














ONTARIO POWER GENERATION	Document Number : N-BCS-00120.3-10007	Revision : 1.0	Page: 1 of 29
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ROUTING	LOCATION	ACTION	SIGNATURE	DATE
PROJECT MANAGER				
Don Seedman (Project Manager) Manager, Facilities & Projects Real Estate & Services	H18-H11	Review BCS		Dec 06/10
Glenn Temple VP, Real Estate & Services	H18-J11	Review BCS		Dec 7/10
PROJECT SPONSOR				
Gary Rose Director, Planning & Control Nuclear Refurbishment	O11	Review BCS		Dec. 9/10
Mark Arnone VP, Refurbishment Execution Nuclear Refurbishment	O11	Review BCS		9 Dec 2010
Dietmar Reiner SVP, Nuclear Refurbishment	O11	Submit BCS		Dec 9, 2010
Bill Robinson EVP, Nuclear Refurbishment Projects & Support	P82-2	Recommend BCS		Dec 10, 2010
FINANCE REVIEW				
Jamie Lawrie Director Nuclear Investment	P82	Review BCS		Dec 9/2010
Randy Leavitt Vice President, Nuclear Finance	P82	Review BCS		Dec 10, 2010
Don Power Vice President, Corporate Investment Planning	H07-G05	Review BCS		Dec 7/10
BCS APPROVAL				
Donn Hanbidge SVP & Chief Financial Officer	H19-F27	Approve BCS		Dec 31/10
Tom Mitchell President & Chief Executive Officer	H19-A24	Approve BCS		13 Dec 2010
FOR DISTRIBUTION				
Magued Ernest Refurb Planning & Controls 703-5428	O11	Return for Distribution & Filing		Jan 03/11

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DARLINGTON REFURBISHMENT COMPLEX AT THE CLARINGTON ENERGY CENTRE
PROJECT ID 10-73803

PHASE 3: DESIGN, CONSTRUCT AND COMMISSION THE DARLINGTON
REFURBISHMENT COMPLEX

1. RECOMMENDATION:

Approval is requested for a full release of \$85.7M (\$84.0M Capital and \$1.7M OM&A) for a total release value of \$105.4M including contingency to carry out design and construction of the OPG Darlington Refurbishment Complex ("DRC") at the Clarington Energy Centre ("CEC"), in support of the Darlington Refurbishment Program. Funding is specifically requested in order to:

- Complete negotiations and award a Design-Build contract,
- Manage the Design-Build contract during the design and construction period,
- Commission the completed building and furnish the office areas to OPG standards, and
- Provide owner's oversight, project controls, and reporting on the progress of the Project.

The following table summarizes releases to date and the full release project estimate.

\$000's	Funding	LTD 2010	2011	2012	2013	2014	2015	Later	Total
Currently Released	Partial	7,248	7,098	4,480	860				19,686
Requested Now	Full	(5,157)	24,593	40,795	25,444				85,676
Future Funding Req'd	Full	-	-	-	-	-	-	-	-
Total Project Costs		2,091	31,691	45,275	26,304	-	-	-	105,362
Ongoing Costs	~6M/year	-	-	-	2,820	5,752	5,867		14,439
Grand Total		2,091	31,691	45,275	29,124	5,752	5,867	-	119,801
Investment Type Strategic		Class Cap & OM&A		NPV or IEV -96,556		IRR N/A		Discounted Payback N/A	

A request for proposals (RFP) was issued on September 24, 2010 to 5 proponents. The RFP included the statement of needs for the facility. The RFP closed on November 17, 2010. Evaluation of the proposals is underway. OPG will select a proponent or proponents to negotiate with, and finalize a contract by March 2011. The project estimate included in this BCS is based on OPG's review of pricing as provided in the RFP responses. Award is planned to be complete by mid March 2011 in order to maintain the overall project schedule and to start construction by July 2011.

Expected Business Results

The expected business results are:

- Design, construction and commissioning of a multi-purpose complex, referred to as the Darlington Refurbishment Complex ("DRC") which will support project readiness for the Darlington Refurbishment Program. This complex will provide the long-term facility for specialized maintenance and other Darlington support functions upon completion of the Darlington Refurbishment program.

The expected benefits of the DRC include:

- A multi-purpose building to meet the needs and timeline of the Darlington Refurbishment Program, including an area available for usage for a mock-up and testing facility for fuel channel and feeder replacement ("R&FR") work in preparation for refurbishment outage execution, a warehouse, a new Information Centre, training and security in-processing centres, and as a project management team office for the Refurbishment Program.



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- Upon completion of the refurbishment project, the DRC will allow the consolidation of leases and co-location of support staff, including Inspection and Maintenance (IMS), closer to the Darlington site.

This project is categorized as a Strategic investment due to its requirement to be in place to meet the timeline of the Darlington Refurbishment Program. The in-service date of mid 2013 for this facility will provide sufficient time for the reactor mock-up tool testing and training in order to meet the timeline for the early start date of the first unit refurbishment in October 2015.

The reactor mock-ups are excluded from the scope of the DRC. The reactor mock-ups project will include the design, supply and installation of the reactor mock-ups, and any required changes to the DRC including electrical trenching to house and support the mock-ups.

Funding for this project is listed in the approved Nuclear Refurbishment Business Plan and included as part of the Darlington Refurbishment Preliminary Planning Release #3 as approved by OPG's Board of Directors on November 19, 2009. The current estimate exceeds the estimate in that Release by \$14.9M.

In March 2010, a total release of \$19.7M was approved for Phase 1, Land Development and Phase 2, Site Servicing and Contract Tendering of this project. OPG executed subdivision and servicing agreements with the Municipality of Clarington and Durham Region. The tendering process for installation of services is scheduled to be initiated in December 2010. Site servicing installation is planned to commence in February 2011 with completion of necessary infrastructure to the DRC by June 30, 2011 to allow construction to commence in July, 2011. Specifications for the DRC were finalized; an RFP was issued and closed and evaluation of the proposals is currently underway.

The purpose of this Business Case Summary is to obtain Senior Management and Board concurrence to access previously approved funds under Release #3, to award a contract in Q1 2011, and to design, construct, and commission the Darlington Refurbishment Complex Project.



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2. SIGNATURES

Submitted by:

A handwritten signature in blue ink, appearing to read "D. Reiner".

Dietmar Reiner Date
SVP - Nuclear Refurbishment

Recommended by:

A handwritten signature in blue ink, appearing to read "Bill Robinson".

Bill Robinson Date
EVP - Nuclear Refurbishment,
Projects, and Support

Finance Approval by:

A handwritten signature in blue ink, appearing to read "Donn Hanbidge".

Donn Hanbidge Date
SVP & Chief Financial Officer

Executive Approval by:

A handwritten signature in blue ink, appearing to read "Tom Mitchell".

Tom Mitchell Date
President & CEO

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3. BACKGROUND & ISSUES


Based on an identified need for additional facilities in the Clarington area, Real Estate Services contracted a national real estate brokerage firm to pursue land acquisition opportunities. A conditional Agreement of Purchase and Sale was signed in March 2007 to purchase a 61 acre property on Osborne Road, west of the Darlington Site. Due diligence activities were completed in June 2007, and the purchase closed in July 2007. The Draft Plan of Subdivision was approved by the Municipality of Clarington on March 24, 2009, and the Subdivision Agreement was executed on July 27, 2010.

The Darlington Refurbishment project, through a Retube and Feeder Replacement ("R&FR") this study, and as documented in NK38-REP-09701-10001, identified the need for a training, mock-up and testing facility within 20 km of the station. The facility will include an extensive reactor mock-up, training, and warehousing facilities to support full R&FR tool set integration testing, for procedure development and crew training. Based on operating experience from other refurbishments, the R&FR study recommended that the training and mock-up facility be available by the fall of 2013 for tool testing and training.

In November, 2009, OPG's Board of Directors approved the overall timeline and release strategy for the refurbishment of the Darlington NGS units, and funding for the preliminary planning phase which includes the development of infrastructure such as the Darlington Refurbishment Complex.

As part of a strategy to address other business needs, create efficiencies and maximize the occupancy of the facilities, the DRC will house other OPG programs and services including components of the Security Program, processing for new staff and a new Information Centre to replace the current facility on-site which will be used by the Nuclear Refurbishment organization. Further, during the refurbishment period, due to the increased volumes of construction staff and transport vehicles for material and equipment, it is advisable to limit public access to the site, to the extent feasible, during the refurbishment period. The DRC is a good location due to its proximity to the Darlington station, Waterfront Trail, Highway 401 and access roads.

Specifications for the DRC were finalized in 2010 and an RFP was prepared and issued. Based on the operating experience from other nuclear unit refurbishments underway a 70,000 sq. ft. Warehouse is included to meet the needs of two units being refurbished in a staggered pattern. The RFP closed on November 17, 2010. Proposals are currently being evaluated and form the basis of the Full Release amount. The contract will be awarded subsequent to this Full Release.

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The following is a summary of the components and square footage of the proposed facility per the RFP Layout Plans:

Component	Footage in Sq. Ft.
Office Space with 448 offices per block plans approved July 23, 2010.	100,000
TMB Mock-up area – with 50' Ceiling	49,922
Refurbishment Warehouse & Storage for Tools	69,500
Change Rooms, Cafeteria, Miscellaneous Training Facilities	25,998
Calibration, Welding and Fabrication Shops	6,600
Information Centre	9,000
Security Loading Bay	9,450
Aisle ways & corridors	10,000
Total	280,470

The following is a breakdown of offices by floor and user:

Offices by Floor & User	Refurbishment	Security	Public Affairs	Facilities	Total Offices
First Floor	0	15	11	8	34
Second Floor	176	32	0	0	208
Third Floor	206	0	0	0	206
Total	382	47	11	8	448

4. ALTERNATIVES & ECONOMIC ANALYSIS

The following alternatives were considered:


Base Case: Do Nothing (Contractor provides Training and Mock-up Facility)

Assume that the Retube and Feeder Replacement contractor has a training and mock-up facility in place and that OPG is not required to develop one.

Additionally, OPG would still need to construct a complex to meet Refurbishment Program needs such as training, additional project management offices in addition to the Construction management office to be build on the Darlington site, security in-processing for new hires (staff or contractors), and warehousing.

To do nothing would have the following impacts:

- Additional travel time and potential schedule delays for tooling modifications as the contractor facility would be further away.
- Increases the risk of a delay in the start of the Darlington Refurbishment outages and a risk of increased idle time on the third and fourth units to be refurbished due to the delayed start.
- Increased risk of critical path delays during the Darlington Refurbishment outages as a result of incomplete tool testing and training.
- Longer security processing of contractors/staff supporting Refurbishment as the DRC will include a security processing centre.

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Due to the above noted impacts, the Base Case is not recommended.

Alternative 1: Construct a Darlington Refurbishment Complex at the Clarington Energy Centre (Recommended Alternative).

This alternative is the development of a 280,000 sq. ft. Darlington Refurbishment Complex ("DRC") on OPG owned lands in the Clarington Energy Centre to the west of the Darlington NGS site. This multi-purpose DRC will meet the needs and timeline of the Darlington Refurbishment project, including housing of the full-size mock-up, tooling, training and testing facility for fuel channel and feeder replacement work in preparation for refurbishment execution, a 70,000 sq. ft. warehouse to store refurbishment materials, an office area to accommodate the off-site project management team and support staff, a security in-processing centre, and a new information centre.

The Present Value of this option is -\$96.6M. This NPV does not include the benefit of additional OPG usage of the DRC post refurbishment. Additionally, this NPV does not consider the benefit of reducing the refurbishment outage period; the DRC and mock-ups will be used to test tooling and train staff in order to reduce delays on the critical path of the refurbishment outage. Without the DRC and mock up, due to increased risks, the refurbishment duration would be expected to be longer. This benefit has not been considered, however, a savings of just 2 months per unit would result in a positive NPV for this project.


Alternative 1 is being recommended for the following reasons:

- The proposed location for the DRC at the Clarington Energy Centre is in close proximity to the Darlington site resulting in decreased transportation and relocation costs associated with the use of an alternate OPG-owned site, such as Wesleyville.
- The DRC consolidates facilities to meet Darlington Refurbishment needs, including project offices, warehousing, training and in-processing.
- Co-location of the project team into a single facility will improve communication, teamwork, and productivity during the Darlington Refurbishment project life cycle.
- A custom-built warehouse will meet the special refurbishment requirements such as floor loading and ability to ship secure loads of materials to site reducing need for Salley port upgrades at Darlington.
- The off-site complex will alleviate the Security processing burden and congestion for the station.
- As the facility would be built off-site, it would be a commercial facility that would have commercial value in the marketplace.

Alternative 2: Construct a Darlington Refurbishment Complex with no Warehouse; and Lease Warehouse space.

This alternative is the Darlington Refurbishment Complex as described in Alternative 1 except with no warehouse, resulting in a total footage of 211,000 square-feet. Approximately 69,000 sq. ft. of warehouse space with 20,000 sq. ft. of office/common services space for procurement staff would be required.

For financial evaluation, 89,000 sq. ft. of warehouse space, at current lease rates, was considered; however, OPG would lease a facility that would meet the needs of OPG that was of similar size but likely not exactly 89,000 sq. ft. This would have a bearing on the final lease rates. Assuming that the warehouse was in the Durham region, extra transportation and labour costs

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were included, however, based on two shipments every day, are not significant (about \$18,000 per year). In addition to the ongoing rent, landlord operating costs and OPG operating costs, a same size loading bay, costing about \$1M, would be required to meet the security requirement to fully enclose the transport truck and trailer. Based on the condition of the selected leased facility, additional leasehold improvements may also be required.

Not building a warehouse at the DRC could save approximately \$10M (without escalation, contingency and capitalized interest) in project costs.

The Present Value of this option is -\$97.7M, a difference of -\$1.2M from recommended Alternative 1.

Alternative 2 is not recommended for the following reasons:

- The risks for damaging the tools would be increased due to transporting them from the leased warehouse to the Darlington Refurbishment Complex.
- Productivity could be impacted due to delayed shipment of tools from the leased warehouse as a result of unexpected traffic jam or accidents.
- Uncertainty in available warehouse space, requirements for leasehold improvements, and potential implications of a long term tenancy.

Alternative 3: Construct a Darlington Refurbishment Complex on the Darlington NGS site.


The Darlington Refurbishment Program explored the opportunity of locating the same Darlington Refurbishment Complex on the Darlington site.

This alternative is not recommended for the following reasons:

- The Present Value of this option is -\$135.3M, a difference of -\$38.7M from recommended Alternative 1. This is due to the higher cost to construct the facility on the Darlington Nuclear site.
- Due to limited land available on the Darlington site, the need to preserve the New Build lands and the increased traffic resulting from building the DRC on the Darlington site, this option is not preferred. The land should be used for personnel that directly support and interact with station workers reducing congestion on the Darlington site.
- Facilities constructed on the Darlington site would not have a commercial value (i.e. could not be sold) if no longer needed.

The key variables for each alternative are summarized below:

	Alternative 1	Alternative 2	Alternative 3
Location of DRC	CEC	CEC	DNGS
Refurbishment Warehouse	At the DRC	Lease 89,000 sq-ft	At the DRC
Total DRC Footage	280,000 sq-ft	211,000 sq-ft	280,000 sq-ft

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Financial Analysis \$M (until Refurbishment Project Close-out):

	Base Case	Alt. 1 (Recommended)		Alt. 2	Alt. 3
		Full Costs	Incremental Costs		
Initial Costs (Gross \$M)*	N/A	105.4	103.6	96.1	164.3
NPV (2010 PV)	N/A	(98.1)	(96.6)	(97.7)	(135.3)

* Excludes Operating Costs and Leasing Costs.

Utilization of the DRC post-refurbishment, by IMS and/or other Nuclear Support organizations, and consolidation of lease costs (cost savings) were not included in the financial evaluations, however, provides additional value to the recommended alternative.

Warehouse fitting, racking, and the reactor mock-up are excluded from the financial evaluations. These options are required for all options and are treated as separate projects within the Darlington Refurbishment Program. See Section 5 for further details.

Additional Alternatives

The following alternatives were considered and eliminated.

Construct a Darlington Refurbishment Complex at another OPG location, i.e. Wesleyville

The Darlington Refurbishment Program explored and discounted the opportunity of locating the DRC and warehouse at OPG's Wesleyville site due to the following reasons:

- This location would result in additional transportation costs (staff and material) and employee relocation costs.
- The Wesleyville location (37 kilometres from Darlington site) would not be a feasible location to accommodate the Refurbishment project team, as suggested by Operational Experience from other refurbishment projects.

Construct a smaller Darlington Refurbishment Complex with less Office Space

This alternative is the Darlington Refurbishment Complex as described in Alternative 1 except with no third floor offices, resulted in a total footage of 242,000 square-feet.

This alternative would save approximately \$14M in construction and associated furniture and information telecommunication infrastructure (without escalation, contingency and capitalized interest).

Insufficient offices at the DRC will require alternative leased office space and/or use of modular offices. Reducing the planned office space will likely move costs to other project rather than reduce them. As well, having refurbishment staff at many locations will reduce efficiency.

It was assumed that the same 39,000 square-feet of office space on the third floor would have to be leased somewhere in the Durham Region to meet the Darlington Refurbishment office need. In addition to the ongoing rent, and operating costs, leasehold improvements of about \$5.8M would be required.

This option is not recommended for the following reasons:

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- There are risks in assuming a 39,000 square-foot office facility will be available for lease in the Durham Region for occupancy in mid 2013. The Durham Region office market is very small with no significant development.
- Having some staff located in a separate leased facility is against the original intent of co-location of the project team into a single facility to improve communication, teamwork, and productivity.
- There would be increased traveling time and costs from staff located at the separate leased facility.
- Reduced flexibility to consolidate staff from the Pickering location to co-locate to Darlington upon closure of the Pickering Nuclear Station.

5. THE PROPOSAL

The scope of this full release includes work associated with the design, construction, and commissioning of the DRC at the Clarington Energy Centre.

The work plan for Phase 3 includes:


- a) Negotiations and awarding the Design-Build contract for the DRC,
- b) Execution of the contract by the Proponent,
- c) Owners oversight of the contract, including project controls, and internal OPG reporting,
- d) Taking possession and furnishing the offices by OPG, and
- e) Commissioning of the facility by the Proponent and OPG.

This proposal excludes:

1. Design, construction, delivery and installation of the reactor mock-ups will be procured under a separate agreement and project. The DRC, however, will house the reactor mock-ups. Costs to service the property after construction and potential increased electrical service, floor work (trenches, conduits), until further defined, to house and support the mock-up will be included in the reactor mock-up project.
2. Racking, carousels or storage units in the warehouse and associated changes to lighting, HVAC, and sprinklers, as required. This will be managed as a separate project.
3. Equipment & infrastructure such as: forklifts, carts, welders, security x-ray machines, relocation changes for equipment or requirements of the x-ray machine & equipment, and tools and devices to support specific work group needs.
4. Information Centre custom artwork, exhibits or decals.
5. Internet wireless service in the building.
6. Staff relocation or move costs.

Project Assumptions include:

1. Floor loading for the reactor/fuel channel mock-up (85' x 259'), approximately 21,900 square-feet, would be 2400 Kg/square-metre. All other areas in the warehouse would be 440 lbs./sq.ft. live loads.
2. All classrooms, briefing rooms, and workstations are located in the office area of the building.
3. There are no mezzanines for storage of equipment or for use as classrooms in the warehouse.

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The key milestones of this project are summarized below.

Phase 2: Site Servicing and RFP Phase (Funded by Phase 2 Partial Release)

Municipal Services

- Finalize Clarington Subdivision Agreement Completed July 27, 2010
- Finalize Regional Subdivision & Servicing Agreement October 29, 2010
- Award Tender for Site Servicing – Clarington (1) January 31, 2011
- Award Tender for Site Servicing – Durham Region January 31, 2011
- Site Servicing (2) February, 2011 to June 30, 2013

Darlington Refurbishment Complex RFP

- Prepare DRC Specification Completed
- Full Release BCS Approved December 16, 2010
- Select EPC Contractor January 31, 2011

Phase 3: Design, Construct, Commission TMB Complex (This Full Release) (3)

- Award EPC Contract Mid March, 2011
- Design Complete June 30, 2011
- Construction Start July 1, 2011
- In-Service July 1, 2013

- (1) Both Clarington and Durham Region have confirmed that site services required for construction will be in place by June 2011 with all site servicing in place at time of full in-service of the DRC.
- (2) The municipal services and the internal road works for the OPG CEC property and the municipal services to DNGS will be constructed during 2011 and the additional works scheduled for 2012 to 2013, are related to the South Service Road upgrades and local intersection improvements.
- (3) Dates for Phase 3 are indicative, and were the basis for the RFP; however, exact timing will be confirmed upon selection of the EPC Contractor.

6. QUALITATIVE FACTORS

Other benefits associated with this project are as follows:

- The DRC provides additional benefits to the Darlington NGS station due to the water main design, water and sanitary sewer services to the site. This will provide the ability for the station to connect to regional water and sanitary sewer services and mitigating environmental concerns related to the operation of the waste treatment facility on the Darlington site. The addition of a sewage line addresses long standing MOE concerns with sewage discharge and removes the requirement for training and qualifying Nuclear Operators under Provincial license standards for Sewage Treatment Plant operations. Currently the station has only one source of domestic water; thus, the scheduling of water outages is difficult. The new water main design would eliminate the need for future domestic water outages at the station.
- OPG owned warehouse and offices at the DRC will add value as future warehouse and office space for Nuclear support functions, including Inspection and Maintenance Services Division, and in support of post refurbishment operations at Darlington.
- The DRC would follow the Leadership in Energy and Environmental Design Green Building (LEED) Canada guideline for green buildings that improves occupant well being, environmental performance and economic benefits through efficiency and sustainability. OPG has set an objective of a LEED 'Silver' rating for the building. Clarington recognizes



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the community benefits of a LEED certified building and it may offer a reduced development charge fee.

- The DRC strengthens OPG's commitment to the Clarington community and Durham Region.

7. RISKS

The following project risks are being managed with respect to this Project:

Table - Risk Management and Contingency Plan				
Risk Class	Description of Risk	Risk Probability	Risk Impact	Risk Management Strategies: Avoidance/Mitigation/Correction
Cost	Service cost increases due to change in scope after the Pre-submission Consultation.	Low	Low	OPG, Clarington and Durham have had several meetings to discuss the amount of supporting plans and technical reports required to complete the submission.
Cost	Higher than planned site servicing costs.	Low	Medium	The site servicing costs is based on an engineering estimate prepared by an external party and includes a [REDACTED] OPG has included [REDACTED] to deal with scope changes.
Cost	Higher than planned design and construction costs (Phase 3 risk)	Medium	Medium	The Full Release estimate represents the highest bid of the proponents and is based on project needs as identified in the RFP specifications. A [REDACTED] has been added to the Full Release estimate to deal with scope changes.
Cost	Costs will increase if the exclusions noted in Section 5 above are brought into the scope of this contract.	High	High	a) Scope and manage exclusions as a separate contract, where appropriate. b) Where appropriate and possible, scope and estimate exclusions early in the time period of this PO to minimize re-work.
Schedule	Delay in municipal approvals.	Low	Low	Clarington has verbalized support for the Site development and the development does not require changes to the Official Plan or Zoning By Law. Clarington has indicated priority processing for OPG development application. A delay is not anticipated but ongoing discussions with Clarington will ensure a timely delivery.
Schedule	Delay in awarding the tender and, hence, the completion of the site services, that are sensitive to seasonal construction, could have cost and schedule implications.	High	High	Provide the required documents and security bonds in a timely manner required for the tender. Escalate to Clarington Mayor and Regional Chair if staff is unable to resolve OPG's concerns on timing to tender for the works.



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Table - Risk Management and Contingency Plan

Risk Class	Description of Risk	Risk Probability	Risk Impact	Risk Management Strategies: Avoidance/Mitigation/Correction
Schedule	Delay in the completion of the project (available for service date – July 2013)	Medium	High	There are only 3 months of float between the AFS and the need date for the R&FR contractor. Any delay beyond 3 months may reduce the testing and tool development time for the R&FR contractor increasing Refurbishment project execution risk. The EPC contract will require on-time delivery of this project. This risk will be re-evaluated closely upon awarding the EPC contract. In particular, the EPC contractor will need to submit their site plans as soon as possible after receipt of PO to ensure minimum delay as the submission is reviewed by Municipality.

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8. POST IMPLEMENTATION REVIEW (PIR) PLAN

A simplified PIR will be carried out within one year of the completion of Phase 3, consistent with the Corporate PIR procedure.

The PIR will be an independent and systematic performance evaluation of the project for these objectives:

- Assess the realization of the project benefits;
- Review project plan, implementation and operational performance;
- Review BCS – major assumptions, economic and financial evaluations looking back from results, for future decisions;
- Review project risk management; and
- Identify lessons learned for future improvement.

Type of PIR:	Target Project In Service date:	Target PIR Approval date:	PIR Responsibility (PIR Co-ordinator):		
Simplified	28-Jun-13	30-June-14	Director, Planning & Project Control Nuclear Refurbishment		
Measurable Parameter		Current Baseline	Target Result	How will it be measured?	Who will measure it? (person/group)
1.	Cost – Cost of Site Servicing	\$15.8M including contingency and escalation	\$15.8M	Final Project Cost Report	Director, P&PC
2.	Cost – Cost of DRC Construction	\$70.8M Including apportionment of contingency and escalation, excluding furniture and IT	\$70.8M	Final Project Cost Report	Director, P&PC
3.	Schedule – In-Service date	July 2013	July 2013	Date of Occupancy Permit	Director, P&PC
4.	LEED Certification	Achieves LEED Silver	Achieves LEED Silver Certification by June 30, 2014	Receipt of certification	VP, Real Estate Services
5.	Occupancy	Occupied by NR staff within 3 months of in-service	Oct 2013	Oct 2013	Director, P&PC

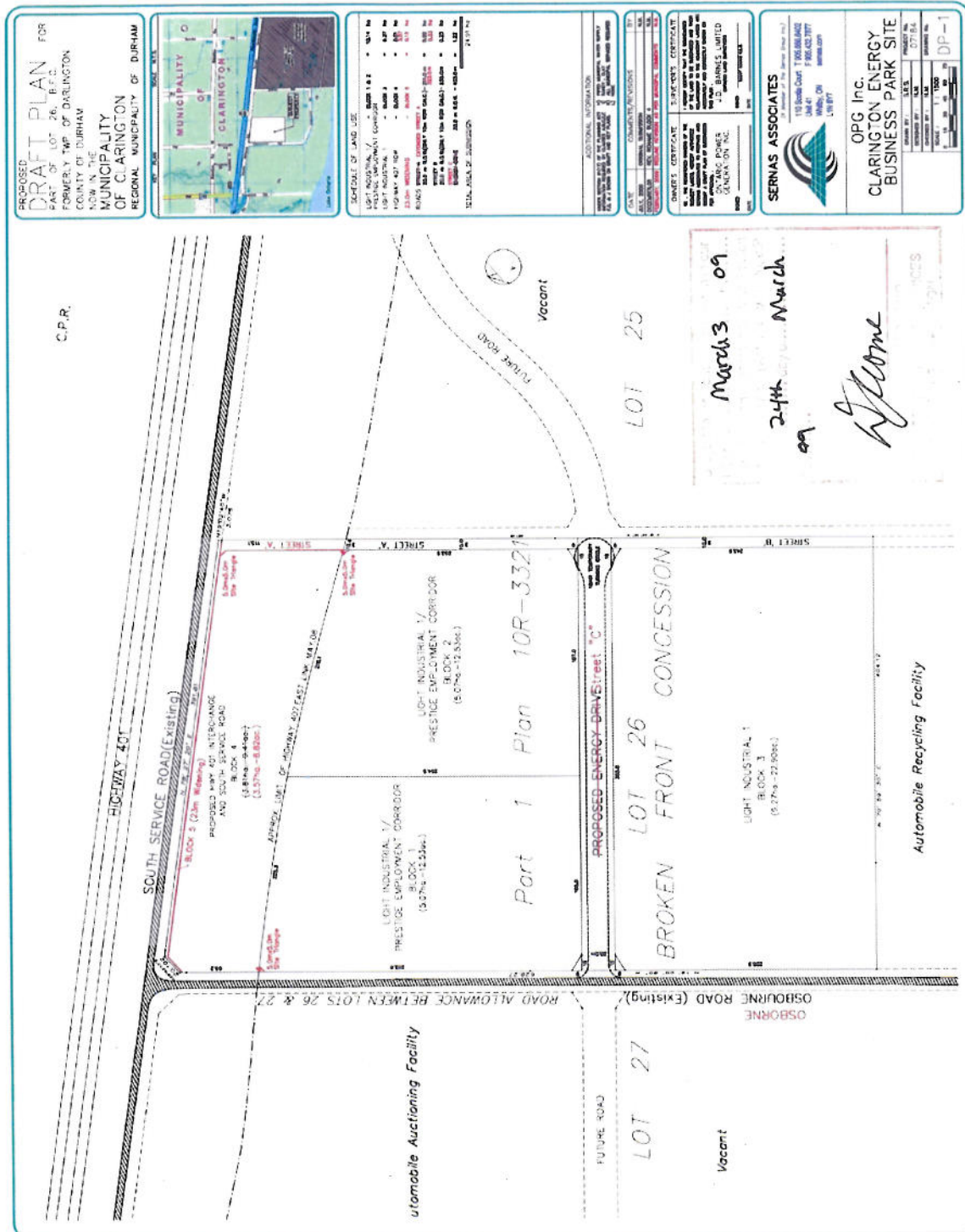
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APPENDIX A: Site Plan

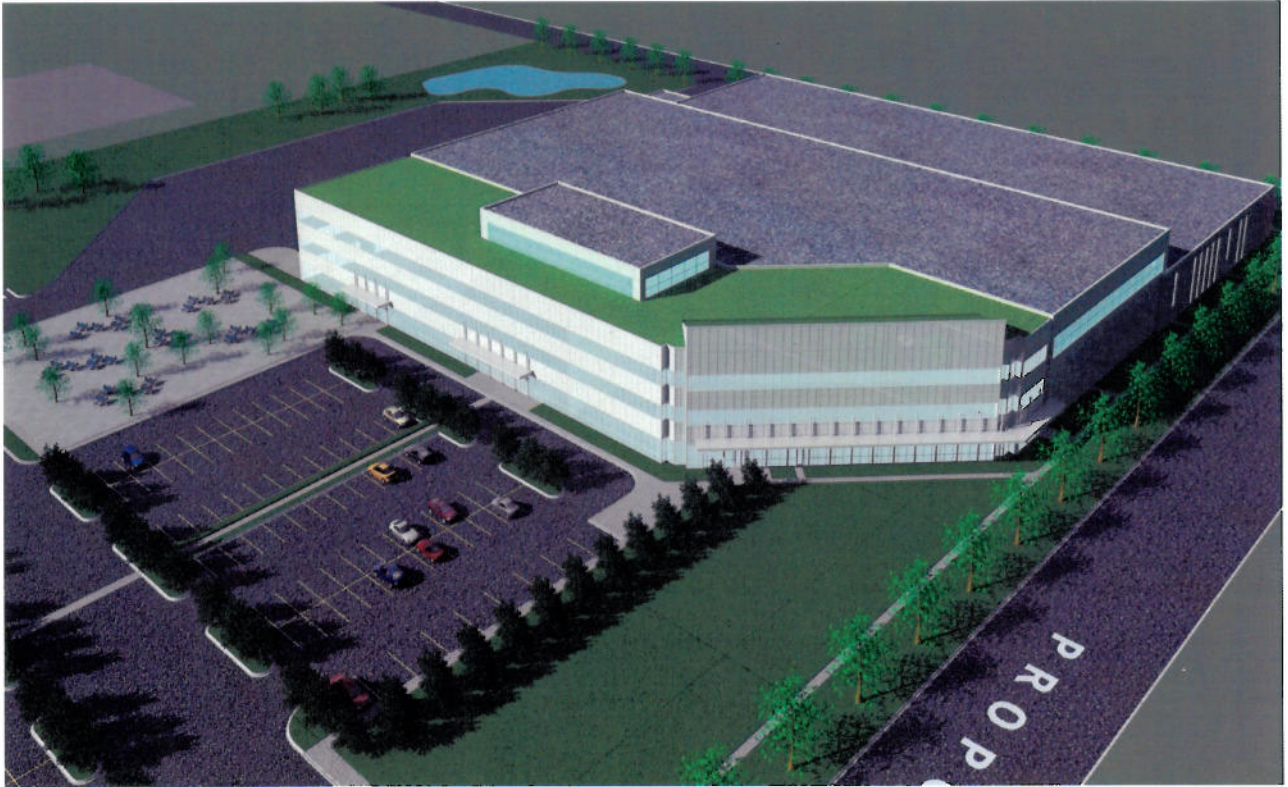


APPENDIX B: Approved Draft Plan of Sub-Division

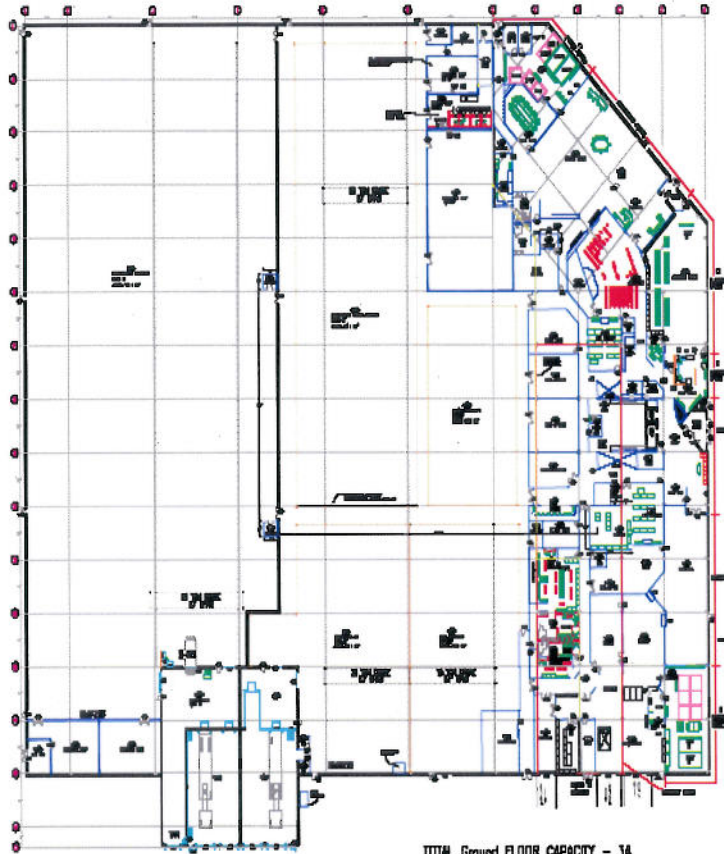
The following draft plan of sub-division was approved by the Municipality of Clarington on March 24, 2009:



APPENDIX C: Proposed Site Plan



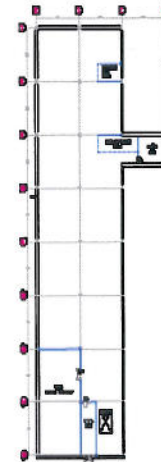
APPENDIX D: Ground Floor Layout Plan



Ground Floor Plan
 199,000 SQ. FT. APPROX.

TOTAL Ground FLOOR CAPACITY - 34

CLEARANCE/IDENT	FACILITIES	PUBLIC AFFAIRS
14 SI	6 SI	6 SI
1 SII	2 SII	3 SII
15	8	2 SIV
		11



Basement Plan

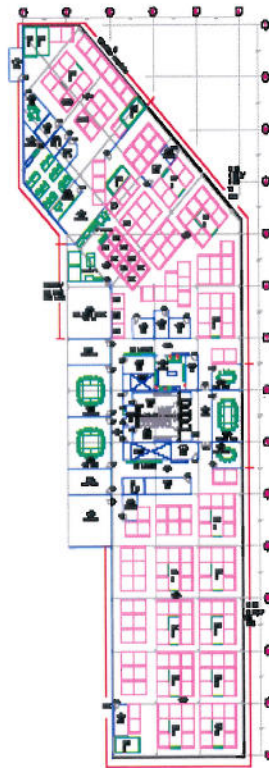
DARLINGTON REFINEMENT COMPLEX
 BLOCK PLAN SCHEMATIC
 Basement & Ground Floor Layout Plan

**ONTARIOPOWER
 GENERATION**

scale: ITS

sheet no.:
 A1-2

APPENDIX E: Second & Third Floors Layout Plans



TOTAL 2nd CAPACITY - 208

STRATEGIC INITIATIVES

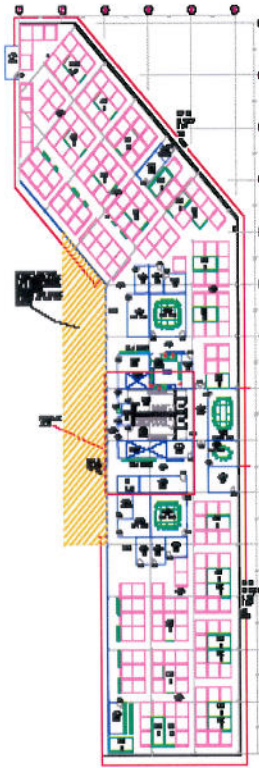
- 1 - DIR
- 2 - STR IV
- 4 - STR II
- 23 - STR II
- 2 - ADMIN
- 32 TOTAL

MCS

- 2 - DIR
- 14 - STR III/IV
- 160 - STR II
- 176 TOTAL

2nd Floor Plan

43,500 SQ. FT. APPROX.



TOTAL 3rd CAPACITY - 208

IMCS

- 1 - SVP
- 4 - DIR
- 24 - STR III/IV
- 177 - STR II
- 206

3rd Floor Plan

38,800 SQ. FT. APPROX.


CLARINGTON REPAIRMENT COMPLEX
 BLOCK PLAN SCHEMATIC
 2nd & 3rd Floor Layout Plans



DATE: 2/13

ISSUED BY:

A2-2

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APPENDIX F: Summary of the Darlington Refurbishment Complex Needs Statement

The following is a summary of the needs of the DRC facility:


Organization	Function	Business Drivers
Nuclear Refurbishment	<ul style="list-style-type: none"> • Training for the re-tube and feeder replacement (R&FR) project • Mock-ups for training and equipment testing • Support R&FR prototype tool testing and development, as well as storage for R&FR tools. • Offices for project management team and support staff. • Warehouse in close proximity to site and mock-up to store tools, retube and other components with secure loading capability 	<ul style="list-style-type: none"> • Address a need that provides training, mock-up, and testing in support of the Darlington Refurbishment timeline. • Provide facilities to accommodate the OPG project Management team. • Eliminate leasing costs.
IMS	<ul style="list-style-type: none"> • Location and design satisfies long-term business plan for IMS, enabling the discontinuance of multiple leases offsetting ongoing operational costs. 	<ul style="list-style-type: none"> • Consolidate IMS Operations starting in 2024 upon completion of refurbishment. • Eliminate leases
Information Centre	<ul style="list-style-type: none"> • CEC is a good location for a temporary facility for the Information Centre due to its proximity to the Darlington station, Waterfront Trail, natural vegetation, 401 and access roads, including access roads to the station. 	<ul style="list-style-type: none"> • Accommodates the Information Centre which will be over 30 years old when refurbishment ends, it will most likely at end of service life without significant re-investment.
Security	<ul style="list-style-type: none"> • Enhanced efficiency and effectiveness through consolidation of Nuclear Security Strategic Initiatives (Tactics and Training, Programs), Security Clearance, and Identification Office functions (badging, parking passes, etc.) 	<ul style="list-style-type: none"> • Eliminate leasing costs. • Greater efficiencies and effectiveness in delivery of security program processing
Training	<ul style="list-style-type: none"> • Facilitation of Nuclear General Employee Training process for new hires (staff/contractors). 	<ul style="list-style-type: none"> • Increased access and efficiency in Nuclear General Employee Training processing

The following is a summary of the components and square footage of the proposed facility per RFP Layout Plans:

Component	Footage in Sq. Ft.
Office Space for workstations/offices for 448 staff per block plans approved July 23, 2010.	100,000
TMB Mock-up area – with 50' Ceiling	49,922
Refurbishment Warehouse & Storage for Tools	69,500
Change Rooms, Cafeteria, Misc Training Facilities	25,998
Calibration, Welding and Fabrication Shops	6,600
Information Centre	9,000
Security Loading Bay	9,450
Aisle ways & corridors	10,000
Total	280,470

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For Internal Project Cost Control

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APPENDIX G: Phase 2 Partial Release Estimate

	Phase 1 Partial Release Approved \$1,244k			Phase 2 Partial Release Approved at March 2010 Board Meeting						
	Actual Cost (k\$)			Estimated Costs (k\$)						
Year	2008	2009	Total	2010	2011	2012	2013	Total		%
Engineering Design		270	270	56	25	25	25	131		1
Consultants/Application Fees	150	339	489							
Subdivision Agreement				199	315	57	5	576		3
Construction										
Other Contracts - Hydro One WAN Costs										
RFP Specification & Tender										
Owner's Contingency										
Cost Escalation (2%/year)				0	214	163	20	397		2
Interest on Capital (6%)				22	373	855	618	1,868		10
Total Project	150	609	759	1,332	11,294	5,053	966	18,645		100
	Phase 1 (Capital) \$759k			Phase 2 (Capital) \$18,645k						
Project Estimates Approved By:	Ray Davies Real Estate Strategy Manager Real Estate & Services									
	Dec 7/10. Date									

Assumptions

Following are the key assumptions used during the development of this release:


1. Phase 2 cost estimates were provided by OPG consultant Sernas Associates, and are in 2010 dollars(\$).
2. Phase 2 work on Subdivision Agreement, Site Servicing, DRC RFP Specification and Tender are treated as capital costs.
3. Owner's Contingency allowance is based on █ % of total direct costs.
4. Cost escalation was added to total costs including contingency based on 2% per annum.
5. Interest charge on capital is based on 6% per annum, and Phase 2 will be 100% in-service July 1, 2013.
6. No cost sharing from Durham, Clarington or others assumed at this time.

In 2007 the following costs were incurred as the result of the land purchase, this is excluded from above estimate.

Land Purchase	\$4,923 K
Real Estate Commission	98
Land Transfer Tax	72
Realty Taxes	1
Consultants for Due Diligence	87
Total 2007 Costs	\$ 5,181 K

APPENDIX H: Phase 3 Full Release Estimate

The following chart summarizes the Full Release estimate for Phase 3, the design and construction of the DRC and includes an analysis of estimate change since the March 2010 Partial Release.

Phase 3 DRC Design and Construct Release Estimate (+15%/ -10%)								
Estimated Costs (k\$)								
Year	2010	2011	2012	2013	Total		%	
Capital Costs								
Design and Construction		17,021	28,511	14,468	60,000		70	
Commissioning				130	130		0	
LEED Consultant			100	250	350		0	
Other Contracts								
IT & Furniture for Refurb Offices								
Owner's Contingency								
Cost Escalation (2%/year)		56	341	456	853		1	
Interest on Capital (6%)		537	2,206	2,035	4,778		6	
Total Capital Costs		20,397	39,496	24,412	84,306		98	
OM&A Costs								
IT & Furniture for other offices								
Owner's Contingency								
Cost Escalation (2%/year)			28	53	82		0	
Total OM&A Costs			726	926	1,652		2	
Total Project	0	20,397	40,222	25,338	85,958		100	
Project Estimates								
Approved By Project Manager:		<div>  <div> Don Seedman Manager, Facilities & Projects Real Estate & Services </div> <div> Dec 7, 2010 Date </div> </div>						

Assumptions

Following are the key assumptions used in the above Full Release estimates (based on highest RFP bid price):

1. The total design & construction costs for Phase 3 equates to \$259 per square-foot at 2010\$ for non-warehouse and \$100 per square-foot for warehouse & loading bay, based on the gross building area of 280,000 square-foot.

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2. Owner's Contingency allowance is based on [REDACTED] of IT & Furniture and [REDACTED] of design & construction direct costs.
3. Cost escalation was added to total costs including contingency based on 2% per annum.
4. Interest charge on capital is based on 6% per annum, and Phase 3 will be 100% in-service July 1, 2013.
5. Annual operating costs is about \$5.3M in 2010\$ including utility costs, property taxes, facilities and IT services costs, commencing July 1, 2013; It equates to \$10 per square-foot for warehouse/Mock-ups/Shops and \$29 per square-foot for offices, Information Centre and other miscellaneous facilities.
6. Further development of the DRC design requirements, since the March Definition Phase release, has led to additional project design & construction costs of approximately \$7M (excluding capitalized interest and contingency) due to the following:

Clarington Energy Centre related requirements:

- a) Prescribed requirements for external finishes, storm water location, etc. (+\$1.3M)
- b) Unexpected site conditions: sub-soil investigation revealed a higher than anticipated water table, requiring dewatering during construction, foundation construction changes and on-going maintenance (+\$0.7M)

OPG newly identified requirements:

- a) Security upgrades around the Loading Bay (+\$1.0M)
- b) Hallways and walkways (+\$1.0M)
- c) Increased Refurbishment warehouse space of 30,000 square-feet (+\$3.0M)

Item (c) is an increased scope based on OPEX from other current refurbishments and further consideration of Darlington Refurbishment's unit overlap execution scenario.

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APPENDIX I: Cost Variances from Business Plan

The following summarizes the cost variances from the 2010 to 2014 approved business plan, as related to the Darlington Refurbishment Complex project:

Total Investment Cost: \$105,362k (\$103,710k Capital & \$1,652k OM&A)
(Including \$19,686k Capital previously approved)

1) Capital Cost Summary

Capital Funding \$ 000's		LTD Dec 2009	2010	2011	2012	2013	2014	Total
Current Release	Project Costs							
	Contingency							
	Total	759	6,489	7,098	4,480	860	0	19,686
This Release	Project Costs							
	Contingency							
	Total	0	(5,157)	24,593	40,069	24,519	0	84,024
Total Release	Project Costs							
	Contingency							
	Total	759	1,332	31,691	44,549	25,379	0	103,710
Future Release	Project Costs	0	0	0	0	0	0	0
	Contingency	0	0	0	0	0	0	0
	Total	0	0	0	0	0	0	0
Project Costs								
Contingency								
Total		759	1,332	31,691	44,549	25,379	0	103,710
Approved 2010-2014 BP			8,327	25,968	22,535	23,391	10,280	90,500
Variance to Business Plan			(6,994)	5,724	22,014	1,987	(10,280)	13,210
Removal Cost (Above)			0	0	0	0	0	0
Inventory W/O			0	0	0	0	0	0
Spare Parts in Inventory			0	0	0	0	0	0

2) OM&A Cost Summary

OM&A Funding \$ 000's		LTD Dec 2009	2010	2011	2012	2013	2014	Total
Current Release	Project Costs	0	0	0	0	0	0	0
	Contingency	0	0	0	0	0	0	0
	Total	0	0	0	0	0	0	0
This Release	Project Costs	0	0	0				
	Contingency	0	0	0				
	Total	0	0	0	726	926	0	1,652
Total Release	Project Costs	0	0	0				
	Contingency	0	0	0				
	Total	0	0	0	726	926	0	1,652
Future Release	Project Costs	0	0	0	0	0	0	0
	Contingency	0	0	0	0	0	0	0
	Total	0	0	0	0	0	0	0
Project Costs		0	0	0				
Contingency		0	0	0				
Total		0	0	0	726	926	0	1,652
Approved 2010-2014 BP			0	0	0	0	0	0
Variance to Business Plan			0	0	726	926	0	1,652

The Darlington Refurbishment Complex Phase 3 conceptual estimates plus capitalized interest and contingency were included in the Darlington Refurbishment Campus Plan submitted 2011-2015 Business Plan.


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APPENDIX J: Project Variance Analysis

The following summarizes the variances from previous release:

Phase 2 Partial Release Estimate					
Capital (\$000)	LTD Oct 2010	Last BCS Feb 2010	This BCS Dec 2010	Variance	Comments
Engineering Design	\$33	\$131	\$131	\$0	
Consultants/Application Fees					
Subdivision Agreement					
Construction					
Other Contracts/Costs - Hydro One WAN					
RFP Specification & Tender					Utilization of project contingency
Owner's Contingency					Contingency reallocated to RFP
Cost Escalation (2% per year)					2010 site servicing work delayed to 2011
Interest on Capital (6%)					Delay of work to 2011
Total Phase 2 Project Costs	\$898	\$18,927	\$18,645	-\$283	
Phase 3 Full Release Estimate					
Capital (\$000)		Last BCS Feb 2010	This BCS Dec 2010	Variance	Comments
Design & Construction					Warehouse increased by 30K sq-ft; Added 10K sq-ft loading bay and 10K sq-ft aisleways & corridors; Prescribed CEC requirements in external finishes and storm water location, and unexpected site conditions.
Commissioning					Higher costs due to larger footage
LEED Consultant					Higher costs due to larger footage
Other Contracts					Higher costs due to larger footage
Capitalized IT & Furniture					Reclassification of NR IT & Furniture Costs
Owner's Contingency					Higher contingency due to higher direct costs
Cost Escalation (2% per year)					Escalation included in current D&C Costs
Interest on Capital (6%)					Higher interest due to higher direct costs
Total Capital Costs		\$68,166	\$84,306	\$16,140	
OM&A (\$000)		Last BCS Feb 2010	This BCS Dec 2010	Variance	Comments
IT & Furniture for Offices					Reclassification of NR IT & Furniture Costs
Owner's Contingency					Lower contingency due to lower direct costs
Cost Escalation (2% per year)					Lower escalation due to lower direct costs
Total OM&A Costs					
Total Phase 3 Project Costs		\$80,892	\$85,958	\$5,066	

Note: The Feb 2010 BCS represents a total release of \$19.7M including \$0.8M for Phase 1, Land Development and \$18.9M for Phase 2, Site Servicing and Contract Tendering of this project.

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APPENDIX K: Financial Model Assumptions

Following are the key assumptions used during the modelling of the Project:

Project Cost Assumptions:

1. The total area of the complex is estimated at 280,000 square-feet; 448 staff.
2. The total design & construction costs for Phase 3 equates to \$259 per square-foot at 2010\$ for non-warehouse and \$100 per square-foot for warehouse & loading bay, based on the gross building area of 280,000 square-feet.

Financial Assumptions:

3. The discount rate is 7% (Regulated Nuclear asset) for this strategic investment decision.
4. The Ontario CPI (2% per year) is used to convert the cost estimates in 2010\$ to "Dollars of the year".
5. CCA Rate 6% or Class 1* is being used for new non-residential buildings.

Project Life Assumptions:

6. The Phase 2 Municipal Site Servicing will be completed by July 1, 2013.
7. The design, construction and commissioning of the DRC at the CEC will take about 2 1/2 years.
8. The DRC at the CEC will be in-service by July 1, 2013.

Operating Cost Assumptions:

9. Annual operating costs for the DRC is estimated at \$5.3M in 2010\$ including utility costs, realty taxes, facilities and IT services costs, commencing July 1, 2013. It equates to \$10 per square-foot for warehouse/Mock-ups/Shops and \$29 per square-foot for offices, Information Centre and other miscellaneous facilities, based on the gross building area of 280,000 square-feet.

Other Assumptions:

10. The following are not included in the cost estimates:
 - Reactor mock-ups Including the design, construction, delivery and installation will be procured under a separate agreement and project. Costs to service the property after construction and potential increased electrical service, until further defined, to house & support the mock-up.
 - Floor work (trenches, conduits) to support the internal of the mock up area or the warehouse.
 - Racking, carousels or storage units in the warehouse or support infrastructure.
 - Equipment such as; forklifts, carts, welders, security x-ray machines, relocation changes for equipment or requirements of the x-ray machine & equipment, and tools and devices to support specific work group needs.
 - Information Centre custom artwork or decals.
 - Internet Wireless service in the building.
 - Staff relocation costs, incremental travel costs or warehouse transportation costs.
 - Office moving costs of affected organizations such as Nuclear Refurb, Information Centre & Security
11. Potential cost recovery of some of the servicing costs if other developers build within the CEC is not included in this evaluation.
12. Incremental travelling time and costs are not included in the NPV calculation for the leased office space alternatives.

[illegible]