

**SEC Interrogatory #043**

**Interrogatory**

**Reference:  
D1-1-2, p. 16**

Question(s):

With respect to the turbine-generator refurbishment program:

- a) Is there an overriding document that lays out all of the stations requiring turbine-generator refurbishment, condition of each of the units, and a schedule for completion? If yes, please provide.
- b) Please explain how OPG prioritizes turbine-generator refurbishment projects?
- c) Please provide an overall schedule covering the full 2016 to 2031 period outlining the start date and in-service date for all turbine-generator refurbishment projects.
- d) Please explain how OPG determines its overall and annual budgets for turbine-generator refurbishment?
- e) Please provide the total cost of the turbine-generator refurbishment program.

**Response**

- a) No. OPG assesses asset condition through its equipment health monitoring process, as described in Ex. L-D1-SEC-041, and prioritizes and schedules investments and projects in accordance with the processes described in Ex. D2-1-1.
- b) Refer to Ex. L-D1-Staff-311.
- c) Refer to Attachment 1, which sets out the full 2016 to 2031 project schedule for turbine-generator refurbishment projects, including project start dates and in-service dates. For the purpose of this interrogatory, project start date refers to the approval date of the first Business Case Summary and in-service date refers to the date the refurbished equipment is returned to service.

In the course of responding to this interrogatory, OPG noted an error in the in-service date for Project #86792 Alexander GS G2 Capital Refurbishment in Ex. D1-

1 1-2 p. 19, line 2 and Ex. D1-1-2 Table 1, line 29. The in-service date should read  
2 Mar-29, not Aug-27. There are no changes to the total in-service amount in Ex. D1-  
3 1-2 Table 1, column (k), or the in-service amounts in columns (n) to (t).  
4

5 d) Asset investments are identified, assessed, and prioritized as per the process  
6 described in Ex. D2-1-1. As part of OPG's annual Business Planning process, OPG  
7 determines a prioritized list of investments to be included in the business plan.  
8 Refurbishment projects that are included in the approved business plan will have  
9 annual cash flows in the business planning period.  
10

11 e) The turbine generator refurbishment program does not have a defined start and  
12 end date. It is an ongoing series of refurbishment projects undertaken for the  
13 regulated hydroelectric fleet. As such, OPG cannot provide a total cost for the  
14 turbine generator program as requested.

**L-D1-SEC-043 - Attachment 1**  
**Turbine Generator Refurbishment Project Schedules (2016-2031)**

**Chart 1 - Turbine Generator Refurbishment Project Schedules (Completed)**

<b>Project#</b>	<b>Project Name</b>	<b>Project Start Date<sup>1</sup></b>	<b>Final In-Service</b>
83155	ABITIBI - G2 CAPITAL UPGRADES/HG	Feb-19	Mar-22
86077	BAR-G2 CAP RFRB; RWND GEN REINS FLD PLS	Jul-20	Apr-25
86082	BAR-G1 CAPITAL REFURB; REWD & FLD PLS	May-22	May-24
84587	BAR-CAP REFURB; RWD GEN & REINSLT FIELD POLES	Jul-19	Nov-23
80980	BAR - REWIND GENERATORS G3/G4	May-16	Nov-23
80604	REWIND G1/G3/G5 STATORS	Sep-10	May-15
80694	LOWER NOTCH G2 CAPITAL UPGRADE	Sep-12	Jun-18
82543	OTTER G2 REFURBISHMENT	Aug-20	Dec-25
86480	OTO - G5 REFURB - TURBINE & GENERATOR	Feb-22	Jul-23
84385	OTO - CAPITAL PROJECT SCOPE G7 1ST UNIT	Sep-19	Sep-22
86477	OTO - G8 REFURB - TURBINE & GENERATOR	Feb-23	Apr-25
83495	SAU - G9 CAPITAL REFURBISHMENT	Dec-20	Aug-25
84558	G1 RUNNER SHAFT REPLACEMENT	Aug-20	Nov-24
80851	G2 OVERHAUL AND UPGRADE	Feb-15	Jul-19
83624	REPLACE G8 RUNNER	Mar-19	Nov-22
80852	G5 OVERHAUL - CAPITAL REPLACEMENT	Nov-12	Dec-17
82777	G5 MAJOR OVERHAUL - CAPITAL SCOPE	May-18	Sep-21
84185	SAB1 G1/G2 REPLACEMENT	Feb-19	Oct-22
80649	G10 UPGRADE GENERATOR RUNNER TRANS	Oct-13	Jun-17
84557	PG3 RUNNER SERVOMOTOR UPGRADE	Oct-20	Dec-25
84022	PG5 RUNNER GENERATOR REHAB (CAP)	Aug-19	Dec-22
82422	PG6 OVERHAUL - CAPITAL SCOPE	Feb-17	May-18
80918	PG1 OVERHAUL - CAPITAL SCOPE	Feb-15	Dec-17
80659	PG5 RUNNER BLADES, DIFFUSER FLAPS	Apr-14	Mar-16
86383	AGU G2 REWIND & CORE REPLACEMENT	Aug-21	Oct-25
82514	AGU G1 FIELD POLES & UNIT INSTRUMENT	May-19	Dec-21
82518	AGU G1 RUNNER REPLACEMENT	May-19	Dec-21
86410	EUG G3 TURBINE OVERHAUL - CAP	May-21	Jun-24
83513	HAG - G1 GENERATOR REWIND	Oct-17	May-19
82264	MEY G1 CAP REFURB	Jun-23	Aug-25
89237	SID G4 BEARING REFURB	Jul-24	Sep-25
82385	G1 REWIND AND NEW CORE	Jan-18	Dec-22
80709	SOUTH FALLS G2 TURBINE REPLACMT	Feb-14	Jan-16
82375	WHDF G3 REWIND	Jul-14	Apr-18
80778	BCSA WHDF GENERATOR - REWIND CABLES G1	Jul-14	May-17
80736	WHDF G2 REWIND	Oct-13	Apr-16

**Chart 2 - Turbine Generator Refurbishment Project Schedules (In Progress / Forecast)<sup>2</sup>**

<b>Project #</b>	<b>Project Name</b>	<b>Actual / Estimated Project Start Date<sup>1,2</sup></b>	<b>Estimated In-Service Date<sup>2</sup></b>
83148	ABI - G1 REFURBISHMENT	Mar-25	Jan-31
83157	ABI - G3 REFURBISHMENT	2028*	>2031
83159	ABI - G4 REFURBISHMENT	2030*	>2031
83161	ABI - G5 REFURBISHMENT	2031*	>2031
89112	ARN-REFURB-RE-INS RTR FLD POLES 1ST UNIT	2029*	>2031
87525	CHF-GENERATOR REWINDS (NET)***	2026*	Nov-30
89136	CHE-4TH UNIT CAPITAL REFURB	2031*	>2031
89135	CHE-3RD UNIT CAPITAL REFURB	2030*	Apr-31
89134	CHE-2ND UNIT CAPITAL REFURB	2029*	Apr-30
87529	CHE-1ST UNIT CAPITAL REFURB	2025*	Apr-29
89622	DEJ-CAPITAL REFURB-REWIND GEN/STATORS	2030*	>2031
82542	OTTER G1 REFURBISHMENT	Feb-19	Dec-26
82544	OTTER G3 CAPITAL UPGRADE	2026*	Jun-29
82545	OTTER G4 REFURBISHMENT	2026*	Mar-28
89155	OTO-G4 REFURB - TURBINE AND GENERATOR	2029*	Apr-30
89154	OTO-G3 REFURB - TURBINE AND GENERATOR	2028*	Apr-29
87546	OTO-G2 REFURB - TURBINE & GENERATOR	2027*	Apr-28
87545	OTO-G1 REFURB - TURBINE & GENERATOR	Jan-25	Apr-27
86478	OTO - G6 REFURB - TURBINE & GENERATOR	Feb-24	May-26
89165	SAU-CAPITAL REFURB - 7TH UNIT	2031*	>2031
89164	SAU-CAPITAL REFURB - 6TH UNIT	2029*	>2031
87549	SAU-CAPITAL REFURB FIFTH UNIT	2027*	Mar-31
87548	SAU-G10 CAPITAL REFURBISHMENT	2026*	Aug-29
86937	SAU - G16 CAPITAL REFURBISHMENT	Nov-24	Feb-28
86587	SAU - G12 CAPITAL REFURBISHMENT	Jun-22	Jun-26
87574	SAU-REINSULATE FIELD POLES	2026*	>2031
89169	STW-CAP REFURB - REWIND GENERATOR (5TH UNIT)	2030*	May-31
89168	STW- CAP REFURB - REWIND GENERATORS (4TH UNIT)	2029*	May-30
87551	G1-STW- REWIND GENERATOR &FIELD POLES	2027*	Apr-29
87550	G4- STW - REWIND GENERATOR & FIELD POLES	2026*	Apr-28
82351	STW - G5 CAP REFURB - RWND GEN & REINSULATE FLD POLES	Oct-24	May-27
87966	DQ2 G1 ELECTRICAL REFURBISHMENT	2029*	>2031
87963	DQ2 G2 RUNNER AND SHAFT REPLACEMENT	2029*	May-31
89524	DECEW I GS REFURBISHMENT	2025*	Jan-29
86372	BK1 G6 G8 REFURBISHMENT	May-24	Apr-30
86570	BK1 G4 REFURBISHMENT	May-22	Jun-27
87596	BK2 G26 G25 REFURBISHMENT	2028*	>2031
87955	BK2 G16 G15 REFURBISHMENT	2027*	>2031
87357	BK2 G14 G13 REFURBISHMENT	May-25	>2031
87356	BK2 G17 G18 REFURBISHMENT	May-25	Nov-30
87768	BK2 G20 G19 REFURBISHMENT	Oct-19	Feb-29
89876	PGS REFURBISHMENT	2029*	>2031
86793	ALX G3 CAPITAL REFURB	Jun-23	Dec-31

82391	ALX G1 CAPITAL REFURB	Apr-23	Sep-30
86792	ALX G2 CAPITAL REFURB	Apr-23	Mar-29
90200	EDY G1 REWIND	2029*	>2031
90201	EDY G2 REWIND	2030*	>2031
83257	CAM G7 CAPITAL REFURB	Aug-19	Dec-26
86852	HAG GENERATOR REWINDS	2028*	Aug-30
87306	HAN G1 REWIND	2029*	Dec-30
89247	MAN G5 - CAPITAL REFURB	2030*	>2031
87233	MAN G4 CAPITAL REFURB	2028*	>2031
89246	MAN G2 - CAPITAL REFURB	2026*	Nov-31
89245	MAN G1 CAPITAL REFURBISHMENT	2026*	Aug-30
86860	MAN G3 CAPITAL REFURB	Dec-24	May-29
87704	MEY G3 CAPITAL UPRATE	2026*	Nov-28
86214	MEY G2 CAPITAL UPRATE	2026*	Dec-27
80847	PIN G1 CAPITAL REFURB	2028*	>2031
84469	PIN G2 CAPITAL REFURB	2030*	>2031
89229	SEY G4 BEARING REPLACEMENT	2028*	Jun-29
89228	SEY G5 BEARING REPLACEMENT	2027*	Jan-29
83205	STH G3 TURBINE REPLACEMENT	2028*	Jan-31
83204	STH G1 TURBINE REPLACEMENT	Apr-24	Jan-29

Notes:

- 1 Project start date for allocated projects in accordance with first approved Business Case Summary
- 2 Projects denoted with " \* " are unallocated. Estimated start/completion dates should be considered preliminary, high-level estimates and subject to change through business planning, and should not be used for the basis of comparison to future project estimates or actual future project performance should the investments be selected for project execution - refer to Ex. D1-Staff-064.