Board Staff Interrogatory #113

Interrogatory

Reference:
Exhibit D2 / Tab 1 / Schedule 3 / Tables 1a-1d

Question(s):

a) Please populate the following table for all projects listed in Table 1a through Table 1d of Exhibit D2 / Tab 1 / Schedule 3.

Project Name	In-service Date	In-service Date – EB-2016-0152	Total Project Cost ($M)	Total 1st Execution Business Case ($M)	Delta ($M)	In-service amount ($M) – EB-2016-0152	IR Term In-service amount ($M)	Total In-service amount ($M)
(a)	(b)	(c)	(d)	(e)	(f) = (d) –(e)	(g)	(h)	(i)

b) Please highlight any projects in the table requested in part (a) of this interrogatory for which the total project cost was, or is expected, to be greater than 10% above the first execution business case. Please also identify the specific reason behind the cost overrun of each of these projects. In the response, please include a summary of the actions taken on these projects to limit the cost overruns.

c) For each project listed in the table requested in part (a) of this interrogatory, please provide the specific OPG organization or external contractor responsible for: (i) project planning, (ii) project oversight and (iii) project execution. In the response, please indicate whether any of these organizations have been replaced or substituted during any project stage.

d) Please provide the contracting strategies used to obtain external resources (i.e. labour, materials, services, etc.) for each project listed in the table requested in part (a) of this interrogatory

e) For each project listed in the table requested in part (a) of this interrogatory, please identify whether OPG's P&M organization was involved in any capacity. In the response, please outline the specific involvement of OPG's P&M organization on each project, where applicable.

f) For any projects listed in the table requested in part (a) of this interrogatory where OPG's P&M organization was involved, please identify the total cost associated with each aspect (e.g. planning, oversight, execution, etc.) that P&M was responsible for or involved with in both absolute dollar amounts and as a

percentage of the approved project budget. Please use the tabular format provided below.

Project Name	Project Aspect	P&M Project Costs ($M)	P&M Project Costs as Percentage of Approved Project Budget (%)

Response

a) See Chart 1.

b) The projects in Chart 1 that are bolded show a greater than 10% difference between total project cost (d) and the first execution business case (e). Where a Tier 1 project cost variance is greater than 10%, the explanation can be found in Ex. D2-1-3, Section 3.6, pp. 24-42. Project cost estimates are categorized by class and their associated cost accuracy range, which is dependent on the project status during its lifecycle.
As each project progresses to subsequent phases during its lifecycle, a risk assessment is conducted and a risk management and mitigation strategy is documented in the business case summary, which outlines the actions to minimize cost overruns.

c) The Nuclear Projects has the overall accountability for all phases during a project's lifecycle, which includes project planning, project oversight and project execution. Within the OPG Nuclear Projects, each project and its respective project manager may liaise and work with one or more internal OPG organizations including, but not limited to: Engineering, Operations, Inspection and Reactor Innovation, Planning & Controls, and Finance. External contractors may be hired to perform all or part of the required activities during any of the phases in project planning, project oversight and/or project execution, as appropriate.

d) For the projects in a), the contracting strategy is shown in Chart 2.

- **No EPC** contract strategy means a single vendor performed only one of Engineering, Procurement & Construction, e.g., a vendor performed Engineering only.
- **Portion of EPC** contract strategy means a single vendor performed only two items of Engineering, Procurement & Construction, e.g., a vendor performed Engineering and Procurement.

- **EPC** contract strategy means a single vendor performed all three items of Engineering, Procurement & Construction, e.g., a vendor performed Engineering, Procurement and Construction.

Refer to Ex. L-D2-01-EP-16 a) for additional information on contracting strategies.

e) As explained in c), OPG Nuclear Projects has the overall accountability for all project phases during its lifecycle, which includes project planning, project oversight and project execution.

f) Chart 3 shows the overall Nuclear Projects project management costs for these projects.

Chart 1

Project Name	In-Service Date	In-service Date - EB-2016-0152	Total Project Cost ($M)	Total 1st Execution Business Case ($M)	Delta ($M)	In-service amount ($M) - EB-2016-0152	IR Term In-service amount ($M)	Total In-service amount ($M)
(a)	(b)	(c)	(d)	(e)	(f) = (d) - (e)	(g)[1]	(h)	(i)
DN Class II Uninterruptible Power Supply Replacement	March 2025	June 2025	63.6	38.4	25.2	31.70	25.2	62.0
DN Fuel Handling Inverter Replacement	April 2021	December 2018	26.2	13.9	12.4	7.89	0.0	26.1
DN Station Fluorescent Lighting Fixtures Retrofit	January 2023	Deferred	20.7	16.9	3.8	0.00	3.9	19.8
DN Restore Emergency Service Water and Firewater Margins	August 2019	September 2016	28.5	28.5	0.0	33.77	0.0	10.5
DN Station Roofs Replacement	November 2027	Deferred	116.9	n/a	n/a	23.62	66.2	116.8
DN Powerhouse Water Air Condition Units Replacement	January 2023	December 2019	38.2	26.6	11.6	16.95	3.1	30.7
DN Water Treatment Plant Interconnections	September 2024	Deferred	53.2	n/a	n/a	50.44	53.2	53.2
DN Transformer Multi-Gas Analyzer Installation	December 2020	March 2018	23.8	15.2	8.7	5.13	0.0	22.5
DN Radiation Detection Equipment Obsolescence	September 2023	December 2021	45.0	n/a	n/a	28.80	22.3	41.3
DN Shutdown Cooling Heat Exchanger Replacement	December 2021	May 2019	111.4	56.1	55.3	25.14	0.0	74.1
DN Neutron Over-Power Ion Chamber & In-Core Flux Detector Amplifier Replacement (Reactor Regulating System, Shutdown System 1 & Shutdown System 2)	April 2027	July 2022	23.8	23.8	0.0	3.35	9.6	17.9
DN Replacement of Emergency Power Supply Uninterruptible Power Supply	February 2022	November 2017	24.6	15.2	9.4	5.66	2.1	24.8
DN Air Conditioning Unit Replacement for Secondary Control Area	August 2025	April 2017	36.0	12.3	23.7	6.13	9.6	34.1

DN Chiller Replacement to Reduce Chloroflurocarbon Emissions	December 2017	January 2013	30.0	14.9	15.1	1.20	0.0	21.6
DN Major Pump-sets Vibration Monitoring System Upgrades	November 2026	July 2021	55.4	12.8	42.6	18.62	18.0	48.2
DN Standby Generator Controls Replacement	March 2021	May 2017	46.3	21.8	24.5	8.72	0.4	46.1
DN Digital Control Computer Replacement / Refurbishment / Upgrades	December 2021	December 2018	26.5	22.1	4.4	3.74	0.3	26.5
DN Auxiliary Heating System - Phases 1 & 2 Alternative Heating	June 2018	April 2016	107.1	45.6	61.5	0.11	0.0	102.1
DN Zebra Mussel Mitigation Improvements	December 2021	July 2016	36.6	21.5	15.2	1.00	0.0	36.5
DN RS Primary Heat Transport Pump Motor Replacement	May 2021	December 2022	84.0	26.7	57.3	60.20	0.2	71.4
DN OH180 Aging Management Hardware Installation	June 2028	December 2022	60.9	60.9	0.0	24.73	16.0	38.0
DN Steam Generator Level Control Valve Replacement	June 2026	October 2022	38.6	n/a	n/a	7.82	38.5	38.5
DN R22 Refrigerant Air Conditioning Unit Replacement	January 2026	October 2021	36.1	n/a	n/a	11.80	27.1	37.8
DN Standby Generators Protective Relay Replacement	February 2023	June 2021	20.0	n/a	n/a	7.33	15.8	15.8
DN Digital Control, Common Process and Sequence of Events Monitoring Computer Aging Management	February 2028	June 2025	77.5	n/a	n/a	7.60	42.2	56.5
DN Primary Heat Transport Pump Motor Overhaul	October 2021	December 2022	53.3	102.8	-49.5	60.20	0.0	43.8
PB Emergency Power Generator and Main Output Power Protective Relay Replacement	October 2019	May 2019	29.7	7.5	22.3	6.22	0.0	25.2
DN Operations Support Building Refurbishment	November 2015	October 2015	61.3	47.8	13.5	0.00	0.0	59.0
DN Fukushima Phase 1 Beyond Design Basis Event Emergency Mitigation Equipment	April 2018	September 2017	55.5	29.1	26.4	13.78	0.0	55.5
DN Condenser Circulating Water and Low Pressure Service Water Travelling Screens Replacement	November 2018	June 2018	33.0	24.4	13.3	15.61	0.0	33.0
DN Improve Maintenance Facilities at Darlington (Capital)	November 2013	October 2013	35.6	49.8	-14.2	0.00	0.0	33.5
DN Fukushima Phase 2 Beyond Design Basis Event Emergency Mitigation Equipment	May 2018	December 2017	23.1	28.0	-4.9	7.68	0.0	21.9
Shutdown System Computer Aging Management	December 2015	May 2016	20.3	17.2	3.1	0.00	0.0	20.3
DN Purchase of Primary Heat Transport Pump Motor Capital Spares	October 2015	May 2015	27.6	12.0	15.6	0.00	0.0	27.6
DN Holt Road Interchange Upgrade	August 2016	December 2016	26.7	31.0	-4.3	0.00	0.0	26.7
DN Generator Stator Core Spare	July 2019	July 2019	30.8	35.0	8.0	32.00	0.0	30.8
PB Fuel Handling Reliability Modifications	December 2018	July 2017	40.4	29.0	1.8	12.14	0.0	39.3
Unit 1 & 4 Fuel Channel East Pressure Tube Shift Tooling	December 2016	March 2016	27.7	22.0	5.7	0.00	0.0	27.7

PN Fukushima Phase 2 Beyond Design Basis Event Emergency Mitigation Equipment	November 2017	June 2017	49.7	46.3	3.4	22.52	0.0	49.7
PA Fuel Handling Single Point of Vulnerabilty Equipment Reliability Improvement Project - Capital	December 2018	March 2016	21.2	27.0	-5.7	2.54	0.0	20.9
PB Fukushima Phase 1 Beyond Design Basis Event Emergency Mitigation Equipment	October 2017	August 2016	41.7	29.3	12.4	11.10	0.0	41.7
Physical Barrier System	December 2013	December 2013	67.2	37.0	30.2	0.00	0.0	67.2
PN Machine Delivered Scrape	October 2018	May 2017	27.0	24.9	2.0	1.50	0.0	27.0
DN Main Power Output Protection System Replacement	August 2027	n/a	65.0	n/a	n/a	n/a	75.0	88.4
DN Group II Pressure Transmitter Replacement	January 2028	n/a	47.7	n/a	n/a	n/a	29.0	37.5
DN Obsolete Controller Replacement	December 2026	n/a	38.0	38.0	0.0	n/a	13.1	28.5
DN Emergency Power Generator 1 and 2 Replacement	May 2022	n/a	176.2	176.2	0.0	n/a	89.4	180.8
DN Fuel Handling Computer Input/Output Subsystem and Interprocessor Communication Replacement	April 2027	n/a	23.4	n/a	n/a	n/a	21.0	22.1
DN Fire Resistant Fluid Pump Improvement	November 2025	n/a	30.0	n/a	n/a	n/a	25.0	25.0
DN Class 1 Rectifier Replacement	December 2032	n/a	42.3	n/a	n/a	n/a	17.0	36.3
DN Main Power Output and Class IV Transformer Control Cabinet Wiring Replacement	Deferred	n/a	26.8	n/a	n/a	n/a	0.0	24.5
DN Fuel Handling Head Major Component Replacement	May 2027	n/a	98.0	n/a	n/a	n/a	59.0	60.9
DN Copper Piping Replacement	December 2022	n/a	45.1	29.3	15.7	n/a	6.0	43.7
DN Fuel Handling Power and Signal Cable Catenary Replacement	January 2027	n/a	24.6	n/a	n/a	n/a	8.7	11.9
DN Powerhouse Upper Level Service Water Piping Replacement	January 2025	n/a	75.2	55.7	19.5	n/a	50.5	66.7
DN Phase 2 Station Battery Replacement	December 2028	n/a	34.5	18.9	15.6	n/a	18.6	26.2
DN Main Output Transformer & Unit Service Transformer Replacement	June 2024	n/a	170.1	170.1	0.0	n/a	98.4	131.2
DN Large Moderator Temperature Control Valve Replacement	June 2026	n/a	36.9	n/a	n/a	n/a	26.2	31.2
DN Secondary System High Priority Control Valve Replacement	December 2027	n/a	35.4	n/a	n/a	n/a	26.5	29.6
DN Condenser Steam Discharge Valve Control System Replacement	December 2027	n/a	29.7	n/a	n/a	n/a	18.5	22.8
DN 4kV Motor Refurbishment and Replacement	June 2028	n/a	278.8	n/a	n/a	n/a	89.8	172.1
DN Isolated Phase Bus Refurbishment	June 2028	n/a	62.4	n/a	n/a	n/a	22.9	36.5

DN Turbine Hall Crane Controls Upgrade	December 2020	n/a	23.6	19.7	3.9	n/a	0.0	23.1
DN Fuel Handling Service Area Bridge F5 Ball Screw Assembly Replacement	June 2025	n/a	28.2	n/a	n/a	n/a	11.8	12.5
DN East Irradiated Fuel Bay Permanent Fuel Inspection Equipment	May 2022	n/a	25.0	25.0	0.0	n/a	8.9	17.9
DN Unit 2 Turbine Control & Aux Systems Upgrade	July 2025	n/a	112.7	n/a	n/a	n/a	102.1	102.2
DN Fuel Handling Replacement of Fuelling Machine Calibration Facility	July 2025	n/a	22.4	n/a	n/a	n/a	22.4	22.4
DN Air Operated Valve Replacement	December 2028	n/a	85.7	n/a	n/a	n/a	39.5	82.9
DN Primary Heat Transport Liquid Relief Valve Modifications (Waterhammer)	July 2026	n/a	86.8	85.9	0.8	n/a	43.5	70.5
DN Motor Operated Valve Replacement	December 2028	n/a	44.5	n/a	n/a	n/a	29.3	37.5
DN Primary Heat Transport Pump Rotor Inspection and Replacement	October 2026	n/a	89.2	89.2	0.0	n/a	46.4	46.4
DN Revenue Metering Transformer Replacement	October 2026	n/a	35.9	n/a	n/a	n/a	25.5	25.5
PN P58 Buried Blowdown Piping Replacement	December 2020	n/a	20.9	20.9	0.0	n/a	0.0	16.6
PA Low Pressure Feedwater Heat Exchanger Replacement	May 2018	n/a	22.0	19.4	2.6	n/a	0.0	20.0
PN High Pressure Turbine Spindle Capital Spares	August 2019	n/a	21.3	23.4	-2.0	n/a	0.0	21.3
Security Project B	September 2021	n/a	32.7	32.7	0.0	n/a	0.1	28.8
Security Project C	March 2021	n/a	22.9	22.9	0.0	n/a	0.0	18.9
DN Rapid Delivery Machine	May 2025	n/a	162.2	n/a	n/a	n/a	113.2	118.4
Fleet Monitoring Initiative (Monitoring & Diagnostic Centre)	July 2023	n/a	29.3	n/a	n/a	n/a	16.0	23.7

Note: column (g) is the in-service amount that was reported in EB-2016-0152

Chart 2

Project Name	Project Number	Contracting Strategy
DN Class II Uninterruptible Power Supply Replacement	31412	EPC
DN Fuel Handling Inverter Replacement	31426	No EPC
DN Station Fluorescent Lighting Fixtures Retrofit	31516	No EPC
DN Restore Emergency Service Water and Firewater Margins	31518	EPC
DN Station Roofs Replacement	31524	EPC
DN Powerhouse Water Air Condition Units Replacement	31532	EPC
DN Water Treatment Plant Interconnections	31535	EPC
DN Transformer Multi-Gas Analyzer Installation	31542	EPC
DN Radiation Detection Equipment Obsolescence	31544	EPC
DN Shutdown Cooling Heat Exchanger Replacement	31710	EPC
DN Neutron Over-Power Ion Chamber & In-Core Flux Detector Amplifier Replacement (Reactor Regulating System, Shutdown System 1 & Shutdown System 2)	31716	No EPC
DN Replacement of Emergency Power Supply Uninterruptible Power Supply	33258	EPC
DN Air Conditioning Unit Replacement for Secondary Control Area	33621	No EPC
DN Chiller Replacement to Reduce Chloroflurocarbon Emissions	33631	No EPC
DN Major Pump-sets Vibration Monitoring System Upgrades	33819	EPC
DN Standby Generator Controls Replacement	33973	Portion of EPC
DN Digital Control Computer Replacement / Refurbishment / Upgrades	33977	No EPC
DN Auxiliary Heating System - Phases 1 & 2 Alternative Heating	34000	EPC
DN Zebra Mussel Mitigation Improvements	38948	EPC
DN RS Primary Heat Transport Pump Motor Replacement[4]	73566	No EPC
DN OH180 Aging Management Hardware Installation	80022	No EPC
DN Steam Generator Level Control Valve Replacement	80023	EPC
DN R22 Refrigerant Air Conditioning Unit Replacement	80036	EPC
DN Standby Generators Protective Relay Replacement	80063	Portion of EPC
DN Digital Control, Common Process and Sequence of Events Monitoring Computer Aging Management	80078	No EPC
DN Primary Heat Transport Pump Motor Overhaul 7	80144	No EPC
PB Emergency Power Generator and Main Output Power Protective Relay Replacement	40691	EPC
DN Operations Support Building Refurbishment	25619	EPC
DN Fukushima Phase 1 Beyond Design Basis Event Emergency Mitigation Equipment 3	31508	EPC
DN Condenser Circulating Water and Low Pressure Service Water Travelling Screens Replacement	31552	No EPC
DN Improve Maintenance Facilities at Darlington (Capital)	31717	Portion of EPC
DN Fukushima Phase 2 Beyond Design Basis Event Emergency Mitigation Equipment 9	32202	EPC
Shutdown System Computer Aging Management	33955	No EPC
DN Purchase of Primary Heat Transport Pump Motor Capital Spares	36001	No EPC
DN Holt Road Interchange Upgrade	73706	EPC
DN Generator Stator Core Spare	80111	No EPC

PB Fuel Handling Reliability Modifications	40976	No EPC
Unit 1 & 4 Fuel Channel East Pressure Tube Shift Tooling 4	41023	No EPC
PN Fukushima Phase 2 Beyond Design Basis Event Emergency Mitigation Equipment 9	41027	EPC
PA Fuel Handling Single Point of Vulnerabilty Equipment Reliability Improvement Project - Capital	46634	Portion of EPC
PB Fukushima Phase 1 Beyond Design Basis Event Emergency Mitigation Equipment 3	49158	EPC
Physical Barrier System	25609	No EPC
PN Machine Delivered Scrape	66600	No EPC
DN Main Power Output Protection System Replacement	80122	EPC
DN Group II Pressure Transmitter Replacement	80123	No EPC
DN Obsolete Controller Replacement	80124	No EPC
DN Emergency Power Generator 1 and 2 Replacement	80126	Portion of EPC
DN Fuel Handling Computer Input/Output Subsystem and Interprocessor Communication Replacement	80148	No EPC
DN Fire Resistant Fluid Pump Improvement	80150	EPC
DN Class 1 Rectifier Replacement	82883	EPC
DN Main Power Output and Class IV Transformer Control Cabinet Wiring Replacement	82890	No EPC
DN Fuel Handling Head Major Component Replacement	82947	No EPC
DN Copper Piping Replacement	83049	No EPC
DN Fuel Handling Power and Signal Cable Catenary Replacement	83052	No EPC
DN Powerhouse Upper Level Service Water Piping Replacement	83053	EPC
DN Phase 2 Station Battery Replacement	83076	No EPC
DN Main Output Transformer & Unit Service Transformer Replacement	83296	No EPC
DN Large Moderator Temperature Control Valve Replacement	83297	EPC
DN Secondary System High Priority Control Valve Replacement	83298	EPC
DN Condenser Steam Discharge Valve Control System Replacement	83299	EPC
DN 4kV Motor Refurbishment and Replacement	83480	No EPC
DN Isolated Phase Bus Refurbishment	83484	EPC
DN Turbine Hall Crane Controls Upgrade	83556	EPC
DN Fuel Handling Service Area Bridge F5 Ball Screw Assembly Replacement	83558	No EPC
DN East Irradiated Fuel Bay Permanent Fuel Inspection Equipment	83559	EPC
DN Unit 2 Turbine Control & Aux Systems Upgrade	83664	Portion of EPC
DN Fuel Handling Replacement of Fuelling Machine Calibration Facility	83916	No EPC
DN Air Operated Valve Replacement	84009	Portion of EPC
DN Primary Heat Transport Liquid Relief Valve Modifications (Waterhammer)	84235	No EPC
DN Motor Operated Valve Replacement	84551	Portion of EPC
DN Primary Heat Transport Pump Rotor Inspection and Replacement	84799	Portion of EPC
DN Revenue Metering Transformer Replacement	84939	EPC
PN P58 Buried Blowdown Piping Replacement	83072	Portion of EPC
PA Low Pressure Feedwater Heat Exchanger Replacement	83088	No EPC
PN High Pressure Turbine Spindle Capital Spares	83668	No EPC
Security Project B	82929	No EPC

Security Project C	82930	No EPC
DN Rapid Delivery Machine	83039	No EPC
Fleet Monitoring Initiative (Monitoring & Diagnostic Centre)	83828	No EPC

Chart 3

Project Name	Project Aspect	OPG Nuclear Projects Mgmt Costs ($M)	Costs as Percentage of Approved Project Budget (%)
DN Class II Uninterruptible Power Supply Replacement	Planning, Oversight, Execution	$4.62	7%
DN Fuel Handling Inverter Replacement	Planning, Oversight, Execution	$2.68	10%
DN Station Fluorescent Lighting Fixtures Retrofit	Planning, Oversight, Execution	$1.98	10%
DN Restore Emergency Service Water and Firewater Margins	Planning, Oversight, Execution	$1.96	7%
DN Station Roofs Replacement	Planning, Oversight, Execution	$1.28	4%
DN Powerhouse Water Air Condition Units Replacement	Planning, Oversight, Execution	$2.76	7%
DN Water Treatment Plant Interconnections	Planning, Oversight, Execution	$0.96	5%
DN Transformer Multi-Gas Analyzer Installation	Planning, Oversight, Execution	$2.40	10%
DN Radiation Detection Equipment Obsolescence	Planning, Oversight, Execution	$2.54	6%
DN Shutdown Cooling Heat Exchanger Replacement	Planning, Oversight, Execution	$2.87	3%
DN Neutron Over-Power Ion Chamber & In-Core Flux Detector Amplifier Replacement (Reactor Regulating System, Shutdown System 1 & Shutdown System 2)	Planning, Oversight, Execution	$3.41	14%
DN Replacement of Emergency Power Supply Uninterruptible Power Supply	Planning, Oversight, Execution	$2.78	11%
DN Air Conditioning Unit Replacement for Secondary Control Area	Planning, Oversight, Execution	$4.87	14%
DN Chiller Replacement to Reduce Chloroflurocarbon Emissions	Planning, Oversight, Execution	$4.01	13%
DN Major Pump-sets Vibration Monitoring System Upgrades	Planning, Oversight, Execution	$15.66	28%
DN Standby Generator Controls Replacement	Planning, Oversight, Execution	$8.95	19%
DN Digital Control Computer Replacement / Refurbishment / Upgrades	Planning, Oversight, Execution	$2.26	9%
DN Auxiliary Heating System - Phases 1 & 2 Alternative Heating	Planning, Oversight, Execution	$7.70	7%
DN Zebra Mussel Mitigation Improvements	Planning, Oversight, Execution	$2.29	6%
DN RS Primary Heat Transport Pump Motor Replacement	Planning, Oversight, Execution	$2.30	3%
DN OH180 Aging Management Hardware Installation	Planning, Oversight, Execution	$3.59	6%
DN Steam Generator Level Control Valve Replacement	Planning, Oversight, Execution	$1.46	6%
DN R22 Refrigerant Air Conditioning Unit Replacement	Planning, Oversight, Execution	$0.97	5%
DN Standby Generators Protective Relay Replacement	Planning, Oversight, Execution	$1.17	9%
DN Digital Control, Common Process and Sequence of Events Monitoring Computer Aging Management	Planning, Oversight, Execution	$1.44	10%
DN Primary Heat Transport Pump Motor Overhaul	Planning, Oversight, Execution	$1.30	2%

PB Emergency Power Generator and Main Output Power Protective Relay Replacement	Planning, Oversight, Execution	$2.49	8%
DN Operations Support Building Refurbishment	Planning, Oversight, Execution	$3.63	6%
DN Fukushima Phase 1 Beyond Design Basis Event Emergency Mitigation Equipment	Planning, Oversight, Execution	$2.46	5%
DN Condenser Circulating Water and Low Pressure Service Water Travelling Screens Replacement	Planning, Oversight, Execution	$3.44	9%
DN Improve Maintenance Facilities at Darlington (Capital)	Planning, Oversight, Execution	$3.24	8%
DN Fukushima Phase 2 Beyond Design Basis Event Emergency Mitigation Equipment	Planning, Oversight, Execution	$1.01	4%
Shutdown System Computer Aging Management	Planning, Oversight, Execution	$2.98	15%
PB Fuel Handling Reliability Modifications	Planning, Oversight, Execution	$2.40	6%
Unit 1 & 4 Fuel Channel East Pressure Tube Shift Tooling	Planning, Oversight, Execution	$3.90	13%
PN Fukushima Phase 2 Beyond Design Basis Event Emergency Mitigation Equipment	Planning, Oversight, Execution	$2.89	6%
PA Fuel Handling Single Point of Vulnerabilty Equipment Reliability Improvement Project - Capital	Planning, Oversight, Execution	$3.62	13%
PB Fukushima Phase 1 Beyond Design Basis Event Emergency Mitigation Equipment	Planning, Oversight, Execution	$3.50	8%
Physical Barrier System	Planning, Oversight, Execution	$3.20	6%
PN Machine Delivered Scrape	Planning, Oversight, Execution	$1.52	6%
DN Main Power Output Protection System Replacement	Planning, Oversight, Execution	$0.82	3%
DN Group II Pressure Transmitter Replacement	Planning, Oversight, Execution	$0.74	5%
DN Obsolete Controller Replacement	Planning, Oversight, Execution	$3.85	13%
DN Emergency Power Generator 1 and 2 Replacement	Planning, Oversight, Execution	$6.92	4%
DN Fuel Handling Computer Input/Output Subsystem and Interprocessor Communication Replacement	Planning, Oversight, Execution	$0.43	16%
DN Fire Resistant Fluid Pump Improvement	Planning, Oversight, Execution	$0.28	6%
DN Class 1 Rectifier Replacement	Planning, Oversight, Execution	$0.46	38%
DN Main Power Output and Class IV Transformer Control Cabinet Wiring Replacement	Planning, Oversight, Execution	$0.11	9%
DN Fuel Handling Head Major Component Replacement	Planning, Oversight, Execution	$1.46	4%
DN Copper Piping Replacement	Planning, Oversight, Execution	$4.51	10%
DN Fuel Handling Power and Signal Cable Catenary Replacement	Planning, Oversight, Execution	$0.27	3%
DN Powerhouse Upper Level Service Water Piping Replacement	Planning, Oversight, Execution	$2.61	4%
DN Phase 2 Station Battery Replacement	Planning, Oversight, Execution	$2.14	6%
DN Main Output Transformer & Unit Service Transformer Replacement	Planning, Oversight, Execution	$2.66	2%
DN Large Moderator Temperature Control Valve Replacement	Planning, Oversight, Execution	$0.97	7%
DN Secondary System High Priority Control Valve Replacement	Planning, Oversight, Execution	$2.50	13%
DN Condenser Steam Discharge Valve Control System Replacement	Planning, Oversight, Execution	$1.34	10%
DN 4kV Motor Refurbishment and Replacement	Planning, Oversight, Execution	$2.60	12%
DN Isolated Phase Bus Refurbishment	Planning, Oversight, Execution	$0.31	28%
DN Turbine Hall Crane Controls Upgrade	Planning, Oversight, Execution	$4.84	21%

DN Fuel Handling Service Area Bridge F5 Ball Screw Assembly Replacement	Planning, Oversight, Execution	$2.40	15%
DN East Irradiated Fuel Bay Permanent Fuel Inspection Equipment	Planning, Oversight, Execution	$2.95	12%
DN Unit 2 Turbine Control & Aux Systems Upgrade	Planning, Oversight, Execution	$3.90	9%
DN Fuel Handling Replacement of Fuelling Machine Calibration Facility	Planning, Oversight, Execution	$0.06	11%
DN Air Operated Valve Replacement	Planning, Oversight, Execution	$0.33	23%
DN Primary Heat Transport Liquid Relief Valve Modifications (Waterhammer)	Planning, Oversight, Execution	$2.46	3%
DN Motor Operated Valve Replacement	Planning, Oversight, Execution	$0.28	26%
DN Primary Heat Transport Pump Rotor Inspection and Replacement	Planning, Oversight, Execution	$7.60	9%
DN Revenue Metering Transformer Replacement	Planning, Oversight, Execution	$0.20	21%
PN P58 Buried Blowdown Piping Replacement	Planning, Oversight, Execution	$1.52	7%
PA Low Pressure Feedwater Heat Exchanger Replacement	Planning, Oversight, Execution	$0.19	1%
Security Project B	Planning, Oversight, Execution	$1.34	4%
Security Project C	Planning, Oversight, Execution	$1.59	7%
DN Rapid Delivery Machine	Planning, Oversight, Execution	$6.65	4%
Fleet Monitoring Initiative (Monitoring & Diagnostic Centre)	Planning, Oversight, Execution	$0.34	4%