OPTIONS EVALUATION REPORT (OER)

Wallerawang 330 Secondary System Renewal

OER 000000001244 revision 3.0

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Project reason: Capability - Asset Replacement for end of life condition
Project category: Prescribed - Replacement

Approvals

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Date submitted for approval	24 November 2016	

Change history

Revision	Date	Amendment
0	28 June 2016	Initial issue
1	28 October 2016	Update to 2016/17 dollars and SFAIRP/ALARP data
2	16 November 2016	Update to format
3	24 November 2016	Added OSR reference

1. Need/opportunity

Wallerawang 330kV Substation was commissioned in 1975 and forms part of the 330kV backbone interconnecting Mount Piper Power Station to Sydney South as well as supplying 132kV to Wallerawang 132kV Substation which in turn supplies Endeavour Energy. The adjacent Wallerawang Power Station is currently being decommissioned and upon completion of these works there will no longer remain a requirement for a breaker and a half configuration at the site.

A significant portion of secondary systems assets at Wallerawang Substation have been identified for replacement.

2. Related Needs/opportunities

The assets proposed to be replaced under this Secondary System Replacement were identified in the following Needs:

- Need ID 605 – Replacement of Quadramho (SHPM) Protection Relays
- Need ID 606 – Replacement of THR Protection Relays
- Need ID 1379 – Protection – GE Multilin Condition
- Need ID 1380 – Protection – Schweitzer SELxxx Condition
- Need ID 629 – Replacement of Remote Terminal Units (RTUs)

3. Options

The options scoped for this need were identified as per the Options Screening Report – Secondary System Renewal.

All dollar values in this document are expressed in un-escalated 2016/17 dollars.

Base Case

The Base Case for this Need is to continue with TransGrid's operation and maintenance (O&M) for the site. This approach does not address the degrading condition of the secondary systems or the risk cost associated with the Need. The risk cost of $3.70m per annum will increase due to:

- The probability of failure increasing as the assets move further past their expected life; and
- TransGrid's means of recovery from asset failure becoming exhausted, increasing the consequence of asset failure.

Key drivers for this risk cost are:

- The majority of relays protecting assets at this site have reached their end of life, with limited spares and limited or no manufacturer support. This therefore increases the likelihood of a hazardous event occurring and decreases TransGrid's ability to react to mitigate or repair any failures.
- Several issues with the Low Voltage (LV) 415V AC systems have been identified which increase the likelihood of a hazardous event occurring.
- The site forms part of the 330kV backbone of the network and carries a risk of a system black event.

Increasing maintenance on the equipment cannot reduce the probability of failure in order to reduce the risk cost.

Option A — Strategic Asset Replacements [OFR 1244A, OFS 1244A]

Option A is to carry out individual replacements of assets that are identified for replacement up to 2023. The option is based on a 'like for like' approach whereby the asset is replaced by its modern equivalent. Additional system modifications or additional functionality would not be deployed under this option.

The expected capital costs for the option total $1.7m. This costing is estimated using TransGrid's "Success" estimating system. A further $1.33m capital investment would be required over the 15 year life cycle of this option through to 2038.

Operating costs have been estimated at $3k per annum for this option based on current maintenance plan settings.

Due to the 'like for like' nature of this option, no benefit has been calculated in accordance with TransGrid's Renewal and Maintenance Strategy for Secondary Systems Site Installations[1].

The residual risk associated with this option upon completion of the project amounts to $2.53m per annum (base case risk cost = $3.70m). The risk reduction is realised through the reduction in the probability of failure for all assets.

Option B — Complete In-situ Replacement [OFR 1244B, OFS 1244B]

Option B is to replace all secondary systems assets at the Wallerawang Substation with current designs and architectures. This option also replaces Direct Current (DC) supplies to account for increase in power requirements and remediates the 415V Alternating Current (AC) distribution in the building and segregates the LV AC cables from DC cables.

The expected capital costs for the option total $3.8m. This costing is estimated using TransGrid's "Success" estimating system. No further capital investment would be required over the 15 year life cycle of this option through to 2038.

Operating costs have been estimated at $3k per annum based on current maintenance plan settings.

A benefit figure of $28k per annum has been calculated for this option in accordance with TransGrid's Renewal and Maintenance Strategy for Secondary Systems Site Installations.

The residual risk associated with this option upon completion of the project amounts to $249k per annum (base case risk cost = $3.70m). The risk reduction is realised through the reduction in the probability of failure for all assets and remediation of the risk posed by the 415V AC distribution.

Option C — Complete In-situ Replacement with CB Reconfiguration [OFR 1244C, OFS 1244C]

Option C is to replace all secondary systems assets at the Wallerawang Substation with current designs and architectures. This option also includes the replacement of DC supplies to account for increase in power requirements and remediates the 415V AC distribution in the building and segregates the LV AC cables from DC cables. There are 5 identified CBs at Wallerawang which are nearing their end of life condition. Option C includes replacement of and reconfiguration of these CBs[2]. This work can be streamlined in combination with the secondary systems replacements outlined above.

The expected capital costs for the option total $4.7m. This costing is estimated using TransGrid's "Success" estimating system. No further capital investment would be required over the 15 year life cycle of this option through to 2038.

Operating costs have been estimated at $3k per annum based on current maintenance plan settings.

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[1] Refer SSA Strategy – Renewal and Maintenance - Secondary Systems Site Installations

[2] There are four generator switchbays that has been disconnected and therefore this option looks at removing the CBs and other redundant equipment associated with the switchbays and reconfiguring it.

A benefit figure of $36k per annum has been calculated for this option in accordance with TransGrid's Renewal and Maintenance Strategy for Secondary Systems Site Installations. As compared to Option B, an additional benefit of $7.6k per annum for breaker maintenance savings is included for this option.

The residual risk associated with this option upon completion of the project amounts to $218k per annum (base case risk cost = $3.70m). The risk reduction is realised through the reduction in the probability of failure for all assets and remediation of the risk posed by the 415V AC distribution.

Option D — Complete SSB Replacement with CB Reconfiguration [OFR 1244D, OFS 1244D]

Option D is to replace all secondary systems assets at the Wallerawang Substation with current designs and architectures utilising modular SSBs. This option also includes the replacement of DC supplies to account for increase in power requirements and remediates the 415V AC distribution in the building and segregates the LV AC cables from DC cables. Additionally, this option requests the complete replacement of supporting infrastructure, including cables, buildings and switchyard marshalling kiosks. There are 5 identified CBs at Wallerawang which are nearing their end of life condition. Option D includes replacement of and reconfiguration of these CBs. This work can be streamlined in combination with the secondary systems replacements outlined above.

The expected capital costs for the option total $14.6m. This costing is estimated using TransGrid's "Success" estimating system. No further capital investment would be required over the 15 year life cycle of this option through to 2038.

Operating costs have been estimated at $3k per annum based on current maintenance plan settings.

A benefit figure of $69k per annum has been calculated for this option in accordance with TransGrid's Renewal and Maintenance Strategy for Secondary Systems Site Installations. As compared with Options A, B and C, a benefit of $331k over the first ten years for building remediation works and an additional benefit of $7.6k per annum for breaker maintenance savings have been included for this option.

The residual risk associated with this option upon completion of the project amounts to $147k per annum (base case risk cost = $3.70m). The risk reduction is realised through the reduction in the probability of failure for all assets and remediation of the risk posed by the 415V AC distribution.

Option E — IEC-61850 Deployment with CB Reconfiguration [OFR 1244E, OFS 1244E]

Option E is to replace all secondary systems assets at the Wallerawang Substation with an IEC-61850 solution. This option also includes the replacement of DC supplies to account for increase in power requirements and remediates the 415V AC distribution in the building and segregates the LV AC cables from DC cables. There are 5 identified CBs at Wallerawang which are nearing their end of life condition. Option D includes replacement of and reconfiguration of these CBs. This work can be streamlined in combination with the secondary systems replacements outlined above.

The expected capital costs for the option total $12.5m. This costing is estimated using TransGrid's "Success" estimating system. No further capital investment would be required over the 15 year life cycle of this option through to 2038.

Operating costs have been estimated at $10k per annum based on current maintenance plan settings.

A benefit figure of $69k per annum has been calculated for this option in accordance with TransGrid's Renewal and Maintenance Strategy for Secondary Systems Site Installations. As compared to Options A, B and C, a benefit of $331k over the first ten years for building remediation works and an additional benefit of $7.6k per annum for breaker maintenance savings have been included for this option.

The residual risk associated with this option upon completion of the project amounts to $3.41m per annum (base case risk cost = $3.70m). The risk reduction is realised through the reduction in the probability of failure for all assets and remediation of the risk posed by the 415V AC distribution.

Options A, B, C, D and E have all been assessed as technically feasible.

4. Evaluation

Evaluation of the proposed options has been completed using both commercial considerations and the ALARP (as low as reasonably practical) regulatory requirements. The results of these evaluations are outlined below.

4.1 Commercial evaluation

The result of commercial evaluation for each of the options is summarised in Table 1.

Table 1 – Commercial evaluation ($ million)

Option	Description	Total capex	Annual opex	Annual post project risk cost	Economic NPV @10%	Financial NPV @10%	Rank
Base case	Run-to-fail	N/A	0.003	3.70	N/A	N/A	6
A	Strategic Asset Replacement	1.70	0.003	2.53	(1.01)	3.85	4
B	Complete In-Situ Replacement	3.80	0.003	0.249	1.98	16.7	1
C	Complete In-Situ Replacement with CB Reconfiguration	4.70	0.003	0.218	1.40	16.2	2
D	Complete SSB Replacement with CB Reconfiguration	14.60	0.003	0.147	(5.57)	9.63	3
E	IEC-61850 Deployment with CB Reconfiguration	12.50	0.010	3.41	(5.35)	(7.75)	5

The commercial evaluation is based on:

- Economic life of the assets is assumed 15 years, hence this assessment period has been applied.
- Write-offs have been estimated at $63k for Options B, C, D and E only as Option A only addresses assets that have reached the end of their financial lives.
- Capital cost is not escalated and it does not include capitalised interest.

Sensitivities on economic Net Present Value (NPV) for all three options with changing discount rates are shown in Table 2.

Table 2 – Discount rate sensitivities ($ million)

Option	Description	Economic NPV @13%	Economic NPV @6.75%
A	Strategic Asset Replacement	2.60	5.92
B	Complete In-Situ Replacement	12.61	22.95
C	Complete In-Situ Replacement with CB Reconfiguration	12.14	22.49
D	Complete SSB Replacement with CB Reconfiguration	5.81	15.79

Option	Description	Economic NPV @13%	Economic NPV @6.75%
E	IEC-61850 Deployment with CB Reconfiguration	(7.53)	(7.85)

4.2 SFAIRP/ALARP evaluation

Options to reduce the network safety risk as per the risk treatment hierarchy have been considered in other lifecycle stages of the asset, and it has been determined that no reasonably practicable options exist to reduce the risk further than those capital investment options listed below.

Evaluation of the proposed options has been completed against the SFAIRP (So Far As Is Reasonably Practicable)/ALARP (As Low As Reasonably Practical) obligation, as required by the Electricity Supply (Safety and Network Management) Regulation 2014 and the Work Health and Safety Act 2011. The Key Hazardous Events and the disproportionality multipliers considered in the evaluation are as follows:

- Conductor drop/structure failure - 6 times the bushfire risk, 6 times the safety risk and 10% of the reliability risk (applicable to safety)

The results of this evaluation are summarised in the tables below.

Table 3 – Feasible options ($ thousand)

Option	Description	CAPEX	Expected Life	Annualised CAPEX
Base	Do nothing	N/A	N/A	N/A
A	Strategic Asset Replacement	1,700	15 years	110
B	Complete In-Situ Replacement	3,800	15 years	250
C	Complete In-Situ Replacement with CB Reconfiguration	4,700	15 years	310
D	Complete SSB Replacement with CB Reconfiguration	14,600	15 years	970
E	IEC-61850 Deployment with CB Reconfiguration	12,500	15 years	830

Table 4 – Annual risk calculations ($ thousand)

Option	Annual Residual Risk			Annual Risk Savings		
	Safety Risk	Reliability Risk	Bushfire Risk	Safety Risk	Reliability Risk	Bushfire Risk
Base	70	2,921	8	N/A	N/A	N/A
A	55	1,852	2	15	1,069	6
B	4	211	1	66	2,710	7
C	4	186	1	66	2,735	7
D	3	118	1	67	2,803	7

Option	Annual Residual Risk			Annual Risk Savings		
	Safety Risk	Reliability Risk	Bushfire Risk	Safety Risk	Reliability Risk	Bushfire Risk
E	4	3,236	6	66	(315)	2

Table 5 – Reasonably practicable test ($ thousand)

Option	Network Safety Risk Reduction[3]	Annualised CAPEX	Reasonably practicable[4]?
A	188	110	Yes
B	511	250	Yes
C	514	310	Yes
D	523	970	No
E	179	830	No

Options A, B, and C are reasonably practicable.

Options D and E are not reasonably practicable.

4.3 Preferred option

The outcome of the SFAIRP/ALARP evaluation is that Option C is the preferred option as it is reasonably practicable and provides the greatest network safety risk reduction, and is therefore required to satisfy the organisation's SFAIRP/ALARP obligations.

The preferred option to address the condition of the secondary systems is Option C – Complete In-Situ Replacement with CB Reconfiguration.

This option has been selected due to its technical viability and reduction in reliability risk. This option provides significant technical benefits and provides huge positive NPV.

Capital and operating expenditure

There is negligible difference in predicted ongoing operational expenditure between the preferred option and base case. Implementing Option D will reduce callouts to address defects and this benefit has been captured in the risk assessment. These have been captured as benefits for delivering the project.

Regulatory Investment Test

A Regulatory Investment Test for Transmission (RIT-T) is not required as this is an asset replacement project with no augmentation component.

5. Recommendation

It is recommended that Option C – Complete In-Situ Replacement with CB Reconfiguration be scoped in detail.

[3] The Network Safety Risk Reduction is calculated as 6 x Bushfire Risk Reduction + 3 x Safety Risk Reduction + 0.1 x Reliability Risk Reduction

[4] Reasonably practicable is defined as whether the annualised CAPEX is less than the Network Safety Risk Reduction

Option A NPV calculation

Project_Option Name	Wallerawang 330kV Secondary Systems Renewal - Option A

1. Financial Evaluation (excludes VCR benefits)

NPV @ standard discount rate	10.00%	-$1.01m	*NPV / Capital (Ratio)*	*-0.60*
NPV @ upper bound rate	13.00%	-$1.02m	*Pay Back Period (Yrs)*	*-0.01 Yrs*
NPV @ lower bound rate (WACC)	6.75%	-$0.95m	*IRR%*	*-1.24%*

2. Economic Evaluation (includes VCR benefits but excludes tax benefits from non-cash transactions, ENS penalty and overall tax cost)

NPV @ standard discount rate	10.00%	$3.85m	*NPV / Capital (Ratio)*	*2.26*
NPV @ upper bound rate	13.00%	$2.60m	*Pay Back Period (Yrs)*	*1.57 Yrs*
NPV @ lower bound rate (WACC)	6.75%	$5.92m	*IRR%*	*32.48%*

Benefits

Risk cost	As Is	To Be	Benefit		
Systems (reliability)	*$2.92m*	*$1.85m*	*$1.07m*	*VCR Benefit*	*$1.04m*
Financial	*$0.67m*	*$0.60m*	*$0.07m*	*ENS Penalty*	*$0.01m*
Operational/compliance	*$0.00m*	*$0.00m*	*$0.00m*	*All other risk benefits*	*$0.13m*
People (safety)	*$0.07m*	*$0.05m*	*$0.02m*	Total Risk benefits	$1.18m
Environment	*$0.01m*	*$0.00m*	*$0.01m*	Benefits in the financial NPV*	$0.14m
Reputation	*$0.04m*	*$0.02m*	*$0.02m*	**excludes VCR benefits*	
Total Risk benefits	$3.70m	$2.53m	$1.18m		
Cost savings and other benefits			$0.00m	Benefits in the economic NPV**	$1.17m
Total Benefits			$1.18m	***excludes ENS penalty*	

Other Financial Drivers

Incremental opex cost pa (no depreciation)	-$0.00m	Write-off cost	$0.00m
Capital - initial $m	-$1.70m	Major Asset Life (Yrs)	15.00 Yrs
Residual Value - initial investment	$0.00m	Re-investment capital	-$1.33m
Capitalisation period	5.00 Yrs	Start of the re-investment period	2021-22

Option B NPV calculation

Project_Option Name	Wallerawang 330kV Secondary Systems Renewal - Option B

1. Financial Evaluation (excludes VCR benefits)

NPV @ standard discount rate	10.00%	$1.98m	*NPV / Capital (Ratio)*	*0.52*
NPV @ upper bound rate	13.00%	$1.10m	*Pay Back Period (Yrs)*	*0.20 Yrs*
NPV @ lower bound rate (WACC)	6.75%	$3.40m	*IRR%*	*19.51%*

2. Economic Evaluation (includes VCR benefits but excludes tax benefits from non-cash transactions, ENS penalty and overall tax cost)

NPV @ standard discount rate	10.00%	$16.67m	*NPV / Capital (Ratio)*	*4.39*
NPV @ upper bound rate	13.00%	$12.61m	*Pay Back Period (Yrs)*	*1.10 Yrs*
NPV @ lower bound rate (WACC)	6.75%	$22.95m	*IRR%*	*67.86%*

Benefits

Risk cost	As Is	To Be	Benefit		
Systems (reliability)	*$2.92m*	*$0.21m*	*$2.71m*	*VCR Benefit*	*$2.61m*
Financial	*$0.67m*	*$0.03m*	*$0.64m*	*ENS Penalty*	*$0.04m*
Operational/compliance	*$0.00m*	*$0.00m*	*$0.00m*	*All other risk benefits*	*$0.80m*
People (safety)	*$0.07m*	*$0.00m*	*$0.07m*	Total Risk benefits	$3.45m
Environment	*$0.01m*	*$0.00m*	*$0.01m*	Benefits in the financial NPV*	$0.87m
Reputation	*$0.04m*	*$0.00m*	*$0.03m*	**excludes VCR benefits*	
Total Risk benefits	$3.70m	$0.25m	$3.45m		
Cost savings and other benefits			$0.03m	Benefits in the economic NPV**	$3.44m
Total Benefits			$3.48m	***excludes ENS penalty*	

Other Financial Drivers

Incremental opex cost pa (no depreciation)	-$0.00m	Write-off cost	-$0.06m
Capital - initial $m	-$3.80m	Major Asset Life (Yrs)	15.00 Yrs
Residual Value - initial investment	$0.00m	Re-investment capital	$0.00m
Capitalisation period	3.00 Yrs	Start of the re-investment period	0.00 Yrs

Option C NPV calculation

Project_Option Name	Wallerawang 330kV Secondary Systems Renewal - Option C

1. Financial Evaluation (excludes VCR benefits)				
NPV @ standard discount rate	10.00%	$1.40m	*NPV / Capital (Ratio)*	*0.30*
NPV @ upper bound rate	13.00%	$0.54m	*Pay Back Period (Yrs)*	*0.16 Yrs*
NPV @ lower bound rate (WACC)	6.75%	$2.78m	*IRR%*	*15.73%*

2. Economic Evaluation (includes VCR benefits but excludes tax benefits from non-cash transactions, ENS penalty and overall tax cost)				
NPV @ standard discount rate	10.00%	$16.20m	*NPV / Capital (Ratio)*	*3.45*
NPV @ upper bound rate	13.00%	$12.14m	*Pay Back Period (Yrs)*	*1.35 Yrs*
NPV @ lower bound rate (WACC)	6.75%	$22.49m	*IRR%*	*58.80%*

Benefits					
Risk cost	As Is	To Be	Benefit	*VCR Benefit*	*$2.63m*
Systems (reliability)	*$2.92m*	*$0.19m*	*$2.74m*	*ENS Penalty*	*$0.04m*
Financial	*$0.67m*	*$0.02m*	*$0.64m*	*All other risk benefits*	*$0.82m*
Operational/compliance	*$0.00m*	*$0.00m*	*$0.00m*	Total Risk benefits	$3.49m
People (safety)	*$0.07m*	*$0.00m*	*$0.07m*		
Environment	*$0.01m*	*$0.00m*	*$0.01m*	Benefits in the financial NPV*	$0.89m
Reputation	*$0.04m*	*$0.00m*	*$0.03m*	**excludes VCR benefits*	
Total Risk benefits	$3.70m	$0.22m	$3.49m		
Cost savings and other benefits			$0.04m	Benefits in the economic NPV**	$3.48m
Total Benefits			$3.52m	***excludes ENS penalty*	

Other Financial Drivers			
Incremental opex cost pa (no depreciation)	-$0.00m	Write-off cost	-$0.06m
Capital - initial $m	-$4.70m	Major Asset Life (Yrs)	15.00 Yrs
Residual Value - initial investment	$0.00m	Re-investment capital	$0.00m
Capitalisation period	3.00 Yrs	Start of the re-investment period	0.00 Yrs

Option D NPV calculation

Project_Option Name	Wallerawang 330kV Secondary Systems Renewal - Option D

1. Financial Evaluation (excludes VCR benefits)

NPV @ standard discount rate	10.00%	-$5.57m	*NPV / Capital (Ratio)*	*-0.38*
NPV @ upper bound rate	13.00%	-$6.10m	*Pay Back Period (Yrs)*	*0.01 Yrs*
NPV @ lower bound rate (WACC)	6.75%	-$4.45m	*IRR%*	*1.21%*

2. Economic Evaluation (includes VCR benefits but excludes tax benefits from non-cash transactions, ENS penalty and overall tax cost)

NPV @ standard discount rate	10.00%	$9.63m	*NPV / Capital (Ratio)*	*0.66*
NPV @ upper bound rate	13.00%	$5.81m	*Pay Back Period (Yrs)*	*4.07 Yrs*
NPV @ lower bound rate (WACC)	6.75%	$15.79m	*IRR%*	*22.00%*

Benefits

Risk cost	As Is	To Be	Benefit		
Systems (reliability)	*$2.92m*	*$0.12m*	*$2.80m*	*VCR Benefit*	*$2.70m*
Financial	*$0.67m*	*$0.02m*	*$0.65m*	*ENS Penalty*	*$0.04m*
Operational/compliance	*$0.00m*	*$0.00m*	*$0.00m*	*All other risk benefits*	*$0.82m*
People (safety)	*$0.07m*	*$0.00m*	*$0.07m*	Total Risk benefits	$3.56m
Environment	*$0.01m*	*$0.00m*	*$0.01m*	Benefits in the financial NPV*	$0.92m
Reputation	*$0.04m*	*$0.00m*	*$0.03m*	**excludes VCR benefits*	
Total Risk benefits	$3.70m	$0.15m	$3.56m		
Cost savings and other benefits			$0.07m	Benefits in the economic NPV**	$3.58m
Total Benefits			$3.62m	***excludes ENS penalty*	

Other Financial Drivers

Incremental opex cost pa (no depreciation)	-$0.00m	Write-off cost	-$0.06m
Capital - initial $m	-$14.60m	Major Asset Life (Yrs)	15.00 Yrs
Residual Value - initial investment	$2.30m	Re-investment capital	$0.00m
Capitalisation period	3.00 Yrs	Start of the re-investment period	2037-38

Option E NPV calculation

Project_Option Name	Wallerawang 330kV Secondary Systems Renewal - Option E

1. Financial Evaluation (excludes VCR benefits)				
NPV @ standard discount rate	10.00%	-$5.35m	*NPV / Capital (Ratio)*	*-0.43*
NPV @ upper bound rate	13.00%	-$5.65m	*Pay Back Period (Yrs)*	*-0.01 Yrs*
NPV @ lower bound rate (WACC)	6.75%	-$4.66m	*IRR%*	*-0.62%*

2. Economic Evaluation (includes VCR benefits but excludes tax benefits from non-cash transactions, ENS penalty and overall tax cost)				
NPV @ standard discount rate	10.00%	-$7.75m	*NPV / Capital (Ratio)*	*-0.62*
NPV @ upper bound rate	13.00%	-$7.53m	*Pay Back Period (Yrs)*	*Not measurable*
NPV @ lower bound rate (WACC)	6.75%	-$7.85m	*IRR%*	*-7.72%*

Benefits					
Risk cost	As Is	To Be	Benefit	*VCR Benefit*	*-$0.38m*
Systems (reliability)	*$2.92m*	*$3.24m*	*-$0.32m*	*ENS Penalty*	*$0.04m*
Financial	*$0.67m*	*$0.15m*	*$0.52m*	*All other risk benefits*	*$0.63m*
Operational/compliance	*$0.00m*	*$0.00m*	*$0.00m*	Total Risk benefits	$0.29m
People (safety)	*$0.07m*	*$0.00m*	*$0.07m*		
Environment	*$0.01m*	*$0.01m*	*$0.00m*	Benefits in the financial NPV*	$0.74m
Reputation	*$0.04m*	*$0.02m*	*$0.02m*	**excludes VCR benefits*	
Total Risk benefits	$3.70m	$3.41m	$0.29m		
Cost savings and other benefits			$0.07m	Benefits in the economic NPV**	$0.32m
Total Benefits			$0.36m	***excludes ENS penalty*	

Other Financial Drivers			
Incremental opex cost pa (no depreciation)	-$0.01m	Write-off cost	-$0.06m
Capital - initial $m	-$12.50m	Major Asset Life (Yrs)	15.00 Yrs
Residual Value - initial investment	$0.83m	Re-investment capital	$0.00m
Capitalisation period	3.00 Yrs	Start of the re-investment period	0.00 Yrs