Numbers may not add due to rounding.

SEC Interrogatory #160

Attachment 1

Table 1
OM&A Project Listing - Nuclear
Projects ≥ $20M Total Project Cost[1]

Line No.	Facility	Project Name	Project No.	Category	Start Date	Final Completion Date	Total Project Cost[2] (M$)	Total Project Cost (EB2016-0152) (M$)	Partial/Devmt Release ($M)	Initial Full Release ($M)	Superceding Full Release ($M)	2016 Actual ($M)	2017 Actual ($M)	2018 Actual ($M)	2019 Actual ($M)	2020 Budget ($M)	2021 Budget ($M)	2022 Plan ($M)	2023 Plan ($M)	2024 Plan ($M)	2025 Plan ($M)	2026 Plan ($M)
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(g)	(h)	(i)	(j)	(n)	(o)	(p)	(q)	(r)	(s)	(s)	(s)	(s)	(s)	(s)
		ONGOING PROJECTS FROM EB-2016-0152																				
1	DN	DN Boiler Blowdown Piping Refurbishment	31506	Sustaining	Dec-12	Aug-20	20.7	17.8		20.7		4.4	7.2	3.3	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0
2	DN	DN IFB Stacking Frame Replacement (Long Bundle)	80067	Sustaining	Dec-14	Dec-22	29.7	33.0		29.7		2.5	1.3	4.0	4.4	2.3	3.1	0.0	0.0	0.0	0.0	0.0
3	ENG	Fuel Channel Life Extension	80014	Value Enhancing	Nov-13	Dec-21	69.3	105.8		69.3		14.9	11.0	8.1	3.9	5.1	4.4	0.4	0.0	0.0	0.0	0.0
		Subtotal					119.7	156.5				21.8	19.5	15.5	8.5	7.6	7.5	0.4	0.0	0.0	0.0	0.0
		COMPLETED PROJECTS FROM EB-2016-0152																				
4	ENG	Fuel Channel Life Management	62444	Sustaining	Aug-09	Jun-16	49.5	54.1		54.1		0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Subtotal					49.5	54.1														
		PROJECTS NOT IN EB-2016-0152																				
5	DN	DN PHT Pump Motor Oil Leak Vendor Support	84415	Sustaining	Jan-20	Jul-25	47.4	-				0.0	0.0	0.0	0.0	3.2	2.3	2.4	3.9	1.4	0.2	0.1
6	DN	DN U0 Switchgear Refurbishment	84484	Sustaining	Jul-20	Dec-27	21.3	-	4.1			0.0	0.0	0.0	0.0	0.0	5.3	2.1	1.4	1.8	2.2	0.3
7	DN	DN Periodic Safety Review	84589	Regulatory	Feb-20	Mar-24	27.0	-	15.7			0.0	0.0	0.0	0.0	3.1	5.6	5.5	5.0	1.2	0.0	0.0
8	DN	DN Annulus Spacer Life Management	83280	Sustaining	Jun-17	Dec-21	29.3	-		29.3		0.0	2.1	6.9	3.7	2.7	3.1	0.0	0.0	0.0	0.0	0.0
		Subtotal					124.9	0.0														

Notes:
1 Projects with expenditures during IR Term AND Completed/Deferred Projects (from EB-2016-0152 or subsequent).
2 Total Project Cost reflects BCS amounts at the time of preparing the Amended 2020-2026 Business Plan, with the exception of Completed/Deferred/Cancelled Projects (for which actual costs are shown). BCS amounts reflect point estimates or, if range estimate or no estimate is provided in lieu of a point estimate, the current estimate of total project cost

Table 2a
OM&A Project Listing - Nuclear
Projects $5M - $20M Total Project Cost[1]

Line No.	Facility	Project Name	Project No.	Category	Project Description	Start Date	Final Completion Date	Total Project Cost[2] ($M)	Total Project Cost (EB2016-0152)[3] (M$)
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(h)
		ONGOING PROJECTS FROM EB-2016-0152							
1	DN	DN GFP Sample Delay and Alternative PHT Sampling Point	31514	Sustaining	Modify the sample lines of the Gaseous Fission Product (GFP) Monitoring system to ensure adequate Heat Transport System (HTS) sample delay in order to correct a legacy design deficiency discovered during commissioning of the new system and allow the GFP Monitoring system to function within its design requirements; and provide an alternate HTS sampling point.	Dec-12	Dec-20	8.5	8.5
2	DN	DN OH180 Aging Management/Support Program	34011	Sustaining	Design and qualify replacement circuit boards, power supplies and other components to replenish inventory and eventually replace obsolete components in the OH180 programmable logic controllers.	Dec-08	Mar-20	5.1	5.1
3	DN	DN PHT LRV Modifications (Waterhammer)	38933	Regulatory	Developmental activities to investigate waterhammer and Primary Heat Transport Liquid Relief Valve designs that would address issues with original valves and configuration.	Dec-08	Dec-16	9.8	25.8
4	DN	DN Reduced HTS Pressure-Temperature Envelope Modifications	80016	Regulatory	Implement modifications necessary to meet the revised pressure-temperature envelope during cooldown arising from results of the Fuel Channel Life Management project.	Jan-14	Dec-26	15.2	11.7
5	DN	DN New Heat Transport Pump Seals (OM&A)	80071	Sustaining	Install new design Heat Transport Pump seals that address the operating deficiencies and poor reliability of the existing seals.	Dec-14	Jul-19	16.6	13.8
6	DN	DN Aging Management	80079	Sustaining	Fund a dedicated team initially for 2 years at station to strategize and manage the aging management scope in collaboration with Station and Refurbishment stakeholders and eventually manage these issues into Darlington station business plan.	Nov-14	Dec-19	9.5	8.2
7	DN	DN Aging Management Scope Defining Inspections	80110	Sustaining	Support execution of inspection activities to better define the aging management scope is support of the updated Integrated Implementation Plan.	Feb-15	Dec-23	9.9	9.9
8	DN	Darlington DCC/CP/SEM Computers Software Shipments	82825	Sustaining	Software shipments are a new version of the DCC/CP/SEM computer software, created to maintain configuration control over the real time process control and monitoring software changes, to incorporate the existing software	May-16	Aug-26	6.5	0.0
9	DN	DN Annunciation Modifications and Post-Accident Monitoring Configuration Management	83545	Regulatory	Improve control schemes for silencing, acknowledging and resetting annunciations in the Control room to reduce the potential for errors.	Jan-17	Apr-21	9.2	0.0
10	PN	PN Instrumentation & Control Obsolescence	41024	Sustaining	Specify and qualify replacement instrumentation and control devices to replace obsolete components in a number of different systems.	Dec-12	Dec-19	13.4	9.3
11	PN	PN Equipment Reliability Initiatives	80060	Sustaining	Address selected equipment and/or system degradation to ensure improvement in forced loss rate.	Feb-14	Dec-20	13.4	19.5
12	PN	Pickering 58 Digital Control Computer Hardware Modernization (OM&A)	80135	Sustaining	Test and qualify Digital Control Computer hardware components acquired from other CANDU units to increase reliability of Pickering 58 DCCs.	Oct-16	Dec-22	8.7	0.0
	Table continues on Ex. F2-3-3 Table 2b								

Notes:
1 Projects with expenditures during IR Term AND Completed/Deferred Projects (from EB-2016-0152 or subsequent).
2 "Total Project Cost" reflects BCS amounts, with the exception of Completed/Deferred Projects (for which actual costs are shown).
3 Projects with no project cost from EB-2016-0152 due to projects having a start date post cut off for EB-2016-0152 filing and/or projects being in Tier 3 status at time of EB-2016-0152 filing

Table 2b
OM&A Project Listing - Nuclear
Projects $5M - $20M Total Project Cost[1]

Line No.	Facility	Project Name	Project No.	Category	Project Description	Start Date	Final Completion Date	Total Project Cost[2] ($M)	Total Project Cost (EB2016-0152)[3] (M$)
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(h)
		ONGOING PROJECTS FROM EB-2016-0152							
13	PN	PN Unit 4 SG11 and SG12 Nozzle Installation	83269	Sustaining	Install access nozzles on Steam Generators SG11 and SG12 for water lancing above top pre-heater baffle plate to mitigate outside diameter degradation.	Sep-16	Jun-18	5.3	0.0
14	PN	DCC Aging Management	62553	Sustaining	Participate in CANDU Owners' Group joint project to manage the aging of digital control computers vital to the operation of the units.	Mar-04	Dec-20	16.3	14.5
15	IRI	Inspection Qualification	66105	Regulatory	Demonstrate compliance with the Canadian Standards Association Standard N285.4 Periodic Inspection of CANDU Nuclear Power Plant Components by proving a systematic and well-documented approach to non-destructive examination qualification.	Nov-06	Mar-22	15.3	15.3
		Subtotal						**162.5**	**141.5**
		DEFERRED/COMPLETED PROJECTS FROM EB-2016-0152							
16	DN	DN RD-310 Implementation - Safety Analysis Improvement	80028	Regulatory	Upgrade the Darlington Safety Report to meet the requirements of CNSC Regulatory Document REGDOC-2.4.1 Deterministic Safety Analysis (formerly RD-310 Safety Analysis for Nuclear Power Plants).	Jul-14	Dec-22	9.0	9.0
17	PN	PB DCC Obsolescence	40505	Sustaining	Upgrade display hardware, replace necessary components, and procure critical spares.	Aug-03	Jul-17	5.9	5.9
18	PN	PB Boiler Blowdown Pipe Support Improvements	40683	Sustaining	Install new and/or modified piping supports at selected locations in the Reactor Auxiliary Bay and Screenhouse to make the Boiler Blowdown system more robust.	Oct-10	May-17	11.1	11.1
19	PN	PB Irradiated Fuel Bay Leakage Mitigation	40703	Regulatory	Reduce leakage rate from PB Irradiated Fuel Bay and collection sumps to minimize potential for leaks to the environment.	Nov-12	Nov-18	12.9	0.0
20	PN	PA Fuel Handling SPV Equipment Reliability Improvement Project - OM&A	46635	Sustaining	Refurbish fuel handling equipment that present single points of vulnerability for reliable operation.	Feb-11	Aug-17	7.0	7.0
21	PN	Locking Tabs - Boiler Divider Plate (U1 &U4)	49248	Sustaining	Replacing the current locking tabs installed in Units 1 and 4 with a new design will allow for the folliwing which are aligned with the project objectives: SGs to run until EOL without possiblity of locking tab failure; ability for maintenance to be conducted with minimal interference from the new design which will replace the current locking tabs; ability to remove and/or replace components of the new design with releative ease if required and installation to be less complex, optimizing cost, schedule and dose.	Jun-07	Nov-12	13.5	23.9
22	ENG	Power Operated Valve Program, N-PROC-MA-0092, Recovery	62447	Sustaining	Update power operated valve program to address deficiencies and complete outstanding work.	Jul-11	Apr-16	6.9	6.9
23	ENG	Fukushima Oversight Project	62448	Regulatory	Fund a dedicated project oversight team to interface with regulatory and nuclear industry agencies, manage regulatory actions, identify and initiate projects, and provide high level monitoring for successful completion of the Fukushima Response regulatory commitments and project portfolio.	Dec-11	Aug-16	7.4	7.4
24	ENG	Severe Accident Management Guidelines (SAMG) Implementation Improvements	62449	Regulatory	Improve the OPG Severe Accident Management program and ensure related CNSC Fukushima Action Items are completed.	Mar-12	Aug-16	19.5	19.5
25	ENG	Nuclear Fleet Safety Systems Functional Assessment	80072	Regulatory	Perform functional assessments of the Backup Safety Systems to assure they are capable of performing their functions required by design and licensing basis and that testing is adequate to demonstrate reliable safety functions.	Aug-14	Sep-18	7.3	10.0
26	DN	DN X-750 Spacer Retrieval	80112	Regulatory	Retrieve 24 spacers, intact, from all four axial locations of six selected channels, for material surveillance as mandated by OPG's established plan for maintaining Inconel X-750 annulus spacer fitness-for-service and, thereby, allow the Darlington units to operate to their planned service lives in advance of their respective refurbishments.	Mar-15	Nov-18	10.4	13.6
		Subtotal						**110.9**	**114.2**
	Table continues on Ex. F2-3-3 Table 2c								

Notes:
1 Projects with expenditures during IR Term AND Completed/Deferred Projects (from EB-2016-0152 or subsequent).
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3 Projects with no project cost from EB-2016-0152 due to projects having a start date post cut off for EB-2016-0152 filing and/or projects being in Tier 3 status at time of EB-2016-0152 filing