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## **UNDERTAKING J2.1**

### **Undertaking**

To advise whether, at the end of the five-year plan, station components as they pertain to the regulated assets are going to be newer, older, or about the same.

### **Response**

Given the long life of hydroelectric stations and with its continuing maintenance and investment programs, it is the opinion of OPG that the regulated hydroelectric stations will be in about the same condition at the end of five years.

OPG has reviewed the recently completed work program and its future investments plans by major component at the regulated hydroelectric stations. The results are summarized in Table 1 below. While most of the components of the regulated hydroelectric stations will experience normal aging, a number of major components will be refurbished or replaced over the next five years.

OPG's approach to investing in its hydroelectric stations is described in Ex. F1-T1-S1 on pages 3 and 4. Additional detail is provided in the Hydroelectric Business Plan Presentation (Attachment 1 to Ex. F1-T1-S1) and in the response to the PWU Interrogatory L-11-010.

**Table 1 – Major Component Work Program for Regulated Hydroelectric Stations**

Regulated Generating Stations	Work Program	Generators	Turbines	Electrical Equipment	Auxiliary Systems	Dams	Other Civil Structures
Sir Adam Beck 1 Generating Station	Completed	G7 & G9 new, G6 1995	G7 & G9 new, G6 1995	New protections and controls, new transformer & switchgear on G7 & G9	New headgates on all units between 2001 & 2005; Powerhouse cranes replaced in mid 1980's		Major concrete work on powerhouse (PH) and screenhouse (SH) 50-80% complete - Dredging and slope repairs in early 1980's for Power Canal
	Planned	Overhauls or replacements over the next 10 - 12 years	Overhauls or replacements over the next 10 - 12 years	Assessments will occur prior to overhauls / rehabilitations & replaced as required; New governor controls in next 2 years; new P&C on units during rehabs		Rehab. Screenhouse (SH) & tailrace piers, decks & gains over next 10 years & Chippawa intake diffuser	Concrete work & replace roofs on PH & SH over next 5 years; Canal and forebay rehab. in 2017; Assessments to identify rehab. requirements for Penstocks
Sir Adam Beck 2 Generating Station	Completed	Rewound and overhauled between 1995 & 2005	Turbines were replaced between 1995 & 2005	General electrical overhaul was completed between 1995 & 2005	Headgates rehabilitated between 1995 & 2005 - Powerhouse cranes overhauled in late 2000's		Headworks roof replaced in late 2000's
	Planned	Generator rehabilitations will start in the early 2020's	Turbine overhauls will start in the early 2020's	Governor controls and excitation system will be completed in the mid 2010's	Trashracks will be rehabilitated in the early 2010's	Tailrace deck will be rehabilitated in the mid 2010's	Powerhouse roof will be replaced within 6 years; tunnel gates overhaul in early 2010's; dewater station replacement in mid 2010's

**Table 1 – Major Component Work Program for Regulated Hydroelectric Stations**

Regulated Generating Stations	Work Program	Generators	Turbines	Electrical Equipment	Auxiliary Systems	Dams	Other Civil Structures
Sir Adam Beck Pump Generating Station	Completed	Overhauls 1978 - 1991	Turbine overhauls from 1978 - 2009	Misc. PLC's replaced in late 2000's; switchgear replaced in late 1990's	Powerhouse crane overhauled in late 2000's	Improvements to dyke monitoring and dam safety instrumentation in late 2000's	
	Planned	Generators will be overhauled/rehab'd as required during unit overhauls in mid to late 2010's	Turbine overhauls are planned for mid to late 2010's	Transformers will be replaced in early 2010's; switchgear overhaul in late 2010's; P&C upgrade mid 2010's	Elevator installation mid 2010's	Dyke rehabilitation starting in 2016	Unit hatch cover upgrades mid 2010's
DeCew Falls 1 Generating Station	Completed	G6 & G7 overhauled in late 2000's	G5, G6 & G7 overhauled in mid to late 2000's				Powerhouse brick restoration late 2000's
	Planned	G5 & G8 overhaul in early 2010's	G8 replacement in early 2010's	General electrical station upgrade and station automation in mid 2010's	Trashrack replacement in early 2010's; trashrack cleaning machine purchase in early 2010's	Levee remediation early 2010's	Penstock replacement in progress: intake canal remediation mid 2010's; tailrace bridge rehabilitation mid 2010's
DeCew Falls 2 Generating Station	Completed	Overhauled in mid 2000's	Overhauled in mid 2000's	Generator cable replacement mid 2000's; switchgear replacement late 1990's; pilot exciter replaced late 2000's; transformers replaced early 2000's	Headgate replacement mid 2000's		powerhouse structural repairs early 2000's; road and slope repairs late 2000's
	Planned	Next overhauls late 2020's early 2030's	Next overhauls late 2020's early 2030's		Governor replacement mid 2010's; powerhouse crane replacement early 2010's	Weir repair mid 2010's	West approach bridge replacement early 2010's

**Table 1 – Major Component Work Program for Regulated Hydroelectric Stations**

Regulated Generating Stations	Work Program	Generators	Turbines	Electrical Equipment	Auxiliary Systems	Dams	Other Civil Structures
R.H. Saunders Generating Station	Completed	Overhauls and rewinds all units (1992-2001)	New runner blades 14 of 16 units (1992-2001)	Transformers replaced 1994-1997, power cables replaced 1998-2001	Headgate refurbishment all 48 gates (1991-2005), new cables (1994-2001) - Iroquois Dam cranes (qty -2) rehabilitation 2005-2006	Geomation system replaced 2009; Iroquois Dam civil repairs 2009	Roofs replaced all buildings early 90's; Admin Bldg HVAC replaced 2008
	Planned	Replace Exciters 2012-2013; 600V station service upgrade 2012-2015		Upgrade generator protections 2010-2012; upgrade transformer and line protections 2010-2012	Rehabilitation of all station cranes 2013-2014; replace service water system 2012-2014; replace dewatering system 2013-2014	Concrete growth mitigation 2013-2015; ice sluice drumgate removal & plug 2015; tailrace deck repair 2015	Admin Bldg envelope 2015; fire water system replacement 2011-2014