

Wylfa Site Summary

Lifetime Plan

PSWBS Site ref.: **29**

2006/07 Lifetime Plan



Lifetime Plan Overview

The 2006/07 Lifetime Plan describes all the activities in terms of scope, schedule and cost to be undertaken on the Wylfa Site in the remaining period of its lifecycle from 1 April 2006 to the end of Final Site Close-Out.

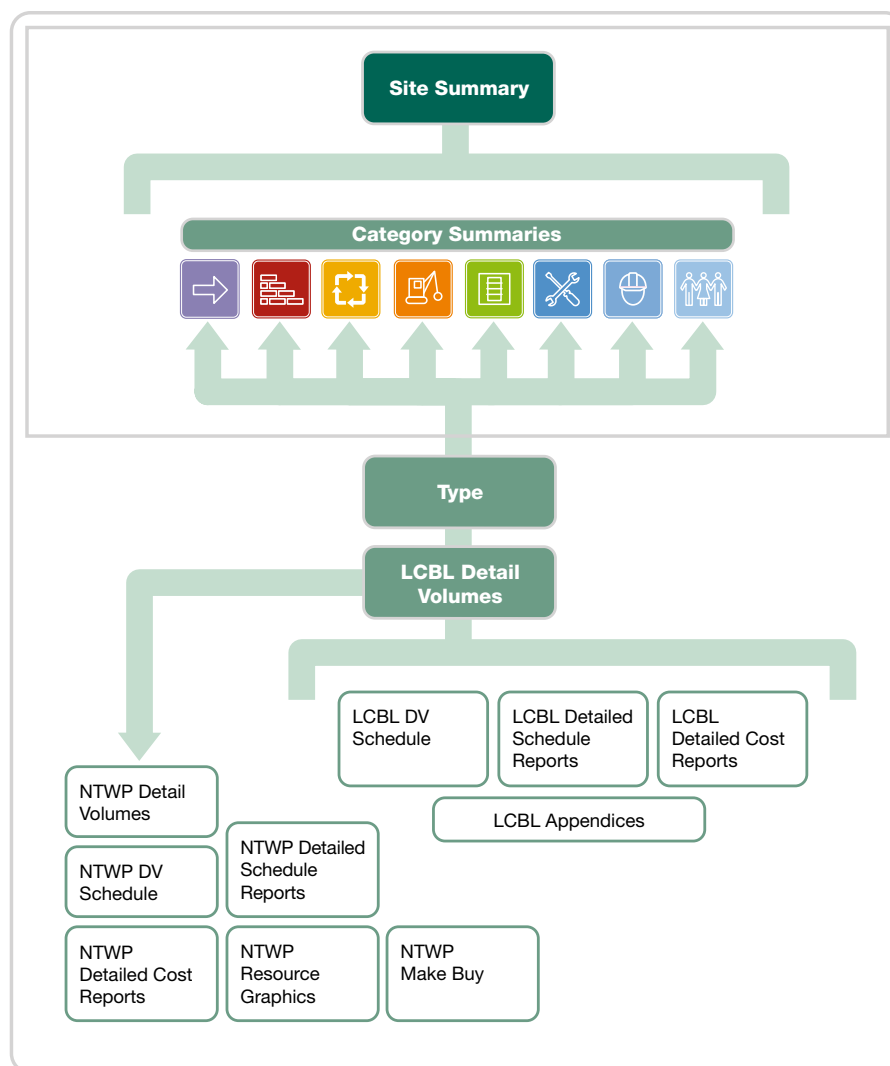
This Lifetime Plan draws on information from existing plans that have been developed over many years. The Magnox Operating Programme (MOP) covers the integration and management of nuclear fuel from initial manufacture to final reprocessing across all Magnox reactor sites.

The Lifetime Plan reflects the declared strategy for the site, which is to continue electricity generation until December 2010 which is a working assumption, and then provided it remains safe and economic to do so. Decommissioning of the site in line with proposals that were subjected to Quinquennial Review by the Health & Safety Executive (H&SE) and reported by them in 2002 as being 'appropriate' will then commence.

Because of some unique design differences at Wylfa together with the early application of innovative thinking, opportunities will be identified which will result in the acceleration of decommissioning activities at the site. This could result in considerable improvements to the plan as stated.

Wylfa will also be supporting Maentwrog Hydro-electric station until 2088.

Figure 29-1 – Wylfa Lifetime Plan structure



Contents

Lifetime Plan Overview	2
Site Overview	3
Site Key Phases	4
Scope of Work by Phase:	
Generation	6
Defuelling	8
Care & Maintenance Preparations	10
Care & Maintenance	12
Final Site Clearance	14

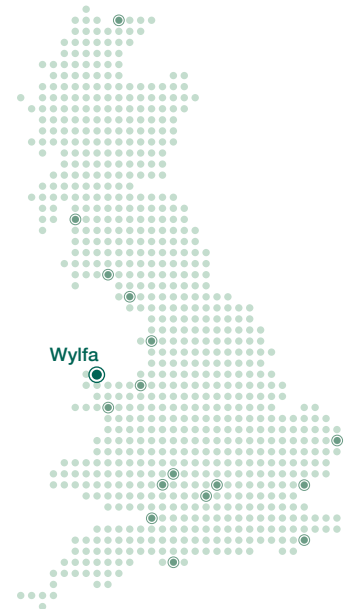
Near Term Work Plan (Years 1 to 3)	16
Major Assumptions & Exclusions	18
Risk Management	20
Staffing Curve	21
Summary Milestone Schedule	22
Lifetime Plan Value	24
Reconciliation of Costs	26
Metrics & Key Quantity Curves	27
Conclusion	28

Site Overview

Wylfa stands on a 50-hectare site on the north coast of Anglesey. Its two Magnox reactors are the largest of their type in the world, capable of generating 980MW.

Figure 29-2 – Wylfa key facts

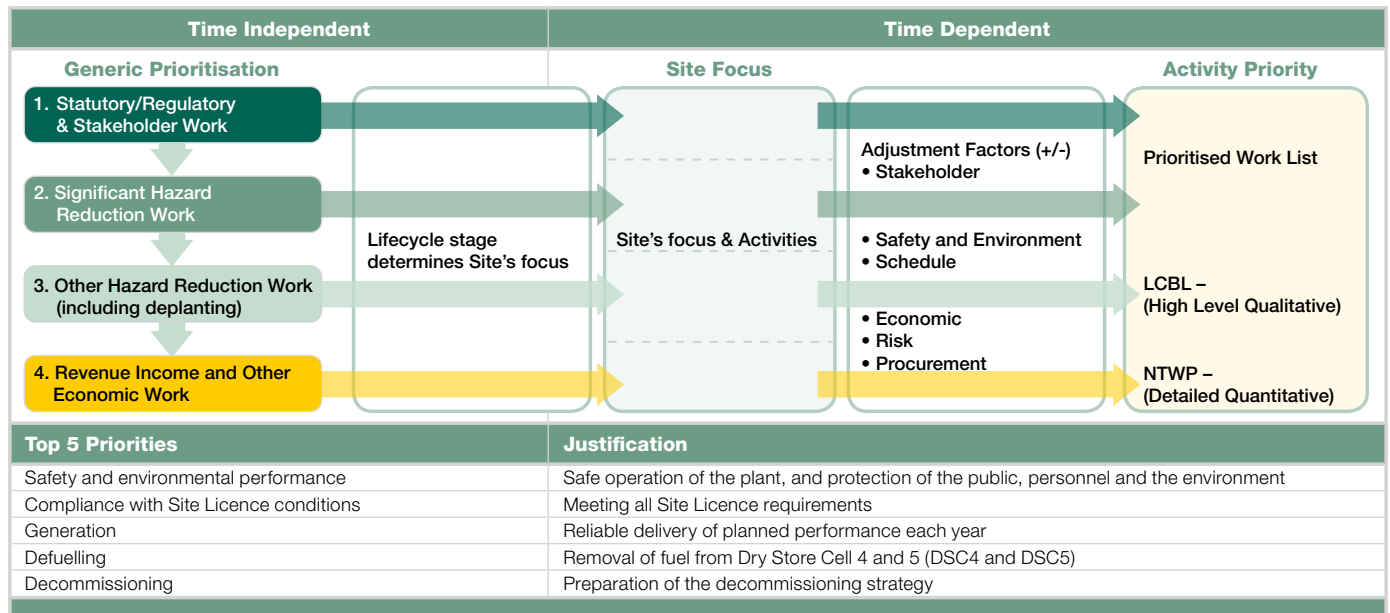
Basics	Location:	Anglesey
	Nearby towns/cities:	Cemaes (2km) Holyhead (15km)
	Site area:	50 hectares
	Number of current employees:	532
Key dates	Construction start:	1963
	Construction end:	1971
	Start operation:	1971
	End operation:	2010
	Defuelling start:	2011
	Defuelling end:	2012
	Care & Maintenance Preparations start:	2012
	Care & Maintenance Preparations end:	2025
Plant description	Reactor type:	Magnox
	Number of reactors:	2
	Number of fuel channels per reactor:	6,156
	Number of fuel elements per channel:	8
	Number of control rods:	185
	Fuel material:	Uranium
	Reactor coolant:	Carbon Dioxide
	Number of turbo generators:	4
	Electrical output – design (net):	1,180MW sent out
	Electrical output – current (net):	980MW sent out
	Station lifetime output to date:	185TWh
	Previous operators:	Central Electricity Generating Board/National Power/ Nuclear Electric/Magnox Electric
	Adjacent nuclear power station:	None
Unique factor	On a typical day, Wylfa supplies 23 million kWh of electricity – enough to meet the needs of two cities the size of Liverpool or Manchester. Wylfa is responsible for the management and operation of the Hydroelectric power station at Maentwrog in the nearby Snowdonia National park.	



Care & Maintenance Preparations enabling work will begin in 2009.

The Care & Maintenance Preparations phase begins in 2012 after the Defuelling phase.

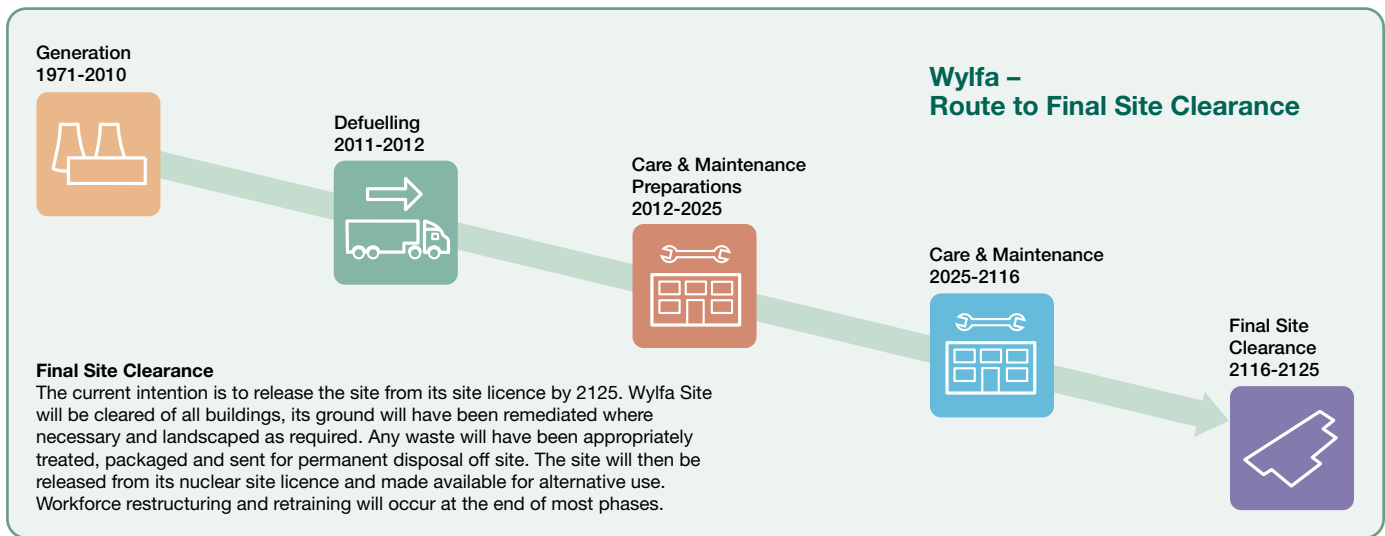
Figure 29-3 – Prioritisation logic



Wylfa Lifecycle Baseline Key Phases

Wylfa will stop generating electricity in 2010. The diagram below shows how this milestone will lead to Wylfa’s decommissioning and the Wylfa Site made available for alternative use by 2125.

Figure 29-4 – Route to Final Site Clearance



Site History

Construction of the site started in 1963 and electricity generation began in 1971.

Under the current plan, the site will operate until December 2010 and will then be defuelled and decommissioned.

By 2125, Wylfa will have been re-landscaped and made available for alternative use.

1. Generation – 1971-2010

Wylfa will generate electricity in accordance with the MOP until December 2010.

During the Generation Phase, a number of plant improvements will be carried out to further enhance nuclear and conventional safety, to reduce risks to the environment and to mitigate risks to generation.

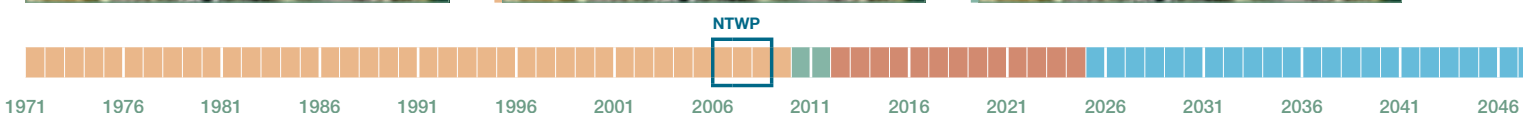
Included are activities to optimise and enhance fuel handling equipment ready for the Defuelling phase.

2. Defuelling – 2011-2012

After the cessation of electricity generation planned for December 2010, all fuel will be removed from the reactors and the irradiated fuel storage cells and then despatched to Sellafield for reprocessing.

These defuelling operations will remove 99% of the site’s radioactive waste inventory.

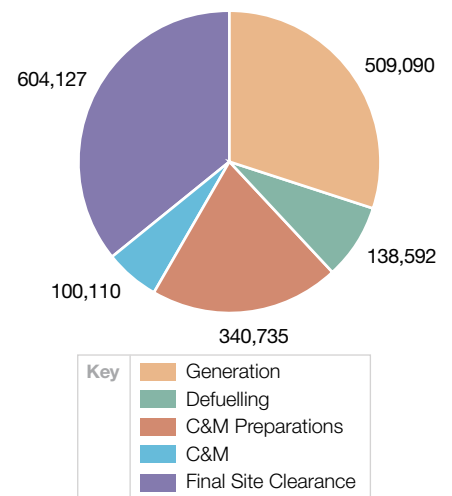
Initial Care & Maintenance Preparations (C&M Preps) work will also be started in parallel with the defuelling operations.



The LCBL Plan for Wylfa is:

- Generation ends December 2010.
- Defuelling ends August 2012.
- Care & Maintenance Preparations begin 2012.
- Enter Care & Maintenance in 2025.
- Care & Maintenance ends 2116 and Final Site Clearance begins.
- Final Site Clearance ends 2125.

Figure 29-5 – Total cost distribution by key phase for LCBL (£k)



3. Care & Maintenance Preparations – 2012-2025

During C&M Preps, dismantling, demolition and waste management work will be undertaken to remove most radioactive and non-radioactive plant and buildings. The reactor block including the reactors, the primary dry store cells and the Intermediate Level Waste (ILW) storage vaults will be put into a passively safe and secure state.

4. Care & Maintenance – 2025 to 2116

Following the active period of C&M Preps, Wylfa will enter C&M, a prolonged period where the site will remain in a quiescent state, during which no significant dismantling work will be undertaken.

The Care & Maintenance phase provides for site surveillance and security, radiological and environmental monitoring, and programmed inspection and maintenance of the fabric of the buildings remaining on site.

5. Final Site Clearance – 2116 to 2125

A purpose-built waste processing plant will be required for this period.

The site will be cleared of the reactors and all remaining buildings; the ground will be remediated and landscaped to fit in with the local surroundings.

Any waste will be appropriately treated, packaged and sent for permanent disposal off site.

The site will then be released from its Nuclear Site Licence and made available for alternative use by 2125.



Scope of Work: Generation

In accordance with the Magnox Operating Programme, Wylfa will be operated and maintained safely to earn income from electricity sales, until the cessation of Generation in 2010.

The MOP requires Wylfa to generate until December 2010. The focus during this period will be to maximise the value of generation while maintaining nuclear, industrial and public safety and environmental protection.

The MOP covers the integration and management of nuclear fuel from initial manufacture to final reprocessing across all Magnox reactor sites. This level of coordination is critical to meeting the UK's treaty obligations under the Oslo-Paris (OSPAR) agreement, which impacts on the allowable discharges from the reprocessing plants at Sellafield.

Plans include activities to modify fuel handling equipment to facilitate the safe, rapid and reliable defuelling at the end of operational life.

Maintenance is carried out on the plant in accordance with an established policy that meets statutory requirements and maintains a high standard of material condition of the plant and equipment.

The comprehensive maintenance programme is complemented by statutory outages, which ensure the plant and systems remain safe and compliant with Nuclear, Environmental Maintenance and other statutory obligations.

Wylfa is aiming to minimise the cost of running the site safely through a motivated, innovative and aligned workforce with a robust financial control structure.

Wylfa will continue its commitment to improving standards through the 'Conduct of Operations' and 'Conduct of Maintenance' procedures, learning from operating experience, having independent reviews by the World Association of Nuclear Operators (WANO), and contributing to benchmarking worldwide.

Several types of waste will be produced during the remainder of the Generation phase. Where disposal routes are currently available they will be used to dispose of these wastes, eg Low Level Waste (LLW) will be sent to an authorised off site repository, and asbestos will be sent to a licenced site.

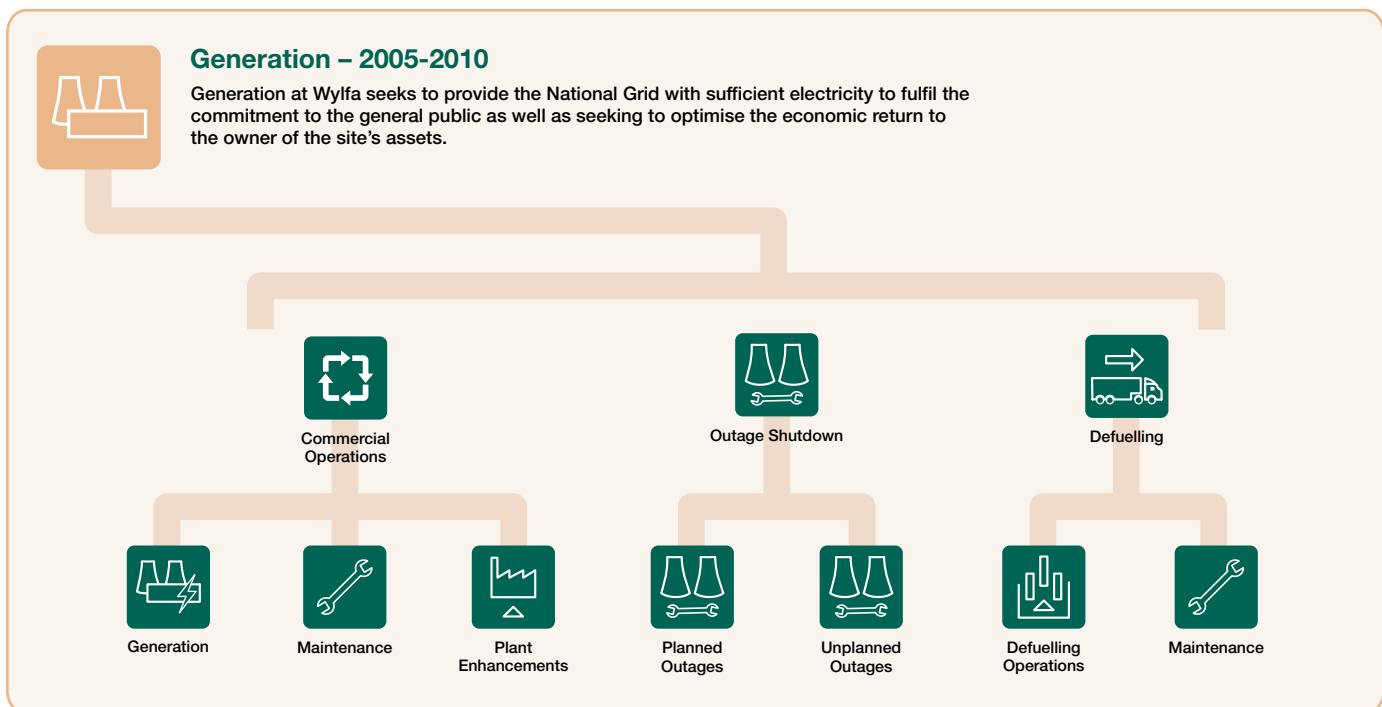
Currently there is no disposal route for ILW; consequently the waste will be retained on site in a secure facility.

Non-hazardous wastes will be removed under subcontract. Wylfa has rigorous environmental standards and objectives and an ongoing campaign to Reduce, Reuse and Recycle materials wherever practicable.

During the period of Generation, workforce restructuring plans will be developed to facilitate smooth transition through the different phases of the site life cycle.

Implementation of the Socio-Economic Development Plan will ease the effects of the eventual site closure on the local community.

Figure 29-6 – Generation scope of work





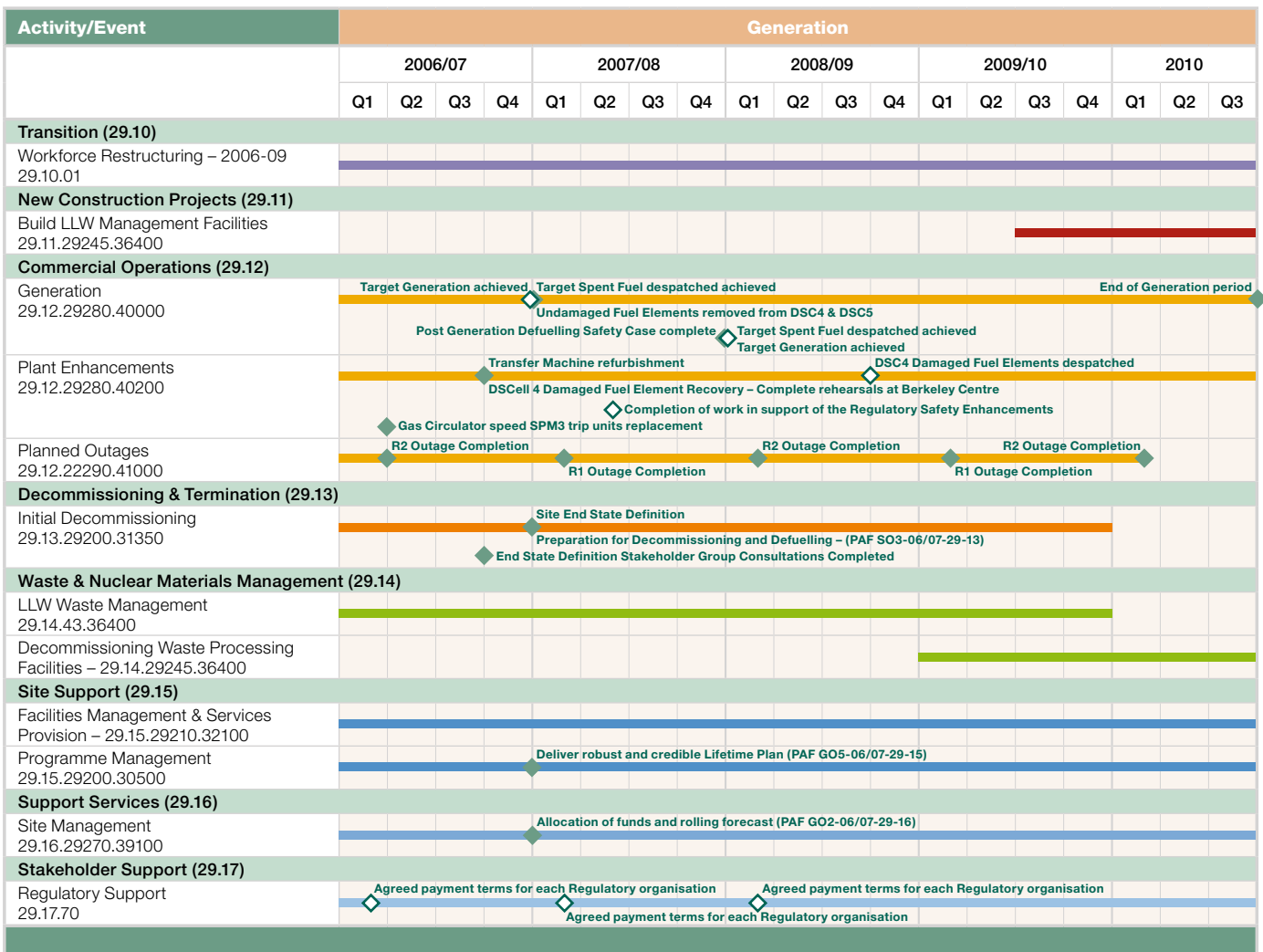
Safe Generation is a Priority.



Wylfa has four turbine generators cumulatively producing 980MW.

Key	◇ Regulatory Milestone
	◆ Other Milestone

Figure 29-7 – Generation summary work programme



All date ranges are in Financial Years

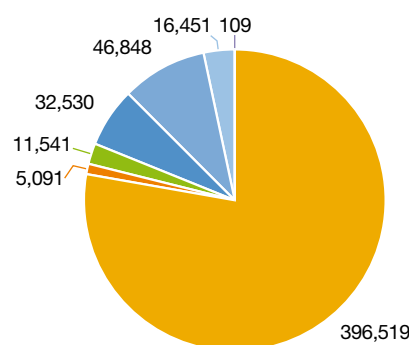


Figure 29-8 – Generation cost distribution by category (£k)

Key	Transition (29.10)
	New Construction Projects (29.11)
	Commercial Operations (29.12)
	Decommissioning & Termination (29.13)
	Waste & Nuclear Materials Management (29.14)
	Site Support (29.15)
	Support Services (29.16)
	Stakeholder Support (29.17)

Defuelling

During the Defuelling phase, the priority at Wylfa will be to remove safely and despatch all fuel elements off site to the Sellafield reprocessing plant.

Defuelling comprises all activities required for safe regulatory-compliant defuelling of the reactors and the despatch of irradiated fuel to Sellafield, including maintenance of the fuel handling plant.

Defuelling at Wylfa will be coordinated with other defuelling sites and the Sellafield reprocessing plant, under the auspices of the MOP. This will contribute critically to meeting the UK's OSPAR agreement.

Plant and systems required to ensure safety and support the defuelling process or needed to ensure safety will be maintained as necessary to rectify defects, meet statutory requirements and maximise plant availability.

Other non-essential plant and systems will be shutdown, isolated and placed in a passively safe and segregated state in preparation for final decommissioning.

Defuelling will remove more than 99% of the hazardous nuclear material from the site.

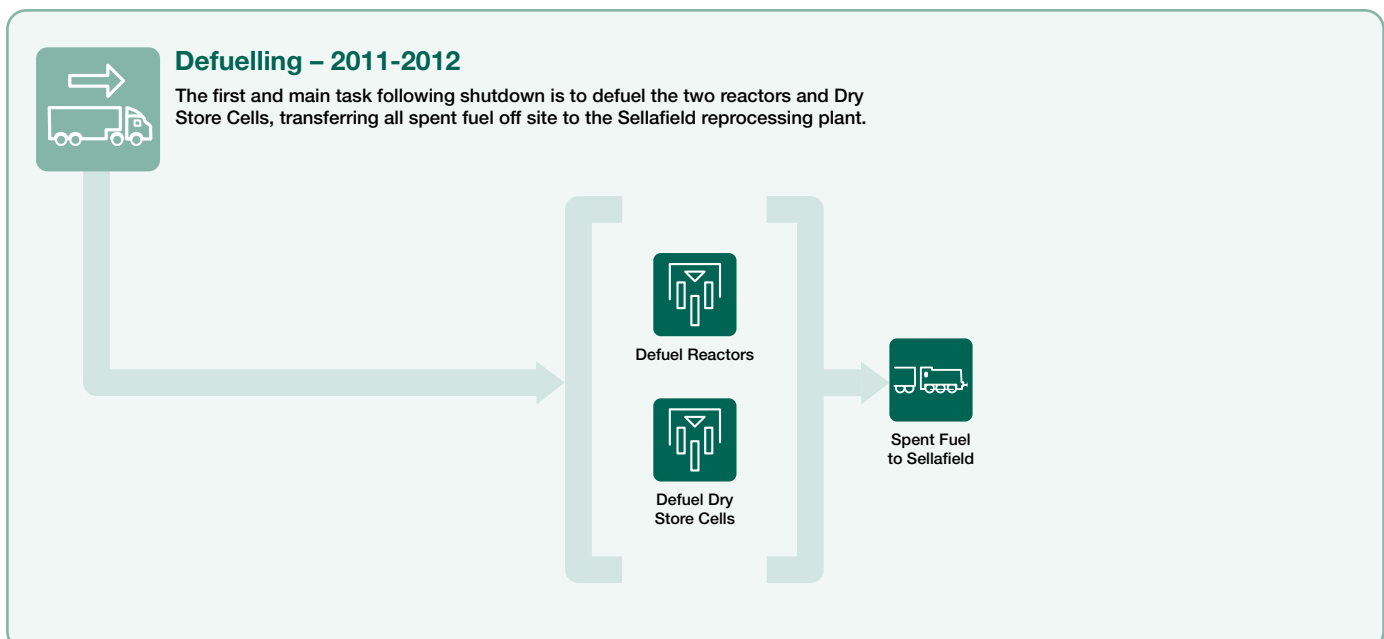
Workforce restructuring will take place to align with the defuelling scope of work, which will be a significant milestone and ensure the safe despatch of fuel elements off site.

Some decommissioning work will be carried out during the Defuelling phase where this can be done safely and compliantly without jeopardising the defuelling programme.

Waste processing activities will continue as described in Generation phase.

Support activities will continue in a similar way to the Generation phase.

Figure 29-9 – Defuelling scope of work



Key	◇ Regulatory Milestone
	◆ Other Milestone

Figure 29-10 – Defuelling summary work programme

Activity/Event	2011	2011/12				2012	
	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Transition (29.10)							
Workforce Restructuring – 2006-09 29.10.01	[Bar spanning 2011 Q4 to 2012 Q2]						
New Construction Projects (29.11)							
Reactor Building Safestore Conversion 29.11.29240.36300		◆ Submit preliminary safety report to NII					
Build LLW Management Facilities 29.11.29245.36400					◆ Commission and practical completion		
Active Effluent Sludge Solidification 29.11.29225.34200							
Mobile Effluent Treatment Plant 29.11.29235.35200			◆ Commission and practical completion				
Install New Electrical & C & I Systems 29.11.29230.34600							◆ Commission and practical completion
Commercial Operations (29.12)							
Defuelling Operations Inc. Management 2010-12 – 29.12.29215.32800							◆ Last Fuel Elements off site
Decommissioning & Termination (29.13)							
Fuel Route Plant & Building 29.13.29220							
Conventional Plant & Building 29.13.29230							
Miscellaneous Contaminated Plant & Buildings – 29.13.29235							
Reactor Plant & Buildings 29.13.29240							◆ Auxiliary Plant removed
Land Management 29.13.29250							
Fuel Route Plant & Building 29.13.29220							
Conventional Plant & Building 29.13.29230				◆ Cooling Water System Removed			
Land Management 29.13.29250							
Waste & Nuclear Materials Management (29.14)							
Solid Wastes 29.14.29225.34200							
Decommissioning Waste Processing Facilities – 29.14.29245.36400							
Site Support (29.15)							
Facilities Management & Services Provision – 29.15.29210.32100							
Programme Management 29.15.29200.30500							
Support Services (29.16)							
Site Management 29.16.29270.39100							
Stakeholder Support (29.17)							
Regulatory Support 29.17.70							

All date ranges are in Financial Years

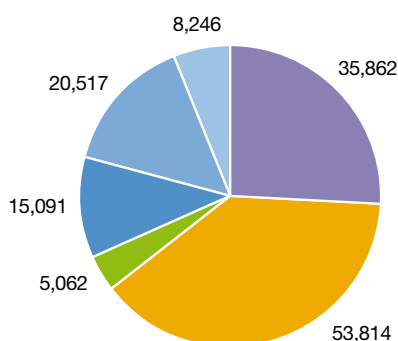


Figure 29-11 – Defuelling cost distribution by category (£k)

Key	Transition (29.10)
	New Construction Projects (29.11)
	Commercial Operations (29.12)
	Decommissioning & Termination (29.13)
	Waste & Nuclear Materials Management (29.14)
	Site Support (29.15)
	Support Services (29.16)
	Stakeholder Support (29.17)

Care & Maintenance Preparations

The aim of Care & Maintenance Preparations is to make the site passively safe and minimise the amount of surveillance and maintenance required during the Care & Maintenance phase.

During the C&M Preps phase most plant and buildings, with the exception of the reactor buildings, will be removed. The reactor buildings will be put into a passively safe and secure state. The majority of accumulated operational wastes will be processed and packaged.

The reactor buildings and service block will be deplanted and decontaminated and a safe store for long term C&M phase created. The fuelling machines, reactor service machine and all plant and equipment associated with fuelling machine and pile cap maintenance will be removed.

Dry Store Cells 4 and 5 will be deplanted, decontaminated and demolished following the defuelling phase. Dry Store Cells 1, 2 and 3 will be sealed and contained within the reactor Safestore building. Most of the ILW will be stored in a modified waste storage vault.

In order to prepare the reactors for prolonged C&M, the primary penetrations (CO₂ and fuel) and secondary circuits (water and steam) will be sealed, along with all other penetrations around the pile cap. In addition, the reactor pressure vessel will be sealed.

The turbine hall will be deplanted, with a specialist contractor removing the remaining asbestos. The turbine hall basement walls will be breached to permit the free flow of groundwater and the area backfilled with hardcore and crushed concrete.

The effluent discharge line that is currently in use will be decontaminated and prepared for C&M. All the plant and equipment related to the main cooling water system on site will be removed, the structures demolished and culverts backfilled or broken through as appropriate.

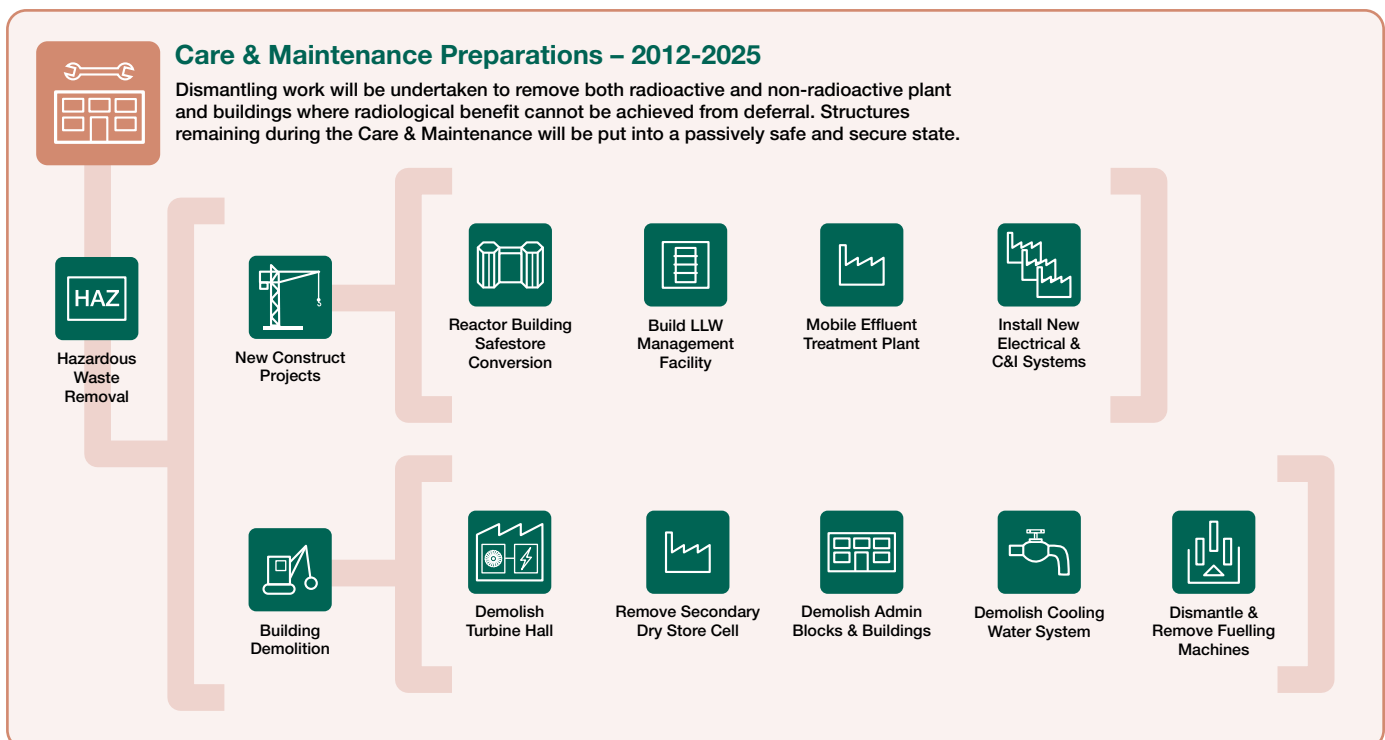
The administration and ancillary buildings on the site will be deplanted and demolished down to their slabs and the area cleared.

The miscellaneous site wide services will be fully or partially deplanted and alternative provision established as appropriate.

A new LLW management Facility will be created. This will enable the waste to be processed centrally and more efficiently. A new Mobile Effluent Treatment Plant (METP) will be built to treat the accumulated active effluent to an activity level, which permits free discharge into the site drainage system.

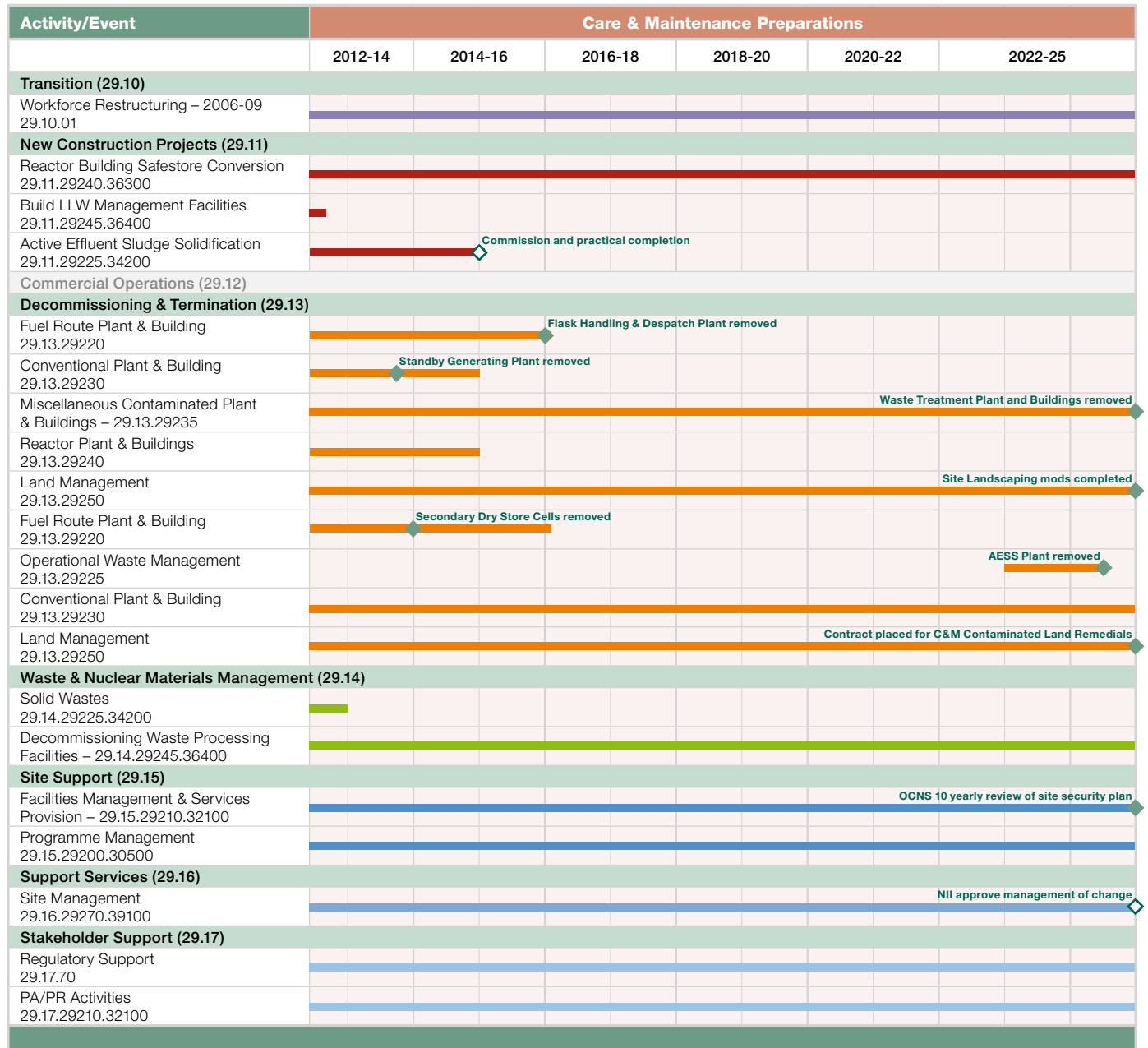
It is proposed to create an alternative electrical and C&I supply system from the local area board supply at a rating of 1MW. A new site distribution system will also be installed with the new cables distinctly colour coded to aid future identification.

Figure 29-12 – Care & Maintenance Preparations scope of work



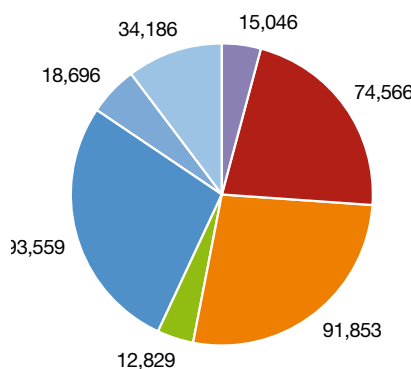
Key	◇ Regulatory Milestone
	◆ Other Milestone

Figure 29-13 – Care & Maintenance Preparations summary work programme



All date ranges are in Financial Years

Figure 29-14 – C&M Preps cost distribution by category (£k)



Key	Transition (29.10)
	New Construction Projects (29.11)
	Commercial Operations (29.12)
	Decommissioning & Termination (29.13)
	Waste & Nuclear Materials Management (29.14)
	Site Support (29.15)
	Support Services (29.16)
	Stakeholder Support (29.17)

Care & Maintenance

In the Care & Maintenance phase the site will remain in a quiescent state for a prolonged period, throughout which no significant dismantling work will be undertaken. This will allow radiation levels to reduce to facilitate future reactor.

It is assumed that the C&M phase will be split into two periods. The Initial C&M period will last five years during which time the site will remain continuously staffed. This will be followed by the main, quiescent C&M period for which the staffing on site will be reduced to a level appropriate to maintain safety and security.

All buildings will be routinely maintained, inspected regularly and will undergo periodic surveys. The buildings will be inspected on a periodic basis, or following severe weather, to discover any failure of the weathertight envelope. It will also be necessary to undertake ground maintenance on the site.

The extent and frequency of the inspection and maintenance programmes will be derived from the relevant safety cases and the associated site Maintenance Schedule. The following indicative programme is considered representative, based on current knowledge and includes some elements of land management around the Safestore.

- Weekly external inspections that will identify obvious damage to building fabric (such as the loss of cladding).
- Monthly ground maintenance of the site consisting of cutting the grass, applying weed killer to hardstandings, etc, and clearing ditches and drains, as required.
- Half yearly external engineering inspections and minor maintenance.
- Yearly internal engineering inspections and minor maintenance.
- Twenty five yearly external and internal engineering inspections followed by more major maintenance, if required.

During the Main C&M period, all buildings will be maintained to a high standard commensurate with the risk to the plant housed within and the associated potential hazards.

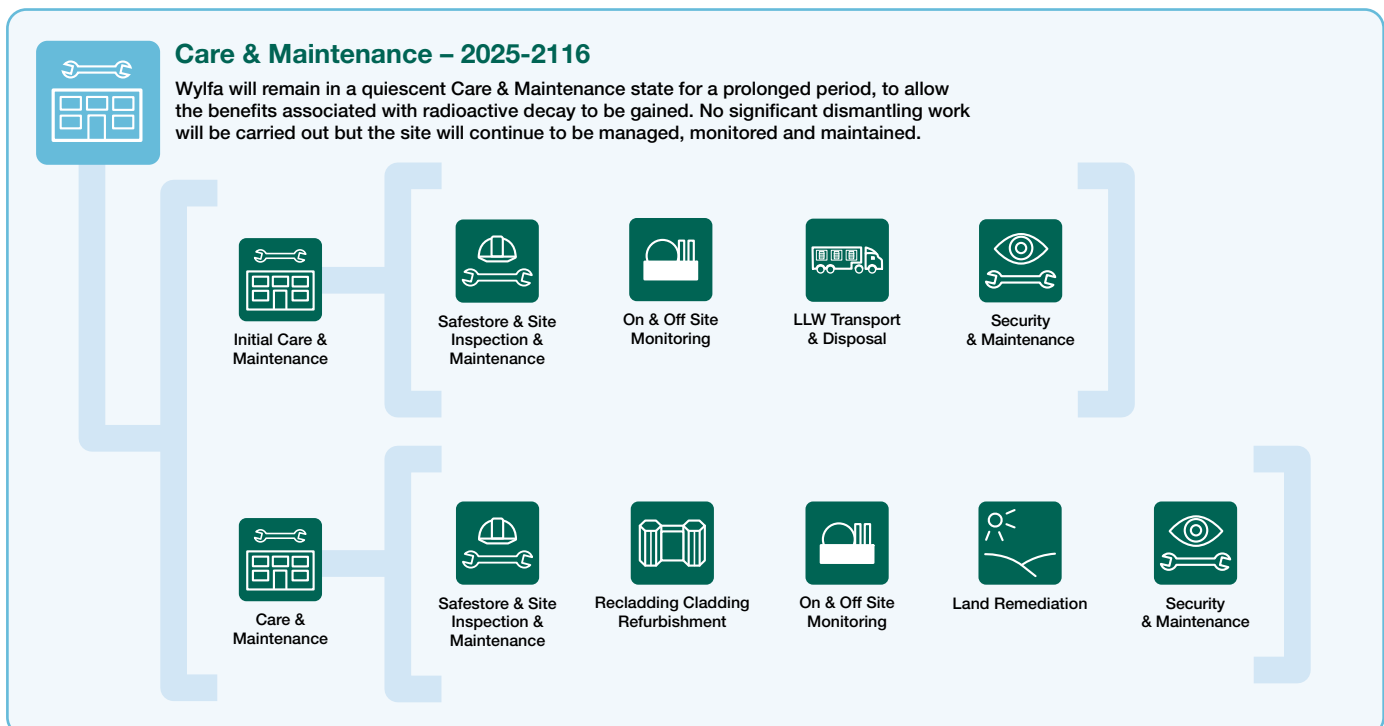
The cladding on the safestore building has been planned to be replaced after 30 years. It will then be checked after a further 30 year period and refurbished as necessary.

Radioactivity levels will be monitored during the C&M phase to demonstrate adequate contamination control, verify the effectiveness of containment, demonstrate compliance with authorised discharge limits, assess the radiation exposure to the public and to reassure the general public.

In addition to the on site monitoring, a limited off site monitoring programme will be performed. Annual sampling and assay of green vegetation gathered from the locality will indicate any changes to the ambient levels of radioactivity.

It is during this phase that the decommissioning of the Maentwrog hydroelectric power station will take place.

Figure 29-15 – Care & Maintenance scope of work





The Socio-Economic Development Plan will provide proactive support to the local communities.



Wylfa will continue to generate safely, reliably and economically until 2010 under the current Magnox Operating Programme.

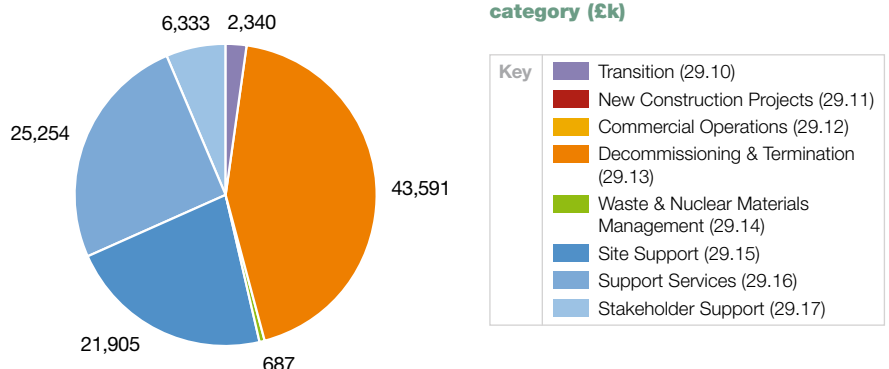
Key	◇ Regulatory Milestone
	◆ Other Milestone

Figure 29-16 – Care & Maintenance summary work programme

Activity/Event	Care & Maintenance					
	2025-40	2040-55	2055-70	2070-85	2085-2100	2100-16
Transition (29.10)						
Workforce Restructuring – 2006-09 29.10.01	[Timeline bar]					
New Construction Projects (29.11)						
Commercial Operations (29.12)						
Decommissioning & Termination (29.13)						
Conventional Plant & Building 29.13.29230	[Timeline bar]					
Waste Management 29.13.29245	[Timeline bar]					
Land Management 29.13.29250	Contract placed for C&M Contaminated Land Remedials					
Waste & Nuclear Materials Management (29.14)						
Decommissioning Waste Processing Facilities – 29.14.29245.36400	[Timeline bar]					
Waste Transport & Disposal 29.14.29245.36700	Initial LLW Trans. & Disposal Ends EA Packaged Waste transfer/disposal authorisation granted for FSC					
Site Support (29.15)						
Support Services (29.16)						
Initial C&M Site Staff 29.16.29270.39100	NII approve management of change					
C&M Main Site Licence Management 29.16.29270.39100	NII approve management of change					
Stakeholder Support (29.17)						
Regulatory Support 29.17.70	[Timeline bar]					

All date ranges are in Financial Years

Figure 29-17 – C&M cost distribution by category (£k)



Final Site Clearance

After the Care & Maintenance phase, the site will be cleared of all remaining buildings and delicensed to make it available for reuse.

The site infrastructure will be reinstated early in the Final Site Clearance (FSC) phase.

A waste management facility will be designed, constructed and commissioned. This will be used to receive, monitor, treat, package and dispatch waste arising during FSC.

Entrance to the Safestore structures will be gained at an early stage in order to carry out preliminary structural and radiological surveys. These will be followed by an initial clean-up to remove loose contamination.

A section of the Safestore roof will be removed to allow larger items of plant to be lifted out using a mobile 150 tonne capacity crane situated at ground level. A 50 tonne capacity mobile crane will be lifted in through the same roof opening to assist in dismantling operations and a temporary, removable cover provided over the roof opening in order to maintain a weathertight envelope.

Pile cap extension buildings will be constructed over the pile caps to enable the reactors to be demolished. Each reactor will be completely dismantled by taking apart the concrete pressure vessel and diagrid, removing the active concrete from the reactor, dismantling the reactor structures and removing the inactive concrete.

The Central Block will be prepared for demolition by removing radioactive material from the vaults, removing contaminated plant, removing non-radioactive plant and equipment and decontaminating the structure.

Once all radioactive plant and contamination has been removed from the reactor buildings and the Central Block they will be demolished and the voids below ground level backfilled.

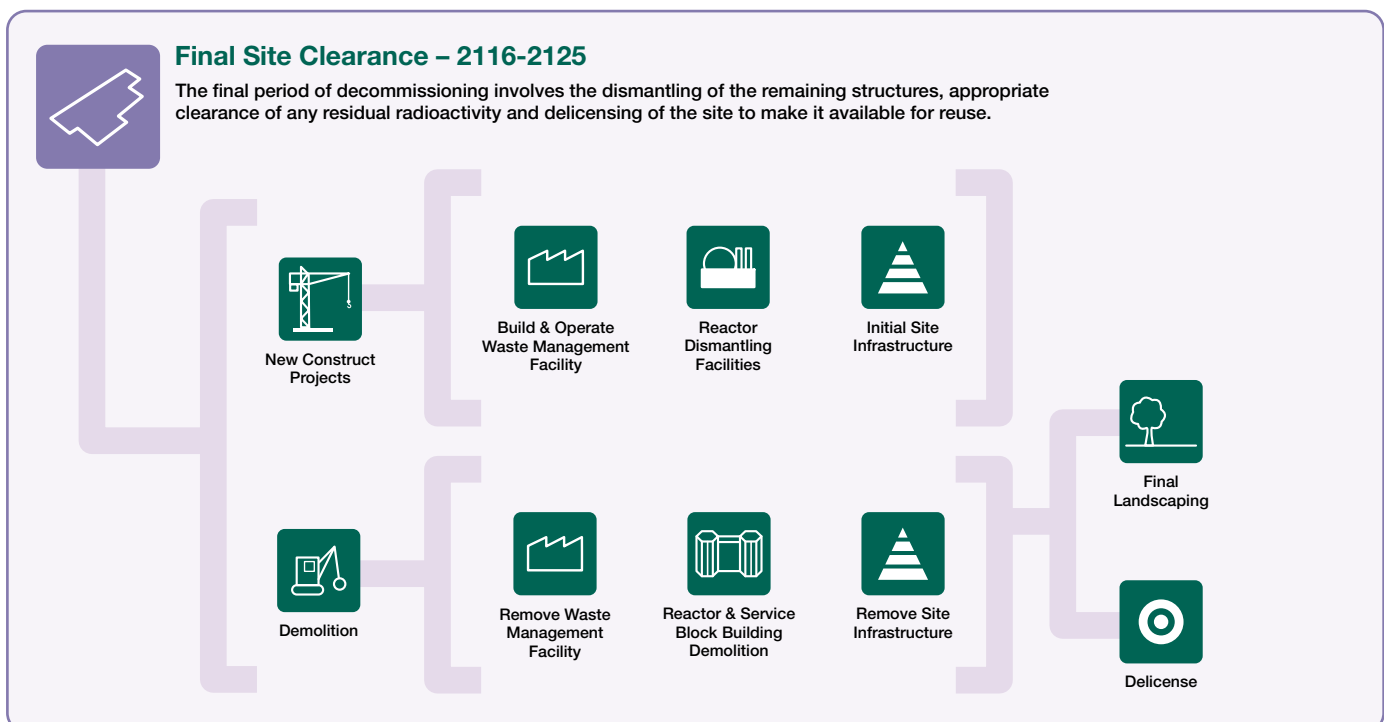
At the end of the FSC phase, all the new services and structures installed to support the project will be deplanted, demolished and removed. Buildings will be removed

down to a depth of 1m below ground level. Depending on the function of the buildings being removed, some minor decontamination may be needed before the strip out of fittings and demolition can commence. Demolition will be carried out using conventional industrial techniques.

Clean concrete produced by the demolition of the buildings will be used as infill material where required.

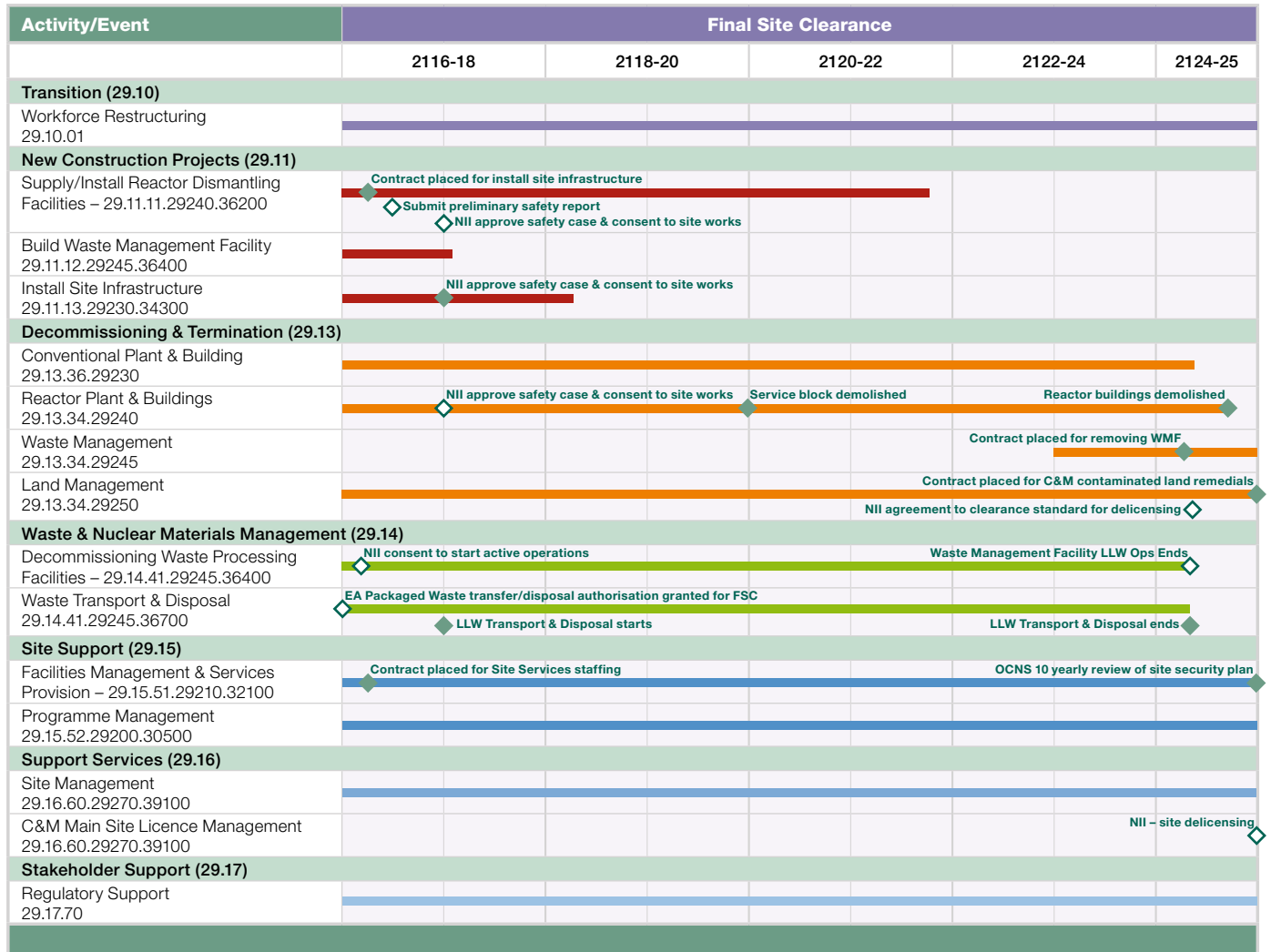
As demolition nears completion, clearance of the site will commence. This work includes removal of site infrastructure, including roads, car park, hardstandings, fences, underground main cables and water mains. Active drains and outfall will be removed; foul and surface water drains will be removed if less than 1m below ground level; basements will be demolished to 1m below ground level and any remaining structure punctured to assist drainage.

Figure 29-18 – Final Site Clearance scope of work



Key	◇ Regulatory Milestone
	◆ Other Milestone

Figure 29-19 – Final Site Clearance summary work programme



All date ranges are in Financial Years

Monitoring during the C&M phase will have identified any areas where the soil is contaminated.

This soil will be excavated and disposed of as LLW. Following this a radiological survey will be carried out to confirm that the Site Licence can be withdrawn and the site released for alternative use.

Once this has been confirmed, the entire site within the outer fence will be regraded and covered with 300mm of imported topsoil. Land drains will be installed at 20m centres across the site and then the whole area seeded.

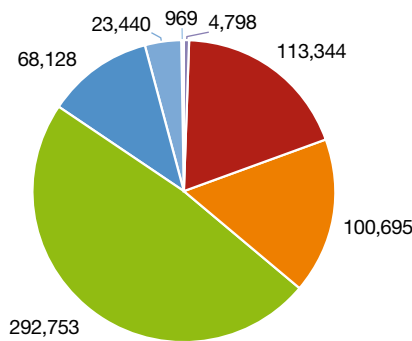


Figure 29-20 – FSC cost distribution by category (£k)

Key	Transition (29.10)
	New Construction Projects (29.11)
	Commercial Operations (29.12)
	Decommissioning & Termination (29.13)
	Waste & Nuclear Materials Management (29.14)
	Site Support (29.15)
	Support Services (29.16)
	Stakeholder Support (29.17)

Near Term Work Plan (Years 1 to 3)

Throughout the period from April 2006 to 2009 Wylfa will continue to generate electricity safely and will take all opportunities to prepare for the future defuelling and decommissioning of the plant.

Wylfa will generate electricity until December 2010 in line with the MOP. The focus during this period will be to maximise the value of generation while maintaining nuclear, conventional and public safety and environmental protection.

In parallel with generation the site will prepare for the Defuelling phase.

A major activity to be undertaken over the next three years is the ongoing delivery and support of plant maintenance. Part of plant maintenance is to carry out biennial outages on each of the reactors. Under Site Licence Conditions 30 & 28 there is a requirement for the reactors to be shut down periodically to carry out

inspections, maintenance and testing as defined by the Maintenance Schedule. In addition, pressurised systems require to be inspected to comply with the Pressurised Systems Safety Regulations.

Wylfa will also take advantage of the requirement to shut down the reactors for these regulatory needs to carry out routine maintenance to ensure reliability of the plant between outages. Wylfa will also reduce the risk of unplanned outages by rectifying those minor defects that cannot be undertaken with the reactor and turbines at power.

During the three year period the site will continue with defuelling operations where

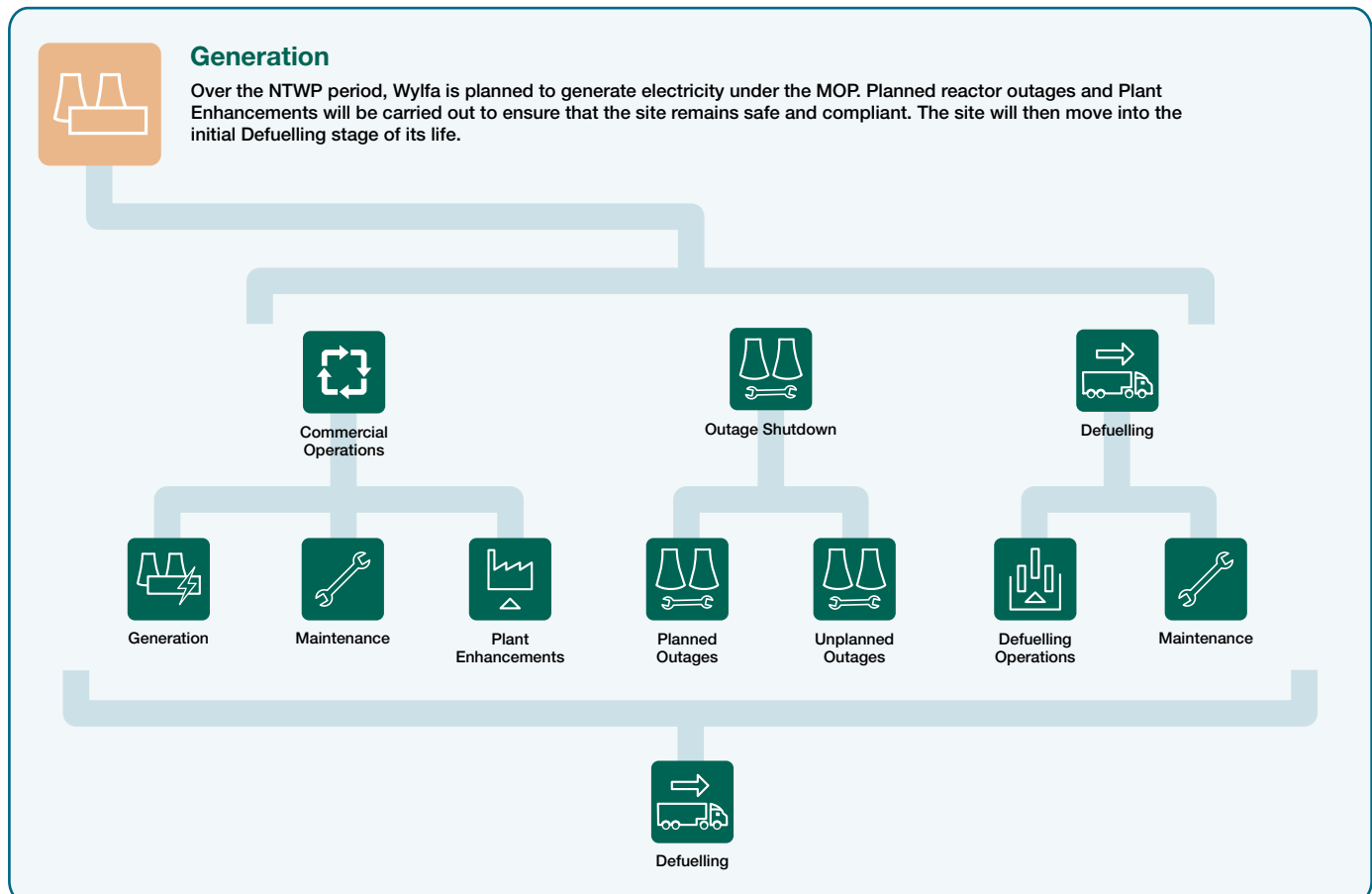
irradiated fuel elements are removed from the Dry Store Cells and despatched to the Sellafield reprocessing plant.

In addition, specific plant enhancements have been identified that will further enhance nuclear and conventional safety, protection of the environment and the achievement of the MOP targets.

During the Generation phase opportunities exist to prepare for subsequent phases of work. Preparations will be made to ensure a smooth transition to the defuelling and decommissioning phases. These will include:

- Production of Post Generation Defuelling Safety Case.

Figure 29-21 – NTWP (Years 1 to 3) scope of work





Major focus of work for Years 1 to 3 is on safe and reliable electricity generation and despatch of spent fuel to Sellafield.



During the remainder of the Generation phase, there will be five statutory outages.

Key	◆ Regulatory Milestone
	◆ Other Milestone

Figure 29-22 – NTWP (Years 1 to 3) summary work programme

Activity/Event	NTWP											
	2006/07				2007/08				2008/09			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Transition (29.10)												
Workforce Restructuring – 2006-09 29.10.01	[Timeline bar]											
Commercial Operations (29.12)												
Generation 29.12.29280.40000	Target Spent Fuel despatched Achieved, Undamaged Fuel Elements removed from DSC4 & DSC5 Target Generation Achieved, Target Spent Fuel despatched achieved, Target Generation achieved Post Generation Defuelling Safety Case complete											
Plant Enhancements 29.12.29280.40200	Transfer Machine refurbishment, DSC4 Damaged Fuel Elements despatched Gas Circulator speed SPM3 trip units replacement, Completion of work in support of the Regulatory Safety Enhancements											
Planned Outages 29.12.22290.41000	R2 Outage completion, R1 Outage completion, R2 Outage completion											
Decommissioning & Termination (29.13)												
Initial Decommissioning 29.13.29200.31350	End State Definition Stakeholder Group Consultations completed Site End State Definition Preparation for Decommissioning and Defuelling – (PAF SO3-06/07-29-13)											
Waste & Nuclear Materials Management (29.14)												
LLW Waste Management 29.14.43.36400	[Timeline bar]											
Site Support (29.15)												
Programme Management 29.15.29200.30500	Deliver robust and credible Lifetime Plan (PAF GO5-06/07-29-15)											
Support Services (29.16)												
Site Management 29.16.29270.39100	Allocation of funds and rolling forecast (PAF GO2-06/07-29-16)											
Stakeholder Support (29.17)												
Regulatory Support 29.17.70	Agreed payment terms for each Regulatory organisation Agreed payment terms for each Regulatory organisation Agreed payment terms for each Regulatory organisation											

All date ranges are in Financial Years

- Enhancement of fuel route plant and processes to facilitate defuelling.
- Production of Technical Baseline for Decommissioning to support detailed planning for decommissioning.
- Workforce restructuring to manage the changes that will be required to put in place a workforce structure appropriate for the defuelling phase. This will be done in a way that retains key skills and ensures that there are sufficient Suitably Qualified and Experienced Persons (SQEP) to maintain safe and effective working.

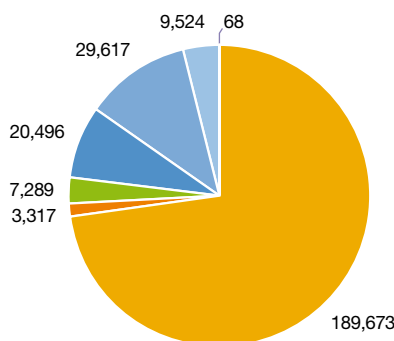


Figure 29-23 – NTWP (Years 1 to 3) cost distribution by category (£k)

Key	Transition (29.10)
	New Construction Projects (29.11)
	Commercial Operations (29.12)
	Decommissioning & Termination (29.13)
	Waste & Nuclear Materials Management (29.14)
	Site Support (29.15)
	Support Services (29.16)
	Stakeholder Support (29.17)

Major Assumptions & Exclusions

Assumptions are made to move from a position where uncertainty exists to one that provides a firm basis for the work, allowing it to be fully scoped, scheduled and costs to be estimated.

Figure 29-24 – Major assumptions by category

Category	Assumptions	Justification	Applies to:	
			LCBL	NTWP
Workforce Restructuring (29.10)				
	Innovations in relating to accelerated decommissioning plans not included.	This is a request from the Nuclear Decommissioning Authority (NDA).	✓	
	Decommissioning strategy remains the same – Safestore strategy.	This is the current strategy.	✓	
	No change in decommissioning plans based on the Environmental Impact Assessment for Decommissioning report and the socio-economic impact.	There is no reason to believe otherwise at the current time.	✓	
New Construction Projects (29.11)				
	The one-box strategy will be followed, ie one safestore to include both reactors and an Intermediate Level Waste (ILW) store according to Wylfa PDP 1994.	Based on the content of Wylfa PDP 1994.	✓	
Commercial Operations (29.12)				
	During the inspection programmes contained within these work scopes, no new type of defect that challenges the Safety Case is found.	The Oxidation Baseline Safety Case has assessed all likely defects we expect to find.		✓
	Magnox Fuel is supplied free issue by Springfields Fuels Ltd on behalf of the NDA and the fuel manufacture facility closure programme does not change.	Current plans are not expected to change.	✓	✓
	Reactors will be operational 288 (+/- 5) days per year.	This has been averaged over two years and is taken from the system notebook.	✓	✓
	Both the Primary and DDR routes to have at least 90% availability.	This includes the planned downtime for maintenance.		✓
Decommissioning & Termination Projects (29.13)				
	End of Generation is 31 Dec 2010.	Date has been agreed with the NDA.	✓	✓
	Defuelling is completed by 31 Aug 2012.	Date has been determined by examination of current fuelling rates by Suitably Qualified & Experienced Persons.	✓	✓
	Cost estimates for Care & Maintenance and Final Site Clearance (FSC) have been built in detail for Hinkley and have been parametrically adjusted for Wylfa.	Parametrically scaled for Wylfa.	✓	
	The cost of FSC work is similar to that for a steel pressure vessel station, parametrically scaled to account for the size of Wylfa.	Parametrically scaled for Wylfa.	✓	
	This Lifecycle Baseline is constructed from technical information given in the Pre-Decommissioning Plan (1994 TD/ETB/REP/1107) and will be updated when the Technical Baseline for Decommissioning is produced.	This is the best available information in advance of the Technical Baseline.	✓	
Waste & Nuclear Materials Management (29.14)				
	Graphite, because of its high C14 content, not suitable for disposal in a near-surface Low Level Waste Repository and hence needs to be treated as ILW requiring deep disposal. (FSC).	Requirement reflects current legislation. Further guidance is awaited from Corporate Centre.	✓	
Support Services (29.16)				
	The current, draft NDA strategy proposals are accepted by the government and form the basis of the industry's future policies and framework.	A different strategy could impact significantly on the customers requirements from another site.		✓
Stakeholder Support (29.17)				
	No major change to the sustained level of current public support to strategy. (Generic).	Based on current political climate.	✓	

The above figure contains the major assumptions by category upon which the scope of work is based in this plan.

These assumptions, along with those defined in the supporting documentation are intended to clarify the boundaries of the work, which has been planned and costed. They will be addressed as and when they arise. This approach will allow the efficient costing and planning of work.

All work in this Lifecycle Baseline (LCBL) has been based on the following assumptions:

- The Nuclear Decommissioning Authority’s (NDA) ‘Key technical and strategic assumptions’ issued as guidance.
- Current Government Policy, Legislative and Regulatory, remains constant with the Regulators adopting a consistent and proportional approach.
- Current waste disposal and environmental discharge authorisations remain unchanged.

Figure 29-25 – Major exclusions by category

Category	Exclusions	Justification	Applies to:	
			LCBL	NTWP
Commercial operations (29.12)				
	Radiological monitoring of Trawsfynydd lake.	Work to be carried out by Trawsfynydd site staff.	✓	
Waste & Nuclear Materials Management (29.14)				
	Disposal or processing of Intermediate Level Waste (ILW).	There is no recognised/authorised current disposal route for ILW.		✓

Risk Management

It is important that the more significant cost and programme risks associated with the delivery of the work across Wylfa are well understood, this allows effective risk mitigation activities to be developed and then actively managed.

Figure 29-26 – Risk summary

	Description	Applies to:	
		LCBL	NTWP
PSWBS 29.10 – Workforce Restructuring – (Decommissioning Strategy)			
Description	Decommissioning Strategy changes.		
Possible Impact	Plan will need to be accelerated.	✓	
Mitigation Activities	Early stakeholder arrangement with the Nuclear Decommissioning Authority.		
PSWBS 29.11 – New Construction Projects – (Higher Costs)			
Description	Cost derived from reference station is much greater than required for the build of Wylfa facilities.		
Possible Impact	Cost is overestimated.	✓	
Mitigation Activities	Characterisation of active sludge will identify the extent of facilities required.		
PSWBS 29.12 – Commercial Operations – (Ageing Plant)			
Description	As a result of ageing plant there is a threat that reliability will suffer leading to plant and equipment failures.		
Possible Impact	Extreme case could lead to reactor outage.		✓
Mitigation Activities	Ensure adequate maintenance regime is in place plus effective inspection activities to provide for safe, compliant operation and maximum availability to plant.		
PSWBS 29.12 – Commercial Operations – (Fuel Flask Availability)			
Description	As a result of plant problems at Sellafield there is a threat that this will disrupt flask availability on site and would challenge the Magnox Operating Programme targets.		
Possible Impact	Failure to meet contractor business deliverable.		✓
Mitigation Activities	The Nuclear Installations Inspectorate would have to be informed. Change control will have to be entered to amend fuelling and possibly generation targets.		
PSWBS 29.12 – Commercial Operations – (Suitably Qualified & Experienced Persons Resource Issues)			
Description	As a result of competition from other nationwide project requirements there is a threat of Suitably Qualified & Experienced Persons resources being difficult to obtain leading to schedule delays and difficulties with projects.		
Possible Impact	Schedule delays and difficulties with projects.		✓
Mitigation Activities	Consider the skills required and plan to obtain resources in good time.		
PSWBS 29.13 – Decommissioning & Termination – (Inadequate Cost Estimates)			
Description	Cost estimates may be inadequate for boiler removal.		
Possible Impact	Costs increased.	✓	
Mitigation Activities	Accept and re-evaluate as more data becomes available.		
PSWBS 29.14 – Waste & Nuclear Materials Management – (Government Legislation)			
Description	As a result of Government legislation there is a threat of disposal sites become unavailable leading to the requirements to build a waste storage facility on site.		
Possible Impact	Failure to execute Near Term Work Plan to costs.		✓
Mitigation Activities	Build on site storage facilities.		
Opportunities			
PSWBS 29.13 – Decommissioning & Termination Projects			
Description	As a result of acceleration studies there may be OPPORTUNITIES to reduce the scope, schedule and cost of future Lifetime Plans and execute identified acceleration projects such as early deplanting etc.	✓	✓
PSWBS 29.13 – Decommissioning & Termination Projects			
Description	As a result of the Orphan Plant Survey, there is an OPPORTUNITY to remove plant early thus reducing Lifetime Plan scope/Cost.	✓	✓

The above diagram summarises the major pre-mitigated site risks at Wylfa. A full listing of the site risks can be found in the Site Summary Risk Register. All risks are managed in compliance with the NDA's Programme Control Procedure. Risks are regularly reviewed at the Site Programme Control.

Site Risk Management is carried out in accordance with PCP 10 – Risk Management and Contingency.

The risk process is as follows:

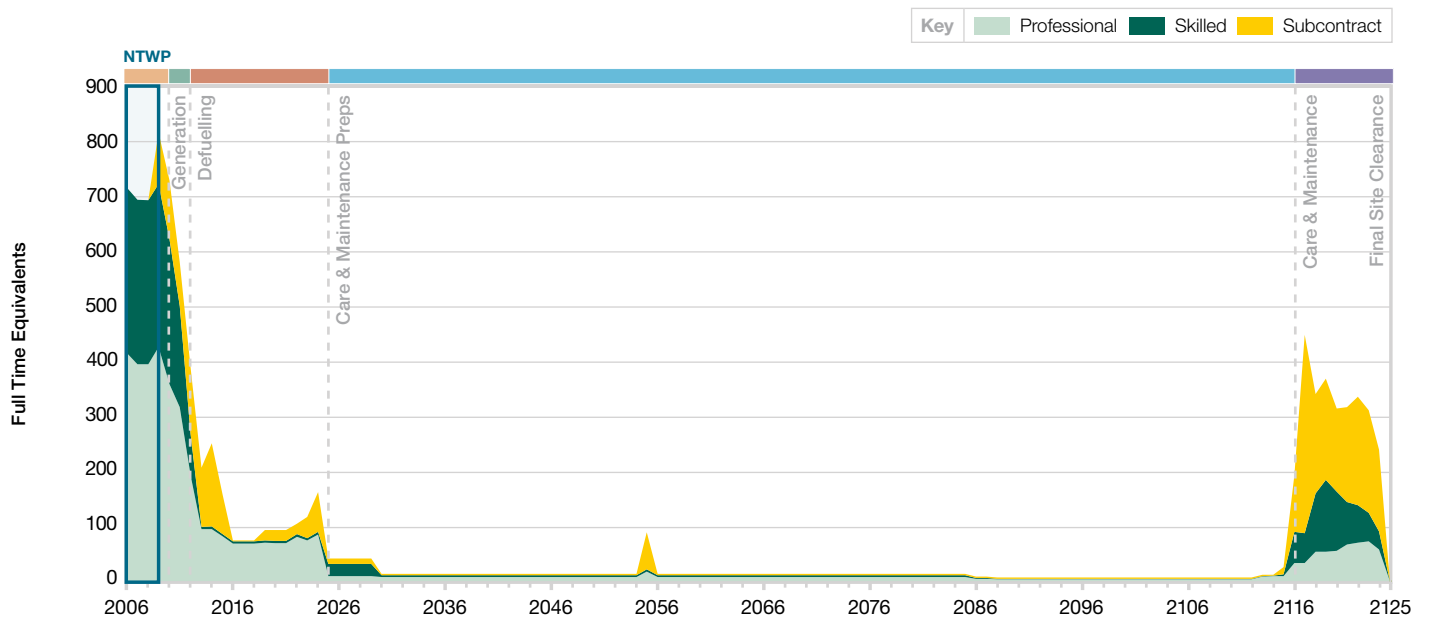
- Identification of the risk.
- Prioritisation of the risk.
- Risk management and allocation.

The regular review and collation of all risk registers into a common database enables this data to be regularly reviewed and managed. Probabilistic analyses using methods to allow quantification by consideration of the probability of coincident risks.

Staffing Curve

Staffing is critical to successfully delivering the plan. The site's staffing curves depict the established resources for the Lifetime Plan.

Figure 29-27 – Staffing profile curve against time and key phases



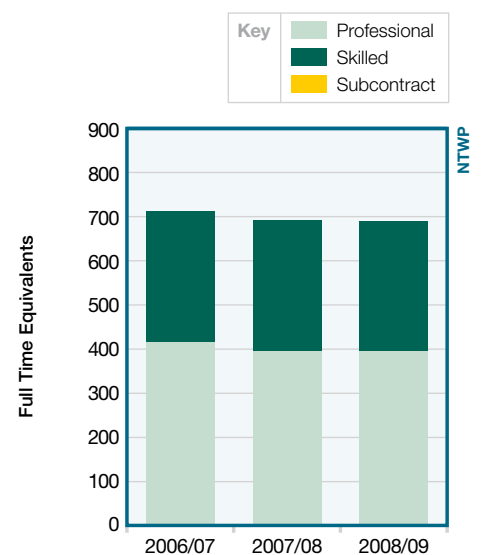
LCBL Staffing

Following detailed planning and negotiations, that are an integral component of the Transition category, the workforce will be restructured as each lifecycle phase demands.

NTWP Staffing

Wylfa is currently in its generation phase and the staffing levels remain at a consistent level, apart from during an outage, where the staffing levels increase due to the increased workload. This is likely to remain the case for the next three year period.

Figure 29-28 – NTWP (Years 1 to 3) staffing profile against time



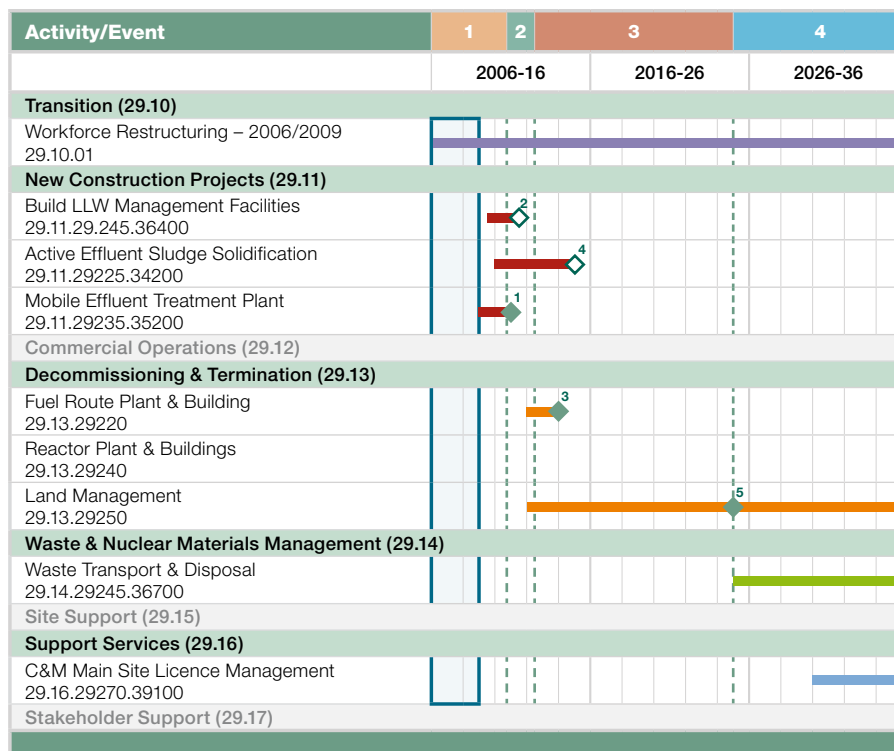
Summary Milestone Schedule

The key milestones for Wylfa are derived from the category summaries and based on the Key Performance Indicators.

Key milestones

	Date	Description
◇	Regulatory	
2	01-12-2011	Commission and practical completion
4	31-03-2015	NII approve management of change
6	29-03-2113	NII approve safety case & consent to site works
7	31-03-2117	NII – site delicensing
11	30-03-2125	
◇	Other	
1	30-06-2011	Commission and practical completion
3	02-04-2014	Secondary Dry Store Cells removed
5	01-04-2025	Contract placed for C&M Contaminated Land Remedials
8	02-04-2120	Service Block demolished
9	01-08-2124	LLW transport & Disposal Ends
10	13-12-2124	Reactor Buildings demolished

Figure 29-29 – Lifecycle milestone schedule



All date ranges are in Financial Years

NTWP

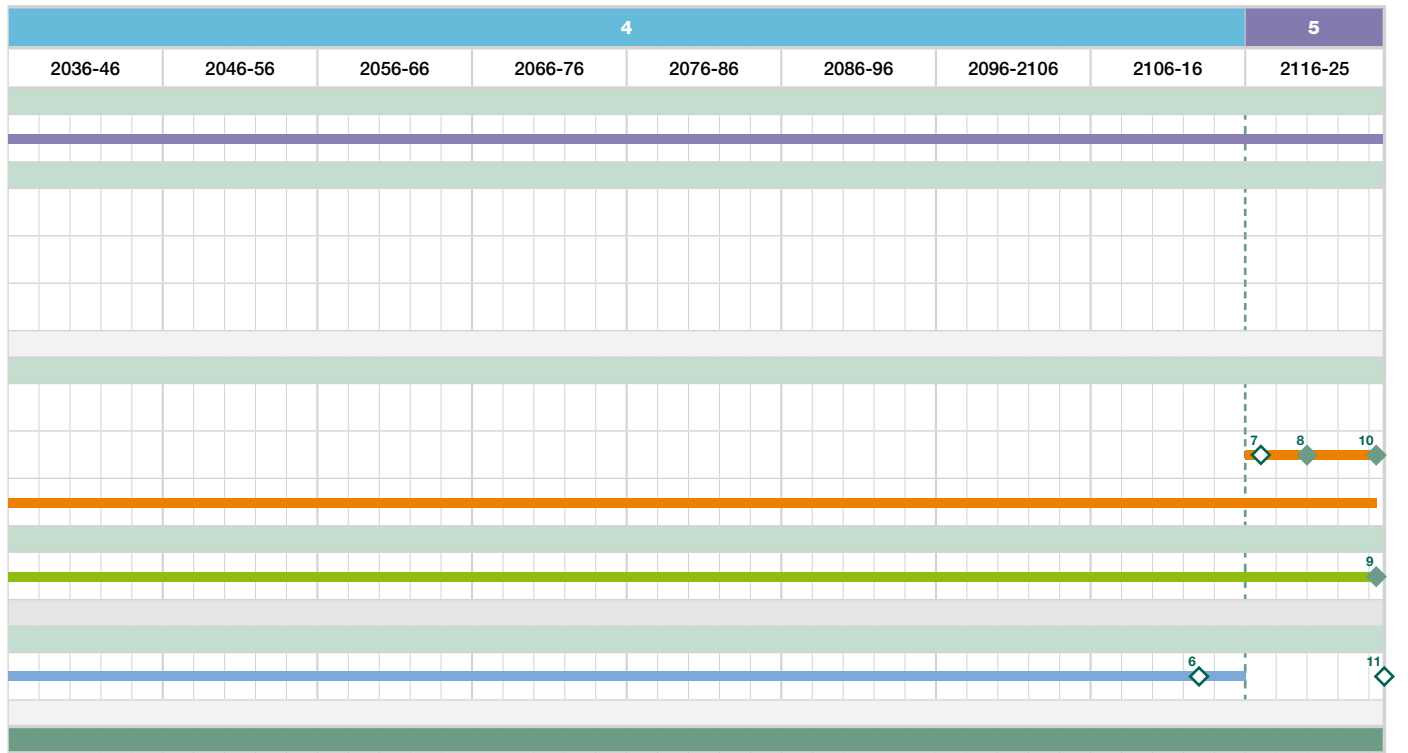


Workforce restructuring plans will be developed, and retraining will be provided where necessary.



Some of the costs will be incurred by carrying out plant enhancements and maintenance of the plant.

Lifecycle milestone schedule – continued



1. Generation 2. Defuelling 3. Care & Maintenance Preparations 4. Care & Maintenance 5. Final Site Clearance

Lifetime Plan Value

The summary tables and graphs show the present day, escalated and discounted costs for the site. Also included is the budgeted cost of work scheduled profile curve. Category cost distribution is also presented.

Figure 29-30 – Summary of costs – present day, escalated and discounted values

Category	Prior years cost to date (£k)	FYs 2006/07-10/11				
		Year 1 (£k)	Year 2 (£k)	Year 3 (£k)	Year 4 (£k)	Year 5 (£k)
Transition (29.10)	191,140	22	23	23	23	3,606
New Construction Projects (29.11)	0	0	0	0	268	18,232
Commercial Operations (29.12)	64,102,183	66,334	61,831	61,509	62,954	50,519
Decommissioning & Termination (29.13)	222,674	1,277	1,025	1,014	1,013	889
Waste & Nuclear Materials Management (29.14)	667,539	2,429	2,430	2,430	2,429	2,680
Site Support (29.15)	11,136,789	6,813	6,807	6,877	10,104	4,366
Support Services (29.16)	7,145,609	9,528	10,242	9,846	10,735	11,677
Stakeholder Support (29.17)	1,111,707	1,588	3,978	3,958	3,960	4,209
Fee (29.18)						
NDA Funded (29.19)						
Subtotal	84,577,641	87,991	86,336	85,657	91,486	96,179
Escalated value			89,012	91,051	100,261	108,671
Discounted value			84,477	82,009	85,704	88,161
Revenue Income (29.20)						

All date ranges are in Financial Years

NTWP

Figure 29-31 – NTWP (Years 1 to 3) cost distribution by category (£k)

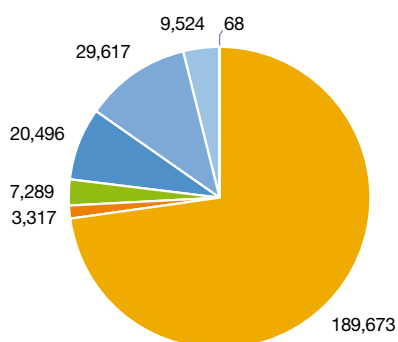


Figure 29-32 – Years 1 to 5 cost distribution by category (£k)

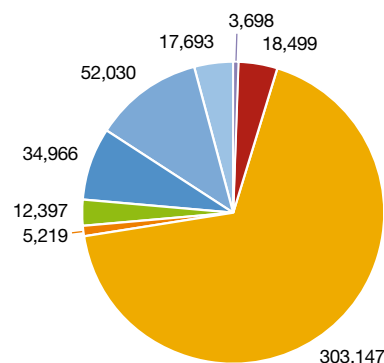
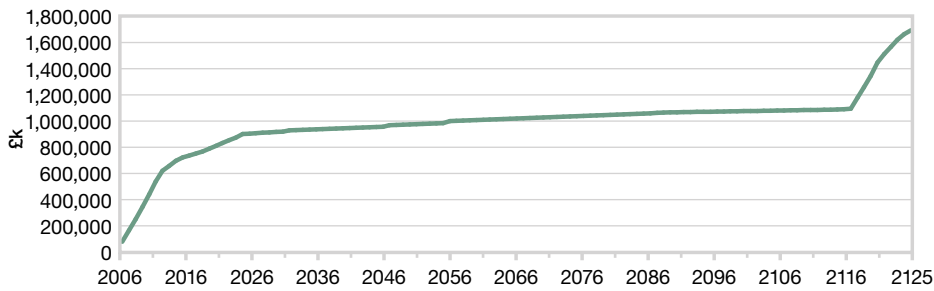


Figure 29-33 – Budgeted cost of work scheduled (BCWS) profile curve



Summary of costs – present day, escalated and discounted values – continued

Subtotal years 1-5 (£k)	FYs 2010/11-15/16					Subtotal years 1-10 (£k)	Lifecycle balance years 11+ (£k)	Total lifecycle cost (£k)
	Year 6 (£k)	Year 7 (£k)	Year 8 (£k)	Year 9 (£k)	Year 10 (£k)			
3,698	10,773	22,175	1,198	1,198	1,203	40,245	17,911	58,156
18,499	14,567	7,009	5,285	5,001	0	50,361	137,549	187,910
303,147	35,268	14,920	1,347	1,083	1,087	356,854	93,479	450,333
5,219	7,029	19,387	17,291	20,017	8,975	77,917	163,307	241,225
12,397	3,141	1,923	998	998	1,002	20,458	302,409	322,867
34,966	9,105	7,964	7,431	7,431	7,460	74,358	156,856	231,213
52,030	10,837	5,336	1,489	1,489	1,494	72,675	62,079	134,754
17,693	4,955	3,582	2,723	2,723	2,734	34,411	31,774	66,185
447,649	95,677	82,296	37,763	39,940	23,955	727,280	965,363	1,692,644
476,986	111,456	98,840	46,760	50,989	31,529	816,560	20,613,360	21,429,920
428,343	85,813	72,223	32,427	33,558	19,694	672,058	247,166	919,225

Figure 29-34 – Years 1 to 10 cost distribution by category (£k)

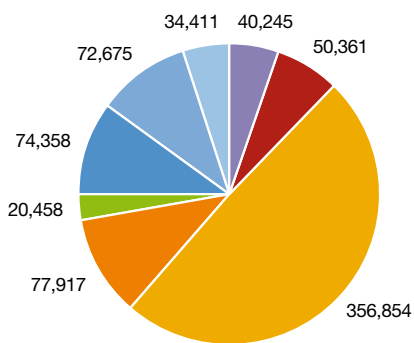
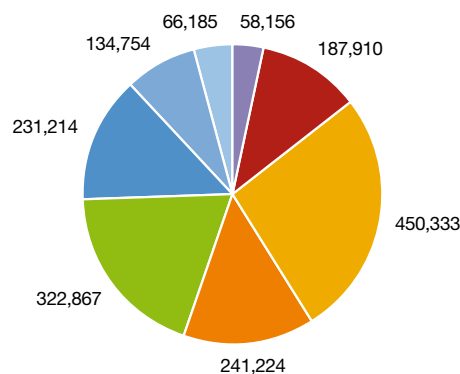


Figure 29-35 – LCBL cost distribution by category (£k)



Key	Category
Transition (29.10)	Transition (29.10)
New Construction Projects (29.11)	New Construction Projects (29.11)
Commercial Operations (29.12)	Commercial Operations (29.12)
Decommissioning & Termination (29.13)	Decommissioning & Termination (29.13)
Waste & Nuclear Materials Management (29.14)	Waste & Nuclear Materials Management (29.14)
Site Support (29.15)	Site Support (29.15)
Support Services (29.16)	Support Services (29.16)
Stakeholder Support (29.17)	Stakeholder Support (29.17)

Reconciliation of Costs

The value presented in this 2006/07 Lifetime Plan is the continuation of previous plans at Wylfa site. These costs are reconciled against the 2005/06 LCBL (previous title of the Lifetime Plan).

Figure 29-36 – Reconciliation of costs

Category/Type	Lifetime Plan 2006/07 (£k)	LCBL 2005/06 (£k)	Variance (£k)	Justification
Transition (29.10)	58,155.9	67,048.7	-8,892.8	Central Costs now with Oldbury (Lead Site).
New Construction Projects (29.11)	187,910.1	186,494.9	1,415.2	Remove/Modify Essential Services (R1200) has moved to Category 13 Lifetime Plan 2006/07.
Commercial Operations (29.12)	450,333.1	378,779.6	71,553.5	Generation phase has been extended from 31 Mar 2010 (Lifecycle Baseline (LCBL) 2005/06) to 31 Dec 2010 (Lifetime Plan 06) and the Defuelling period completion has moved from 31 Mar 2012 (LCBL 2005/06) to 31 Aug 2012 (Lifetime Plan 2006/07). Engineering, Inventory Management, Reactor Physics Safety Case, Ops and Project Support (Generation & Defuelling only) and Supply Chain Management (Part) have moved from Category 15 (LCBL 2005/06).
Decommissioning & Termination (29.13)	241,229.8	237,451.6	3,778.2	Decommissioning Preparation Management and Post Generation phase Changeover (Generation phase only) has moved from Category 15 (LCBL 2005/06). Remove/Modify Essential Services (R1200) has moved from Category 11 LCBL 2005/06.
Waste & Nuclear Materials Management (29.14)	322,872.4	308,818.0	14,054.4	Central Team Support Costs, Wylfa now Lead Site.
Site Support (29.15)	231,214.0	236,076.3	-4,862.3	Engineering, Inventory Management, Reactor Physics Safety Case, Ops and Project Support (Generation & Defuelling phases only) and Supply Chain Management (Part) have moved into Category 12 in Near Term Work Plan 2006/07. Post Generation phase Changeover (Generation phase only) has moved to Category 13. Part of Supply Chain Management has moved to Category 16.
Support Services (29.16)	134,754.3	107,968.0	26,786.3	Part of Supply Chain Management has moved from Category 15. Site Management - Wylfa E&TS Costs increased.
Stakeholder Support (29.17)	66,184.9	54,591.2	11,593.7	Socio-Economic Plan Starts Earlier.

Metrics & Key Quantity Curves

In order to facilitate the work carried out over the Lifetime Plan, a number of key quantities are identified here. They have been selected because they provide a clear indication of progress being made.

Figure 29-37 demonstrates Wylfa's generation targets for each year until the end of Generation, currently dated December 2010.

The chart in Figure 29-38 shows the projected fuel element removal from site up until the end of the Defuelling period in August 2012.

Figure 29-39 shows the quantities of LLW, Raw and Processed ILW arising over the Wylfa lifecycle.

Figure 29-37 – Annual Generation Targets

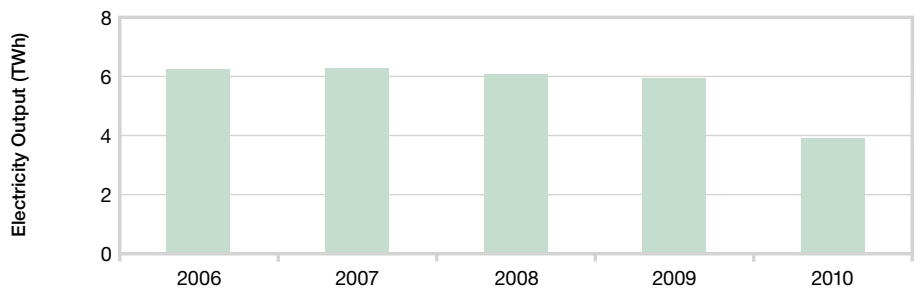


Figure 29-38 – Fuel elements remaining on Wylfa Site

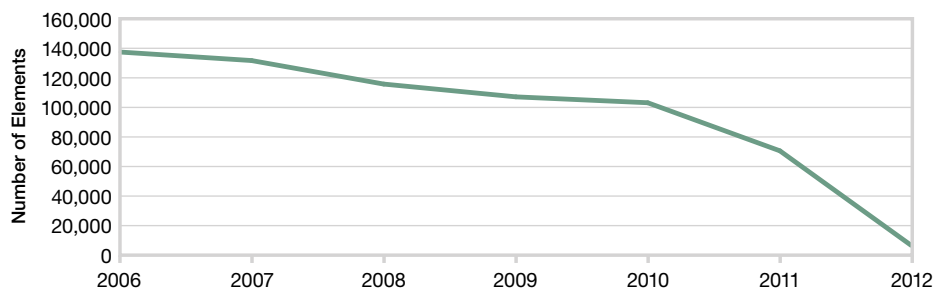
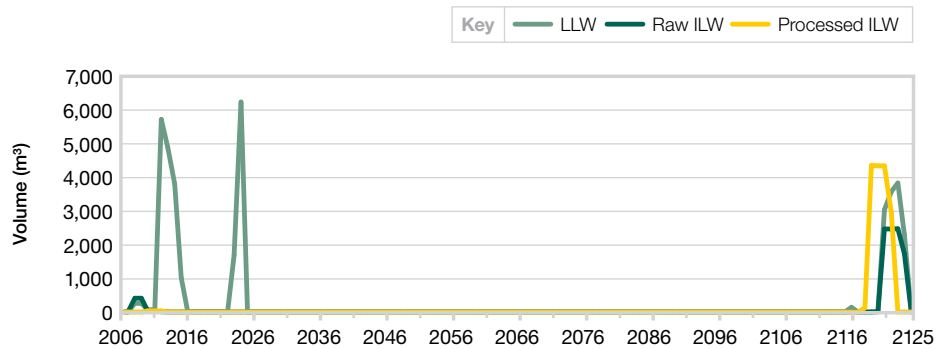


Figure 29-39 – Annual arisings of LLW, Raw and Processed ILW (m³)



Conclusion

The strategic aim for Wylfa in the near term is to maintain the excellent nuclear, industrial and environmental safety record, to generate electricity to the targets set by the NDA and to continue the despatch of spent fuel to Sellafield to programme.

During the early years of this Lifetime Plan significant preparatory work will be undertaken to ensure a successful seamless transition into the Defuelling period which will follow the planned cessation of generation in 2010. During this period, the site is expected to be operating steadily and costs will be comparable during each year.

Significant expenditure is in the Commercial Operations category. This represents the cost of all operations, maintenance, plant enhancement and operational safety casework to be undertaken.

The majority of the assumptions concern decisions and policies of external stakeholders that would have a major impact on this plan.

Measurements of Wylfa's performance include meeting key deliverable milestones and key quantity metrics.

The risks relate to consequences of plant ageing and failure, regulator relations and external stakeholder perception. The site has mitigation strategies in place to reduce the probability of these risks occurring.



The site will incorporate all those activities required to allow safe continued operation of the plant to generate electricity, refuel the reactors, despatch irradiated fuel to Sellafield and deal with radioactive waste.



Work will be delivered to allow smooth transitions to occur throughout the site lifetime and also to enable the completion of Defuelling aligned to the MOP. The site will produce a technical decommissioning plan.



The site will dispose of all waste in accordance with statutory requirements over this LCBL. Work included is deemed high priority because of Site Licence/Radioactive Substances Act/Environmental Agency requirements.



Wylfa's Safety Environmental Enhancement Plan (SEEP) aims to improve safety performance, maintain emergency preparedness, maintain operational plant and facilities and improve security system.



Wylfa will maximise efficiencies by sharing best practice support with other sites. Direct and manage work on site to be performed effectively through efficient management of infrastructure support by site policies and strategies.



Stakeholder and Regulatory support will be maintained as the site moves from Generation to Decommissioning. The Information Centre at the site will be used to promote the Socio-Economic Development Plan and increase awareness.



Nuclear
Decommissioning
Authority

Herdus House,
Westlakes Science & Technology Park,
Moor Row, Cumbria, CA24 3HU, UK

T +44 (0)1925 802001
F +44 (0)1925 802003
www.nda.gov.uk



**British Nuclear Group is a business
group of British Nuclear Fuels plc**

Wylfa Power Station,
Cemaes Bay, Anglesey,
Gwynedd, LL67 0DH, UK

T +44 (0)1407 733733
F +44 (0)1407 733406
www.britishnucleargroup.com