SUBMARINE DISMANTLING PROJECT (SDP)

OUR APPROACH

TO

DECISION MAKING

(updated to support the Submarine Dismantling Consultation)

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Distribution

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1. Introduction

1.1. This Document

1.1.1. The purpose of this document is to provide an overview of the Submarine Dismantling Project (SDP) decision making process to date and how the remaining decision making steps will be conducted. It is intended for stakeholders who wish to understand MOD decisions processes in greater depth.

1.1.2. SDP - formerly known as the ISOLUS (Interim Storage of Laid-Up Submarines) project - started in 2000 and is a complex, long-term project. As a result of its importance, scale and the need to engage fully with the public, the decision making process (leading to fully implemented solutions) will take several more years to complete. This document has therefore been prepared as a 'roadmap' to help stakeholders understand how the various past and future assessments fit together and how the decisions are, and will be, made.

1.1.3. The decision making process is fully aligned with standard Ministry of Defence (MOD) processes and documentation requirements. However, many stakeholders will be unfamiliar with the processes and terminology used by the MOD. This document therefore explains the main elements of the MOD's processes and the different reports which must be produced.

1.1.4. To help with the MOD terminology a list of abbreviations is included at Annex A and definitions of key terms at Annex B. Full references for the MOD documents referred to in the text are listed in Annex C.

1.1.5. A companion summary document covers the associated public and stakeholder engagement process and in particular the forthcoming Submarine Dismantling Consultation[1].

1.2. The Submarine Dismantling Project

1.2.1. The Ministry of Defence has established the Submarine Dismantling Project to dismantle and safely manage the resulting materials and waste, from 27 defuelled submarines. This includes submarines that are currently stored afloat and others that are yet to leave service.

1.2.2. The project will be responsible for managing all stages of the process of dismantling the submarines and safely managing the waste and other materials that are generated. The key activities involved include:

- Removing the radioactive material (initial dismantling):

  Radioactive material on the submarine will be safely removed. This material is mainly metalwork in the reactor compartment that has become radioactive during use. Some decontamination will also be required in other parts of the submarine to bring levels of radiation below strict regulatory limits. Initial dismantling does not include breaking up the hull of the submarine after the radioactive material has been removed; this is a separate activity (see the final bullet below.)

[1] '*SDP – Our Approach to Public and Stakeholder Engagement* is available at www.submarinedismantling.co.uk

- *Storage of Radioactive Waste Storage:*

  Some radioactive waste can be disposed of immediately through existing routes but Intermediate Level Waste (ILW) must be stored until it can be disposed of. Storage will be required for some time because the UK's proposed Geological Disposal Facility (GDF) is not expected to be available to receive ILW from SDP until after 2040. Part of the SDP's remit is to identify the best storage solution for the ILW from dismantled submarines.

- *Recycling and disposal of non-radioactive waste:*

  The non-radioactive waste that is generated during initial dismantling will be managed using existing disposal routes. For hazardous waste this will be carried out in accordance with the relevant legislation.

- *Ship recycling:*

  The vast majority of the submarine is not radioactive, and contains high quality materials that can be recycled. Once the radioactive material has been removed, the submarine's hull will be transported to an established UK ship recycling facility (with the appropriate environmental permits) to be broken up and recycled wherever possible. This is similar to the way in which MOD recycles surface warships that are not sold or re-used.

1.2.3. The project will also be responsible for:

- The safe transport of the submarines to the initial dismantling site if required;
- The safe transport (if off-site transport is required) of the ILW to the storage site and from the storage site to the proposed GDF;
- The safe transport of the submarine hull to a ship-recycling facility;
- Building any new facilities that are needed or upgrading existing facilities; and
- Decommissioning and disposing of facilities when they are no longer needed.

1.3. Project Timescales

1.3.1. It is not possible for MOD to publish detailed schedules and timescales as these will not be set until the SDP business case is approved (after the completion of public consultation and further analysis). However, existing berthing capacity for redundant submarines is expected to be reached by 2020. This being the case, the MOD must either develop additional berthing capacity or have a submarine dismantling capability (with the associated waste management streams) operational some time before 2020.

2. Introduction to MOD Decision Making Process

2.1. Principles

2.1.1. The purpose of the decision making process is to deliver a rational, evidence based outcome which delivers value for money for the taxpayer whilst ensuring that the selected approach to submarine dismantling is safe, complies with regulatory requirements, inspires public confidence, is environmentally responsible and does not compromise UK military operations.

2.1.2. The MOD has an established process of choosing between options for all major projects, which is subject to formal internal scrutiny by the MOD's Investment Approvals Committee. The MOD must also ensure that enough evidence exists for the National Audit Office (NAO), Parliament or HM Treasury to scrutinise and be satisfied as to how and why decisions have been made.

2.1.3. SDP is also committed to public consultation and open and transparent decision making. The project will therefore:

- Follow the MOD decision making process in as thorough and transparent a way as possible;
- Follow established good practice in stakeholder engagement and public consultation;
- Undertake a Strategic Environmental Assessment (SEA) in accordance with the legislation[2].

2.1.4. It is important to stress that the option selected at the end of the decision making process will not be decided simply on the basis of cost alone. The selected option must meet the requirements of the project, take account of the views of the public and stakeholders, *and* deliver value for money to the taxpayer.

2.2. Option Screening

2.2.1. There are a number of key decisions which must be made before it is possible to develop a more detailed approach to dismantling the UK's submarines. These are:

- How the radioactive waste will be removed from the submarines (technical options);
- Where the radioactive waste will be removed from the submarines (initial dismantling site options);
- Which type of site will be used to store ILW that is awaiting disposal in the proposed GDF (interim storage options).

2.2.2. For each of these, screening was first carried out on a wide range of options to generate short lists of practicable options. Detailed studies were then carried out to understand their performance and cost.

2.2.3. To ensure that factors such as transport are fully accounted for, the shortlisted options were then brought together into a list of integrated solutions ('integrated options'), each of which included a technical, an initial dismantling site and a storage

[2] Strategic Environmental Assessment Directive, 2001/42/EC

option. This process is described in Chapter 3.

2.3. Option Assessment

2.3.1. Those integrated options which were not ruled out through screening were then assessed in detail, based on three strands of analysis:

- Operational Effectiveness (OE) analysis to determine how well each integrated option meets the needs of the MOD;
- Investment Appraisal (IA) analysis to determine the cost of each integrated option across its lifetime; and
- Other Contributory Factors (OCF) analysis to identify the potential significance of factors that cannot be quantified, in terms of cost or effectiveness, for each integrated option.

2.3.2. The SEA, which includes both environmental and socio-economic assessment criteria, informed all three types of analysis. Throughout this process the integrated options have been compared against the alternative of continuing to store submarines afloat and intact – the 'do minimum' option which is considered as a comparator rather than a practicable option.

2.3.3. The results of these analyses have been brought together in a summary document called the Operational Analysis Supporting Paper (OASP), which is a key reference during the public consultation process. This process is described fully in Chapter 4. Figure 1 summarises the decision making process leading to the key decisions on technical options, initial dismantling site options and interim storage options.

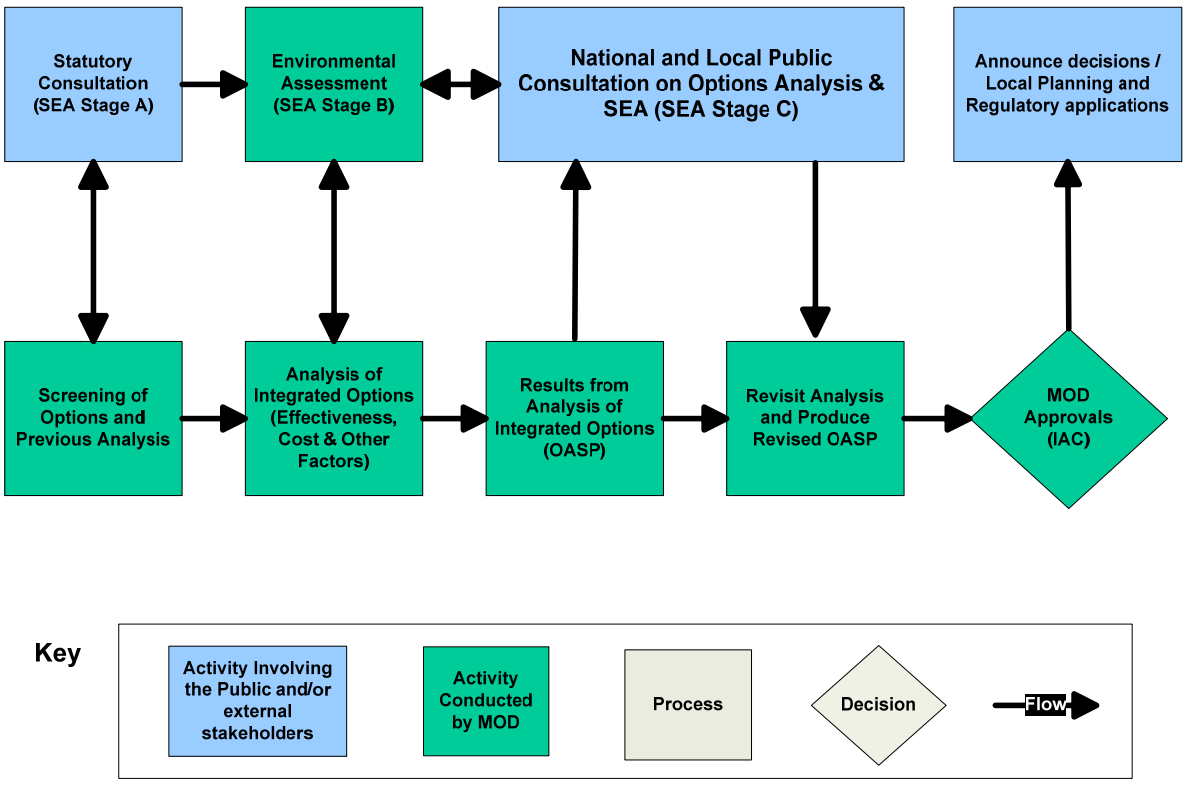

Figure 1: Simplified Decision Making Process

3. Option Screening

3.1. Technical Options for Removing Radioactive Waste

3.1.1. The MOD established this project in 2000, at which time it was called ISOLUS. Between 2002 and 2004, two consultation exercises were conducted: the Front End Consultation (FEC) and Consultation on ISOLUS Outline Proposals (CIOP).

3.1.2. The FEC explored factors that members of the public and other key stakeholders believed should be taken into account when developing a solution for submarine dismantling. The CIOP then considered proposals to meet the project's requirement put forward by four industry groups. These proposals as amended after CIOP plus variants added later constituted the original technical options 'long list'.

3.1.3. Since then, various technical and environmental assessments have been carried out to develop a more detailed understanding of the available options and the original long list has been screened down to a shortlist of three alternatives for removing the radioactive waste from the submarines:

- *Separate and store the Reactor Compartment (RC)*: the RC is separated from the front and rear sections of the submarine and stored whole, leaving the hull of the submarine in two halves.
- *Remove and store the Reactor Pressure Vessel (RPV)*: the RPV and other radioactive materials are removed from the submarine and the RPV stored in its entirety with the other radioactive materials inside. The submarine is left intact.
- *Remove and size reduce the RPV*: the RPV and other radioactive materials are removed and then cut into smaller pieces and packaged into boxes for storage. The submarine is left intact.

3.1.4. A preliminary study involving MOD and external stakeholders was carried out in 2008 to 'identify features of the three options that would impact on their implementation with a view to reducing the number of variables that will have to be addressed in the ongoing procurement strategy'. The outputs were used to help define the eventual option comparison criteria and scope the data requirements. The details are contained in the *SDP Technical Options Study: Options Report*.

3.1.5. A two-stage 'MOD Proposed Option Study' (MPOS) conference was held in 2010. The results of the evidence gathered to date were presented to a panel of MOD Senior Personnel to review and critique the evidence, the analysis, and the emerging picture. The details are contained in the *SDP Technical Options Analysis Paper*.

3.1.6. These findings were used to inform the assessment of the different options, by developing a better understanding of the criteria against which the assessment was conducted. It is important to note that for RC separation and RPV removal, the project has assumed that a further process of size reduction of ILW, to form packaged waste, will be required prior to disposal. This assumption remains under review as the proposed GDF design and its conditions for acceptance develop.

3.2. Siting Options for Removing Radioactive Waste

3.2.1. Three generic types of sites were assessed for their suitability for removing radioactive waste from submarines:

- Greenfield sites: sites that are undeveloped (or have reverted to a 'natural' state) and with no existing Authorisation or Licence for nuclear work.
- Brownfield sites: sites that are already developed but do not have an existing Authorisation or Licence for nuclear work.
- Existing Authorised / Licensed sites: sites that are already developed and have an existing Authorisation or Licence for nuclear work.

3.2.2. It was concluded, on value for money and environmental grounds, that Greenfield and Brownfield sites will only be considered further if no suitable existing Licensed/Authorised site is available. The Greenfield and Brownfield site options are, therefore, not entirely discounted from further consideration but were excluded from the long list of site options, which comprised the list of all existing Authorised / Licensed sites in the UK.

3.2.3. This long list of sites was screened to assess their suitability for initial dismantling against two primary screening criteria, both of which had to be satisfied (ie. they were both pass/fail criteria):

- Coastal location (the site must be accessible by sea);
- Physical capacity (the site must have enough space and facilities available).

3.2.4. This reduced the number of possible sites to 5. These were then assessed against 8 secondary screening criteria such as "the site must have security of tenure" or "must be able to manage safety risks".

3.2.5. All of these had to be satisfied (i.e. they were all pass/fail criteria), further reducing the number of possible initial dismantling sites. The remaining shortlisted options were:

- Devonport Dockyard;
- Rosyth Dockyard;
- Both Devonport and Rosyth Dockyards.

3.2.6. The SEA studies cover the three generic site types (Greenfield; Brownfield; and existing Authorised / Licensed sites) and also more detailed analysis of Devonport and Rosyth Dockyards specifically.

3.3. Interim Radioactive Waste Storage Options

3.3.1. The same three generic types of sites were assessed for their suitability for interim ILW storage: Greenfield sites; Brownfield sites; and existing Authorised / Licensed sites. It was concluded that Greenfield and brown field sites will only be considered further if no suitable existing Licensed/Authorised site is available.

3.3.2. The Greenfield and Brownfield site options were not entirely discounted but the initial interim storage options 'long list' was again the list of all existing Authorised/Licensed sites in the UK.

3.3.3. At this stage, it was not deemed appropriate to screen these to identify individual potential candidate storage sites because of differing site specific contexts and developing strategies affecting different sites.

3.3.4. As an intermediate step, the 'long list' of sites options has been divided into categories according to ownership by MOD, the Nuclear Decommissioning Authority (NDA) or industry; and also by geographical location relative to the initial dismantling sites, either at the point of waste generation or remote from it. The latter geographical category is significant in considering the need for transporting waste.

3.3.5. Site options for interim storage have therefore been identified and assessed at a generic level as follows:

- Storage at the point of waste generation. This could include Devonport or Rosyth Dockyards, or Devonport Naval Base if initial dismantling were done at Devonport Dockyard.
- Storage at sites owned by industry, remote from the point of waste generation. This could also include Devonport or Rosyth Dockyards if initial dismantling occurred on the other site.
- Storage at sites owned by MOD, remote from the point of waste generation. This includes Nuclear licensed or authorised sites owned by MOD.
- Storage at sites owned by the NDA. These would all be remote from the point of waste generation.

3.3.6. All the options, except the NDA option, assume that a new build storage facility will be required. Thus, with the exception of the NDA option, it is assumed that ILW storage would only take place on one site as building more than one new storage facility for SDP would be uneconomic.

3.4. Integrated Options

3.4.1. Following initial screening work, therefore, there remain three technical options, two potential site options for removing radioactive waste (with a third option for dismantling at both sites), and four categories/subcategories of ILW storage sites available for consideration.

3.4.2. There are 36 (3 technical options x 3 initial dismantling site options x 4 interim storage options) potential combinations of shortlisted options, each of which constitutes a complete solution, plus the 'do minimum' benchmark of continued afloat support. This gives a total of 37 potential integrated option solutions.

3.4.3. Not all of these 37 integrated options are practicable. As described in the *SDP Integrated Options Report*, transport and other constraints mean that only 25 could realistically be implemented. The 25 are composed of 8 combinations of technical option and interim storage option, each of which has 3 dismantling site options, and the 'do minimum' option. These integrated options are summarised in the table below:

Option – combination of Technical Option and Interim Storage Option	**Variants – Initial Dismantling Site Option**
Option 0: Do Minimum	None
Option 1: RC separation and storage at point of waste generation Option 2: RPV removal with storage at point of waste	Three variants for each: dismantling at Devonport, Rosyth, and at both Devonport and Rosyth.

Option – combination of Technical Option and Interim Storage Option	Variants – Initial Dismantling Site Option
generation	
Option 3: RPV removal and storage at remote commercial site	
Option 4: RPV removal and storage at remote MOD site	
Option 5: RPV removal and size reduction to form Packaged Waste with storage at point of waste generation	
Option 6: RPV removal and size reduction to form Packaged Waste with storage at remote commercial site	
Option 7: RPV removal and size reduction to form Packaged Waste with storage at remote MOD site	
Option 8: RPV removal and size reduction to form Packaged Waste with storage on NDA site(s)	

4. Option Assessment

4.1. Assessment Process

4.1.1. SDP is in the highest financial bracket for a MOD project (known as Category A) and the current phase of work will conclude with the submission of a business case for further funding to the Investment Approvals Committee (IAC). Because of the size of investment required the MOD employ a formal process to ensure that the proposed solution is based on firm evidence and realistic cost estimates.

4.1.2. The next phase of the project will involve investment in a demonstrator facility and the decision to proceed is considered by MOD as a 'Main Gate' because a significant commitment of funds will be required.

4.2. User Requirements Document

4.2.1. The User Requirement Document (URD) provides a clear definition of the requirements that the project must deliver and the basis for measuring the effectiveness of any option. The URD is informed by a comprehensive map of the benefits and impacts of the project for the MOD, external stakeholders and the environment. This 'benefits map' ensures that requirements in the URD are linked to the benefits that the project is seeking to bring about or the adverse impacts it is seeking to avoid.

4.2.2. The development of the benefits map, which included an internal stakeholder workshop, is documented in the SDP Benefits Report. The development of the benefits map took particular account of earlier ISOLUS and SDP work including previous rounds of consultation and stakeholder workshops.

4.3. Operational Effectiveness (OE)

4.3.1. The OE analysis assessed 'how well' different integrated options deliver the requirements of SDP. The ability of each option to meet the URD has been analysed using Multi-Criteria Decision Analysis (MCDA). This approach was adopted because expert judgement is central to assessing how well each option can meet the SDP requirements. The MCDA model was developed and populated using the outputs of three two-day workshops attended by subject matter experts, MOD personnel and observers from the SDP Advisory Group. The three workshops were:

- Criteria Workshop: criteria were developed from the requirements in the URD, with scoring scales between minimum required level of performance and the maximum level of performance above which no further benefit is accrued.
- Weighting Workshop: each member of the panel attending provided a weight corresponding to the significance of each of the criteria and groups of criteria.
- Scoring Workshop: each member of the panel attending scored each integrated option against the criteria.

4.3.2. The uncertainty and variation in expert judgement was recorded and Monte Carlo simulation was used to generate uncertainty 'error bars' for each option.

4.3.3. The OE analysis is documented in detail in the SDP Operational Effectiveness Report.

4.4. Investment Appraisal

4.4.1. Key decisions on SDP require a full investment appraisal (IA) using Treasury and MOD procedures. The IA is informed through the development of whole life cost (WLC) estimates for each option, including the full costs of the following throughout the lifetime of SDP:

- Training (such as training for submarine dismantling)
- Equipment (such as dismantling equipment)
- Personnel (manpower)
- Infrastructure (such as ILW storage facilities)
- Doctrine and Concepts (the approach to dismantling and storage and its impact on operations)
- Organisation (potential changes to MOD structures)
- Information (to support dismantling and storage)
- Logistics (such as the provision of spare parts)

4.4.2. The WLC model has been developed by the SDP team with strict independence from potential suppliers. Both the input data and the model itself are submitted for verification and validation by MOD's Cost Assurance and Analysis Service (CAAS) and formal scrutiny by MOD's Defence Analytical Services & Advice (DASA).

4.4.3. One of the functions of the WLC model is to statistically analyse the data and determine uncertainty in the cost estimates. This is possible as all costs included within the WLC model have estimates for a minimum, most likely and maximum value attached to them. The model also takes account of estimates of technical and other risk associated with each integrated option and their effect on WLC, which enables the impact of those risks to be understood.

4.4.4. The Investment Appraisal is documented in detail in the SDP Investment Appraisal report.

4.5. Other Contributory Factors (OCF)

4.5.1. The OCF addresses factors which:

- Cannot practically be measured in terms of effectiveness or WLC and are therefore not included in the OE or IA; or
- Depend on insights from Public Consultation or the political, policy and strategic positions of external stakeholders which are, in some cases, evolving or dynamic.

4.5.2. The level of stakeholder interest and influence, including that of the public, is such that there are a larger number of relevant OCF with greater potential to affect the SDP integrated options than are usually found with other MOD equipment projects.

4.5.3. The work to date has involved identification and characterisation of the OCF, including review of the findings of the FEC and CIOP consultations and a workshop in June 2011 to identify, review and discuss the potential implications of OCF. The workshop was attended by project staff, internal MOD stakeholders and observers from the SDP Advisory Group. It was used to develop an output *SDP OCF Report*

which identifies the implications of some OCFs but recognises that a more comprehensive assessment will only be possible following the Submarine Dismantling Consultation.

4.5.4. The OCF report has not, therefore, been used in the development of proposals for consultation but will be further developed, on the basis of consultation and stakeholder engagement, to inform decision making on the options. Moreover, for some of the OCF identified to date it may, in future, be possible to assess them as OE or IA if data becomes available to justify a quantitative assessment.

4.6. Strategic Environmental Assessment

4.6.1. As already described, MOD is undertaking a SEA in parallel with the analysis described above. This is a formal and legally-defined process that assesses any potentially significant environmental, health, social and economic effects arising from SDP, and the wider implications for sustainable development.

4.6.2. The SEA has informed the environmental and socio-economic effects assessed in the OE, IA and OCF analysis. For example:

- The environmental criteria were defined and scored using the scope and findings of the SEA.
- The WLC of achieving regulatory standards was informed by the SEA.
- Scoping of OCF such as socio-economic impact on the community or impact on local projects used information from the SEA.

4.6.3. The stakeholder engagement procedures for SEA at both scoping and reporting stages are defined in the SEA legislation. Statutory consultation on the scope of the SEA is complete and the scoping report issued (Strategic Environmental Assessment (SEA): Scoping Report).The Environmental Report containing the detailed results will be a key document for the main SDP public consultation.

4.7. Integrating the Results

4.7.1. The results of the OE and IA have been brought together to form a Combined Operational Effectiveness and Investment Appraisal (COEIA), which forms a standard MOD approach to analysing the cost-benefit trade-off between options. The COEIA has been brought together with the results of the OCF to generate the OASP with proposals for consideration during public consultation. This will allow the public and external stakeholders to review the options, supporting evidence, and the logic underpinning the MOD's proposed course of action. The OASP contains proposals for the suggested way forward based on the available evidence, and explains why the certain integrated options demonstrate better or worse value for money.

4.7.2. Figure 2 shows how MOD's various decision making documents relate to each other in supporting the proposals for consultation.

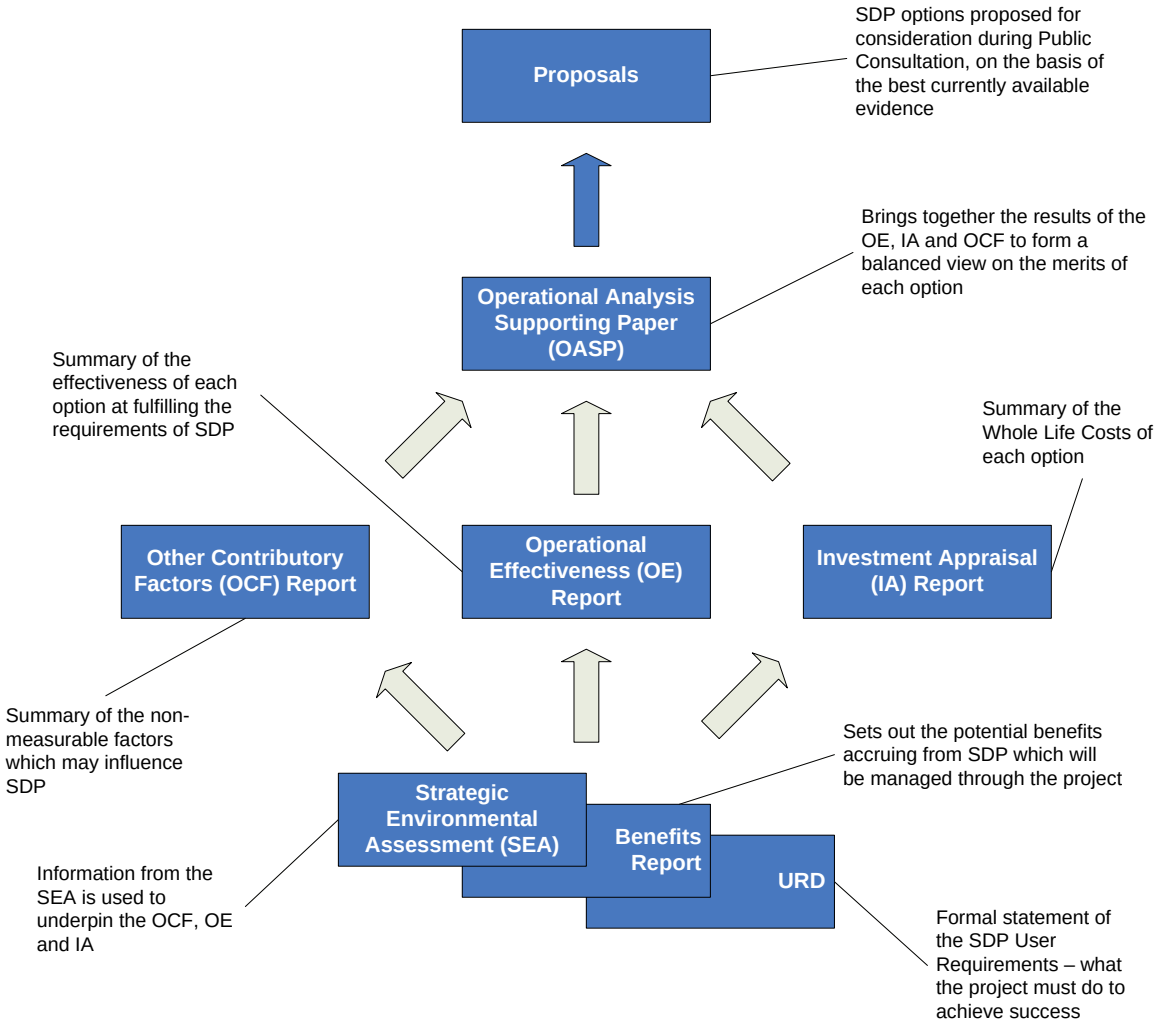

Figure 2: Key decision making documents

4.7.3. Having taken the public consultation responses and further studies into consideration, the OASP and supporting documents will be reviewed, revised and re-issued. They will then be submitted in support of the Business Case which will be presented to the relevant authorities in the MOD for approval. If approval is given, strategic decisions will then be announced together with feedback on how the findings of the public consultation have been taken into account.

5. Future Analysis and Consultation

5.1. Further Analysis of ILW Storage Options

5.1.1. The Submarine Dismantling Consultation and subsequent assessment is expected to arrive at specific decisions on the technical and initial dismantling site options but only a generic decision on the *type* of site to be used for storage of ILW arising from SDP. It is acknowledged that the eventual selection of specific storage site(s) will require further assessment and public and stakeholder engagement. It is stressed that no submarine dismantling activities will commence until an agreed solution is established for storage of ILW.

5.2. Next Steps

5.2.1. Once the MGBC is approved by MOD, funding will be released to allow the project to enter what is known as its Demonstration Phase. This would involve a 'Demonstrator' to optimise the industrial, regulatory and commercial processes through complete dismantling of at least one submarine. Before starting work on a Demonstrator, the MOD would first need to obtain site specific planning and regulatory approvals (as required) for:

- the Demonstrator initial dismantling activity;
- the ship recycling activity that follows initial dismantling; and
- the interim storage solution for the ILW arising from the Demonstrator and, if appropriate, subsequent submarines as well.

5.2.2. Once the dismantling and ILW storage solutions have been adequately demonstrated, internal MOD approval will be sought, via a further business case, for the release of funds to dismantle the remaining submarines. This funding will be used to enhance the demonstrator facilities (if required) and satisfy the long-term commercial arrangements that will need to be put in place for full operation of the dismantling and ILW storage facilities.

Annex A: Abbreviations

Abbreviation	Meaning
SDP AG	SDP Advisory Group
CAAS	Cost Assurance & Analysis Service
CIOP	Consultation on ISOLUS Outline Proposals
COEIA	Combined Operational Effectiveness and Investment Appraisal
DASA	Defence Analytical Services & Advice
FEC	Front End Consultation
GDF	Geological Disposal Facility
IA	Investment Appraisal
IAC	Investment Approvals Committee
ILW	Intermediate Level Waste
ISOLUS	Interim Storage of Laid-Up Submarines
LLW	Low Level Waste
MCDA	Multi Criteria Decision Analysis
MGBC	Main Gate Business Case
MOD	Ministry of Defence
MPOS	MOD Proposed Option Study
NAO	National Audit Office
NDA	Nuclear Decommissioning Authority
OASP	Operational Analysis Supporting Paper
OCF	Other Contributory Factors
OE	Operational Effectiveness
RC	Reactor Compartment
RPV	Reactor Pressure Vessel
SDP	Submarine Dismantling Project
SEA	Strategic Environmental Assessment
URD	User Requirements Document
WLC	Whole Life Cost

Annex B: Definitions

Term	Definition
CADMID	This is MOD's standard equipment project lifecycle. It stands for: Concept, Assessment, Demonstration, Manufacture, In-Service and Disposal. 'Manufacture' in the case of SDP relates to the development of facilities whilst 'Disposal' relates to the decommissioning of facilities at the end of the project.
COEIA	Combined Operational Effectiveness Investment Appraisal (COEIA) is a formal comparison of acquisition options on a cost versus effectiveness basis to satisfy a User Requirement. The COEIA is undertaken to ensure that Business Cases are founded on fundamental principles of cost effectiveness.
IA	Investment Appraisal (IA) is a method of gathering information in a structured format, to enable decisions to be made as to which of a number of options to meet a specific requirement offers the best value for money
MCDA	Multi-Criteria Decision Analysis (MCDA) provides decision makers with the means to evaluate different options when faced with numerous and potentially conflicting desired outcomes. In the case of SDP a MCDA model was built with 20 criteria arranged into a hierarchical tree. A panel of Subject Matter Experts was used to weight the relative importance of each set of criteria or group of criteria. Each option was then scored against each criteria and an overall value for effectiveness derived from the weights and scores. The results, although largely subjective, are based on expert judgement and were subject to moderation through the process of debate and the recording of the Subject Matter Experts' views, scores and weights at the three workshops used to shape the MCDA model.
MoE	Measures of Effectiveness (MoE) are directly related to high level operational or business objectives and are usually defined as a numerical quantity that increases with improved effectiveness.
NPV	Net Present Value - this discounts current money values by a HM Treasury agreed weight and is used across investment appraisals to fairly assess options with different spend profiles.
OASP	The Operational Analysis Supporting Paper (OASP) offers a well proven structured approach to planning, preparation and presentation of essential foundation evidence on which to construct the Business Case.
OCF	Other Contributory Factors (OCF) are those aspects that may have significant influence on procurement decisions but cannot be taken into account within quantitative analysis. OCFs may include political, environmental, sociological, technological and environmental aspects.
OE	Operational Effectiveness (OE) adopts a combination of methods in assessment of operational and business capability embracing: • Quantitative approaches via mathematical modelling of physical system behaviour within context of representative operational or business situations. • Qualitative approaches exploiting judgement of military and technology subject matter experts drawing on operational evidence and technology application opportunities.
Option	Depending on context, either – one possible solution, in competition with other mutually exclusive solutions, or – a possible variation within a solution, to be judged on its merits relative to the basic solution and other options.

Outturn	Outturn – is the term given to financial profiles that include the impact of annual inflation and it is used to review affordability.
URD	The User Requirements Document (URD) is a structured definition of the MOD's through-life need for a particular capability.
WLC	Whole Life Cost is a term that is used in financial modelling to affirm that scenarios or options considered include all the costs from a project from its beginning to end commonly referred to as 'cradle to grave'.

Annex C: References

Title	Originator	Reference/ Version	Date
SDP Benefits Report	ISM – SDP	Issue 1.1	Oct 11
SDP Integrated Options Report	ISM – SDP	Issue 1.1	Oct 11
SDP Investment Appraisal (IA)	ISM – SDP	Issue 1.0	Oct 11
SDP Operational Effectiveness (OE) Report	ISM – SDP	Issue 1.0	Oct 11
SDP Other Contributory Factors (OCF) Report	ISM – SDP	Issue 1.0	Oct 11
SDP Operational Analysis Supporting Paper	ISM – SDP	Issue 1.0	Oct 11
SDP Technical Options Analysis Paper (2010 MPOS study workshops)	ISM – SDP	Issue 2	Jul 10
SDP Technical Options Study: Options Report (2008 stakeholder workshops)	Frazer-Nash / ISM – SDP	FNC 35114/35042R Issue 2	Jun 10
SDP User Requirements Document	ISM	Issue V5.0	Oct 11
Strategic Environmental Assessment (SEA): Scoping Report	ENTEC	Reg. No. 25271	Dec 10