

Summary: Analysis & Evidence Policy Option 2

Description: Maintain current insurance and liability levels at €160m (approx. £140m) for intermediate sites

FULL ECONOMIC ASSESSMENT

Price Base Year 2016	PV Base Year 2016	Time Period Years 10	Net Benefit (Present Value (PV)) (£m)		
			Low: £0m	High: £0m	Best Estimate: £0m

COSTS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low	N/A	0	£0m
High	N/A	Optional	£0m
Best Estimate			£0m

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

The Paris Brussels Convention requires nuclear site operators to hold third party insurance covering the risks they present. Sites classed as standard risk are required to hold insurance for €1200m and those deemed to be low risk sites are required to hold insurance of €70m. Government has consulted with stakeholders on defining a third category of sites, intermediate sites, whose risk lies between that of standard and low risks sites. The agreed definition moves 14 sites out of the standard sites category and into an intermediate sites category. This change is expected to reduce the cost of insurance for these sites by £44.8m.

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

Non-monetised costs include any extra administrative costs passed onto insurance premia of having to hold insurance in euros rather than pounds. These are likely to be very minimal.

Implementing the changes to the Conventions will widen the types of damage for which compensation may be claimed for compared to today. Therefore, the insurance premia will increase to reflect this wider scope of damages covered even when the total liability covered is held constant. There are currently no data available to quantify this potential impact so it is non-monetised.

BENEFITS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Benefit (Present Value)
Low	Optional	Optional	£0m
High	Optional	Optional	£0m
Best Estimate			£0m

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

The creation of an intermediate sites category is expected to reduce the cost of insurance to the 14 affected nuclear sites by approximately £44.8m. As the Convention sets out the liability requirements in euros the cost of insurance will fluctuate as exchange rates change, sensitivity analysis has been done to capture the range of uncertainty in exchange rates.

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

The widening of the scope of liability and insurance cover for business, which may lead to a non-monetised cost to business will have an equivalent and offsetting benefit to government in terms of reduced liability held by government. No evidential basis to reduce current level of liability.

Key assumptions/sensitivities/risks

Discount rate(%) 3.50

Likelihood of incident at intermediate sites assumed to be low. The exchange rate used in this analysis is such that £140 is equal to €160 (see footnote 1).

BUSINESS ASSESSMENT (Option 2)

Direct impact on business (Equivalent Annual) £m:			In scope of OI30?	Measure qualifies as
Costs: 0.0	Benefits: £5.8	Net: £5.8	No	N/A

Evidence Base (for summary sheets)

Background

1. The UK is a Party to the Paris Convention on nuclear third party liability and the Brussels Supplementary Convention (The “Conventions”). These Conventions provide for the payment of compensation for damage following a nuclear incident. The UK implements the Conventions through the Nuclear Installations Act 1965 (the 1965 Act). The Conventions were updated in 2004 and the Act has been prospectively amended by the Nuclear Installations (Liability for Damage) Order 2016 (2016/562) (the 2016 Order) to implement the changes to the regime. As part of the third party liability regime the operators of nuclear licensed sites are liable for compensation claims for third party damage arising from a nuclear incident and are required to have insurance to cover their liabilities.
2. From 2018, when the revised regime is expected to come into force, the liability of operators of nuclear sites will increase. Standard sites will see their liability increase from £140m to €1200m (~£1bn) and low risk nuclear sites will see liabilities increase from £10m to €70m (~£60m)¹.
3. Once the revised regime comes into force the types of damages that may be compensable increases by a further four types (see figure 1). At this stage, it is not possible to know whether this could lead to more claims.

Figure 1: current and new liabilities under the Paris Convention

	Current regime	Revised regime
Categories of damage	Property damage Personal injury/death	Property damage Personal injury/death Economic loss arising from property damage or personal injury Costs of measures of reinstatement of impaired environment Loss of income deriving from a direct economic interest in any use or enjoyment of the environment Costs of preventive measures
Time limits	10 years	Personal injury/death - 30 years All other damages – 10 years
Geographical scope	Injury/damage in countries that are party to the Paris/Brussels Conventions	Paris /Brussels signatory states Non-nuclear states not party to the Conventions Vienna Convention parties who have ratified the Joint Protocol (if the UK has ratified it as well) Countries with reciprocal arrangements

Problem under consideration

4. Several sites classified as standard sites do not have a level of risk warranting a €1200 million liability limit, but do not qualify for the “low-risk” category of liabilities. For this reason the Government wants to introduce a new category of “intermediate sites” setting a liability limit that is proportionate to the risks of each site.

¹ The central analysis implicitly assumes an exchange rate of around 0.875 GBP to EUR would leave the liability and insurance requirement of the preferred option neutral in terms of the switch from a £140m threshold to one at €160m. We have assumed the exchange rate to be around 0.875 in the analysis as it is a close yet conservative approximation to a long-term historic average, and one that removes exchange rate volatility: over the past eight years since April 2008 – the time of the global financial crash – the GBPEUR exchange rate has averaged around 0.82 or within 5-6% of the rate required to leave the preferred option approximately neutral. Since the outcome of the referendum of Britain exiting the EU, the GBREUR exchange rate has averaged around 0.86 or within 2-3% of the rate required to leave the preferred option approximately neutral. At the average rate post-Brexit the GBREUR exchange would cause a new liability threshold of 160 EUR to be lower (£138m) than the current threshold. *Source: Bank of England*

5. In response to the public consultation² a number of operators stated that the definition excluded several sites classifiable as “intermediate sites”. Keeping these sites in the standard category would have prevented achieving proportionate regulation.
6. These operators argued that Government should extend the definition of intermediate lower level of liability and insurance for such “intermediate sites”.

Rationale for intervention

7. Nuclear sites are required to hold insurance which covers the liability they, and society, would face in the event of a nuclear accident. The various categories of nuclear sites present different levels of risk and as such it is appropriate that the level of insurance required for each site category is adjusted to reflect the risk they pose. As the operator is best placed to minimise the risks and costs of a nuclear incident it is likely that the transfer of risk from government to site operator will lead to a more efficient social outcome.
8. The Paris Convention sets a minimum liability and insurance limit of €700m for standard sites. The Government has chosen to set a limit of €1200m as this transfers to the nuclear operators liability that would otherwise rest with the taxpayer (this was agreed at the time not to be gold-plating). The Convention also provides the scope to set a lower limit (minimum €70m under the revised regime) in the case of sites where an accident is unlikely to give rise to significant levels of damage, and the discretion to determine the classification of such sites. In implementing the revised Paris Convention, the Government has increased the liability and insurance limit for the current very low risk sites from £10m to €70m (the minimum permitted under the revised regime).
9. In the impact assessment for the 2016 Order³, the €1200m⁴ insurance requirement is applied to all standard sites including those that were not power plants but undertook activities such as the manufacture of nuclear fuel and uranium enrichment.
10. The current policy on Convention implementation would lead to a €1200m liability and insurance requirement to power generating and other high risk sites and intermediate sites alike when the UK implements the changes to the Conventions. Therefore, it is necessary to intervene to prevent a disproportionate regime applying to these intermediate sites when the Convention amendments come into force. Government committed to considering the options to set a lower level of liability for such intermediate sites in its response to the earlier consultation.

Policy objective

11. The policy is intended to ensure that certain nuclear licensed sites in the UK, which do not engage in electricity generation or spent fuel reprocessing i.e. “intermediate sites”, are regulated proportionately to the risk they represent and for their financial liability under the revised regime to be set at an appropriate level.
12. In considering the question of the appropriate level of liability limit for intermediate sites Government’s objectives are that implementation of the Convention for these sites:
 - i) complies with the Conventions;
 - ii) does not unnecessarily add to operators’ business costs or reduce their competitiveness; and
 - iii) is proportionate to the risks.

Description of options considered

13. Alternatives to regulation were not considered because the Conventions and UK legislation - the Nuclear Installations Act 1965 (under section 19)⁵ - require operators to have insurance in place to cover their liabilities. Therefore, implementation of the Conventions can only be done through amendments to legislation.

² <http://www.gov.uk/government/consultations/consultation-on-defining-nuclear-prescribed-sites-and-transport>

³ The IA was published alongside the implementing legislation in May 2016: <http://www.legislation.gov.uk/ukSI/2016/562/impacts>

⁴ The liability will initially be €700m, rising to €1200m over 5 years.

⁵ <http://www.legislation.gov.uk/ukpga/1965/57/section/19>

14. Government carried out a consultation between June and August 2016 on proposals to define prescribed sites and transport, including proposals for the definition of intermediate sites⁶. 17 relevant responses to the consultation were received of which two thirds commented on the intermediate sites definition. Overall the responses supported the Government's proposed definition of intermediate sites but considered that the proposed definition was too narrow because it did not take account of the range of activities that take place on some sites and did not include nuclear power reactors that are being decommissioned. As a result Government is amending its proposals to apply to wider range of sites that present a low hazard and likelihood of an incident occurring which would cause damage greater than the proposed liability limits.
15. Government is consulting further on the definition to apply to intermediate nuclear sites. This impact assessment updates the earlier impact assessment⁷ on these proposals to cover a larger number of prospective intermediate sites.
16. The options considered were:

Do nothing counterfactual: The UK Government implements the requirements of the Conventions by making amendments to the 1965 Act⁸ and sets the liability of intermediate and standard risk sites at the same level. Intermediate site operators would be required to hold insurance for €700m (~£600m) worth of liability in 2018, increasing by €100m (~£85m) each year until 2023, at which point they would be holding insurance for a liability of €1.2b (~£1bn). At this point, there would be no further increases in insurance levels and intermediate site operators would be required to hold insurance for €1200m (~£1bn) worth of liability into the future.

Option 1: Also does not distinguish between intermediate and standard risk sites, it sets a constant liability and insurance requirement of €700m (~£600m) (the minimum the Conventions allow for standard sites). This would require an amendment to the 1965 Act to implement;

Option 2: Introduces a distinction between intermediate and standard risk sites. The insurance requirements under this option are broadly in line with that practiced for similar sites by a number of other Paris Convention countries. This sets the financial liability and insurance requirements at €160m and is the preferred option. The installations included in the definition of "intermediate sites" do not achieve a critical nuclear fission reaction, nor do they handle or store the large radioactive (including fission product) inventories associated with power reactors, and spent fuel reprocessing plants and their associated facilities. Therefore the hazards are lower. The principal risk at these intermediate sites tends to be chemical rather than nuclear and such non-nuclear risks are not covered by the Conventions in any event. For sites that are no longer operating as nuclear power plants and are in the process of decommissioning, once irradiated nuclear fuel has been permanently removed from the reactors and stored safely in line with relevant good practices the likelihood of an incident at such sites falls very considerably.

Option 3: makes no distinction in risk between very low risk sites and intermediate risk sites by setting the financial liability and insurance requirements at €70m (~£60m) (the minimum the Conventions allow for low risk sites);

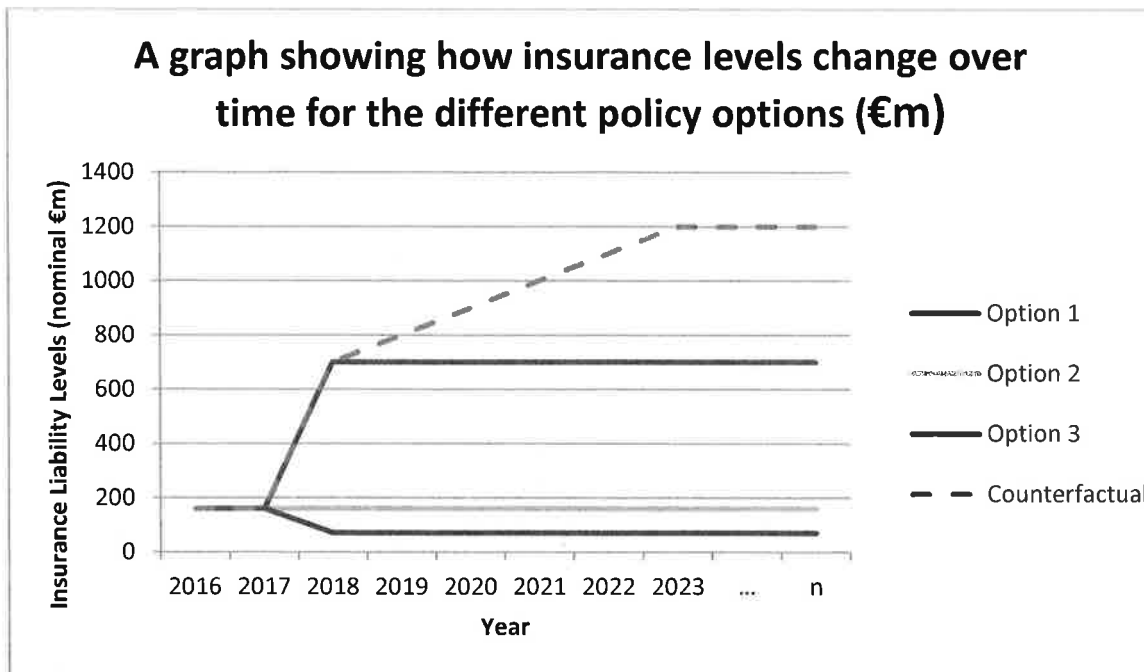
Option 4: sets the financial liability and insurance requirements of intermediate risk sites within the bounds set out under the Paris Convention (between €70m (~£60m) and €700m (~£600m). This would require an amendment to the 1965 Act to implement.

⁶<http://www.gov.uk/government/consultations/consultation-on-defining-nuclear-prescribed-sites-and-transport>

⁷https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/533265/Nuclear_intermediate_sites_consultation_impact_assessment_May_2016.pdf

⁸ This would be the case upon implementation of the amendments to the Conventions without further government intervention.

Figure 2: Graph showing changes in insurance levels over time for the different policy options (nominal €m)



Note – Option 4 is not displayed on the graph above due to the uncertainty in the levels of liability required under this option. The level of insurance liability will lie between those for options 2 and 3.

- It is worth noting that all considered options have an increased scope of damages covered than that presently covered, this is in line with the requirements of the Convention. The insurance quotes underlying the cost and benefits analysis does not take this into account and as such underestimate costs faced by site operators.

Societal impact: Costs and benefits of each option (including administrative burden)

- When considering the costs and benefits of each option it should be noted that it is the impact on business that is presented below. The impact at the societal level is estimated at zero for each of the options. This is because changing the level of financial liability and the corresponding insurance cover does not change the underlying nature of the risk being insured, it only reallocates who pays for any contingent liabilities should they arise. Government is obligated to pay for any costs arising from an accident at these sites that exceeds their capped liability and so any changes in liability levels for business will represent an equal and opposite change in liability levels for government.
- It should also be noted that, in the unlikely event of an incident at an intermediate site, although the risk of claims for compensation exceeding €160m is judged to be very low it cannot be completely ruled out and therefore neither can the risk of the Government having to provide additional public funds for compensation in the preferred scenario. The value of this risk increases with lower liability levels for the private operators and decreases with increases in private sector liability. To date there have been no claims under the 1965 Act from these sites.
- The resource cost associated with Government holding such contingent liability (Government effectively holds some of this currently) is not quantified in Government Accounts. However, we can use estimates of nuclear industry insurance costs as a theoretically sound and appropriate proxy value for the equivalent costs to Government of holding this liability. This is approved by HMT and is consistent with the approach taken in the original Paris and Brussels Conventions IA⁹; this was deemed fit for purpose by the RPC.

⁹ <http://www.legislation.gov.uk/uksl/2016/562/impacts>

21. In using this approach, it is noted that there may be some difference between the costs of the private insurance sector of holding this liability and of Government holding it. However, there is no proportionate way to estimate such potential differences and so they are not monetised.
22. There is a large global capital market which may be able to provide reinsurance facilities to allocate this risk. It is not clear whether this would be more or less efficient than when the contingent liability is allocated among UK taxpayers by HMT. This potentially provides a small non-monetised cost or benefit of options that do not maintain the current liabilities level.
23. The on-going cost of the liability regime for operators is the requirement to have insurance or other financial security to cover their nuclear third party liabilities. The amendments to the regime will require them to pay for an increased range of insurance cover.
24. There is a potential non-monetised cost with the increased liability level options, relating to the risk that some businesses might close down or operate with lower employment, wages and/or profits. This could happen if the higher levels of liability required increased costs to businesses by an amount that they could not afford. There is no increased cost to consumers because there is little or no change that the operators would be passing on. This is not monetised as any reduction in profits and wages at these businesses would be expected to be offset by increases in other economic activity associated with the reduction in government liabilities.

Business impact: Costs and benefits of each option (including administrative burden)

25. At least 14 sites (belonging to four nuclear operators – GE Healthcare Ltd, Nuclear Decommissioning Authority (NDA), Urenco UK Ltd, Springfields Fuels Ltd) of the 30 civil nuclear licensed sites in the UK appear suitable to be considered as intermediate sites benefitting from maintaining their liability at €160m (~£140m).
26. Estimates for future insurance costs were obtained from three representative sites for the three liability thresholds presented in options 1-2, the mean estimated future insurance cost has been applied to all 14 eligible sites. For option 3 a proxy of the insurance costs associated with a liability threshold of €70m, using data from Cyclife, has been used to assess the impacts on all 14 eligible sites. Estimates and proxies have been used instead of actual insurance quotes due to it being disproportionate for insurers to calculate policy quotes purely for this assessment. Actual insurance costs for option 2 are likely to be higher than that used in this analysis, despite the liability threshold remaining approximately unchanged; this is due to the introduction of exchange rate risk along with the increased scope and new heads of damage which will apply to intermediate sites under the revised Paris regime.
27. For the range of options presented, the expected range of impacts compared to the counterfactual is that the proposals will have an impact on business of savings of £8m and £52m over 10 years (benefit of £26m to £114m over 25 years) (2016 prices, 2016 PV base year) in net present value terms (figures 3 & 4)¹⁰.
28. Since the new liability and insurance level is required to be held in euros rather than sterling, it is plausible that the sterling quotes obtained from firms may fluctuate according the EURGBP exchange rate. As a result, a sensitivity analysis was undertaken whereby unforeseen exchange rate fluctuations cause the cost of options to increase or decrease by 10% around our central estimate¹¹.

¹⁰ These are estimates the companies have provided for cover at £140m (~€160m), €700m (~£600m) and €1200m (~£1bn) and quotes for a proxy site for €70m (~£60m).

¹¹ Note this does not necessarily mean that exchange rates changed by +/-10% as some element of the change in quotes may be due to fixed costs. Without better evidence on exchange rate changes, an arbitrary 10% margin was taken either side of the central estimate.

Figure 3: Summary benefits to business relative to Do Nothing Counterfactual, discounted at the social discount rate (10 years)

	NPV benefits to business over 10 years		
	High Estimate (Weak GBP)	Central Estimate	Low Estimate (Strong GBP)
Option 1 - €700m liability	£20.0m	£14.8m	£8.4m
Option 2 - €160m liability (Preferred)	£47.3m	£44.8m	£41.8m
Option 3 - €70m liability	£51.9m	£49.8m	£47.3m
Option 4 - €70m - €700m liability	£51.9m	-	£8.4m

Figure 4: Summary benefits to business relative to Do Nothing Counterfactual, discounted at the social discount rate (25 years)

	NPV benefits to business over 25 years		
	High Estimate (Weak GBP)	Central Estimate	Low Estimate (Strong GBP)
Option 1 - €700m liability	£49.1m	£32.1m	£25.7m
Option 2 - €160m liability (Preferred)	£104.4m	£85.3m	£93.3m
Option 3 - €70m liability	£113.7m	£94.2m	£104.5m
Option 4 - €70m - €700m liability	£113.7m	-	£25.7m

29. Analysis shows that lower levels of insurance liability result in greater benefits for site operators, this is because insurance premiums fall proportionately with liability. As there is no evidence to support a change in the risk of intermediate sites the preferred option is to hold the amount of insurance liability at close to the current level of £140m (€160m), this view is supported by industry¹².

Rationale and evidence that justify the level of analysis used in the IA (proportionality approach)

30. The central estimate for option 2, the preferred option, anticipates a cost saving to business approximately £44.8m. Due to the lack of claims history for these sites it is not possible for Government to be sure of the exact level of insurance to set. There is no evidence to suggest that £140m (~€160m), the level of insurance intermediate sites currently require, is inappropriate.

Risks and assumptions

31. The main assumptions are:
- The likelihood of an incident at an intermediate site which leads to a release of radioactive material, which causes damage, is extremely low.
 - Operators cite that the distinction between the level of risk associated with sites that are not operating power reactors or where nuclear reprocessing takes place is an established concept in other European jurisdictions.
 - Insurance limits specified by the different options are minimum, and not maximum, values that the nuclear sites might take out insurance for.
 - "Industry" refers to the four operators, (Nuclear Decommissioning Authority, Urenco, Springfields Fuels Ltd and GE Healthcare Ltd), that operate intermediate sites.
32. The main risks are:

¹² Operators argue that likely consequences of a nuclear incident originating at their plant are minimal due to the plant not having a nuclear reactor. <https://www.gov.uk/government/consultations/compensating-victims-of-nuclear-accidents>. In the case of nuclear reactors that have been permanently defueled the risk of damage arising from an incident is expected to be substantially lower.

- That following a nuclear incident at an intermediate site the costs of claims for damages are such that they exceed the amount of liability and insurance set and must be met from the public purse.
 - This would bring into question whether the level of the liability and insurance requirement for intermediate nuclear site operators is correct.
 - It would not affect the numerical analysis of the policy options relative to the counterfactual

Direct costs and benefits to business calculations (following OI30 and BIT methodology)

33. These costs apply to the four operators of intermediate nuclear sites (Nuclear Decommissioning Authority, Urenco, Springfields Fuels Ltd and GE Healthcare Ltd).
34. The direct costs considered in the assessment are the changes in the insurance costs arising from different levels of liability limits as set out in paragraph 16. For each option the costs and benefits are shown in figures 3 and 4.

Scoring for Business Impact Target

35. Ministers in the then Department for Business, Innovation and Skills (BIS) agreed that the overarching policy on the implementation of the Paris Brussels Conventions was compliant with the guiding rules to transpose international commitments¹³ and that as such, its impacts were out of scope of the then One-In-One-out commitments of the department¹⁴. As this measure implements one aspect of the Conventions, its impacts are also out of scope from the Business Impact Target. Note that these costs were also included in the monetised costs to business in the 2016 Order Impact Assessment.

Wider impacts

36. The wider impacts of the implementation of the revised Conventions are set out in the Wider Impacts section of the Impact Assessment for the 2016 Order and are unchanged¹⁵.

Specific impact tests

37. Small firms and micro-business: the four operators (14 sites) impacted by the policy all have >49 employees¹⁶, therefore this policy will not create disproportionate burdens on small businesses.

Summary and preferred option with description of implementation plan

38. Certain nuclear licensed sites do not pose a significant risk of third party damage in the event of a nuclear incident. The installations at these intermediate sites do not achieve a critical nuclear fission reaction, nor do they handle or store the large radioactive (including fission product) inventories associated with power reactors and spent fuel reprocessing plants and their associated facilities, and therefore the hazards are lower. In the case of former nuclear power plants the fuel has been permanently removed from the reactors and stored safely in accordance with recognised best practices. Therefore, it would be disproportionate to apply the same level of liability and insurance as for operating nuclear power plants and spent fuel processing facilities. The preferred option is to set the liability and insurance limit for intermediate sites at the approximately current level of liability of £140m (~€160m).
39. Following the consultation on the Government's revised proposals on prescribed sites (including intermediate sites) the criteria to define the nuclear sites that will be covered by the new intermediate sites category will be set out in a replacement to the Nuclear Installations (Prescribed Sites) Regulations 1983 (1983/919).

¹³ <http://www.legislation.gov.uk/ukxi/2016/562/impacts>

¹⁴ See footnote 14

¹⁵ According to company websites

¹⁶ See footnote 16

Annex A

Liability Levels in Other Countries

1. Other European countries such as the Netherlands and Germany (both places where Urenco has sites), impose reduced liability and insurance levels for such intermediate sites and they are expected to continue to do so. For example, in the Netherlands enrichment facilities fall within a category of low-risk installations that has levels of liability between €22.5m and €45m (which are lower than the level of liability for other nuclear sites). Under the revised regime has been set at €70m. In Germany the position is that whilst all nuclear operator liability is unlimited in amount, enrichment facilities are required to carry a lower level (€240m) of financial security than reactor operators. France also has the concept of low risk installations which carry a level of liability (currently €22.9m) which is lower than that of nuclear reactor operators. The French and Dutch liability levels will rise to a minimum of €70m when the revised liability regime comes into force.
2. In the USA, (although not party to the Paris Convention) enrichment facilities constructed after 1990 are exempt from their national liability regime and legislation provides for the Nuclear Regulatory Commission to determine appropriate levels of liability for such enrichment facilities. The Nuclear Regulatory Commission has subsequently determined that an appropriate level of nuclear liability for Urenco's enrichment facility in New Mexico is \$300m, which is substantially less than the level imposed on reactor operators.

Table A.1: International nuclear liability and insurance requirements for “intermediate” sites

Country	Liability and insurance requirement	
	Current	Revised regime
Netherlands	€22.5m - €45m	€70m
France	€22.9m	€70m
UK	£140m (~€160m)	€160m
Germany	€240m	€240m
USA	\$300m (~€220m)	N/A