE technical experts to:

“gasoline” means a fluid which –

- (a) is liquid at 15°C and 1013.25 millibars;*
- (b) when tested in accordance with Part A9 of the Annex to the Directive has a flashpoint (as defined in that part) of less than 21°C; and*
- (c) can be used or blended for use as a fuel for motor vehicles*

“the Directive” means Commission Directive 92/69 EEC adapting to technical progress for the seventeenth time and Council Directive 67/548/EEC on the approximation of laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances”.

2. HSE now welcomes your further comments on the modification to the definition of gasoline that was originally consulted on.

QUESTION 1

Do you have any comments on the revised definition of gasoline for inclusion within PSR?

REGULATION 23 NOTIFICATION IN OTHER CASES

3. HSE proposed to amend regulation 23 in order to extend the circumstances when an operator must notify certain changes in relation to the pipeline to HSE. This was to deal with the situation where an existing industrial complex is split up and the operation undertaken ceases to be under the control of one operator, to that of a number of operators managing different chemical plants and processes.

23(2) Where, by reason of a change in the occupancy of premises, a major accident hazard pipeline ceases to be excluded from the scope of these Regulations by regulation 4(2) and paragraph 3 of Schedule 1, the operator must notify the Executive of the particulars specified in Schedule 4 within 3 months after the date on which the change occurs.

4. There was a general agreement with this proposal; however, stakeholders believed there were unintended consequential impacts if the pipeline in question was a major accident hazard pipeline (MAHP). This would require the pipeline operator to prepare a major accident hazard document (MAPD) and for the local authority to prepare an emergency pipeline plan for what could potentially be a short length of pipe.

5. The policy intent behind this change was to notify HSE of these pipelines and for a MAPD and emergency pipeline plan to be prepared. This was to ensure the operator has assessed the risks from major accidents and has introduced an appropriate safety management system. It is also to ensure the local authority has adequate emergency procedures in place to deal with the consequences of a major accident involving a pipeline.

6. HSE have also identified that by extending the scope of regulation 23, subsequent amendments to regulations 25 and 26 will also be required. This is because regulation 25 only requires for an operator to prepare a MAPD before the design of a MAHP is completed and it will not always be possible for the pipeline operator to prepare the MAPD at this stage, particularly in the situation where a site splits.

7. Similarly, regulation 26 places a duty on an operator to ensure that no fluid is conveyed in a major accident hazard pipeline unless emergency procedures have been established and recorded. In the situation where a site splits, the fluid will already be conveyed. Therefore, a period of grace is required in both regulations 25 and 26 to allow operators to prepare a MAPD and to establish emergency procedures. HSE has addressed this issue by including similar provisions in both regulations 25 and 26:

25(3) *Where provisions of this Part of these Regulations apply to a pipeline by reason of a change in the occupancy of premises, paragraph (1) has effect as if it required the operator to prepare the document referred to within [12] months after the date on which the change occurs.*

26(2) *Where the provisions of this Part of these Regulations apply to a pipeline by reason of a change in the occupancy of premises, paragraph (1) has effect as if it required the operator to establish and record the procedures referred to within [6] months of the date on which the change occurs.*

8. HSE would now welcome your comments on the new provisions under regulations 25 and 26.

QUESTION 2

Do you have any comments on the new provisions that are being proposed in regulations 25 and 26?

Impact Assessment (IA) for the classification of gasoline as a dangerous fluid

9. During the consultation a review of the methodology used for setting consultation distances (CDs) around gasoline pipelines was underway and stakeholders raised concerns that the IA could not fully address the cost implications to industry until this review was completed. This review has now been completed and the HSE economist has prepared a revised IA which is attached at **Annex 2**. HSE welcome your comments on the revised IA.

QUESTION 3

Do you have any comments on the revised impact assessment for the classification of gasoline as a dangerous fluid?

How to respond:

- Responses **by e-mail** to pipelines@hse.gsi.gov.uk
- Responses **on paper** – you can do this by making a written response in whatever format you wish and sending to;

Lyndsey Bennett, HSE, 5S2. Desk 22, Redgrave Court, Merton Road, Bootle, Merseyside, L20 7HS, Tel: 0151 951 3186

Responses are welcome by Friday 8 October 2010

TITLE: AMENDMENTS TO THE PIPELINES SAFETY REGULATIONS 1996 AND THE HEALTH AND SAFETY (FEES) REGULATIONS – CLASSIFYING GASOLINE AS A DANGEROUS FLUID LEAD DEPARTMENT OR AGENCY: OTHER DEPARTMENTS OR AGENCIES:	Impact Assessment (IA)
	IA No:
	Date: 2nd September
	Stage: Final
	Source of intervention: Domestic
	Type of measure: Primary legislation
	Contact for enquiries: Karen McDonough 0151 951 3308 karen.mcdonough@hse.gsi.gov.uk

Summary: Intervention and Options

What is the problem under consideration? Why is government intervention necessary? Gasoline pipelines are not classified as major accident hazard pipelines and therefore do not fall within the scope of the additional duties as set out in Part III of the Pipeline Safety Regulations (PSR) 1996. Research has shown that gasoline pipelines have major accident hazard potential. Following the Buncefield incident the Major Incident Investigation Board expressed concern at the anomaly that gasoline pipelines are still not within the scope of the additional duties of PSR.	
What are the policy objectives and the intended effects? The policy objective is to reduce the risks of gasoline pipeline accidents, and to reduce the impact of accidents that may arise from gasoline pipelines. This will be achieved by the following: 1) Applying 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) Applying land use planning (LUP) controls around gasoline pipelines to manage the residual risks; 3) Updating the guidance “A 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 those 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 preferred option (further details in Evidence Base) The following regulatory options are being considered: i) no change; ii) to classify gasoline as a dangerous fluid under Schedule 2 of PSR, therefore ensuring pipelines conveying gasoline are subject to both the general and additional duties of PSR, i.e. they will become major accident hazard pipelines. This is the preferred option which is presented in this	
When will the policy be reviewed to establish its impact and the extent to which the policy objectives have been achieved?	It will be reviewed 01/04/2013
Are there arrangements in place that will allow a systematic collection of monitoring information for future policy review?	Yes

SELECT SIGNATORY Sign-off For final proposal stage Impact Assessments:

I have read the Impact Assessment and I am satisfied that (a) it represents a fair and reasonable view of the expected costs, benefits and impact of the policy, and (b) the benefits justify the costs.

Signed by the responsible Minister:..... Date:

Summary: Analysis and Evidence

Policy Option 1

Description: Do nothing, or the Baseline

PRICE BASE YEAR	PV BASE YEAR	TIME PERIOD YEARS	NET BENEFIT (PRESENT VALUE (PV)) (£M)		
			LOW: NIL	HIGH: NIL	BEST ESTIMATE: NIL

COSTS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low	Nil	Nil	Nil
High	Nil	Nil	Nil
Best Estimate	Nil		

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

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

BENEFITS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Benefit (Present Value)
Low	N/a	N/a	N/a
High	N/a	N/a	N/a
Best Estimate	N/a	N/a	N/a

Description and scale of key monetised benefits by 'main affected groups'

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

Key assumptions/sensitivities/risks

Key assumptions are documented in Annex 2

Discount rate (%) 3.5/3

IMPACT ON ADMIN BURDEN (AB) (£M):			IMPACT ON POLICY COST	IN
NEW AB: NIL	AB SAVINGS: NIL	NET: NIL	POLICY COST SAVINGS:	Yes/No

Summary: Analysis and Evidence

Policy Option 2

Description: Amend PSR to include gasoline as a dangerous fluid and implement Land Use Planning restrictions

PRICE BASE YEAR	PV BASE YEAR	TIME PERIOD YEARS	NET BENEFIT (PRESENT VALUE (PV)) (£M)		
			LOW:	HIGH:	BEST ESTIMATE:
COSTS (£m)					
		Total Transition (Constant Price)	Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)	
		Years			
Low		0.5	0.13	1.1	
High		0.8	0.30	2.5	
Best Estimate		0.64	0.22	1.8	
Description and scale of key monetised costs by 'main affected groups' :					
Cost to society include the cost to industry under PSR of between £1m and £1.6m and LUP costs to society of between £90,000 and £900,000.					
The cost to industry is between £1.2m and £4.3m which includes potential compensation to landowners of between £0.18m and £2.7m. The cost of compensation is an equal and opposite benefit to landowners, and so there is no overall cost to society.					
Other key non-monetised costs by 'main affected groups'					
There may be costs to industry if societal concern is raised on classification of the pipelines as dangerous under PSR. While nothing will change in practice for the public living in close proximity, this might require careful risk communication strategies to limit the number of queries to and adverse attention focussed on the industry.					
BENEFITS (£m)					
		Total Transition (Constant Price)	Average Annual (excl. Transition) (Constant Price)	Total Benefit (Present Value)	
		Years			
Low		Nil	0.09	0.7	
High		Nil	0.17	1.4	
Best Estimate		Nil	0.13	1.1	
Description and scale of key monetised benefits by 'main affected groups' Benefits are calculated based on two scenarios, either that risk will be reduced by 10% or risk will be reduced by 20%. This is illustrative only, with other outcomes being possible. Health and safety benefits have therefore been estimated between £76,000 and £151,000. Cost savings benefits of between £640,000 and £1.3m over the 10 year period have been estimated based on the expected economic cost of an incident being around 10% of the total cost of the explosion at Buncefield fuel storage depot,(which reflects the lower expected consequences associated with gasoline pipelines than with a large scale fuel depot).					
Other key non-monetised benefits by 'main affected groups' It is expected that the population around pipelines will increase over the 10 year appraisal period in the base line scenario. However, due to the lack of evidence available and a number of uncertainties, this effect has not been possible to quantify. This means that the health and safety benefits calculated under option 2 might in fact be greater than the estimates provided. The effect is not expected to be significant however, as many gasoline pipelines are already in populated areas so there is a limit to the amount by which the population can increase. There may also be benefits if the public take more care around gasoline pipelines, reducing the number of incidents involving third party damage each year.					
Key assumptions/sensitivities/risks				Discount rate (%)	3.5
The key assumptions are documented in annex 2.					

IMPACT ON ADMIN BURDEN (AB) (£M):			IMPACT ON POLICY COST		IN
NEW AB: 0.001	AB SAVINGS: NIL	NET:	POLICY COST SAVINGS: NIL		NO

Enforcement, Implementation and Wider Impacts

What is the geographic coverage of the policy/option?	Great Britain				
From what date will the policy be implemented?	06/04/2011				
Which organisation(s) will enforce the policy?	HSE				
What is the annual change in enforcement cost (£m)?	N/a – costs recovered.				
Does enforcement comply with Hampton principles?	Yes				
Does implementation go beyond minimum EU requirements?	N/a				
What is the CO ₂ equivalent change in greenhouse gas emissions? (Million tonnes CO ₂ equivalent)	Traded: Not quantified		Non-traded: Not quantified		
Does the proposal have an impact on competition?	No				
What proportion (%) of Total PV costs/benefits is directly attributable to primary legislation, if applicable?	Costs:		Benefits:		
Annual cost (£m) per organisation (excl. Transition) (Constant Price)	Micro < 20	Small <0.007	Medium <0.007	Large <0.007	
Are any of these organisations exempt?	No	No	No	No	No

Specific Impact Tests: Checklist

Set out in the table below where information on any SITs undertaken as part of the analysis of the policy options can be found in the evidence base. For guidance on how to complete each test, double-click on the link for the guidance provided by the relevant department.

Please note this checklist is not intended to list each and every statutory consideration that departments should take into account when deciding which policy option to follow. It is the responsibility of departments to make sure that their duties are complied with.

Does your policy option/proposal have an impact on...?	Impact	Page ref within IA
Statutory equality duties ¹ Statutory Equality Duties Impact Test guidance	Yes	
Economic impacts		
Competition Competition Assessment Impact Test guidance	No	23
Small firms Small Firms Impact Test guidance	No	23
Environmental impacts		
Greenhouse gas assessment Greenhouse Gas Assessment Impact Test guidance	No	23
Wider environmental issues Wider Environmental Issues Impact Test guidance	Yes	23
Social impacts		
Health and well-being Health and Well-being Impact Test guidance	Yes	24
Human rights Human Rights Impact Test guidance	No	24
Justice system Justice Impact Test guidance	No	24
Rural proofing Rural Proofing Impact Test guidance	No	24
Sustainable development Sustainable Development Impact Test guidance	yes	24

¹ Race, disability and gender Impact assessments are statutory requirements for relevant policies. Equality statutory requirements will be expanded 2011, once the Equality Bill comes into force. Statutory equality duties part of the Equality Bill apply to GB only. The Toolkit provides advice on statutory equality duties for public authorities with a remit in Northern Ireland.

Evidence Base (for summary sheets) – Notes

Use this space to set out the relevant references, evidence, analysis and detailed narrative from which you have generated your policy options or proposal. Please fill in **References** section.

References

Include the links to relevant legislation and publications, such as public impact assessment of earlier stages (e.g. Consultation, Final, Enactment).

No.	Legislation or publication
1	Consultation document_ http://www.hse.gov.uk/consult/condocs/cd228.htm
2	
3	
4	

+ Add another row

Evidence Base

Ensure that the information in this section provides clear evidence of the information provided in the summary pages of this form (recommended maximum of 30 pages). Complete the **Annual profile of monetised costs and benefits** (transition and recurring) below over the life of the preferred policy (use the spreadsheet attached if the period is longer than 10 years).

The spreadsheet also contains an emission changes table that you will need to fill in if your measure has an impact on greenhouse gas emissions.

Annual profile of monetised costs and benefits* - (£m) constant prices

	Y ₀	Y ₁	Y ₂	Y ₃	Y ₄	Y ₅	Y ₆	Y ₇	Y ₈	Y ₉
Transition costs	0.6									
Annual recurring cost	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22
Total annual costs	0.86	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22
Transition benefits	Nil									
Annual recurring benefits	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
Total annual benefits	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13

* For non-monetised benefits please see summary pages and main evidence base section



Microsoft Office
Excel Worksheet

Evidence Base (for summary sheets)

Extension of Pipelines Safety Regulations (1996) to include gasoline as a dangerous fluid

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

Purpose and intended effects

Issue

2. Gasoline is currently not a prescribed dangerous fluid for the purposes of the Pipelines Safety Regulations 1996 and therefore the additional duties of PSR for major accident hazard pipelines (those which carry prescribed dangerous fluids) do not currently apply to gasoline pipelines.

Objectives

3. The objective of this extension of PSR 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 Pipelines Safety Regulations (PSR) 1996. The aim is that amended regulations can be ready for implementation in April 2011.
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 currently only attract the 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 for the pipeline operator to notify HSE of its plans to construct a MAHP, produce a major accident prevention document and set in place emergency procedures, for the local authority to prepare an emergency pipeline plan or for land use planning zones to be set around gasoline pipelines.
7. At the time of implementation of the Pipelines Safety Regulations, HSE initially proposed including 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 projects² 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 inclusion 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, which is presented in this final stage Impact Assessment, compared with the baseline, or 'do-nothing' scenario.
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 PSR 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 again became 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 for the local authority to produce a pipeline emergency plan or for land use planning zones to be set 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.
13. Additionally, pipeline operators might only consider the private costs and benefits relating to gasoline pipelines. External costs arising from the risk posed by the pipeline (to the public and environment) may not be fully captured in the operators' risk management decision making. These external costs are referred to as negative externalities and are a source of market failure. The maximising outcome for the firm is not that which maximises the welfare of society. Government intervention is therefore required to ensure that these negative externalities are appropriately controlled.

² Arthur 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.

Options

14. The initial approach when considering the amendments to PSR was to address gaps in legislation and clarify existing arrangements for duty holders. In light of the Coalition Government's new approach to regulation, HSE have rigorously reviewed the proposed amendments to identify what is regarded as still requiring regulatory change and what can be handled through an alternate approach to regulation. However, non-legislative approaches have been discounted for the following reasons:

- (a) Gasoline pipelines create major hazard risks that could have a direct impact on communities in the vicinity of a pipeline. In these circumstances regulatory options provide certainty in the system that non-regulatory options can not. With many Government interventions, if some amount less than 100% of the target population follow the guidance or push from the government, an improvement in outcomes will still be achieved. However, due to the catastrophic potential associated with major hazards, discretion on implementation of safety practices can not be tolerated. For example if just 1% of duty holders did not follow the behavioural push from government which resulted in one accident, this could have catastrophic consequences for society, including very significant economic costs to Government, the hazard operators, to individuals and the environment. Therefore when there is a real risk of catastrophe that needs addressing, methods which can not be enforced by the regulator will not adequately protect against this risk.
- (b) The uncertainty that is associated with non-regulatory options would also increase societal concern. There are costs to society associated with societal concern, which include; time spent by the regulator and duty holders communicating risk management; time spent directly addressing public concerns; and the possibility of land values in close proximity to the hazard sites being blighted. Regulatory options which guarantee the regulator can ensure safety is ALARP will quite rightly increase public assurance and so avoid these sort of costs.
- (c) Notifications required under the additional duties of PSR provide the sole measure which enable HSE to intervene at a point when the safe design of the pipeline can be influenced. Building safety into design is usually the most cost effective means of reducing risks. Early intervention also enables enforcement action to be taken where standards fall short of the law. Defects caused by poor design can lie dormant for a long time and only become known once a serious event occurs. Non-regulatory options would not deliver the benefits of early regulatory intervention.

15. Two realistic options have therefore been considered:

Option one – Do nothing

16. No change to PSR so that gasoline would continue to not be classified as a dangerous fluid under PSR. 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.

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

17. Option two is the preferred option and would consist of the following:

- Arrangements for notifications for new major hazard pipelines;
- Pipeline operators to prepare a major accident prevention document and emergency procedures put in place;
- Local Authority to prepare a pipeline emergency plan;
- Land use planning controls (consultation distances) around gasoline pipelines to manage residual risks from gasoline pipelines; and
- 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. A full list of detailed assumptions is provided in Annex 2.
19. Costs have been discounted over a period of ten years and expressed in present value terms³. Beyond a period of ten years there is too much uncertainty to be able to represent the costs of this intervention in a reasonable and fair manner.
20. A discount rate of 3.5% is applied to costs and non-health and safety benefits in line with HM Treasury guidelines. A 1.5% discount rate is applied to health and safety benefits.
21. Based on current plans, it is assumed there will not be any further pipelines constructed during the appraisal period.
22. It is assumed that operators keep their pipelines in good repair and will upgrade them regularly to compensate for any deterioration and decline in capacity that would otherwise occur.
23. It has been estimated that there are between 30 and 40 operators of gasoline pipelines, 6 being the main operators with the rest being smaller operators.
24. Consultation distances (CDs) have been estimated by HSE for a variety of pipeline diameters in urban and rural areas, see Annex 3. A weighted average CD for urban and rural areas has been estimated as 80m and 60m respectively, based on length of pipeline for each diameter out of the total length of gasoline pipeline, see Annex 3.
25. It is assumed that classifying gasoline as dangerous under PSR and implementing Land Use Planning advice will reduce individual risk by between 10 and 20%. This estimated range of the risk reduction is for illustrative purposes only; the actual risk reduction and so cost savings / benefits achieved could vary from the figures presented here.

Methods of calculating risk

Individual risk

³ The present value is the future value of a cost / benefit expressed in present terms by a process called discounting. The discount rate includes 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

26. Evidence is not yet available to HSE on the average individual risk around pipelines over a consultation distance (CD) of 80m for urban pipelines and 60m for rural gasoline pipelines. For prudence the average individual risk for both urban and rural areas has been estimated as 1×10^{-6} based on HSE best estimates.
27. Multiplying the calculated individual risk by the population within proximity of gasoline pipelines for both urban and rural areas (being 45,913 and 8,506 respectively) gives an estimation of the expected number of fatalities per year. These are night-time residential populations. The actual population could be different to this if the incident occurred during the daytime, depending on the type of developments in the vicinity of the pipelines, e.g. housing would have a maximum population during the night time, but retail developments and schools would have their maximum population during the day. However, sensitivity analysis has been performed, which shows that if the population around these pipelines was to increase by 10% or 20%, the health and safety benefits calculated in paragraph 44 would also increase by 10% or 20%, which is valued at up to a maximum increase of £33,000. This is not significant to the decision making process and so no further work has been performed on the population estimate assumptions.
28. Additionally, due to land use planning advice, it would be expected that the population around gasoline pipelines will be prevented from increasing into the future and by applying LUP there will be an additional benefit from avoiding this population being exposed to risk. Due to the lack of available evidence and the level of assumptions that would be necessary in order to quantify this effect, no attempt to quantify the growth in population has been made. In the analysis, the expected risk reduction of 10% to 20% is assumed to include the risk reduction from implementing the additional duties under PSR as well as the reduced risk from avoiding exposure of populations due to land use planning.
29. Analysis of past accident reports also indicates that each fatality from a gasoline pipeline leak ignition might be associated with four significant injuries. Thus, the expected number of injuries is obtained by multiplying the expected number of fatalities by 4.
30. The calculated fatality / injury estimates of an average incident 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 10 yr period	Expected injuries over 40 yr period
Urban	45,913	0.046	0.184	0.459	1.837
Rural	8,506	0.009	0.034	0.085	0.340

Pipeline Failure

31. Estimates of the risk of pipeline failure have been provided by the Health and Safety Laboratory⁴. These estimates are based on historical failure data collected by CONCAWE (Conservation of Clean Air and Water in Europe)⁵, using 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 2. These updated estimates recommend that an average failure rate across all diameters of pipeline of 0.263 events per 1000 km years is used (0.207 rural and 0.767 suburban).

⁴ Advice provided by Higher Scientist, Health and Safety Laboratory to the Health and Safety Executive in July 2008.

⁵ Concauwe report number 7/08. Performance of European cross – country pipelines. Available at: http://www.concauwe.be/DocShareNoFrame/docs/2/MFAMCPDCHLDPELAMHMLNJKIIVEVCBW939YBDC3B6ENE3/CEnet/docs/DLS/Rpt_08-7-2008-03666-01-E.pdf

32. Although this is an average failure rate across all pipelines, the data is only used to estimate environmental clean up costs, and it is possible that a small, less easily detected release may have a similar environmental impact as a large, short duration release. Given this, it has been assumed that the average risk of a pipeline failure is sufficient for this analysis.
33. 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 = $0.1 * 2.15 * 0.767 * 0.05 = 0.008$ (see annex 2 for assumptions).

Benefits

Option one – No change to PSR

34. This option provides the baseline for analysis of costs and benefits in this impact assessment, and so by definition there are no benefits associated with this option.

Option two – Amend PSR to include gasoline as a dangerous fluid

35. By classifying gasoline as a dangerous fluid the additional duties under part 3 of PSR for Major Accident Hazard Pipelines will apply to 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. deliver health and safety benefits. The costs of damage to property and infrastructure, disruption to economic activity and potentially injuries / fatalities will also be reduced by HSE LUP advice around these pipelines.

i) Health and safety benefits

36. The expected cost of fatal and major injuries associated with a gasoline pipeline incident has been calculated. This is based on the expected number of fatalities / injuries per year (see paragraph 30) and the HSE estimated cost of a fatality / injury of £1.5m and £40,500 respectively.⁶ Benefits of intervention are estimated by comparing what the health and safety costs of an incident are with no intervention, compared to the expected health and safety costs if risk is reduced by classifying gasoline as dangerous under PSR. Two alternative assumptions have been made, which show how outcomes might change if risk is reduced by either 10% or 20%. It should be emphasised that these are just illustrative options which are thought to be likely, but different outcomes could be achieved.

Urban areas

37. The total expected cost of injuries and deaths in urban areas due to gasoline incidents has been estimated as £640,000 over a 10 year appraisal period.
38. If the individual risk due to gasoline pipelines is reduced by 10% as a result of the intervention, then the total expected costs of fatalities and major injuries over the period is estimated to be £574,000. The difference between the current expected costs and those expected if risk is reduced by 10% is a saving of £64,000.

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

39. If classifying gasoline as dangerous under PSR reduces risk by 20% then the total expected cost of fatal and major injuries over the 10 year period is £510,000. The difference between the current expected costs and those expected if risk is reduced by 20% is a saving of £130,000.

Rural areas

40. The same methodology has been applied for rural areas. The total expected cost of fatalities and major injuries in rural areas is calculated as £118,000 over the 10 year appraisal period.

41. If the individual risk due to gasoline pipelines was reduced by 10% then the total cost would be £106,000 over the appraisal period. The difference between the current expected costs and those expected if risk is reduced by 10% is a saving of £12,000.

42. If the individual risk due to gasoline pipelines was reduced by 20% then the total present value of the costs over a 10 year appraisal period would be £95,000. Compared to the current expected costs, this would be a saving of £24,000 over the appraisal period.

43. As noted, the benefit of land use planning advice is to reduce the population around the pipelines. Thus, in the baseline scenario and against which the benefits of the intervention should be measured; the population would increase in the absence of land use planning advice.

44. A quick analysis of the possible benefits of excluding populations from around major hazards has been performed. Paragraph 77 onwards describes the costs of Land use planning advice and assumes that between 1 and 2 developments are advised against per annum. If it is assumed that these developments are all housing, and that average housing density is 43 dwellings per hectare⁷, then the average number of dwellings advised against per application is between 3 and 17. At an average population density of 2.32, this equates to between 10 and 50 extra people per development advised against. Given that individual risk is estimates to be 1×10^{-6} and the total population around gasoline pipelines is already estimated to be over 50,000, the extra health and safety benefit from preventing these 10 – 50 people being in the vicinity for 1 or 2 developments is small.

45. The following table summarises these potential health and safety benefits.

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	Death and injury	0.08	0.15
Total		0.08	0.15

ii) Other benefits

Business Interruption and clean up costs

⁷ Average number of dwellings per hectare and average household size taken from the Housing and Planning Key Fact report August 2010: available at: www.communities.gov.uk/documents/statistics/xls/1693158.xls

46. Following an ignition incident there will be business interruption costs and clean up costs. HSE is looking into the feasibility of modelling such costs, but currently there is no readily available information at this time. Thus, in the absence of alternative information, the Buncefield Incident of 11th December 2005 has been used to illustrate the potential costs of such a large scale incident.⁸ This was a major incident and the total estimated costs of £894m include the site operators' compensation claims, aviation costs, Competent Authority and Government response, emergency response and environmental impact.
47. 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 the average incident might be 10% of the costs associated with Buncefield (i.e. £89m) for incidents occurring in urban areas, and 1% (i.e. £8.9m) for those occurring in rural areas.

Urban areas

48. The expected number of incidents in urban areas is 0.008 (see risk section above and annex 2 for assumptions). Applying this expected frequency to the estimated costs per average incident, the total expected clean up costs associated with ignition incidents is £740,000 per annum with a present value of £5.6m over the 10 year appraisal period.
49. As noted above, two scenarios have been modelled, assuming that classifying gasoline as dangerous under PSR 1996 might reduce risk by between 10 and 20%. Thus, if risk is reduced by 10%, the expected number of ignition events in urban areas will decrease to 0.0074 per annum. This will equate to a present value of the cost of an incident of £5.0m over the 10 year appraisal period and so a cost saving of £560,000 over the appraisal period compared to the current expected costs.
50. If instead the risk is reduced by 20% the expected number of ignition events per annum in urban areas will be 0.0066 and the total present value of the cost of incidents over the 10 year period will be £4.5m, with a cost saving of £1.1 m compared to the current expected costs.
51. In summary, in urban areas over the 10 year appraisal period, the present value of the total costs that could be saved in relation to clean up costs / business disruption in urban areas could range between £560,000 and £1.1m.

Rural areas

52. 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. As described above, instead of 10% of the costs of Buncefield it is assumed that costs may be an order of magnitude less, in other words 1%, or £8.9m.
53. 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 years to 0.207 for rural areas. The expected number of ignition events per year is therefore 0.012 (which is greater than in urban areas due to the assumption that there is 9 times more pipeline in rural areas). The expected cost of an ignition event is calculated as £107,000 per annum with a present value of £816,000 over the 10 year appraisal period.

⁸ 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>

54. Again, if the classification of gasoline as a dangerous fluid under PSR 1996 should reduce the risk of an incident by 10% then the expected costs of an incident in rural areas would be £735,000 over the appraisal period, being a cost saving of £82,000.
55. If the risk is reduced by 20% then the costs will be £653,000 over the appraisal being a cost saving of £163,000.
56. The total cost savings of clean up, property and business interruption costs in rural areas are therefore estimated to be somewhere in the region of £81,000 to £163,000 over the 10 year appraisal period.
57. The total cost savings in urban and rural areas associated with clean up, property and business interruption costs are estimated to be between £642,000 and £1.3m

Improved awareness of gasoline pipelines

58. It is possible that by classifying gasoline as dangerous under PSR, that the general public will have an increased awareness of the risks associated with such pipelines and take more care when performing digging and other such works around these pipelines. This might in turn reduce the amount of third party damage to pipelines, saving costs to operators and reducing the risk of large scale incidents. It is not possible to quantify such an effect however.

Total Cost savings – rural and urban areas

	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	0.6	1.3

Cost to Industry

Option 1 – do nothing

59. 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

60. There would be no cost implications from general regulations (5 – 18) as these already apply to gasoline pipelines.
61. The additional costs of this option apply under additional duties in Regulations 21- 28. These are considered below, based on the assumption that operators will take advantage of transitional arrangements, being 3 months for notifications, 12 months in which to prepare an MAPD and 6 months to put in place emergency procedures and an emergency plan.

Regulation 21 – Notification before construction

62. This applies to new pipelines only. It is considered to be unlikely that any new gasoline pipelines will be constructed over the next 10 years so no additional costs should be incurred.

Regulation 22 – Notification before use

63. 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 when the amended Regulations come into being, all gasoline pipeline operators will have to notify the Regulator that they have a Major Accident Hazard Pipeline conveying a dangerous fluid. It is estimated that there are between around 30 – 40 operators, 6 main operators with the remainder being smaller operators. The notification process will require 2 days of time of a technical expert at the larger operators, and around 0.5 days worth of time of a technical expert at the smaller operators.

64. The total one off cost to industry is calculated to be between £4,600 and £5,600, which is not significant.

Regulation 23 – Notification in other cases

65. HSE must be notified about any changes in the operator within fourteen days. In such circumstances, the operator will also have to notify customers and others of this change and so the act of notifying HSE is a small marginal cost and not expected to be significant.

66. 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 such a change in operating limits / fluid will occur about twice a year. The notification of such changes is not anticipated to take much longer than between 1 and 2 hours of time of a science and technology professional. The total cost is not therefore expected to be greater than £500 over the 10 year appraisal period.

67. As part of the amendments to PSR, HSE has extended the circumstances when an operator must notify certain changes in relation to the pipeline to HSE under regulation 23. This is to deal with the situation where an existing industrial complex is split up and the operation undertaken ceases to be under the control of one operator, to that of a number of operators managing different chemical plants and processes. 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 grounds 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 major accident hazard pipeline definition, it will attract both the general and additional duties of PSR. This would require the pipeline operator to prepare a major accident prevention document and for the local authority to prepare an emergency pipeline plan, the costs of which are estimated in paragraph 74 below. It is not expected that this situation would occur more than 5 times over the 10 year period and the cost of notifications under regulation 23 would therefore cost less than £220. The total cost of regulation 23 is estimated to cost less than £700.

Regulation 25 – Major Accident Prevention Document (MAPD)

68. The operator will have to prepare, and thereafter revise or replace as often as necessary, a document relating to the pipeline, to demonstrate that all hazards relating to the pipeline

are identified; the risks evaluated; the safety management system is adequate and that adequate arrangements are in place for the audit of such.

69. The MAPD is not dissimilar to documents required under other regulations and so it is anticipated that 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 per MAPD document.
70. The total one off cost of preparing MAPD's will be between £174,000 and £232,000 for the 30 – 40 gasoline pipeline operators. 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.
71. 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 each time the MAPD'S are reviewed. Over a period of 10 years, the present value of the costs of reviewing the MAPDs will be between £29,000 and £39,000.
72. In the situation where an existing industrial complex is split up and a major accident hazard pipeline falls within the scope of PSR, the pipeline operator will be required to prepare a major accident prevention document. It is assumed that the pipeline operator will already have an existing major accident prevention document in place which can be extended to include the new pipeline. It is anticipated this will take between 2-5 days by a technical expert. However, the likelihood of this situation occurring is rare and any given pipeline operator is unlikely to have to carry out this task on more than five occasions during the 10 year appraisal period. The cost of the initial preparation of the MAPDs for these industrial complexes is estimated to be between £1,600 and £4,000 over the 10 year appraisal period.
73. The cost of review for the MAPDs which are produced when industrial complexes split up is estimated to also be one fifth of the initial cost, estimated to be less than £500 over the appraisal period.
74. So, over a period of 10 years, the total cost of initial preparation and five yearly reviews is estimated to be between £205,000 and £271,000.
75. Regulation 23 also requires adequate arrangements for audit and for making reports on the audit, which can be performed in-house provided the person doing so is sufficiently independent of the system. Thus, the costs to industry are in terms of the time it takes to complete these audits. It is assumed an audit is undertaken each year and that it takes one person one week for the six major gasoline pipeline companies. The opportunity cost of this time is estimated to be £960 per audit⁹. The remaining smaller operators are assumed to have costs a quarter of the cost for the main operators. The total cost to industry per annum of the audits is between £12,000 and £14,000. The total present value of the costs over the 10 year appraisal period is estimated to be between £88,000 and £106,000.
76. As the costs of the audit are dependent on the number of operators rather than the number of MAPDs, it is not expected there will be additional costs of audit procedures

⁹ Based on the Annual Survey of Hours and Earnings 2009, and the gross hourly wage rate for a science and technology professional of £19.70, see : http://www.statistics.gov.uk/downloads/theme_labour/ASHE-2009/tab14_5a.xls The true economic cost of the employment is calculated by grossing up the hourly rate by 30% to reflect the other costs associated with employment such as employer NICS / Income tax and pension contributions.

associated with the splitting up of an industrial site and a major hazard pipeline falls within the scope of PSR.

Regulation 27 – Preparation for Emergency Plans in case of major accidents

77. Every local authority (LA) which has a pipeline passing through it, must prepare an adequate plan detailing how an emergency relating to a possible major accident in its area will be dealt with before the pipeline is used or within 9 months of notification that there will be a major accident hazard pipeline in the area. Thus, on classification of gasoline as a dangerous fluid under PSR, the LAs will have a duty to prepare an emergency plan for that pipeline.
78. The Emergency Plan has to set 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 has 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 between 15 and 25 days of work by a Business and Public Service Professional¹⁰ and so the cost per LA is calculated as between £3,000 and £5,000 one off cost. Assuming the total number of LAs with a major accident hazard pipeline running through it is 103¹¹ and that all these LAs are required to produce such a plan, the total one off cost in year 1 is between £318,000 and £529,000.
79. Under regulation 25 plans must also be reviewed and revised every 3 years. The cost of this is assumed to be approximately half of the initial preparation costs, i.e. between £1,500 and £2,600 per LA. Over a 10 year appraisal period, the present value of reviewing / revising the plans for 103 LAs is expected to be between £389,000 and £648,000.
80. In the situation where an existing industrial complex is split up and a major accident hazard pipeline falls within the scope of PSR, the local authority will be required to prepare an emergency pipeline plan. It is assumed that the local authority will already have an existing generic emergency pipeline plan which can be extended to include the new pipeline. This is anticipated to take between 2-5 days by a Business and Public Service Professional. However, the likelihood of this situation occurring is rare and any given local authority is unlikely to have to carry out this task on more than five occasions during the 10 year appraisal period. On this basis, the total cost of drafting the emergency plans for the industrial complexes that split up will be the same as the costs of drafting the MAPDs, approximately £1,600 to £4,000.
81. The cost of reviewing the emergency plans over the appraisal period, at half the initial preparation costs is estimated to be between £4,000 and £9,800 over the 10 year appraisal period for industrial complexes that split up.
82. In total, therefore, the cost of regulation 25 to the local authorities will be between £712,000 and £1.2m. According to Regulation 26, the LA can charge a fee to the operator of the pipeline to which the plan relates. The fee must not exceed the costs reasonably incurred by the LA. Thus, in practice, the industry will incur costs of up to £1.2m over the 10 year appraisal period.
83. Total costs to industry of complying with the regulations are as follows:

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.

¹¹ Source: Health and Safety Laboratory, GIS team: Local Authorities intersected by gasoline pipelines as of 16/04/2010.

	Min (£'000)	Max (£'000)
Notifications	5	6
MAPD Initial preparation	176	236
MAPDs 5 yearly reviews	29	39
MAPD audit	88	106
Emergency plans	712	1,200
Total	1,000	1,600

Of this total, the cost of notifications is classed as administrative burdens as notifications relate to requirements on the duty holder to provide information.

Cost of Land Use Planning (LUP) around gasoline pipelines.

84. If gasoline pipelines are notifiable to HSE as major accident hazard pipelines under PSR (1996) then they will become subject to HSE land use planning advice. HSE is a statutory consultee on the route of major accident hazard pipelines and thus will provide advice on the routing of any new gasoline pipeline. HSE will also be required to set LUP consultation distances (CDs) around gasoline pipelines and will in future advise local planning authorities on developments in the vicinity of gasoline pipelines. The duty on HSE to act as consultee arises out of the Town and Country Planning (General Development Procedure) Order 1995, and so although the costs of LUP calculated below are a real cost to both society and industry, they are not a direct consequence of HSE amending the Pipeline Safety Regulations 1996.
85. The land use planning restrictions will only impose additional costs for *future* development proposals near existing pipelines. HSE will not apply advice retrospectively, so there will be no alterations made to developments which have been previously allowed but which would now be considered inappropriate.
86. 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.
87. If a proposal is rejected, other less sensitive schemes may be planned instead and the actual loss in development potential will be the difference between the value of the development if it had been allowed to proceed and the next best use to which the land could be put. The overall net loss in development value is the value of development that would have taken place with the gasoline pipeline remaining in operation but without HSE's advice, less the value of development that actually occurred in the CD in the specified period, less the value of development that was displaced elsewhere. If development is displaced elsewhere, the loss to the original land owner is equal to the development value of the land in the absence of HSE's advice on LUP. However, the loss to society is just the difference between the original development value and the value of the alternative development (which will also include any loss in efficiency due to the second best option being selected).
88. HSE is currently undertaking a study into the economic cost of Land Use Planning advice around major hazard sites, which will also cover pipelines. While this study is not complete at the time this Impact Assessment is being prepared, initial results indicate that development loss is greatest in highly populated urban areas where space is at a premium, while development loss is much lower in rural areas where there are likely to be other planning restrictions on the land anyway. Whilst a robust estimate of the average

development loss due to HSE planning advice around pipelines is not available at this stage, indications are that the development value lost around Control of Major Accident Hazards (COMAH) sites can be upwards of 50% in urban areas but almost zero in rural areas.

89. Given that there are a number of ways that a development could be altered so as to keep the most sensitive parts away from the inner zone of the CD around a pipeline, and by moving the development a matter of meters it might go ahead, it is assumed that there won't be much efficiency loss in total, estimated to be around perhaps 5% of the original value of the land.
90. It has been assumed that the value of housing development land for small sites is £2.1m per hectare¹², or £210per m². Thus, if development is advised against, it is assumed that the possible loss in development value of the land would be 5% of this, or £10.48 per m².
91. With no past history of planning applications around gasoline pipelines, a best estimate of the number advised against by HSE has been required. Using details from PADHI+ database, the number of planning applications advised against around major hazard pipelines in 2008 and 2009 was 50 and 44 respectively. It has been estimated that there is approximately 25,000km of natural pipeline in the UK, and so on a simplified basis, the number of advised against cases was 2 per 1,000km for an average CD of 100m. Based on the estimated length of gasoline pipeline (being 215km in urban areas and 1,932km in rural areas), this would equate to around half an advised against applications (AA) per annum in urban areas and 4AA applications per annum in rural areas. Most development that would be advised against only on health and safety grounds would be in urban areas, but there is no analysis available of how the AA applications in 2008/09 were split between rural and urban areas for pipelines in general. It is not anticipated that there will be as many planning applications made in rural areas as urban areas, due to other restrictions on the land apart from health and safety concerns. Thus, the estimate in rural areas is reduced by 50% to reflect this. The estimate of 2 applications per 1,000km also applies to a CD of 100m. However, for gasoline pipelines, the average CD in urban areas will be 80m (or 80% of 100m) and the average CD in rural areas will be 60m (or 60% of 100m). If the AA cases are adjusted to reflect this weighting of the CDs compared to that of natural gas pipelines, then the total number of AA cases per annum is expected to be between 1 and 2 along the length of gasoline pipeline.
92. It is possible that this might be reduced further given the knowledge that the majority of gasoline pipelines run through urban areas which are already fully developed, and so there is limited opportunity to propose alternative developments. However, no further adjustment is made to reflect this due to lack of available evidence and the fact LUP would apply to any new and alternative developments proposed on sites already developed.
93. The land area that might be affected by each development advised against has been estimated using data from the Valuation Office Agency (VOA). The Property Market report (see footnote 12) estimates that the average suburban development will be 5,000m². To account for the fact that some development applications may be smaller retail sites or development for vulnerable populations, a range of development size has been used, between 1,000m² and 5,000m². The inner zone CD is estimated to be about 40m on average, (see Annex 2) applying this to the size of development used would give a range

¹²Average per hectare land value for residential development as at January 2010, averaged across all regions. Data taken from the Valuation Office Agency, Property Market Report 2010, available at: http://www.voa.gov.uk/publications/property_market_report/pmr-jan-2010/jan-2010-pmr-sections/jan-2010-pmr-sct-2.pdf

of development length of between 25m and 125m which seems reasonable for a range of development types.

94. So, based on the assumption that between 1 and 2 applications will be advised against each year, the total cost of the land use planning restrictions around gasoline pipelines are estimated to be between £10,500 and £105,000 per annum. Over the 10 year appraisal period, the present value of the cost of the land use planning restrictions to society is estimated to be between £90,000 and £902,000.
95. As noted, this is the cost to society from development being lost to the area and is a cost directly associated with the Town and Country Planning (General Development Procedure) Order 1995, which places a duty on HSE to act as statutory consultee. The costs calculated are not a direct consequence of HSE amending the Pipeline Safety Regulations 1996.

Cost of compensation to industry

96. As noted, the total loss to society is the difference between the development that would have occurred if the pipeline was not hazardous, the development that did take place, and the development that was displaced.
97. However, the loss to the landowner above that which is the loss to society is equal to the development that was displaced from their land
98. From the initial research undertaken for HSE, indications are that the value of development that is displaced is a much smaller proportion of the original development value than the development that actually occurred anyway. Around pipelines, displaced development is likely to be even less, given that there are ways in which developments can be altered along the length of the pipeline to fit in with HSE advice without having to pick an alternative location altogether.
99. Consequently, it has been assumed that the development that might be displaced due to the LUP advice might be between another 5 – 10% of the total development that would have occurred without the hazardous pipeline. So, with a total loss to society of 5% of the original value, this then means we are assuming that the development that does in fact occur around the site is between 85% and 90% of the development that would have occurred without HSE advice.
100. Using the above assumptions, for the 1 to 2 developments advised against per annum, the total cost to landowners over the 10 year appraisal period would be between £0.18m and £2.7m.
101. Under the General Deed of Grant (Easement), if the only reason for planning permission not being granted is the presence of the pipeline, the landowner (developer) can request the pipeline to be moved or that the pipeline owner pays compensation for the loss of development value. 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. Thus, the maximum cost to the pipeline operators to compensate for this loss is between £0.18m and £2.7m over the 10 year appraisal period.
102. However, the pipeline operator may look for alternatives to paying compensation, for instance installing additional safety measures subject to HSE approval or diverting the pipeline. In both cases, it is assumed that the costs of doing so must be

less than the compensation payments. It would also mean that the original development would go ahead and so the only cost to society of this approach would be the costs to the pipeline operators.

103. However, in the absence of information about these alternative costs, it has been assumed that if there is a loss to landowners then this will be compensated by industry and so the cost to industry is estimated to be between £0.18m and £2.7m over the 10 year appraisal period.
104. As noted, this cost to industry is a transfer payment to the landowners for any development that is displaced, and so the overall cost to society is just the 5% of the development value that is actually lost for each consultation, estimated to be between £90,000 and £902,000 over the appraisal period. As noted, the costs are directly associated with the Town and Country Planning (General Development Procedure) Order 1995, which places a duty on HSE to act as statutory consultee. The costs calculated are not a direct consequence of HSE amending the Pipeline Safety Regulations 1996.
105. The costs of compensation have been included to reflect the maximum costs to the industry that could in theory arise as a result of LUP. In practice, the scale of compensation that will actually be required is uncertain as there is no evidence of payments having been made in the past.
106. It is also possible that by classifying gasoline as dangerous, some members of the public may become more concerned than they have been previously about pipelines on their land, simply due to how the pipeline is classified under PSR and not due to an increase in risk associated with the pipeline. In fact, the risk from the pipeline should decrease due to the additional duties that will be employed under PSR. It is possible though that if this is not communicated to the public as effectively as possible, the industry will experience an increased number of questions from the public, combined with possible reputation concerns. This is offset against the chance that an increase in public awareness, which might reduce third party damage, which is discussed in paragraph 57 above.
107. HSE will commit to undertake a post implementation review 2 years after the implementation date, in order to try to find out what was the direct impact on industry as a result of these amendments.

Consultation and familiarisation

108. 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 from the main pipeline operator who are required to familiarise themselves with the changes to the regulations, and 1 each from the smaller pipeline operators. Assuming this familiarisation process takes 2 hours per person, the total cost to industry of familiarisation will be less than £3,000 in total which is insignificant.
109. 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 per LA half an hour to read up on their requirements. The total familiarisation costs for all LAs involved is therefore calculated as £1,400, again being insignificant.
110. Total costs to society of familiarisation are between £3,500 and £4,000.

Costs to HSE

111. When notifications are received, HSE (HID Gas & Pipelines Team) will be required to check that all information received is correct and complete, this is usually carried out by a HSE Band 3 Inspector and is estimated to take half a day. This information is then referred to another part of HSE (HID Risk Assessment Team) for setting the land use planning zones.
112. The HID Risk Assessment Team will spend between 3 and 5 days assessing the information and compiling a paper for submission at a 'Panel'. Panel is a forum for HSE internal technical review and will confirm the appropriateness of the assessment and land use planning distances calculated. HSE estimates that approximately 90% of notifications may be presented to the Panel. There will be around half a day's time required to advise local authorities and local HSE offices of the LUP zones.
113. There will be a small amount of local authority time required when HSE informs them about the land use planning zone, but this is not expected to be significantly more than they are currently incurring.
114. Following notification of a gasoline pipeline, the HSE inspector will prepare an inspection programme covering a 5 year period for the operator which, on average, comprises 3-4 inspector days in the first year, 1-2 days in the second; and as necessary (decided between inspector and operator) in subsequent years.
115. As HSE will not require additional inspectors to meet this requirement, but resource will be diverted from other duties, there will be no additional cost to HSE overall. There could be a change in health and safety outcomes associated with this diversion of resources, but it is not possible to quantify the impact that this might have due to the uncertainty around how inspection activities would change and the complex causality between interventions and outcomes.
116. It should also be noted that work on notifications and enforcement functions in connection with major accident hazard pipelines (as defined under PSR) that are not currently subject to an existing charging regime will become subject to cost recovery in the future and so the cost of these functions will fall to industry. The impact of this has been estimated as being between £1.1m and £2.3m over the 10 year appraisal period.

Total cost to industry

117. The total cost to industry is therefore between £1.2m and £4.3m, including the costs of including gasoline as a dangerous fluid under PSR of between £1m and £1.6m and the potential compensation payments to landowners of between £0.18m and £2.7m.

Total cost to society

118. Comparing the costs to society with the cost to industry, the costs of LUP compensation claims to industry will be an equal and opposite benefit to land owners, and so there will not be an impact on society. Only the actual development lost will be create a cost on society.

119. Total cost to society of Option 2

Cost to society	Total present value £'000 (Min)	Total present value £'000 (Max)
Familiarisation	4	4
Notification	5	6
MAPD – Initial preparation	176	236
MAPD – 5 yearly reviews	29	39
MAPD – yearly audit	88	106
Emergency plans – reviewing and revising	712	1,200
Land use Planning	90	902
TOTAL	1,100	2,500

Risks and Assumptions

120. 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.
121. 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.
122. 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.
123. Thus, the costs and benefits here present just one scenario out of many possible alternative scenarios. However, the scenario selected is thought to represent the most reasonable approximation of reality based on the evidence available at this time.
124. Assumptions are detailed in Annex 2.
125. The health and safety benefits of this intervention have been assessed by estimating the reduction in individual risk that might be achieved by the intervention, and valuing this using HSE's 'value of preventing a fatality' which is currently £1,500,000¹³.
126. The actual calculated 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 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 unignited releases to fall. So, although an attempt has been made to calculate the monetary value that would result for two estimated levels of risk reduction, this is just an illustration of what could be achieved. There are a number of alternative assumptions that could have been made

¹³ <http://www.hse.gov.uk/economics/eauappraisal.htm>

about risk, but in the absence of alternative evidence the 10% - 20% assumption has been used here.

127. The actual costs of land use planning restrictions will depend on the specific development proposals that become subject to Land Use Planning. Again, in the absence of evidence it has been necessary to make assumptions about the number of applications that will be advised against. The cost of LUP restrictions is the largest driver of the cost estimate. HSE has commissioned research to find a weighted average estimate of the cost of LUP restrictions in specific relation to Pipelines. As this project is not complete, assumptions have been made based on the preliminary findings of the research and HSE opinion.

Balance of resource costs and benefits

128. Total costs to society are estimated to be between £1.1m and £2.5m over the 10 year appraisal period. Total benefits are estimated to be between £0.7m and £1.4m over the 10 year period, or costs being 1.7 times the benefits. Costs to society include the costs of LUP advice of between £0.09m and £0.9m around the gasoline pipelines, and although this advice is provided by HSE, the legal duty for HSE to provide this advice comes out of the Town and Country Planning (General Development Procedure) Order 1995 under section 10 and so is not a direct consequence of PSR.

Wider Impacts

Wider impacts per the specific impacts checklist on page 3 have been considered further below.

Statutory Equality Duties

A statutory equality assessment has been performed in accordance with the equality legislation.

Economic impacts

Impact on Competition

The Office for Fair Trading's advice on competition provides four filter questions:

Does the policy:

- Directly limit the number or range of suppliers – No. it is not expected that the review of the Regulations proposed will limit the number of operators of gasoline pipelines, for instance it will not award exclusive rights to a supplier or create closed procurement or licensing programmes.
- Indirectly limit the number of range of suppliers – No, it is not expected that the review of the proposed Regulations will limit the range of operators of gasoline pipelines. Although costs of complying with the additional duties of PSR would have a greater impact on smaller operators, the sort of industries involved with the transport of gasoline in pipelines at the pressures specified, will require large start up costs and so there will be significant barriers to entry. Thus, it is likely that the operators of such gasoline pipelines will be larger organisations. The nature of the industry will already limit competition and so it is not expected that PSR regulations will have a significant additional impact on competition.

- Limit the ability of suppliers to compete –No, it is not expected that the channels available to suppliers will be reduced or reduce the geographic area in which they can operate.
- Reduce supplier’s incentives to compete rigorously – No, it is not expected that it will encourage or enable the exchange of information on prices, costs, sales, or outputs between suppliers.

Impact on Small Businesses, Charities and Voluntary Organisations

As noted above, the sort of industries which will transport gasoline will be large by nature of the significant start up costs associated with such industries. Thus, although the costs of complying with PSR additional duties would have a larger impact, proportionally, on smaller companies, it is unlikely that such smaller companies will be operating at such pressures. Thus, it is not expected that there will be an impact on small businesses, charities or the voluntary sector.

Environmental impacts

Greenhouse gas assessment – the burning of gasoline contributes to CO₂ emissions. The amendments to PSR will only serve to make the transportation of gasoline safer, and will not have an impact on the ultimate end use of gasoline by users, and so will not have an impact on CO₂ emissions.

Wider environmental issues

Updating the Regulations to ensure that the transportation of gasoline in pipelines is appropriately controlled will help to reduce the risk of a catastrophic incident which might adversely affect the environment. Estimates of the reduction in risk that might arise as a result of classifying gasoline as dangerous have been attempted, but are for illustrative purposes only. If an explosive gasoline incident occurred it would cause infrastructure and environmental damage, as well as harm to individuals. By increasing the controls required for the transportation of gasoline the risk of such an explosion is reduced and so there is likely to be less environmental damage over time. Overall cost savings associated with gasoline incidents has been calculated and this includes an element of environmental damage.

Social impacts

Health and wellbeing

It is expected that the amendments proposed will ensure the health and safety of those people working on and in the vicinity of gasoline pipelines. It has been estimated that the amendments might save injuries and lives over the 10 year appraisal period, see paragraph 29 – 43.

Human Rights

Everyone’s life must be protected by law. Thus, the proposal to amend these regulations will assist duty holders in protecting the lives of their workers and the public around gasoline pipelines.

Justice

It is not expected that the proposal will have any impact on justice.

Rural Proofing

It is not expected that the proposal will have any impact on the quality of rural lives.

Sustainability

The sustainability principle is that the current generation satisfies its basic need and enjoys an improving quality of life without compromising the position of future generations. It is expected that the regulations will reduce the number of adverse incidents associated with the transportation of gasoline, and so reduce possible environmental damage, helping to preserve the quality of the environment for future generations.

Summary and preferred option

The preferred option is to amend the Pipeline Safety Regulations 1996 and the Health and Safety (Fees) Regulations to include gasoline as a dangerous fluid, and implement land use planning.

It is estimated that the net cost to society will be between £1.1m and £2.5m over 10 years with an estimated equivalent annual cost of about £216,000. Industry costs are estimated to be between £1.2m and £4.3m over the 10 year appraisal period, with an equivalent annual cost of around £250,000.

Benefits are estimated as between £717,000 and £1.4m over 10 years, with an equivalent annual benefit estimated of around £130,000.

The other options previously outlined were not considered as they would allow discretion on implementation.

Annexes

Annex 1 should be used to set out the Post Implementation Review Plan as detailed below. Further annexes may be added to provide further information about non-monetary costs and benefits from Specific Impact Tests, if relevant to an overall understanding of policy options.

Annex 1: Post Implementation Review (PIR) Plan

A PIR should be undertaken, usually three to five years after implementation of the policy, but exceptionally a longer period may be more appropriate. A PIR should examine the extent to which the implemented regulations have achieved their objectives, assess their costs and benefits and identify whether they are having any unintended consequences. Please set out the PIR Plan as detailed below. If there is no plan to do a PIR please provide reasons below.

<p>Basis of the review: [The basis of the review could be statutory (forming part of the legislation), it could be to review existing policy or there could be a political commitment to review];</p>
<p>Review objective: [Is it intended as a proportionate check that regulation is operating as expected to tackle the problem of concern?; or as a wider exploration of the policy approach taken?; or as a link from policy objective to outcome?]</p>
<p>Review approach and rationale: [e.g. describe here the review approach (in-depth evaluation, scope review of monitoring data, scan of stakeholder views, etc.) and the rationale that made choosing such an approach]</p>
<p>Baseline: [The current (baseline) position against which the change introduced by the legislation can be measured]</p>
<p>Success criteria: [Criteria showing achievement of the policy objectives as set out in the final impact assessment; criteria for modifying or replacing the policy if it does not achieve its objectives]</p>
<p>Monitoring information arrangements: [Provide further details of the planned/existing arrangements in place that will allow a systematic collection systematic collection of monitoring information for future policy review]</p>
<p>Reasons for not planning a PIR: [If there is no plan to do a PIR please provide reasons here]</p>

Annex 2 - List of assumptions used in the model

- Failure rate = 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). (Higher Scientist, Health and Safety Laboratory dated 23rd July 2008).
- Total length of pipeline in UK = 2,147 km (per Health and Safety Laboratory, GIS team calculations, 2010)
- Expected number of ignition events: rural areas = 3%; urban = 5% (Based on original estimates per WSA Report, page 12, which estimated 2.5% of incidents were ignition events in rural areas and 4.3% in urban areas, and adjusted by HSE for wider experience to 3% and 5% respectively).
- Location of pipelines = 10% urban and 90% rural. Advice provided by Higher Scientist, Health and Safety Laboratory (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 = on average 80m in urban areas and on average 60m in rural areas (Assessed by HSE, see Annex 3 for detailed analysis by width of pipeline).
- Individual risk: 1×10^{-6} for urban and rural areas, on average over the whole consultation distance. (HSE best estimate given the extended consultation distance from previous estimates and evidence available at the time of publishing).
- Total night time residential population in zone = 50,593 (urban) and 9,206 (rural). (GIS team at Health and Safety Laboratory 2010, based on 80m buffer zone)
- 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 in rural areas for the average incident (including business interruption costs) = 1% of the Buncefield economic cost = 1% x £894m (Chapter 3 of the Final Report of the MIIB).
- Based on data from HSE PADHI system, analysis of the average number of planning applications advised against around all major accident hazard pipelines over the last two years (50 per annum) and the estimated length of all pipelines of 25,000km, it has been estimated there are approximately 2 advised against cases per 1,000km of pipeline for an average CD of 100m. When this assumption is applied to the length of gasoline pipeline in urban areas, it is estimated that 0.43 applications are advised against per annum. In rural areas there is a much lower development pressure on land and other planning constraints which reduce the impact of HSE planning advice. Therefore it has been assumed that 2 advised against cases per 1,000km of pipeline is an over estimate in rural areas, and it may be more like one advised against case per 1,000km. The number of applications advised against in urban areas is therefore assumed to be around 2. Both the rural and urban estimates are based on the average number of AA cases for all major hazard pipelines, which cover 100m CD on average. It would be expected that the number of cases would reduce in proportion to the size of the CD for gasoline in these areas to reflect the smaller CD in which AA cases might occur. Thus, the total number of AA cases for 2,147km of pipeline is estimated to be between 1 and 2 per annum.
- Whether or not development is advised against depends on the type of development and the zone is it proposed for. According to PADHI, development is advised against if it is classed as a very large and sensitive development in any zone; development for vulnerable people would be advised against if in the middle zone and inner zones; development would be advised against in the inner zone if used by the general public, and finally no developments are advised against if they are used by working populations.

- The Valuation Office Agency (VOA) Property Market Report 2010 was used to estimate the size of the average developments that might be advised against. According to the VOA, the average suburban residential site might be half a hectare in size, or 5,000m². Alternative developments that may be advised against include retail developments and sensitive developments. These are not expected to be a frequently applied for as housing, and the area of 5,000m² is assumed to cover such developments also. To account for smaller retails / sensitive type developments a range in development size has been provided from 1,000m² to 5,000m²
- The value of development that is lost to society for each advised against case is assumed to be 5% of the total land value for residential development (5% lost value for each application reflects the fact that the majority of developments will proceed on alternative sites, or be slightly modified and so proceed on the same land, and so there will just be some efficiency loss to society, Results from an on-going research project indicates that this loss is up to 50% in urban areas, but almost zero in rural area for major hazard sites. Due to the nature of a pipeline and that developments do not have to be moved very far to be outside of the CD, the efficiency loss is expected to be quite small at around 5%).
- The value of land for a residential site has been used to value all the development assumed to be lost. This is the most expensive use of land, so enables the maximum value of the land to be estimated.

Annex 3 - LUP Zones for Representative Gasoline Pipelines

Pipeline	Inner Zone	Middle Zone	Outer Zone/CD
16" Urban	44	75	80
12" Urban	40	75	80
8" Urban	32	55	70
6" Urban	19	45	60
16" Rural	44	44	55
12" Rural	40	40	60
8" Rural	32	32	32
6" Rural	19	19	35

The weighted average consultation distance is estimated as follows, weighted using the percentage of total gasoline pipeline accounted for by each diameter.

Pipeline	Inner Zone	Middle Zone	Outer Zone / CD
Weighted av Urban	38	71	78
Rounded	40	70	80
Weighted av Rural	39	39	57
Rounded	40	40	60

Annex 4 - References

- WSA Report: Assessing the risk from gasoline pipelines in the UK based on a review of historical experience. Prepared by W.S Atkins Safety and Reliability for the Health and Safety Executive. Contract Research Report 210/1999. Available at: http://www.hse.gov.uk/research/crr_pdf/1999/crr99210.pdf
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