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BUSINESS CASE SUMMARY	

Pickering B Steam Generator Locking Tab Replacement 13 - 40641

Full Release Business Case Summary NK30-BCS-33115-00007-R000

1/ RECOMMENDATION:

We recommend a full release of \$20.5M (including contingency) to design, install, and commission new locking devices in all 12 Steam Generators (SGs) in Unit 7 during the 2008 outage and Unit 8 during the 2010 outage.

The business objective of this project is to remove the current requirement to shut down Unit 7 and Unit 8 after 6.3 Effective Full Power Years (EFPYs) because of the threat of fatigue failure of the cold leg locking tabs, by developing and installing a new design that will:

- Allow Units 7 and 8 to run until End of Life (EOL) without concerns of locking tab failure
- Reduce the overall project cost and dose uptake by ~\$4.3M and 40% respectively (compared to Units 5 and 6)
- Align with the Pickering B 85/5 initiative by allowing installation within a 40 day outage schedule
- Allow inspection/maintenance to be conducted with minimal interference with the new design
- Allow for the removal and/or replacement of components of the new design with relative ease, if required

If a cold leg locking tab were to fail, it is speculated that it would cause significant damage to the Heat Transport System. More importantly, a broken cold leg locking tab could block Primary Heat Transport (PHT) water flow through feeder pipes and orifices. Lack of flow can cause overheating of fuel and result in fuel failure. In the worst case scenario, a broken cold leg locking tab could cause Pressure Tube failure leading to a Loss of Coolant Accident (LOCA). However, repairs to Units 7 and 8 can be postponed until March 2011 and October 2010 respectively since a Fitness for Service Evaluation of cracked hot leg locking tabs concluded that cold leg locking tabs will not fail prior to 6.3 Effective Full Power Years (EFPYs) and failure of hot leg locking tabs is not an operability issue. This analysis is based on a safety factor of 2. (see Glossary)

Locking tab design problems were first experienced when broken pieces of locking tabs and sealing skins were found on the hot leg (inlet) side of the Unit 5 SGs during the P551 outage. Similar problems were later found in Unit 6. The root causes were determined to be insufficient design analysis for the locking tabs and inadequate installation of the sealing skins. Repairs to both locking tabs and sealing skins were conducted on Units 5 and 6 because of the imminent threat posed by the sealing skin installation. Due to greater rigor applied during the installation of sealing skins in Units 7 and 8, there is no need to replace them prior to End of Life (EOL). Additionally, there is no need to replace the locking tabs on Units 5 and 6 as they are expected to operate without problems to EOL.

We have considerable experience in locking tab design and installation; however, a contingency has been included to address the risk associated with designing, qualifying and installing a new design or defaulting to the Unit 5/6 design in the remote chance that the new design is ineffective and/or cost prohibitive.

\$M (incl. contingency)	Funding	LTD 2005	2006	2007	2008	2009	2010	Later	Total
Currently Released	None								
Requested Now	Full			0.6	9.4	0.5	9.7	0.3	20.5
Future Funding Req'd				0.6	9.4	0.5	9.7	0.3	20.5
Total Project Costs				12.9	(6.4)	(1.0)	(5.5)		
Other Costs				13.5	3.0	(0.5)	4.2	0.3	20.5
Committed Cost									
Grand Total Release									
Investment Type		Class	(IEV) Impact on Ec. Value		IRR		Discounted Payback		
Sustaining		ON&A	645.0		238.5%		3.5		

Submitted By:

P. Tremblay

Senior Vice President Pickering B

Date:

Feb 20/07

Finance Approval:

Line Approval (Per OAR Element 1.1 Project in Budget):

J. Hankinson
 President & CEO

D. Power
 Director Investment & Business Planning

March 8/07
 Date:

for
 Date:

2/ BACKGROUND & ISSUES

Adverse Condition

The Steam Generator Divider Plate sealing skin modification was performed on Units 1, 4, 5-8 starting with Unit 4 in 2001 and finishing with Unit 7 in 2004. The primary purpose of this modification was to address Divider Plate bolt degradation as well as the steady increase in Reactor Inlet Header Temperature (RIHT) which was forcing some units to run derated. All modifications were completed successfully as measured by the decrease in RIHT for each unit. When the first unit (U5) SG inspections were conducted during the P551 (Spring of 2005) Outage following installation of the sealing skin/locking tab modification, it was discovered that numerous pieces of locking tabs and divider plate sealing skin had broken off in the hot leg (inlet) side of the steam generators (refer to SCR P-2005-03243) due to high cycle fatigue cracking. Further inspections revealed that all 10 affected steam generators experienced locking tab failures, and 4 of 10 steam generators experienced divider plate skin failures. The root causes of this event were deemed to be insufficient design analysis for the new locking tabs and inadequate sealing skin contact with the Primary Head seat bar.

Repair Scope for Unit 7 and 8

During the original divider plate installations in P481 (Unit 8, 2004) and P471 (Unit 7, 2004), more rigor was applied for installation of sealing skins and design improvements to the skins were made. As a result there is a lower probability of sealing skin failure in these steam generators. This has been proven through subsequent inspections carried out during P681 (Spring of 2006) and P671 (Fall of 2006), as only 1 SG out of the 12 SGs inspected was found with minor, but acceptable skin failures. However, there were no changes made to the design of the locking tabs, so similar numbers of broken hot leg locking tabs have been seen in Unit 8 and 7. To date no broken locking tabs have been reported in cold leg (outlet) side of the any the inspected SGs.

A Fitness for Service Evaluation of cracked locking tabs for PNGS A and PNGS B (P-REP-33115-00001 R01) concluded that cold leg locking tabs will not fail prior to 6.3 EFPYs and failure of hot leg locking tabs is not an operability issue. This assessment allows the delay of the locking tab replacement until the 2010 Outages while development of an improved fastener design is underway to reduce the installation duration, dose and cost. Although it is acceptable from a Fitness for Service perspective to defer the locking tab replacement to 2010, performing this modification for all 24 SGs in 2010 is not aligned with the 85/5 initiatives. Thus, locking tab replacement will be completed in Unit 7 SGs in 2008 and Unit 8 SGs in 2010.

Similar Previous Replacement Campaigns

As mentioned, hot leg locking tab failures were first found in Unit 5. Similar failures were found in Unit 6 Steam Generators during P561 Outage. Upon this discovery, all of the sealing skins, locking tabs, and associated components in all Unit 5 steam generators (except for two steam generators which were previously modified in 1999 with a different Divider Plate design) and in all Unit 6 steam generators were replaced. These repair campaigns were costly, lengthy, and dose intensive as shown below:

Project #13-40932, Unit 5 – approximately \$11M, 2 months, 33 Rem (10 steam generators)
Project #13-40632, Unit 6 – approximately \$12M, 2 months, 65 Rem (12 steam generators)

This BCS covers the funding required for the development, qualification and testing of the new design along with field installation. This project will focus on locking tab replacement (currently installed sealing skins will be retained), and minimizing cost, time, and dose during execution. There are no plans to replace the locking tabs Units 5 and 6 as they are evaluated to be operational to EOL.

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3/ ALTERNATIVES AND ECONOMIC ANALYSIS

Based on the fact that cold leg locking tabs will not fail prior to 6.3 Effective Full Power Years (EFPYs), we have several options for scheduling the installation work. The following analysis examines the impact of various options based on 40 days outages and planned Water Lancing for Units 7 and 8.

\$ Millions	Status Quo	Alt 1 (Recommended) New Design in 2008 / 2010		Alt 2 Old Design in 2008 / 2010	Alt 3 New Design in 2008	Alt 4 New Design in 2010	Alt 5 New Design in 2008 / 2010
		Full Cost	Incremental Cost				
SG's / Outages / Critical Path							
P871	0	12	12	6	12		
P881	0			6	12		6
P1071	0			6			6
P1081	0	12	12	6		12	6
Waterlancing in Outage	N/A	2008 (U8) 2010 (U7)	2008 (U8) 2010 (U7)	2010 (U8) 2010 (U7)	2010 (U8) 2010 (U7)	2010 (U8) 2010 (U7)	2010 (U8) 2010 (U7)
Variance to Critical Path (1 outage)	N/A	-2-2	-2-2	+7+7+13+13	-2-2	+11+11	-2-2+4+4

Financials							
Loss of Revenue	(1,532.2)	0.0	0.0	(22.5)	0.0	(12.0)	(4.4)
Project Cost	0.0	(20.5)	(20.5)	(25.9)	(20.2)	(20.2)	(20.5)
NPV (after tax)	(656.9)	(11.9)	(11.9)	(26.8)	(12.0)	(16.8)	(13.7)
Financial Benefit (vs Status Quo)	N/A	645.0	645.0	630.1	644.9	640.1	643.2
IRR%	N/A	251.3	251.3	1.8	190.5	440.6	2.4
Discounted Payback (Yrs)	N/A	3.5	3.5	4.1	3.7	3.4	3.6
Ranking of Financial Benefits	6	1	1	4	2	5	3

Business Objectives							
Fits Current Generation Plan	No	No	No	No	No	No	Yes
Allows operation beyond 6.3 EFPYs	No	Yes	Yes	Yes	Yes	Yes	Yes
Allows operation to EOL	No	Yes	Yes	Yes	Yes	Yes	Yes
Aligns with 85/5 initiative	No	Yes	Yes	No	Yes	No	No
40% dose reduction	No	Yes	Yes	No	Yes	Yes	Yes
Benefit of new design	No	Yes	Yes	No	Yes	Yes	Yes
*See Alternative 1 description.							

Status Quo - Not Recommended

Status Quo is **not** the recommended option. This alternative is unacceptable because we would have to shut down both units with revenue losses accruing to approximately \$1.5 Billion from the end of 6.3 EFPYs to EOL.

Alternative 1 - Install 12 "New Design" Tabs in Unit 7 in 2008, 12 in Unit 8 in 2010 - Recommended

We recommend this alternative because it satisfies the Business Objectives and provides the greatest financial benefit (when measured against the Status Quo). This alternative minimizes the risk of an outage extension by providing concurrent Water Lancing and Locking Tab repair in the same outage. The recommendation is to advance Unit 8 Water Lancing by 2 years to 2008, install all Unit 7 Locking Tabs in 2008 and all Unit 8 Locking Tabs in 2010. This proposal has been accepted by the Site Management Board (SMB) and is being incorporated into the Generation Plan. Moving Unit 8 Water Lancing to 2008 is also supported by EMD due to the poor condition of Unit 8 SGs in terms of sludge build-up.

Alternative 2 - Install Unit 5 and 6 Design Locking Tabs in Units 7 & 8- Not Recommended

We do **not** recommend this alternative because it doesn't satisfy the Business Objectives and provides the least financial benefit. This alternative is the contingency alternative should the new design not meet expectations.

Alternative 3 - Install 12 "New Design" Locking Tabs in Units 7 & 8 in 2008 - Not Recommended

Although this alternative meets the Business Objectives, we do not recommend it because there are increased schedule risks in completing both units in 2008. Moreover, the financial benefit is marginally less than the Recommended alternative.

Alternative 4 - Install 12 "New Design" Locking Tabs in Units 7 and 8 in 2010 - Not Recommended

We do **not** recommend this alternative because it doesn't align with the 85/5 initiative and provides only the 4th best financial benefit because of the outage extension. Moreover, leaving all Locking Tab installation until 2010 does not provide sufficient time to recover from unknown problems, without unfavourable financial impact.

Alternative 5 - Install "New Design" in 6 SGs per U7 & U8 in 2008, remainder in 2010 - Not Recommended

This is the current Generation Plan. We do not recommend this alternative because it has higher risk of extending the Outages than Recommended Alternative and provides only the 3rd best financial benefit.

4/ THE PROPOSAL

We propose a full release (as opposed to a developmental) at this time because:

- There is little or no risk that this project will be cancelled and the investment subsequently lost
- Major contracts need to be awarded by October 2007 in preparation for the Unit 7 Fall Outage in 2008
- Conceptual funding allowed us to determine the most technically viable and cost effective design from a number of locking tab replacement options
- An extensive risk profile with mitigating actions has been developed to reduce the overall risk to low
- We have considerable experience in locking tab design and installation; however, a contingency has been included to address the risk associated with designing, qualifying and installing a new design or defaulting to the Unit 5/6 design in the remote chance that the new design is ineffective and/or cost prohibitive.

A Full Release will be used to:

- Complete the Design 100%
- Perform the Preliminary and Detailed Engineering
- Award a labour contract (for both units)
- Perform all pre-installation activities for Unit 7 (i.e. workplan preparation, work permits, space allocation, etc.)
- Install, commission, and AFS the modification for Unit 7 (P871)
- Revise Design Engineering documents as required (i.e. Design ECs, drawings, etc.) for Unit 8
- Complete pre-installation activities for Unit 8
- Install, Commission, and AFS the modification for Unit 8 (P1081)
- Close-out the Project

Refer to Appendix C for a list of the project milestones.

5/ QUALITATIVE FACTORS

None other than outlined in the Business Objectives.

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6/ RISKS

Description of Risk	Description of Consequence	Risk Before Mitigation	Mitigating Activity	Risk After Mitigation
Cost Underestimation of cost.	Cost over run. A further release of funds will be required	Medium	Regular review of project expenditures. contingency available.	Low
Scope Results of Qualification Program could cause scope increase.	Change in scope resulting in changes in cost and schedule.	Medium	If scope growth too large, design installed in Units 5 and 6 is ready and available to be installed in Units 7 and 8. contingency available.	Low
As-found conditions of SGs could invalidate analysis and/or uncover unexpected conditions. Damage to SG internals during site execution.	Increase in scope of modification (i.e. skin replacement) resulting in cost and schedule overrun. Unplanned repair required.	Medium High	Inspections have been conducted on 6 SGs each of Unit 7 and 8 in 2006 and have no unexpected findings. Similar conditions are expected on the remaining SGs. SG internals will be protected during installation to preclude damage. Qualification testing as well as mock-up training will provide the basis for risk mitigation during execution.	Low
Schedule Delay in obtaining required materials for qualification testing.	Schedule overrun.	Medium	Materials required for qualification testing have been identified. Some materials have already been obtained, and the remainder will be ordered promptly.	Low
Delay in completion of Design packages.	Schedule overrun.	Medium	Additional design resources will be obtained in order to meet deadlines. There is sufficient float in the project schedule to accommodate minor delays with no impact to start of installation	Low

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<p>Extensive amount of welding rework during execution.</p>	<p>Increase in Outage critical path.</p>	<p>High</p>	<p>Qualification testing will be conducted to ensure limited access welds can be completed to meet acceptance criteria.</p>	<p>Low</p>
<p>Resources Design Engineering resources re-allocated to higher priority projects. Lack of qualified Trades to perform qualification testing due to conflict with P751 Outage.</p>	<p>Delay in Design deliverables</p>	<p>Medium</p>	<p>Design support has been committed to this project.</p>	<p>Low</p>
<p>Technical Locking Tab replacement option does not satisfy all constructability objectives</p>	<p>Delay in qualification testing potentially leading to a delay in Design deliverables.</p>	<p>Medium</p>	<p>Trades will be acquired as soon as the qualification plan has been agreed upon.</p>	<p>Low</p>
<p>Regulatory Regulator may not approve the re-start submissions of Unit 7 and 8.</p>	<p>Constructability issues may impact design</p>	<p>High</p>	<p>Qualification testing will be done to ensure constructability issues are addressed and eliminated through completion of design.</p>	<p>Low</p>
<p>Environmental N/A</p>	<p>Unable to restart Unit 7 and 8.</p>	<p>Medium</p>	<p>Re-start submissions have been approved for Units 5 and 6 for similar modifications.</p>	<p>Low</p>
<p>Health & Safety Potential for safety related events during qualification and site execution due to several conventional and radiological</p>	<p>Injuries to personnel involved in qualification testing and installation.</p>	<p>Medium</p>	<p>Pre-job briefings will be conducted prior to commencement of qualification testing and during installation. Boiler bowls will be surveyed and cleaned if required, and lead</p>	<p>Low</p>

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hazards.

<p>Investment</p> <p>The current requirement to shut down Unit 7 and Unit 8 after 6.3 (EFYs) is not adequately addressed</p> <p>The overall project cost and dose uptake targets are not achieved</p> <p>The installation is not aligned with the 85/5 principles.</p> <p>The new design interferes with inspection / maintenance activities</p> <p>Future Locking Tab problems prevent the operation of the Units to EOL</p> <p>The new design does not allow for easy removal and or replacement of components</p> <p>Premature failure of cold leg locking tabs currently installed.</p>	<p>higher cost</p> <p>higher dose uptake</p> <p>extended schedule</p> <p>outage extension</p> <p>Medium</p>	<p>shielding will be installed prior to personnel entries. All personnel involved will be required to wear appropriate PPE. Review Lessons Learned from previous campaigns</p> <p>Locking Tab replacement option will be designed with a substantial amount of rigour.</p> <p>Qualification Program will be conducted to ensure that the new locking device can meet these project objectives and ensure that the Locking Tab replacement option is robust and will not become Foreign Material.</p> <p>Results of qualification testing will be used to alter the design of the new locking device as required.</p> <p>The Unit 5/6 design is available if this design proves to be too costly or not effective</p> <p>contingency is included</p> <p>Analysis has been completed for the current design with a safety factor of 2 and locking tabs are not expected to fail prior to 6.3 EFYs.</p> <p>Contingency Divider Plate sealing skin sets (12 in total) of the current design are on site and available to be used for an emergent repair campaign.</p> <p>contingency is available and would provide sufficient funding in the remote chance that the Unit 5/6 design is required</p>	<p>Low</p>
	<p>new project required to repair units</p> <p>possible forced outage</p> <p>higher costs</p> <p>Medium</p>	<p>Advancement in preparation and installation of the new design</p> <p>or</p> <p>Repair of Units 7 and 8 with old design (installed in Units 5 and 6).</p> <p>Both of these repairs would significantly impact schedule and costs.</p>	<p>Low</p>

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7/ POST IMPLEMENTATION REVIEW PLAN

Type of PIR:	Targeted Final AFS Date:	Targeted PIR Approval Date:	PIR Responsibility (Sponsor Title)
Simplified	Jan 2011	Feb 2015	Components & Equipment

Comments:

	Measurable Parameter	Current Baseline	Targeted Result	How will it be measured?	Who will measure it? (person / group)
1.	Durability of Steam Generator divider plate fastener locking device	Unit 7 and 8 Boilers were found with several broken locking tabs	Divider plate locking device to remain intact until end of SG life.	Perform as-found inspections during the first and second planned outages subsequent to installation of the locking devices. Each steam generator must be inspected to confirm the Divider plate assembly is intact.	Major Components Section, Components and Equipment Department
2.					
3.					
4.					
5.					

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Appendix "A"

Glossary (acronyms, codes, technical terms)

- AFS: Available for Service
- CNE: Chief Nuclear Engineer
- CNSC: Canadian Nuclear Safety Commission
- EC: Engineering Change
- EFPY: Effective Full Power Year
- EOL: End of Life
- HTS: Heat Transport System
- NPV: Net Present Value
- RIHT: Reactor Inlet Header Temperature
- PNGS: Pickering Nuclear Generating Station
- PROL: Power Reactor Operating License
- SG: Steam Generator
- SMB: Site Management Board
- TOE: Technical Operability Evaluation
- Safety Factor of 2: In analyzing the operational life of the locking tabs, the largest crack size was used to account for the worst condition. This crack size was then multiplied by a safety factor of 2 in the model to predict the tab life.

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Appendix "B"

Project Funding History

\$ 000's			Releases (incl contingency)								
Release Type	Month	Year	Cumulative Values								
			2006	2007	2008	2009	2010	2011	2012	Later	Total
Full	Nov	2006		13,326	3,148	0	3,990	61			20,525
											0
											0
											0
											0
											0
											0
											0
											0
											0
LTD Spent	Nov	2,006	0								0

Comments:

There have been no releases for this project to date as currently, conceptual funding is being used to perform preliminary work. A Full Release will be used to complete 100% design, installation, commissioning and AFS of the modification for Units 7 and 8 as well as the project close out. This approach will enable funding for early tender and award of installation contract.

Appendix "C"

Financial Model – Assumptions

Project Cost Assumptions:

For the majority of engineering and design work, overtime has been assumed to be 10%. For field personnel, overtime has been assumed to be 25%. Installation estimate is based on Unit 5 and 6 experiences with assumed installation benefits for new design.

It is assumed that the Locking Tab replacement modification will be conducted over 2 outages as follows:

- Unit 7 during Fall 2008
- Unit 8 during Spring 2010

Financial Assumptions:

The rate of inflation estimated at 2% is consistent with Corporate guidelines.

Project / Station End of Life Assumptions:

Based on a memo to D. Power from J.P. Froats, "Pickering Units 5, 6, 7, and 8 End of Service Life Predictions", May 10, 2006, we have assumed that End of Life for Units 7 and 8 will be 1st quarter 2014 and 1st quarter 2016 respectively.

Energy Price / Production Assumptions

The price of energy is estimated based on Corporate System Economic Values. Production from each Pickering B unit is assumed to be 516 MW at a capacity factor of 85%.

Operating Cost Assumptions

N/A

Other Assumptions:

The cold leg locking tabs are expected to fail after 6.3 EFPYs which is assumed to be:

- Unit 7: September 2011
- Unit 8: October 2010

Repairs to Units 7 and 8 can be postponed until September 2011 and October 2010 respectively because a Fitness for Service Evaluation of cracked hot leg locking tabs concluded that cold leg locking tabs will not fail prior to 6.3 Effective Full Power Years (EFPYs) and failure of hot leg locking tabs is not an operability issue. This analysis is based on a safety factor of 2.

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Attachment "A"

Project Cost Summary

\$000's OM&A	LTD Prior Yr 2005	This Release 2007	This Release 2008	This Release 2009	This Release 2010	This Release 2011		Later	Total
Project Management (OPG)	-	241	223	280	318	163			1,225
Engineering & Drafting (OPG)	-	118	40	10	37	25			229
Material									
Installation - PWU, BTU									
Contract - Design									
Contract - Installation									
Contract - Other									
Installation - IMS									
Interest (Capital Project Only)									
Project Costs (excl contingency)									
General Contingency									
Specific Contingency									
Project Costs (incl contingency)	-	525	9,448	525	9,664	251	-	-	20,525
2007-2011 Business Plan		700	6,300	1,000	6,000	-			14,000
Variance to Business Plan	-								
Committed Cost		12,700	(6,300)	(1,000)	(5,400)				-
Inventory Write Off Required									-
Spare Parts / Inventory									-
Total Release (excl contingency)	-								
Total Release (incl contingency)	-	13,325	3,148	(474)	4,264	251	-	-	20,525
Ongoing OM&A (non-project)									-
Removal Costs (incl in above)									-

Basis of Estimate					
Design Complete	100%	Quality of Estimate		Budget + 30% to - 15%	
3 rd Party Estimate	N/A	OPEX used	Yes	Lessons Learned	Yes
Reviewed by Sponsor	N/A	Budgetary Quote(s)	No	Phase 1 Actual Used	N/A
Similar Projects	Yes	Contracts in place	No	Competitive Bid	N/A

Variance to Business Plan

The estimated variance(s) to the 2007-2011 Business Plan will be addressed through the portfolio management process. A PCRAF will be approved by Jan 2007.

Reviewed By:

P. Asgaripour
 Project Manager

Date:

Approved By:

J. Keto
 Eng & Mods Manager (Strat IV)

Date:

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Attachment "B"

Project Variance Analysis

OM&A	Total Project		Variance	Comments
	Units 5 and 6	Units 7 & 8		
Project Management (OPG)	824	1,225	401	Additional cost due to longer project duration - 4 years instead of 2 years for Units 5 and 6.
Engineering & Drafting (OPG)	529	229	(301)	Replacement of fastener only. No design for sealing skins is required.
Material				
Installation - OPG Support				
Contract - Design				
Contract - Installation				
Kinetics				
Contract - Other				
Installation - IMS				
Sub Total				
Foreign Material Unit 6				
BARC/Open/ Close				
Unit 7 & 8 contingency				
Project Costs (excl contingency)				
General Contingency				
Specific Contingency				
Project Costs (incl contingency)	26,234	20,525	(5,709)	
Comments:				

This project was identified in March 2006. Currently, conceptual funding is being used to start the Design work and prepare the Full Release BCS.

Attachment "C"

Key Milestones

Completion Date			Description
Day	Mth	Yr	
28	Feb	2007	FR1: Full Release BCS Approved
15	Mar	2007	IDR: Design Requirements Approved and Issued
13	Oct	2007	FD1: Final Design Complete (Unit 7) DCP: Design Permanent Mods Documents Issued
01	Nov	2007	MCA: Major Contracts Awarded (2 Units)
20	Sep	2008	SOI: Start of Installation (Unit 7)
15	Dec	2008	AFS: Available for Service Meeting (Unit 7)
01	Feb	2009	FD2: Final Design Complete (Unit 8) DCP: Design Permanent Mods Documents Issued
15	Feb	2010	SOI: Start of Installation (Unit 8)
15	May	2010	AFS: Available for Service Meeting (Unit 8)
15	Feb	2011	PCS: Close-out Starts
31	Aug	2011	PCM: Plan Complete Milestone

A Project Execution Plan (PEP) will be approved by May 2007

Comments:

All outage milestones will comply with N-PROC-MA-0013 **Revision 5B** (Planned Outage Management).