Plan

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Title:
PROGRAM SCHEDULE MANAGEMENT PLAN

Program Schedule Management Plan

NK38-PLAN-09701-10067-0004-R001
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Revision Summary

Revision Number	Date	Comments
R001	2013-03-27	Modified to explain the interfaces between L3 schedules and Proliance for Earned Value calculation.
R000	2013-01-31	Initial issue. Reviewed and updated to reflect planning development and new governance structure.

Table of Contents

Page

Revision Summary 2

1.0 PROGRAM DESCRIPTION 4

2.0 THE OVERALL PLANNING AND SCHEDULING PROCESS: 4

3.0 SCHEDULE INTEGRATION 5

4.0 DEVELOPMENT OF WORK BREAKDOWN STRUCTURE (WBS) 6

4.1 Modification of the WBS 6

5.0 SCHEDULES BASELINE 6

5.1 Overall Program Schedules Baseline 6
5.2 Contractor's baseline schedules 7
5.3 Milestone Management 7
5.4 Schedule Contingency 8

6.0 SCHEDULE CHANGE MANAGEMENT 8

7.0 BASIS OF SCHEDULES DOCUMENTS 9

8.0 SCHEDULE MONITORING AND CONTROL 9

8.1 Schedule reporting (metrics and reports) 10

9.0 PROGRAM SCHEDULE MANAGEMENT AND CONTROLS GOVERNANCE 10

Appendix A: Darlington Refurbishment Schedule Integration 11

Appendix B: Darlington Refurbishment Work Breakdown Structure 12

Appendix C: Key Program Milestones (as of January 1, 2013) 14

1.0 PROGRAM DESCRIPTION

Refer to Program Structure and Summary Plan **NK38-PLAN-09701-10067-0001** as well as D-PCH-09701-10000, R001, Darlington Refurbishment Project Charter.

2.0 THE OVERALL PLANNING AND SCHEDULING PROCESS:

The overall planning and scheduling process can be represented in two major stages:

(a) Project Planning and Schedule Development, resulting in the formation of a Baseline Schedule

(b) Schedule Management, Monitoring, Analysis, Reporting, and Mitigation, resulting in regular periodic schedule updates

The planning process uses a top-down approach for schedule development and a bottom-up approach for schedule management.

The three levels of schedule hierarchy are outlined below; an overview of how the schedules interact with each other is included in **Appendix A –Darlington Refurbishment Schedule Integration Overview**.

Level 1 - Management Summary Level

The level 1 schedule provides a high-level management summary of the project. It will represent all Units, Phases, Bundles, Program and key project milestones.

The level 1 schedule is a roll up from the Level 2 Co-ordination and Control Schedule.

The schedule is prepared by OPG as part of the initial planning phase of the project and updated to reflect the progression of planning, i.e. as projects are better defined, the Level 2 Control and Co-ordination Schedule is updated.

Level 2 – Co-ordination and Control Schedule (C&C Schedule)

The level 2 schedule covers the scope of work by Phase, Unit USI, and Type of work and contains full Critical Path Method (CPM) logic. It is referred to as the C&C schedule, or, Control and Co-ordination schedule, as this is the schedule which will be used, at the Phase and Unit level, to track the overall schedule status of the Program. It will be updated and controlled by OPG and based on the Contractors detailed Level 3 Schedules. The following are some key features of the level 2 schedule:

- Contains an adequate number of activities with realistic activity durations to clearly show the sequence and logic in performing all projects, within the Program, at the Phase and Unit level, in a systematic manner. It will include all interfaces between OPG and contractor, and or between contractors.

- Defines the Program critical path and activity total floats

Level 3 – Detailed Schedules

The level 3 detailed schedules will be prepared by the group executing the work, mainly suppliers and contractors, however, in some case by OPG where OPG is self-performing work. The schedule must be prepared in accordance with the Program's Work Breakdown Structure ("WBS") and coding guideline. This schedule contains the lowest level of detail required to manage and execute the work. It is structured in a way to allow summarizing of the activities in order to update the Level 2 C&C Schedule.

- The Level 3 will include the full scope of each suppliers / contractor showing all interfaces with other contractors / OPG.
- The Schedule will be resource loaded to the lowest level of the defined Resource Breakdown Structure as agreed by OPG.
- The Schedule will define all long lead procurements.
- After being captured as a baseline, the schedule will be regularly updated, providing the basis for status reporting, progress physical percent complete at the activity / Work Package Level, forecasting, and change management.
- All supplier / contractor baseline schedules needs to be approved by OPG to ensure program milestones, WBS and scheduling guidelines and coding are followed.
- Schedule variances and mitigation plans will be analyzed from the Level 3 schedule.
- Daily, Weekly and Monthly look-ahead reports will be generated from Level 3 schedule.
- This method will also be utilized where OPG is self performing the work

3.0 SCHEDULE INTEGRATION

All Contractors' Level 3 Schedules or OPG Functional detailed schedule are fully aligned, utilizing a common Work Breakdown Structure and coding guideline, and integrated in the overall C& C Schedule.

The C&C Schedule will be the program's basis for measuring schedule progress.

4.0 DEVELOPMENT OF WORK BREAKDOWN STRUCTURE (WBS)

As per PMI's Practice Standard for WBS, second edition, Chapter 2: "The WBS subdivides the project work into smaller, more manageable pieces of work, with each descending level of the WBS representing an increasingly detailed definition of the project work. The planned work contained in the lowest level WBS components, which are work packages (WP), can be scheduled, cost estimated, monitored, and controlled."

The WBS is subdivided to Bundles as related to Scope and aligned with contracting strategy.

Each work package (WP) is assigned an owner by the Project Management Team (PMT), called "Account Owner" (AO), who is accountable to the performance of the WP.

Every WP is represented with at least one activity in the C&C Schedule that integrates into Proliance for Earned Value calculations. The WP can be represented in Level 1, C&C and in the Detailed Level 3 schedule, as needed.

The WBS is controlled by the Program Management Office (PMO) Scheduling Group and is available from within Primavera Planner (P6). A visual copy of the WBS structure is included as **Appendix B – Darlington Refurbishment WBS Structure**.

4.1 Modification of the WBS

Modification of the WBS may be required for any new, removal of existing, or splitting of WBS elements.

All requests to modify the WBS shall be forwarded to the Scheduling Group who will update the master WBS structure and ensure a common implementation

5.0 SCHEDULES BASELINE

5.1 Overall Program Schedules Baseline

As project planning progresses in the Definition Phase of the Program, the overall Program Baseline will be updated and finally released, as Revision 0 ("zero") at time of the Release Quality Estimate (RQE); October 15, 2015. However, the C&C Schedules will be prepared and issued as Revision A, B, C for the purpose of monitoring progress prior to RQE.

Revision A will be released after the initial setup of the C&C Schedules, further revisions will be issued as required as individual bundles passes through Gate 2 &3.

5.2 Contractor's baseline schedules

Contractor's baseline schedules will be reviewed to ensure compliance with program milestones, WBS and Scheduling guideline and will be released for use and monitoring after OPG Review.

L3 Schedule variances and progress measurement will be based on the Contractor's baseline schedules

5.3 Milestone Management

Milestones within the Program will be managed at various levels per the following:

All phases will be controlled by Program Milestones. Adherence to milestone timelines and definitions is essential to ensure a successful Refurbishment. Refer to N-MAN-00120-10001 Nuclear Refurbishment – Milestone Definition Framework for the following:

- Milestone Tier Structure
- Milestone Numbering Nomenclature
- Common Milestone Definition Template
- Milestone Completion Progress Monitoring
- Quality Requirements for Milestone Deliverables
- Milestone Closeout and Document Retention Requirements

Milestone Tier Structure identifies Key Program and Project Control Milestones. The Tiers are linked to the level of the Organization that the Milestone is reportable to and the Approval Level required for any deviation to the Milestone

(a) Program Tier 1 - Commitments to the Board of Directors

- Reportable to: EVP Nuclear Refurbishment
- Definition: Milestones that are commitments to the Board or decisions at Board Level.
- Example: RQE Release Quality Estimate, and Unit Start/Finish dates

(b) Program Tier 2 – Critical Impact

- Reportable to: EVP Nuclear Refurbishment
- Definition: Milestones that are critical to the Program, normally documented in Phased based Program BCS's per Release Strategy.
- Example: CNSC Approval of ISR

(c) Program Tier 3 – Program Controls

- Reportable to: SVP Direct Reports
- Definition: Milestones that manage the health of the Program and keep it on track.
- Example: All Projects Scope Freeze/Detailed Eng. Finished

(d) Project Tier 4 – Project Gates

- Reportable to: VP Refurbishment Execution
- Definition: Project Gates (checkpoints of project preparation progress at which funding is released for the next phase).
- Example: G0 Project Scope Approval, G3 Definition Phase

(e) Project Tier 5 – Standard Project Milestones & Project Manager Milestones

- Reportable to: Project Manager
- Definition: Milestones that are within the gated process and are specific to the project life cycle.
- Example: Turbine Generator Project Charter Approved (CHR), Management Plans completed, Project Long Lead Materials

Appendix C – Key Program Milestones provides a listing of the Tier 1 and 2 Program level milestones.

5.4 Schedule Contingency

Schedule contingency will be managed according to the Darlington Refurbishment Risk Management Plan, NK38-PLAN-09701-10067-Sht 0006.

6.0 SCHEDULE CHANGE MANAGEMENT

Changes to the baseline scope will be managed through a formal Change Control process as per the Program Cost Management Plan, N-MAN-00120-10001-PC-R000 and implemented at all levels of schedule.

7.0 BASIS OF SCHEDULES DOCUMENTS

Contractors must issue a basis of schedule document with the submission of the baseline schedule. The document must include the following:

- Summary description of the scope and main deliverables
- List of all Project/Payment milestones and key dates
- WBS / Primavera files structures and integration
- Coding structures for generating the various Schedules layouts
- Calendars used with the various activities
- Productivity rates / Assumptions
- Benchmarking to similar projects for duration assumption
- Progress measurement process for all work packages
- Regular scheduling reports

8.0 SCHEDULE MONITORING AND CONTROL

The contractor's / OPG Level 3 Schedule will be updated regularly using OPG guidelines. During the planning phase, schedules will be updated at least once per month; during execution, that will increase to as frequently as needed to manage the schedule, i.e. critical path activities may be updated daily, near critical path activities weekly, and others monthly.

Variance / critical path analysis, and percent complete at the work package level will be prepared for every schedule on a monthly basis.

OPG will assign a single point of contact or SPOC for each schedule; the SPOC will review the contractor's schedule and prepare highlights of issues / corrective actions required and take appropriate steps working through the project team and the contractor to resolve.

The Level 3 will be summarized in order to update the Coordination and Control schedule.

Overall program variance / critical path analysis will be prepared from the C&C Schedule by OPG's Program Management Office (Project Planning and Controls).

Forecast dates at the work package level and percent complete will be integrated with the Earned Value Software ("Proliance") from L3 Schedules prepared by contractors or OPG, if they self performed the work.

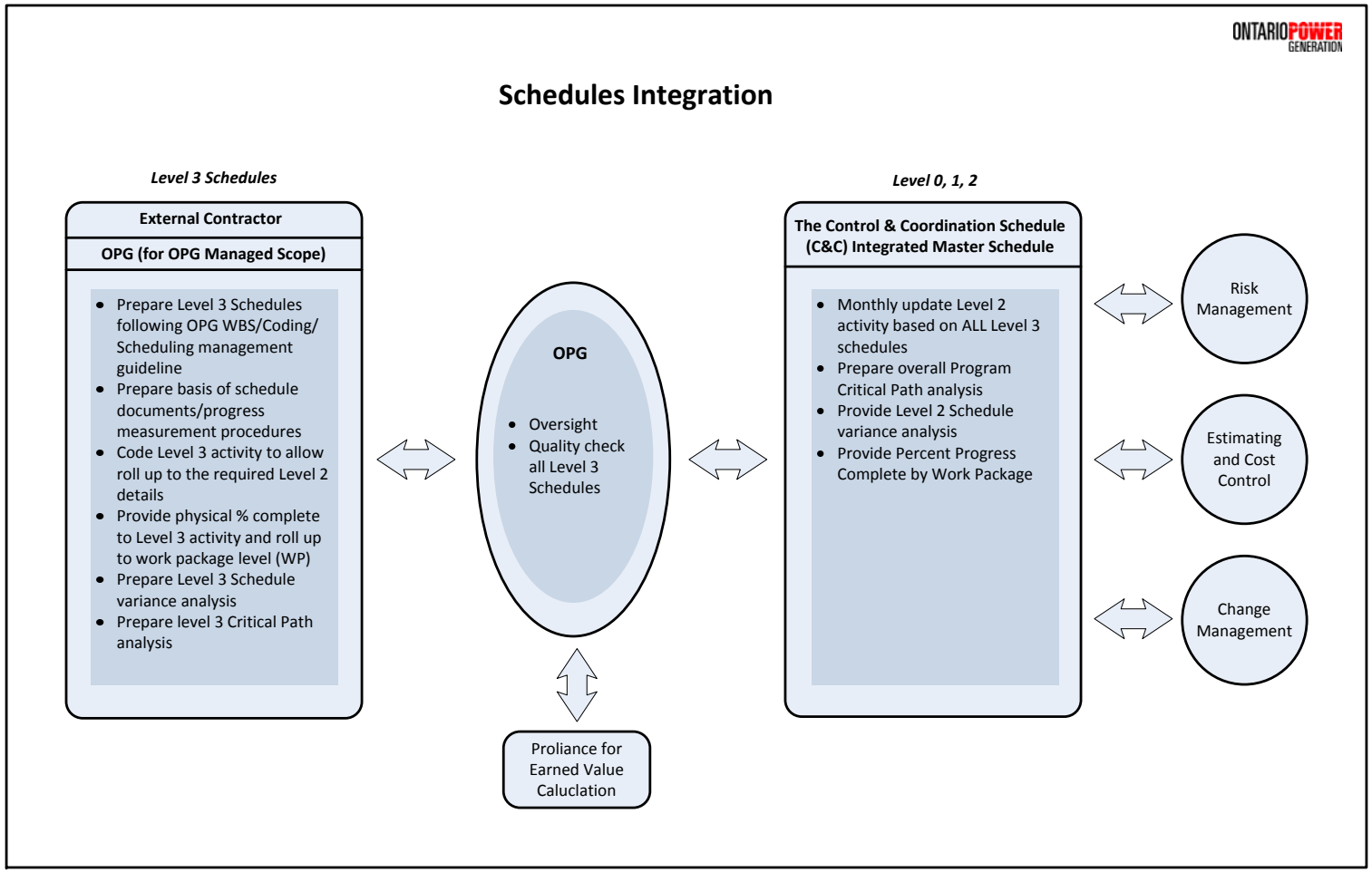
8.1 Schedule reporting (metrics and reports)

Various reports and Metrics will be generated and published on the Program's website within SharePoint.

9.0 PROGRAM SCHEDULE MANAGEMENT AND CONTROLS GOVERNANCE

Additional information, based on the Project Management Standard (N-STD-AS-0028), on the schedule management processes utilized by the Refurbishment Program can be found within the Project Management E-Manual (N-MAN-00120-10001, chapter or sheet "SCH").

Appendix A: Darlington Refurbishment Schedule Integration



Appendix B: Darlington Refurbishment Work Breakdown Structure

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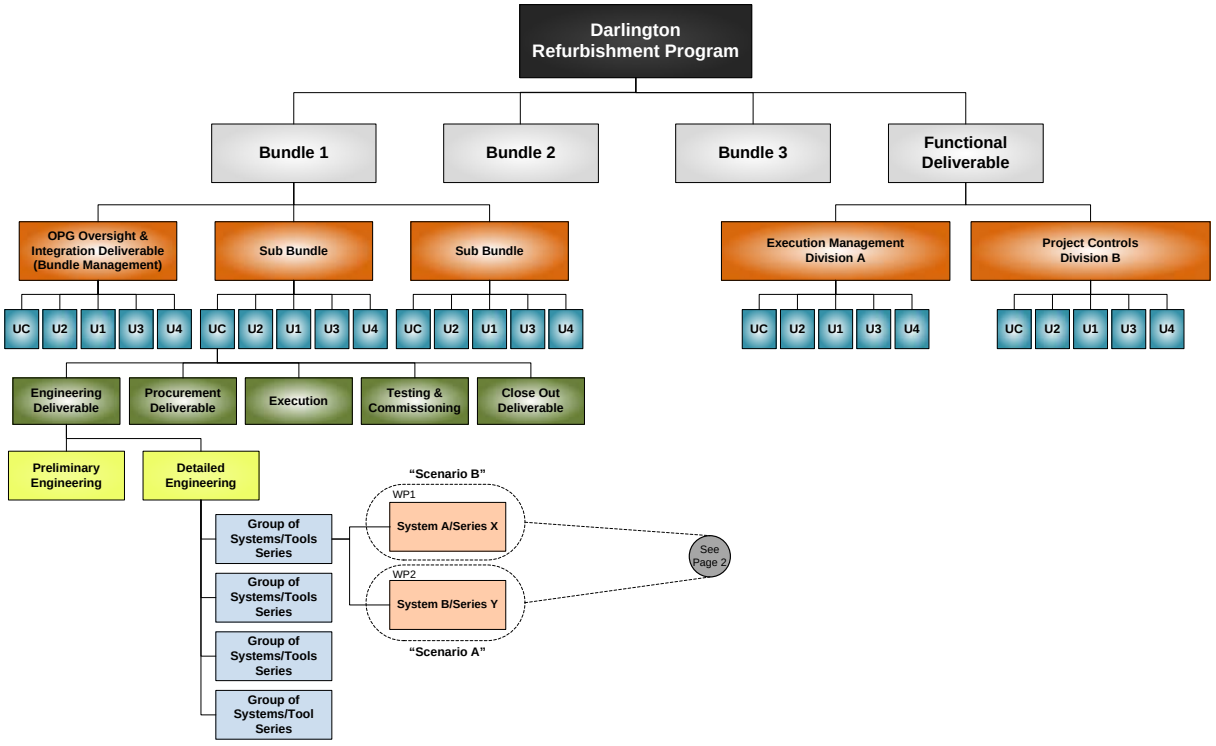
Darlington Refurbishment Program
Work Breakdown Structure (WBS)
REV 0 31-Jan-2013

ONTARIO POWER GENERATION



Page 1 of 2

Plan

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Sheet Number: 0004	Revision Number: R001	Page: 13 of 15

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PROGRAM SCHEDULE MANAGEMENT PLAN

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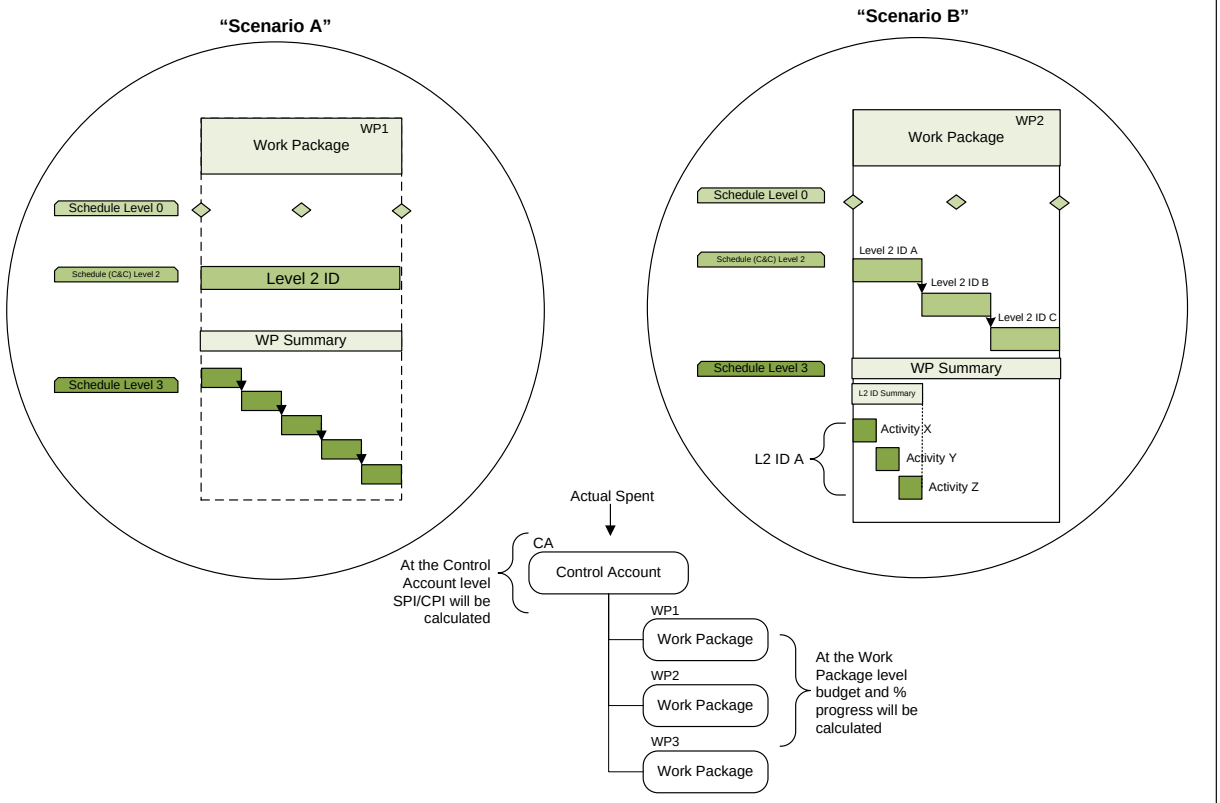
Darlington Refurbishment Program
Schedules Integration with WBS
REV 0 31-Jan-2013

ONTARIO POWER GENERATION



Page 2 of 2

Appendix C: Key Program Milestones (as of January 1, 2013)

PMSS_B-1

Darlington Nuclear Refurbishment Program Milestones and Key Dates (Tier 1/2)

Activity ID	Milestone Name	BL Start	BL Finish
PMSS - Program Milestones and Key Dates		04-Oct-2010 A	15-Dec-2024
Regulatory Key Dates		04-Oct-2010 A	15-May-2023
Regulatory Key Dates Common		04-Oct-2010 A	31-Dec-2014
RG010	Protocol to Manage Interaction on ISR		04-Oct-2010 A
RG020	CNSC Acceptance of ISR Procedure		30-Dec-2010 A
RG030	Submission of EA Project Description		28-Apr-2011 A
RG051	Submission of DNGS License Extension Application		28-Jun-2011 A
RG040	Submission of Final ISR Report		27-Oct-2011 A
RG050	Submission of EIS/TSD's		01-Dec-2011 A
RG060	CNSC Staff Issue Final ISR Report Sufficiency Review		06-Feb-2012 A
RG085	CNSC EA Hearing		03-Dec-2012 A
RG080	Current License End Date		28-Feb-2013*
RG070	CNSC Decision on EA		30-Apr-2013*
RG075	CNSC Approval for NWSF License Renewal		01-May-2013*
RG090	CNSC Certification of RWC Transportation Package Design		15-Jun-2013*
RG100	CNSC Staff Assessment of Final ISR Report		05-Jul-2013*
RG110	Submission of IIP & License Renewal Application		02-Dec-2013*
RG120	IIP Approval by CNSC		31-Dec-2014*
Regulatory Key Dates for Unit 2		15-Jan-2016	15-Mar-2019
RG125	U2 Request Submission of Outage Final Approvals		15-Jan-2016*
RG130	U2 CNSC Outage Final Approvals in Place		15-Jul-2016*
RG140	U2 Restart License Approved		15-Mar-2019*
Regulatory Key Dates for Unit 1		25-Aug-2017	15-Sep-2020
RG143	U1 Request Submission of Outage Final Approvals		25-Aug-2017*
RG147	U1 CNSC Outage Final Approvals in Place		25-Feb-2018*
RG150	U1 Restart License Approved		15-Sep-2020*
Regulatory Key Dates for Unit 3		28-Apr-2019	15-Feb-2022
RG153	U3 Request Submission of Outage Final Approvals		28-Apr-2019*
RG157	U3 CNSC Outage Final Approvals in Place		28-Oct-2019*
RG160	U3 Restart License Approved		15-Feb-2022*
Regulatory Key Dates for Unit 4		06-Oct-2020	15-May-2023
RG163	U4 Request Submission of Outage Final Approvals		06-Oct-2020*
RG167	U4 CNSC Outage Final Approvals in Place		06-Apr-2021*
RG170	U4 Restart License Approved		15-May-2023*
Program Release Dates		15-Nov-2012 A	15-Jul-2020
RL025	Rel.4B: Detailed Planning Release B	15-Nov-2012 A	
RL030	Rel.5/6/RQE: Unit 2 Outage Release	15-Oct-2015*	
RL040	Rel.7: Unit 1 Outage Release	15-May-2017*	
RL050	Rel.8: Unit 3 Outage Release	01-Feb-2019*	
RL060	Rel.9: Unit 4 Outage Release	15-Jul-2020*	
Outage Preparation Key Dates		15-Apr-2013	06-Apr-2021
Unit Common Outage Prep Key Dates		15-Apr-2013	15-Aug-2015
RP120	Engineering RFP Prerequisites for Major Contracts (Excl. BOP)		15-Apr-2013*
RP130	All Projects Detailed Engineering Finished		15-Aug-2015*
Unit 2 Outage Prep Key Dates		15-Nov-2014	15-Jul-2016
OP2040	U2 Long Lead Materials Identified		15-Nov-2014*
OP2055	U2 Project Detailed Engineering Finished (Design Modification Documents Finished)		15-Aug-2015*
OP2070	U2 Work Packages Assessing Complete		15-Sep-2015*
OP2060	U2 Refurb Readiness Assessment Finished		15-Oct-2015*

1/2

PMSS_B-1

Darlington Nuclear Refurbishment Program Milestones and Key Dates (Tier 1/2)

Activity ID	Milestone Name	BL Start	BL Finish
OP2090	U2 Regulatory Approvals Obtained		15-Apr-2016*
OP2100	U2 Initial Stage Materials and Tools On Site		15-Jul-2016*
Unit 1 Outage Prep Key Dates		25-Jun-2016	25-Feb-2018
OP1040	U1 Long Lead Materials Identified		25-Jun-2016*
OP1055	U1 Project Detailed Engineering Finished (Design Modification Documents Finished)		25-Mar-2017*
OP1070	U1 Work Packages Assessing Complete		25-Apr-2017*
OP1060	U1 Refurb Readiness		25-May-2017*
OP1100	U1 Unit Initial Stage Materials & Tools on Site		25-Feb-2018*
Unit 3 Outage Prep Key Dates		28-Feb-2018	28-Oct-2019
OP3050	U3 Long Lead Materials Identified		28-Feb-2018*
OP3055	U3 Project Detailed Engineering Finished (Design Modification Documents Finished)		28-Nov-2018*
OP3070	U3 Work Packages Assessing Complete		28-Dec-2018*
OP3060	U3 Refurb Readiness		28-Jan-2019*
OP3100	U3 Initial Stage Materials & Tools on Site		28-Oct-2019*
Unit 4 Outage Prep Key Dates		06-Aug-2019	06-Apr-2021
OP4040	U4 Long Lead Materials Identified		06-Aug-2019*
OP4055	U4 Project Detailed Engineering Finished (Design Modification Documents Finished)		06-May-2020*
OP4070	U4 Work Packages Assessing Complete		06-Jun-2020*
OP4100	U4 Initial Stage Materials & Tools on Site		06-Apr-2021*
Outage Execution Key Dates		15-Oct-2016	27-Feb-2024
Unit 2 Refurb Outage		15-Oct-2016	24-Dec-2019
Unit 2 Outage Key Dates		15-Oct-2016	24-Dec-2019
U2010	U2 Circuit Breaker Open	15-Oct-2016*	
U2280	U2 Full Power & Handover to DNGS		24-Dec-2019*
Unit 1 Refurb Outage		25-May-2018	01-Jun-2021
Unit 1 Outage Key Dates		25-May-2018	01-Jun-2021
U1010	U1 Circuit Breaker Open	25-May-2018*	
U1300	U1 Full Power and Handover to DNGS		01-Jun-2021*
Unit 3 Refurb Outage		28-Jan-2020	30-Nov-2022
Unit 3 Outage Key Dates		28-Jan-2020	30-Nov-2022
U3010	U3 Circuit Breaker Open	28-Jan-2020*	
U3300	U3 Full Power & Handover to DNGS		30-Nov-2022*
Unit 4 Refurb Outage		06-Jul-2021	27-Feb-2024
Unit 4 Outage Key Dates		06-Jul-2021	27-Feb-2024
U4010	Unit 4 Circuit Breaker Open	06-Jul-2021*	
U4300	U4 Full Power & Handover to DNGS		27-Feb-2024*
Program Closeout Key Dates		15-Dec-2024	15-Dec-2024
CL1000	DR Program Final Acceptance		15-Dec-2024*

2/2