

Part 2b: Decommissioning and Waste Management Plan Guidance

Introduction to the DWMP Guidance

- 2b.1 This section contains revised draft Guidance for operators and potential operators of new nuclear power stations to assist them in drawing up a DWMP which should set out and cost the steps involved in decommissioning a new nuclear power station and managing and disposing of hazardous waste¹.
- 2b.2 Together with separate FAP Guidance, this Guidance provides information on what an FDP should contain in a way which the Secretary of State may approve.
- 2b.3 The aim of the DWMP is to demonstrate that the decommissioning of the nuclear power station and management and disposal of waste can be undertaken in a way which is prudent and consistent with the requirements and expectations of the safety, security and environmental regulators. *[NNB Note: In NNB's view, this is the Regulator's function and this proposal risks dual regulation. The proper aim of the DWMP, from the FDP perspective, is to give accurate and up to date estimates of the costs of decommissioning and waste management as set out in the final sentence of this paragraph. See also NNB comments in relation to paragraph 1.13.]* By forming part of the FDP required to be approved by the Secretary of State, it is designed to ensure that a plan for these activities, based on established techniques and steps, is prepared prior to the construction of the nuclear power station. It is also designed to ensure that accurate and up to date estimates of the costs of decommissioning and waste management and disposal are provided, to demonstrate that prudent provision will be made to meet these costs.
- 2b.4 Under the Energy Act, as one of a number of approvals to build a new nuclear power station, operators will be required to submit an FDP to the Secretary of State for approval. The Energy Act requires such operators to provide to the Secretary of State details of their plans for managing and disposing of all wastes.
- 2b.5 The DWMP is that part of the FDP that addresses those matters referred to in section 45(7)(a) and (b) of the Energy Act, namely details of the steps to be taken in relation to what are called the "technical matters" and estimates of the costs likely to be incurred in taking steps in relation to what are called the "designated technical matters".
- 2b.6 The technical matters are the steps set out in the DWMP relating to the decommissioning of the power station, cleaning up of the site, and waste management and disposal activities. The requirement that these be set out is intended to meet the overall objective of the FDP that operators make prudent provision for the full costs of decommissioning their installations; and their full share of safely and securely managing and disposing their waste, and that in doing so the risk of recourse to public funds is remote at all times.
- 2b.7 Some of the technical matters are designated technical matters. These are defined in the Energy Act as being the steps that need to be taken to decommission the installation and clean up the site (which includes the management and disposal of waste) after the nuclear power station has finally ceased generation. The Act also envisages that certain steps

¹ The Government's policy is that new nuclear power stations should proceed on the basis that spent fuel will not be reprocessed. Thus the Base Case assumes that there will be no re-processing of spent fuel and that spent fuel will be disposed of after it has been used. Therefore spent fuel is regarded as waste for the purposes of this Guidance.

undertaken during the generating life of the station may also be specified as designated technical matters by Order.

- 2b.8 The Government proposes that the following activities will be designated technical matters by Order² under the Energy Act:
- construction and maintenance³ of interim stores for ILW and spent fuel that are not initially constructed as part of the installation;
 - any activity preparatory to the decommissioning of a relevant nuclear installation and the cleaning up of the site. *[NNB Note: NNB understands that this wording is intended to refer only to pre-closure planning in the final 3 years of operation. This should be clarified in the Guidance and it is NNB's view that the FDP Order should also be amended to make this clear (as the Guidance does not have the force of law and such an interpretation may be contrary to the normal English language meaning of the FDP Order).]*
- 2b.9 The key difference between the technical matters and the designated technical matters is that the cost of non-designated technical matters are to be met by the operator from operational expenditure, while the costs of designated technical matters must be provided for in the independent Fund which operators will be expected to set up. Table 3 sets out a summary of principal cost streams and whether the cost will be met from operational expenditure or the independent Fund.
- 2b.10 The costs of non-designated technical matters will not be subject to the terms of the FAP approved by the Secretary of State under the Energy Act. However, operators must detail in their DWMP the steps to be taken in relation to the technical matters to demonstrate that they have realistic, clearly defined and achievable plans. *[NNB Note: NNB considers that the technical matters should only be covered in the DWMP to the extent they are relevant to the designated technical matters. In NNB's view, the requirements in the DWMP in relation to the non-designated technical matters should be minimal. Significantly less detail is necessary in the DWMP (compared to the designated technical matters) due to the fact that the technical matters include operational matters subject to existing regulation and are not financed through the Fund.]* Payments for costs of non-designated technical matters will need to be made at the time these expenses are incurred, that is during the generating life of the station, when the operator should have access to sufficient monies to meet such costs without reference to the Fund. It is also anticipated that such costs are likely to be incurred at regular intervals so it is appropriate that these costs should be met from operational expenditure to avoid the unnecessary cost and burdens that would arise, were monies to be paid into the Fund only to be withdrawn in a relatively short period of time later (e.g. within the same financial year).

Structure of the DWMP

- 2b.11 This Guidance will assist operators in understanding their obligations under the Energy Act, and what is required for an approvable DWMP. The Guidance is not intended to be unduly

² http://www.opsi.gov.uk/si/si2010/draft/pdf/ukdsi_9780111502877_en.pdf

³ Maintenance costs are taken to mean those costs that are required to be incurred so that the integrity of the store remains such that it is able to safely and securely store the waste and spent fuel for the required period of time. It is not considered to include ongoing operational expenditure relating to the stores such as, for example, security and utilities.

prescriptive but instead sets out the principles which the Secretary of State would expect to be satisfied in the operator's DWMP.

- 2b.12 The Secretary of State would expect the DWMP to be divided into three principal phases, as outlined later in this part of the Guidance. In addition, there are a number of elements that an approvable DWMP would also be likely to include, namely:
- A clear timeline showing key milestones and giving scheduling assumptions in each of the three phases of the Base Case as defined below.
 - A summary of the key assumptions underpinning the operator's DWMP. In particular the operator should provide details of any assumptions that differ from the Base Case, with an explanation of reasons for any proposed deviation from the Base Case.
 - A summary of the operator's cost estimates, in a format consistent with Table 3 in this section of the Guidance.
 - An explanation of the derivation of the cost estimates including the operator's analysis of the level and sources of risk and uncertainty in those estimates.
 - An explanation as to how the assumptions and parameters underpinning the DWMP are expected to evolve over time as the new nuclear power station operates and draws near to closure.

Level of detail in the DWMP

- 2b.13 Operators should provide [sufficient detail] in their DWMPs on both the technical matters *[NNB Note: See comments in relation to the information and level of detail in respect of non-designated technical matters in relation to paragraph 2b.10, above.]* and designated technical matters to enable the Secretary of State to have confidence that they have realistic, clearly defined and achievable plans. The amount of information that operators provide on specific activities should be such that the Secretary of State is able to be satisfied that the operator's cost estimates are prudent. The level of detail should be commensurate with the impact that the activity will have on the level of liabilities. However, the Government would expect to see a greater level of detail on the designated technical matters in order to have sufficient information to substantiate the operator's cost estimates for these.
- 2b.14 For example the Secretary of State would want to understand an operator's intended operating strategy, including the level and range of fuel "burn-up" that is anticipated, insofar as it may impact on, for instance, the predicted spent fuel inventory for the site and its relevant characteristics. This information will substantiate the operator's assessment of the volume and characteristics of the spent fuel to be produced, and will thus have a direct bearing on the costs of waste management and disposal. This information is necessary for the Secretary of State to have confidence that the operator is making adequate financial provision to meet liabilities.
- 2b.15 On the other hand, the Secretary of State does not expect the DWMP to provide technical information relating to the day to day running of the station unless this information is material to the estimates of decommissioning and waste management costs. The key consideration is the effect on liabilities at the end of generation and the manner in which these will be discharged. In establishing whether sufficient underpinning detail exists to substantiate cost estimates the Secretary of State would expect to rely on the independent

verification of the operator's DWMP⁴, which will be required to address this question specifically.

The Base Case

Introduction to the Base Case

- 2b.16 This section sets out a number of assumptions regarding the means by which waste may be managed and disposed of and decommissioning carried out by a new nuclear power station operator. These define a generic lifecycle plan for new nuclear power stations known as the "Base Case".
- 2b.17 The Base Case serves two principal functions:
- It sets out the key points which the Secretary of State would expect to be addressed in a DWMP that is submitted for approval.
 - It acts as a vehicle to enable the Secretary of State to estimate the range of costs associated with decommissioning and hazardous waste management and disposal⁵. This will ensure that the Secretary of State, the NLFAB and the Fund have a benchmark against which to assess the estimates produced by the operator.
- 2b.18 It is recognised that DWMPs for individual power stations will differ in detail from the Base Case as they will be based on a specific station design at a specified site run by a particular operator. If, however, a DWMP broadly conforms to the assumptions underlying the Base Case, the Secretary of State would expect to approve it (or approve it with relatively minor modifications). Section 46(4) of the Energy Act requires the Secretary of State to exercise his powers to approve an FDP with or without modifications or conditions in relation to the approval, or to reject it, with the aim of ensuring that it makes prudent provision for the technical matters, including estimates of the costs of designated technical matters.
- 2b.19 An operator's DWMP should achieve the overall outcome of ensuring that prudent provision is made for carrying out and estimating the costs of waste management, disposal and decommissioning. Operators will be expected to have regard to the Base Case when developing the DWMP they will submit to the Secretary of State. However, there will be flexibility to allow operators to propose and justify other ways of carrying out decommissioning, waste management and waste disposal if they choose to do so. If an operator puts forward a DWMP that is not consistent with the Base Case, the onus will be on the operator to justify its proposal and the Secretary of State will consider DWMPs based on alternatives to the Base Case on a case-by-case basis.

Relationship between the Base Case and regulatory requirements

- 2b.20 The Base Case is built on existing policy and regulatory requirements; although it also makes additional assumptions to ensure it represents a realistic and prudent means of estimating the costs of the designated technical matters. Each operator's FDP must ensure

⁴ For more information on third party verification see "The Energy Act 2008: Consultation on the Financing of Nuclear Decommissioning and Waste Handling Regulations"
http://www.decc.gov.uk/en/content/cms/consultations/nuc_waste_cost/nuc_waste_cost.aspx

⁵ The formulation of the cost estimates does not detract from the duty which the Secretary of State expects the Fund should be under to verify cost estimates (as appropriate) put forward by the operator both at the time of first approval of the FDP and pursuant to periodic reviews as set out in the FAP guidance.

that it sets out plans for the management and disposal of all hazardous waste streams and that it includes all the elements for which operators will need to make financial provision.

- 2b.21 The emphasis on ensuring that sufficient financial provision is made to cover the liabilities means that the Base Case may differ in some aspects from the assumptions and requirements of the safety, security and environmental regulators. This is because the Secretary of State and the regulators follow different regimes. However, the distinct purpose of this Guidance is to ensure that operators make prudent financial provision to meet the costs of the designated technical matters.
- 2b.22 Before a decision on approval is made, the Secretary of State will consult the regulators in relation to the plans submitted by operators to ensure that they are consistent with regulatory expectations. [Likewise, where a modification to the DWMP is proposed, the Secretary of State will also consult the regulators.] *[NNB Note: It can be envisaged that the details set out in the DWMP may change from time to time without having material technical or costs consequences. NNB would therefore not anticipate that the SoS or the regulators would wish to be consulted on every occasion that there were such changes to the DWMP.]* We have worked with the regulators to finalise the Base Case.

The Phases of the Base Case to be set out in the DWMP

- 2b.23 The Secretary of State would expect the DWMP setting out the technical matters and the costs of the designated technical matters to be divided into three principal phases.
- Phase 1: Pre-generation – covers those activities relevant to decommissioning and clean up which must be undertaken before construction of a nuclear power station can begin and the period during which operators will be required to obtain all the regulatory permissions required to begin generation. *[NNB Note: NNB does not consider that it is necessary or desirable to set out Pre-Generation activities in the DWMP as we do not believe these have a material impact on the arrangements for decommissioning and waste management.]*
 - Phase 2: During the generating life of the power station – operation of the station, including any modifications or refurbishment required during the generating life and the management of operational wastes.
 - Phase 3: After the end of generation – dismantling the station, management and disposal of remaining waste and clean-up of the site to a condition agreed with the regulators.
- 2b.24 To the extent practicable, operators will be expected to follow this outline of phases in preparing their DWMPs.

[Phase 1 – Pre-generation]

[NNB Note: NNB does not consider that it is necessary or desirable to set out Pre-Generation activities in the DWMP.]

- 2b.25 This phase of the Base Case covers those activities which must be undertaken before a nuclear power station can begin to generate electricity. [The operator will be expected to demonstrate that their DWMP is consistent with the submissions to the planning authorities (including the Infrastructure Planning Commission or its successor bodies) with regard to the application for planning permission or development consent and to the regulators, with regard to the health, safety, security and environmental permits needed to begin

generation.] *[NNB Note: It is difficult to see what value there is for the Secretary of State in this unnecessary, duplicative process which would be time and cost inefficient for operators.]*

- 2b.26 An approvable FDP will require the operator to demonstrate that a credible disposal route for the ILW and spent fuel has been identified. *[NNB Note: In NNB's view, this is not something that operators should be expected to demonstrate in the DWMP as it is in Government's control. It is for Government to assure the planning authorities that they are confident of a credible disposal route.]* The Base Case assumes that this will be in a Geological Disposal Facility (GDF) that the Government will construct to dispose of higher activity radioactive wastes. The terms on which the Government will agree to take title to and liability for an operator's ILW and spent fuel is expected to be set out in a contract to be agreed between the operator and the Government alongside the operator's FDP.

Phase 2 – During the generating life of the power station

- 2b.27 The power station lifetime set out by the operator in their DWMP applies to the maximum period in which funding will need to accrue over the operating life of the station to cover the predicted liabilities. The Base Case assumes that the Fund accrues from a single station operating for 40 years. However we recognise that most current station designs, including those undergoing the UK Generic Design Assessment, anticipate an operational life of at least 60 years and it will be open to operators to justify alternative station lifetimes. If the proposed design has been through the UK Generic Design Assessment process, the Government would expect the proposed station lifetime to be in line with that which has been stated by the Requesting Parties in their submissions. Whatever station life is proposed, in accordance with the relevant part of the FAP Guidance the operator must ensure that its FDP is robust against the risk that the site has to be decommissioned earlier than expected.
- 2b.28 The operator is responsible for ensuring that all the facilities required for any necessary handling, conditioning and storage of operational wastes are available as and when needed. The construction and maintenance costs of interim stores to ILW and spent fuel that are not initially constructed as part of the installation are a designated technical matter. Therefore these activities should be identified and described in the DWMP and provision for these activities set out in the FAP.
- 2b.29 In the final years of the generating life of the power station, the operator will be expected to prepare for the decommissioning of the power station through undertaking detailed pre-decommissioning planning (the main activity undertaken in preparation for decommissioning). Activities preparatory to decommissioning are a designated technical matter for which the cost will need to be met by the Fund. Therefore these activities should also be identified in the DWMP and provision for these activities set out in the FAP.

Phase 3 – After the end of generation

- 2b.30 The Base Case assumes that decommissioning begins when the station is shut down and ceases generating "nuclear" electricity. Decommissioning ends when all station buildings and facilities have been removed and the site has been remediated in accordance with relevant legal and licensing requirements. The Base Case assumption is that the site is restored [to a state similar to "Greenfield"]. *[NNB Note: NNB does not consider that restoration to "Greenfield" status is necessarily appropriate as the Base Case assumption. The key driver for the end state will be the delicensing criteria as set out*

later in this section at Table 2 in paragraph 2b.41.] or similar to its state prior to construction.

- 2b.31 The principal stages of the decommissioning process assumed in the Base Case are described in Table 1.

Table 1: Outline of principal stage of decommissioning

De-fuelling	De-fuelling reactor for the last time and transferring the resulting spent fuel to the fuel pond
Stage 1	Conditioning and packaging of potentially mobile wastes (e.g. spent resins) Transfer of conditioned wastes to interim storage to await final disposal
Stage 2	Demolition of non-essential non-radioactive facilities (e.g. administrative buildings that will not be needed to manage the decommissioning process) Transfer of spent fuel remaining in cooling pond to interim store
Stage 3	Dismantling of reactor and any other structures remaining on site and management and disposal of resulting waste Disposal of ILW and spent fuel from interim stores Remediation of site De-licensing

- 2b.32 The Base Case assumes that the spent fuel from a new nuclear power station is kept in interim storage on the site of the power station until the point at which it is disposed of in a GDF, and that the encapsulation of spent fuel is also carried out on-site. In the absence of proposals for centralised facilities these are considered to be prudent assumptions. However in the event that regional or central facilities were available for either storage or encapsulation of spent fuel that should lead to significant reductions in waste management costs.

"Early Transfer" of title to and liability for an operator's ILW and spent fuel

- 2b.33 The Government expects to take title to and liability for an operator's spent fuel and ILW on a specified Transfer Date, or schedule of Transfer Dates, aligned with the operator's decommissioning timetable. It is currently expected that the Transfer Date(s) will precede the Assumed Disposal Date (the date on which the Government expects to be able to dispose of the ILW and spent fuel in a GDF).
- 2b.34 This "Early Transfer" does not affect the obligations placed on the operator by the Energy Act 2008. In the event that title to and liability for an operator's waste transfers to Government before the Assumed Disposal Date, the operator's plan to manage and dispose of the waste will transfer to Government on the Transfer Date, together with sufficient assets to carry out the plan, in the form of a Lump Sum Payment. After the Transfer Date

the Government will be responsible for ensuring the future management of the waste. The Secretary of State will expect the operator's waste management plans for the period between the Transfer Date and the Assumed Disposal Date to be of the same standard of robustness and prudence as its plans for the period before the Transfer Date.

- 2b.35 The Lump Sum Payment would be a full and final payment for all remaining waste management costs (including the decommissioning of interim stores if necessary). The level of the Lump Sum Payment would not be set at the outset but instead would be estimated in the operator's FDP and regularly reviewed. It is anticipated that the final level of this Lump Sum Payment would be set out in the last quinquennial review of the operator's FDP before the Transfer Date.

[NNB Note: NNB welcomes this clarity and the improved certainty it provides.]

- 2b.36 At present there is uncertainty over these waste management costs but this should reduce over time. By the Transfer Date it should be possible to estimate these costs with a much higher degree of confidence. Notwithstanding this, under this approach the Government would expect the operator's provision to be based on a conservative, evidence-based, estimate of the waste management costs and would expect the Lump Sum Payment to include a [commensurate risk premium] to compensate the taxpayer for taking on the risk of subsequent cost escalation.

[NNB Note: NNB would expect to agree a suitable risk premium to be included in the Lump Sum Payment as part of the Waste Transfer Contract.]

- 2b.37 In the event that the operator expects its waste to transfer to Government before the Assumed Disposal Date, the operator's DWMP should clearly set out those steps expected to take place after the Transfer Date and the cost of those steps. The operator's plan should also contain an estimate of the Lump Sum Payment, including an allowance for a commensurate risk premium, to ensure that the Payment is sufficient to cover all waste management costs incurred between the Transfer Date and the Assumed Disposal Date.
- 2b.38 If geological disposal facilities are not available at the Assumed Disposal Date then the intention of Government would be to meet costs for maintaining the interim stores after the Assumed Disposal Date from the risk premium included in the Waste Transfer Price.
- 2b.39 The terms on which the Government will agree to take title to and liability for an operator's ILW and spent fuel will be set out in a contract that is expected to be agreed between the operator and the Government alongside the operator's FDP.

Updated cost estimates

- 2b.40 The Base Case is a key input into the Government's work to assist operators in drawing up a DWMP. Alongside this, the Government has completed an exercise to develop updated estimates of the costs of decommissioning, waste management and waste disposal and these updated estimates were published in chapter 5 of the March 2010 consultation document⁶. An operator of a new nuclear power station will be expected to calculate their own estimates of these costs, which will differ from those produced by the Government, as they will be specific to the station design, site and other operational decisions of the

⁶ Consultation on a Methodology to Determine a Fixed Unit Price for Waste Disposal and Updated Cost Estimates for Nuclear Decommissioning, Waste Management and Waste Disposal, March 2010, http://www.decc.gov.uk/en/content/cms/consultations/nuc_waste_cost/nuc_waste_cost.aspx).

operator, rather than being generic. However, the Government's cost estimates ensure that the Government and the NLFAB have a benchmark against which to assess the estimates produced by operators.

The Base Case – Working Assumptions List

- 2b.41 The complete set of assumptions underlying the Base Case is set out below in Table 2. However, the Base Case does not prescribe the contents of a DWMP, so there will be flexibility for operators to suggest and make the case to the Secretary of State for alternative approaches if they choose to do so. If an operator puts forward a DWMP that is not consistent with the Base Case, the onus will be on the operator to justify its proposal and the Secretary of State will consider DWMPs based on alternatives to the Base Case on a case-by-case basis.

Table 2: Assumptions underlying the Base Case

Issue	Assumptions
Regulatory regime	<p>The regulatory regime to be applied to waste management and decommissioning is that in force at the time the FDP is submitted.</p> <p>Definitions of waste categories will remain unchanged from those in current use.</p> <p>Dose limits for workers and the public will remain unchanged from those in current use in the UK (set out in the Ionising Radiation Regulations 1999⁷).</p>
Definition of decommissioning and decommissioning costs	<p>For the purpose of the DWMP, decommissioning is defined to begin at the point that the station is shut down with no intention of further use for the purpose of generating electricity.</p> <p>For the purposes of the DWMP, decommissioning is defined to end when all station buildings and facilities have been removed and the site has been returned to an end state which has been agreed with the regulators and the planning authority.</p> <p>Costs for decommissioning should be structured to ensure that the costs of management and infrastructure for the station under decommissioning are fully accounted for and separate from costs for other areas of the operator's business.</p> <p>Demolition and disposal of waste management facilities are regarded as part of the decommissioning activity.</p> <p>Activities preparatory to decommissioning, such as pre-decommissioning planning, are a designated technical matter and the cost will need to be met from the Fund.</p>

⁷ These regulations can be found at <http://www.statutelaw.gov.uk/content.aspx?LegType=All+Legislation&title=ionising&Year=1999&searchEnacted=0&extentMatchOnly=0&confersPower=0&blanketAmendment=0&sortAlpha=0&TYPE=QS&PageNumber=1&NavFrom=0&parentActiveTextDocId=2778898&ActiveTextDocId=2778898&filesize=189255>

Issue	Assumptions
	<p>All other costs associated with operating the site after the end of its generating life and until the site licence is surrendered are regarded as part of the decommissioning activity. These costs include, but are not necessarily limited to, those associated with maintaining the infrastructure necessary for the operator to be a holder of a nuclear site licence.</p>
Decommissioning facilities	<p>The Base Case assumes that the operator's DWMP will ensure that all facilities on site are decommissioned in accordance with a structured plan, which is acceptable to the regulators and which should reduce the hazard presented by the site in a systematic manner.</p> <p>The Base Case assumes prompt decommissioning of the power station, with operators obliged to provide safe and secure interim storage facilities. The storage facilities must ensure that the waste stored will be able to meet the GDF operator's conditions for acceptance at the date scheduled for its disposal.</p> <p><i>[NNB Note: NNB notes that there needs to be clarity regarding the conditions for acceptance at a reasonable point prior to the Transfer Date.]</i></p>
Care and maintenance	<p>The Base Case assumes prompt decommissioning of the power station with no care and maintenance period after the station has been shut down and before decommissioning takes place. It is open to operators to propose a care and maintenance period in their DWMP submissions, but the inclusion must be agreeable to the regulators and approved by the Secretary of State as part of the operator's FDP⁸.</p>
Site end state	<p>The Base Case assumes that the final site end state will be such that all station buildings and facilities have been removed and the site returned to a state agreed with the regulators and the planning authority. The Base Case assumption is that the site is restored to a [state similar to "Greenfield"] <i>[NNB Note: See comments regarding 'Greenfield' above in relation to paragraph 2b.30.]</i> or similar to its state prior to construction.</p> <p>As with all Base Case assumptions the operator can propose an alternative in the DWMP, which the Secretary of State will consider. In practice, the state to which the site is returned at the end of decommissioning will be influenced by its previous, and likely future, use. The intention of this Base Case assumption is not to prescribe the site end state but rather to provide a prudent assumption, for cost estimation purposes, of the end state that will</p>

⁸ A care and maintenance period allows the benefits associated with radioactive decay (lower volumes of ILW and reduced dose rates to decommissioning operators) to be realised. Prompt decommissioning, however, means that the site can be fully remediated on a shorter timescale. The balance between these issues may be considered by operators with reference to operational as well as design specific considerations.

Issue	Assumptions
	<p>have to be achieved at the conclusion of decommissioning in order to return the site to a state which would be agreeable to the regulators and the planning authority.</p>
Cost calculation	<p>It is assumed that for an FDP submitted for approval the cost estimates will be calculated on a money of year basis (escalation and/or discounting terms will be applied post the initial cost assessment).</p>
Effect of station design on the Base Case	<p>The Base Case for different station designs will be the same except where variations are necessary and justifiable.</p>
Station operating lifetime	<p>The Base Case assumes a single station operating for 40 years. However we recognise that all current station designs undergoing Generic Design Assessment have been designed for an operational life of 60 years and it will be open to operators to propose and justify alternative station lifetimes. Whatever station operating lifetime is proposed, the operator must ensure that its FAP is robust against the risk that the station has to be decommissioned earlier than expected.</p>
Decommissioning techniques	<p>The Base Case assumes that decommissioning will be undertaken using equipment and techniques available at the time the FDP is submitted. While it is recognised that technical advances may well have a significant impact on the way in which new nuclear power stations are eventually decommissioned, operators must be able to demonstrate that they have a workable plan for decommissioning and waste management using current technology before construction of their station begins.</p> <p>Furthermore, it is impossible to anticipate the impact of technological advance on overall cost, hence the Government's view is that this Base Case assumption is prudent and appropriate.</p>
Management and disposal of ILW	<p>The Base Case assumes that ILW arising from operations and decommissioning will be stored in safe and secure interim storage facilities on the site of the power station, pending disposal in the same geological disposal facilities to be used for the disposal of ILW from existing nuclear facilities.</p> <p>As part of the technical steps in the DWMP the Secretary of State would expect the operator to set out provision for safe and secure interim storage facilities that are technically capable of being maintained or replaced to last until the ILW contained within them can be disposed of.</p> <p>The construction and maintenance of interim stores for ILW that are not initially constructed as part of the station are a designated technical matter and the cost will need to be met from the Fund.</p> <p>The Base Case assumes that ILW from operations and decommissioning will be disposed of in a GDF. The operator is</p>

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Assumptions

responsible for transport of the waste to the GDF, although the transfer may be undertaken by a third party, acceptable to the UK regulators, under contract to the operator.

Alongside the approval of an operator's FDP, the Government will expect to enter into a contract with the operator regarding the terms on which the Government will take title to and liability for the operator's ILW.

The arrangements for conditioning and storage of ILW must be consistent with those currently acceptable to the UK regulators and must ensure that the waste will meet the GDF operator's conditions for acceptance at the date scheduled for its disposal.

[NNB Note: NNB notes that there needs to be clarity regarding the conditions for acceptance at a reasonable point prior to the Transfer Date.]

Conditioning costs for operational ILW are regarded as operational costs and will not be paid for from the Fund.

Conditioning costs for decommissioning ILW will be met from the Fund.

Management and disposal of spent fuel

The Base Case assumes that new nuclear power stations will use uranium or uranium oxide fuel. It also assumes that there will be no reprocessing of the uranium fuel, and spent fuel will ultimately be disposed of.

Spent fuel will be stored in cooling ponds for a period of time, followed by storage in safe and secure interim stores on the site of the power station until decommissioning has been completed and disposal facilities are available to accommodate it. It is recognised that fuel from the latter stages of the power station's life may have to remain in interim stores on site for some years after the station has ceased generation, because of the need to allow it to cool, before it can be transported and disposed of in a GDF.

The Secretary of State would expect the FDP to contain an obligation on the operator to cost interim storage facilities and to set aside funds for such facilities to be technically capable of being maintained or replaced until the spent fuel contained within them can be disposed of.

The construction and maintenance of interim stores for spent fuel that are not initially constructed as part of the station are a designated technical matter and the cost will need to be met from the Fund.

[NNB Note: NNB notes that its previous representation that interim stores should not be designated technical matters has not been incorporated in this Guidance Consultation.]

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The Base Case assumes that spent fuel will be disposed of in a GDF. The operator is responsible for transport of the spent fuel to the GDF, although the transfer may be undertaken by a third party, acceptable to the UK regulators, under contract to the operator.

Alongside the approval of an operator's FDP, the Government will expect to enter into a contract with the operator regarding the terms on which the Government will take title to and liability for the operator's spent fuel.

The Base Case assumes that spent fuel will be encapsulated immediately prior to transfer to a GDF. In the absence of proposals for centralised packaging facilities, it is assumed that encapsulation of spent fuel is carried out on the originating site.

[NNB Note: NNB does not consider that this is a sensible assumption. An encapsulation facility is a complex and expensive piece of plant, and it would be more appropriate for it to form part of the GDF infrastructure, potentially serving both legacy spent fuel and HLW and new build spent fuel.]

Management and disposal of low level waste (LLW)

The Base Case assumes that LLW arising during operation and decommissioning will be packaged on site by the operator and dispatched to a disposal facility promptly after they have been generated. For the purposes of the Base Case, we assume that disposal will be at the LLW Repository operating in West Cumbria or a successor facility. Dependent on any nuclear new build programme (and any other nuclear sector developments), a successor disposal facility to the LLW Repository is likely to be required, predominantly for decommissioning wastes⁹.

It is assumed that LLW will be disposed of in the UK, and that disposal facilities will be available when required, at a price to be agreed between the power station operator and the operator of the disposal service. Operators will be required to meet the costs of managing and disposing of operational LLW. These costs will be met from operational revenues.

The costs of disposing of decommissioning LLW will be met from the Fund.

The Base Case assumes that operators will be required to ensure that any facilities needed for packaging are available on site, although it is assumed that LLW will not be conditioned on site and that conditioning facilities will therefore not be needed.

⁹ In August 2010 the Nuclear Decommissioning Authority published the UK Strategy for the Management of Solid Low Level Radioactive Waste from the Nuclear Industry <http://www.nda.gov.uk/documents/upload/UK-Strategy-for-the-Management-of-Solid-Low-Level-Radioactive-Waste-from-the-Nuclear-Industry-August-2010.pdf>

Issue	Assumptions
	<p>The assumed arrangements for packaging must be consistent with those currently acceptable to the relevant UK regulators. The operator is responsible for transport of the waste to the disposal facility, although the transfer may be undertaken by a third party, acceptable to the UK regulators, under contract to the operator.</p> <p>The Base Case assumes that title to the waste will pass to the disposal facility operator when an individual package has been transported to the facility and accepted by the facility operator as meeting the relevant criteria.</p>
Management and disposal of non-radioactive hazardous Wastes	<p>The Base Case assumes that non-radioactive hazardous wastes arising as a result of operations and decommissioning will be managed according to regulatory requirements and current practices and will be disposed of using established disposal routes. The costs of managing and disposing of non-radioactive hazardous waste from operations will be met from operational expenditure. The costs of managing and disposing of non-radioactive hazardous waste from decommissioning will be met from the Fund.</p>
Waste minimisation	<p>n line with regulatory requirements operators will be expected to set out the steps they will take to ensure that waste volumes and the costs of waste management and decommissioning are limited throughout the station life; for example, by minimising the production of primary and secondary wastes¹⁰ consistent with the requirements and expectations of the nuclear regulators, and through careful segregation of waste arisings. Operators will be expected to have regard to the waste hierarchy¹¹ in their DWMP and so avoid creation of waste where possible. Additionally new nuclear power stations are required to meet high environmental standards.</p> <p><i>[NNB Note: NNB notes that it will comply with regulatory requirements in this regard.]</i></p>
Waste conditioning	<p>Waste will be conditioned in a manner and on a timescale which is consistent with current regulatory requirements.</p>
Treatment of wastes arising as a result of station refurbishment	<p>This will be managed in the same way as operational wastes and paid for from operational expenditure.</p>

¹⁰ Secondary wastes are those wastes which are generated unavoidably as part of the waste management process itself.

¹¹ A hierarchical approach to minimise the amounts of waste requiring disposal. The hierarchy consists of non-creation where practicable, minimisation of arisings where the creation of waste is unavoidable; recycling and reuse; and, only then, disposal.

Classification of costs arising under the Base Case

Meeting the costs of decommissioning, waste management and waste disposal

- 2b.42 It will be important for operators (and others) to have clarity on which costs the Secretary of State would expect to be paid for from the Fund and which may be regarded as operational costs, which would not be paid for from the Fund. Table 3 shows which decommissioning, waste management and waste disposal costs will be expected to be discharged from the Fund and which would be expected to be met from operational expenditure.
- 2b.43 Costs incurred during the generating life of the station are to be met from operational expenditure, except costs in relation to designated technical matters which will need to be met from the operator's Fund.

Table 3: Summary of principal cost streams and how they will be met

Cost	How cost will be met	Included in the Waste Transfer Price?
Decommissioning the station. Includes but is not limited to the dismantling and demolition of all plant systems and civil structures	Independent Fund	No
LLW		
<i>[NNB Note: NNB notes that it anticipates that Government will provide a disposal route for LLW and this will be available for new build waste on terms no less favourable than for legacy waste.]</i>		
Packaging and disposal of LLW from operations, including transport	Operational Expenditure	N/A
Packaging and disposal of LLW from decommissioning, including transport	Independent Fund	No
ILW		
Conditioning and packaging of operational ILW	Operational Expenditure	N/A
Construction and maintenance of interim stores for ILW ¹²	Independent Fund	No
Conditioning and packaging of decommissioning ILW	Independent Fund	No
Transport of operational and decommissioning ILW for disposal	Independent Fund	No

¹² In line with the Nuclear Decommissioning and Waste Handling (Designated Technical Matters) Order 2010, if the interim stores are built as part of the station construction, the cost of their construction will not be met from the Fund.

Cost	How cost will be met	Included in the Waste Transfer Price?
Disposal of operational and decommissioning ILW	Independent Fund	Yes
Spent Fuel		
Operation of fuel ponds during the generating life of station	Operational Expenditure	N/A
Operation of fuel ponds after the generating life of station	Independent Fund	No
Construction and maintenance of interim stores for spent fuel ¹³	Independent Fund	No
Transport of spent fuel for disposal	Independent Fund	No
Encapsulation of spent fuel for disposal	Independent Fund	No
Disposal of all spent fuel	Independent Fund	Yes
Non-radioactive hazardous waste		
Management and disposal of non-radioactive hazardous waste from operations	Operational Expenditure	N/A
Management and disposal of non-radioactive hazardous waste from decommissioning	Independent Fund	No
Planning		
Decommissioning planning before start of generation	Operational Expenditure	N/A
Pre-closure decommissioning planning ¹⁴	Independent Fund	No
Any planning carried out during decommissioning	Independent Fund	No
Other Costs		

¹³ In line with the Nuclear Decommissioning and Waste Handling (Designated Technical Matters) Order 2010, if the interim stores are built as part of the station construction, the cost of their construction will not be met from the Fund

¹⁴ In line with the Nuclear Decommissioning and Waste Handling (Designated Technical Matters) Order 2010.

Cost	How cost will be met	Included in the Waste Transfer Price?
All other costs associated with operating the site until the end of its generating life. These costs include, but are not necessarily limited to, those associated with maintaining the infrastructure necessary for the operator to be a holder of a nuclear site licence ¹⁵	Operational Expenditure	N/A
All other costs associated with operating the site after end of its generating life and until the site licence is surrendered. These costs include, but are not necessarily limited to, those associated with maintaining the infrastructure necessary for the operator to be a holder of a nuclear site licence ¹⁶	Independent Fund	No

¹⁵ These costs are likely to include the costs of security for the site, site monitoring, ongoing maintenance at the site (other than maintenance of the interim stores for ILW and spent fuel) and liaison with the regulators.

¹⁶ These costs are likely to include the costs of security for the site, site monitoring, ongoing maintenance at the site (other than maintenance of the interim stores for ILW and spent fuel) and liaison with the regulators.