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SUMMARY OF EPC CONTRACT FOR TURBINE GENERATORS WITH SNC/AECON JV

Contract Name:

Engineering, Procurement and Construction Agreement for the Darlington Refurbishment Turbine Generators Refurbishment Project

Dates:

Date of Agreement: January 22, 2014
Date of Summary: May 6, 2016

Summary of Key Terms:

The following is a brief summary of the key terms and conditions of the Engineering Procurement and Construction Agreement for the Darlington Refurbishment Turbine Generators Refurbishment Project for the Darlington nuclear generating station (the “TG EPC Agreement”) that was entered into between Aecon Construction Group Inc. and SNC-Lavalin Nuclear Inc. acting jointly and severally and doing business as a contractual joint venture (the “SNC/AECON JV” or the “Contractor”) as the successful proponent and OPG as of January 22, 2014.

The form of the TG EPC Agreement is an engineering, procurement and construction contract and reflects extensive feedback from the entire OPG project team, external legal counsel (Blake, Cassels & Graydon LLP) and the SNC/AECON JV as the successful proponent.

Contracting Strategy for Turbine Generator Refurbishment Work

OPG initially explored contracting the full scope of turbine generator (“TG”) refurbishment work at Darlington to Alstom Power Canada Inc. (as successor in interest to Alstom Power & Transport Canada Inc., “Alstom”), as the original equipment manufacturer (“OEM”), based on an engineering, procurement and construction (“EPC”) contracting model. As Alstom and OPG were unable to agree upon a mutually acceptable risk sharing arrangement, the TG

1 refurbishment work was divided into two separate work packages enabling OPG to benefit
2 from the experience and expertise of the OEM for the purchase of engineered equipment
3 while achieving value for money through a competitively procured EPC contract for the field
4 work. This strategy also allowed OPG to avoid a potential compatibility risk of having a non-
5 OEM contractor reverse engineer or completely redesign the TG components.

6
7 A separate agreement with Alstom for engineering services and equipment supply (the “TG
8 ESES Agreement”), covers the engineering design and delivery of the equipment required for
9 the TG refurbishment project (the “Alstom Equipment”) as well as the provision by Alstom of
10 installation support work, static commissioning work and dynamic commissioning work.

11
12 The TG ESES Agreement and the TG EPC Agreement function together to govern the
13 refurbishment of the TGs. A memorandum of understanding signed by OPG, Alstom and the
14 SNC/AECON JV requires that the three parties work closely together while working on the
15 TG project. Specifically, the SNC/AECON JV acknowledges Alstom as the OEM and the
16 supplier of the Alstom Equipment.

17
18 Scope of TG EPC Agreement

19 The TG EPC Agreement covers the field work for installation (“construction”) of the Alstom
20 Equipment and some related work necessary for the refurbishment of TGs. In addition to the
21 field work, the TG EPC Agreement also includes the engineering of plans and processes
22 needed to carry out the work and the procurement of any goods not supplied by Alstom
23 under the TG ESES Agreement.

24
25 Phased Approach to TG EPC Refurbishment Work

26 The TG EPC Agreement divides the Contractor’s TG refurbishment work into three distinct
27 phases – the definition (planning) phase, the execution (doing) phase, and the dynamic
28 commissioning phase. The agreement requires that the Contractor commence each phase
29 upon receipt of a notice to proceed with such phase from OPG. While there is only one
30 notice to proceed for each of the definition phase and the execution phase, OPG provides

1 the Contractor with a separate notice to proceed with the dynamic commissioning phase for
2 each unit.

3
4 *Definition Phase*

5 The multi-year definition phase was intended to provide the Contractor and OPG with
6 sufficient opportunity to plan the Contractor's TG refurbishment work. In particular, the
7 Contractor is required to build an integrated progress schedule that aligns with Alstom's
8 deliverables' schedule, prepare tooling documentation for the execution phase, develop
9 project management plans for both the definition and the execution phases and develop a
10 set of commissioning requirements. In addition, as part of the definition phase work, the
11 Contractor is required to develop an "execution phase plan". The "execution phase plan"
12 includes a cost estimate, schedules (milestone, target, submittal) and a risk register for the
13 execution phase. The cost and schedule estimates developed by the Contractor are required
14 to be subjected to a P50 analysis, which means that the cost and schedule estimates
15 included contingency amounts required to be added or deducted from the estimates to
16 provide the contractor with a confidence level of 50% of achieving completion of the work at
17 the estimated cost and within the estimated timeline. The P50 analysis is to be the basis for
18 establishing the target cost and target schedule under the agreement. The Contractor's fixed
19 fee for the execution phase work is to be calculated based on the target cost.

20
21 OPG and the Contractor are in the final stages of agreeing on the execution phase plan.
22 Once agreement on the execution phase plan is finalized, OPG will authorize the Contractor
23 to proceed with the execution phase work by issuing the execution phase work notice to
24 proceed and the execution phase plan will be included into the TG EPC Agreement through
25 an amendment. The dispute resolution mechanism provided for in the TG EPC Agreement
26 does not apply to the terms of the execution phase plan, and the Contractor is not entitled to
27 any extraordinary payment if OPG decides not to proceed with the execution phase work.
28 OPG is entitled to terminate the agreement for convenience if it decides not to proceed with
29 the execution phase work.

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1 *Execution Phase*

2 During the execution phase, the Contractor must order any long lead material, stage the site,
3 mobilize field crews, complete OPG site specific training, fabricate tooling, develop a
4 commissioning work plan, complete refurbishment and static and dynamic commissioning of
5 the unit, and submit all closeout documentation to OPG.

6

7 *Dynamic Commissioning Phase*

8 During the dynamic commissioning phase, the Contractor is required to provide trade-labour
9 to support OPG around the clock.

10

11 Target Cost Model for Key Components of Contract Price

12 The TG EPC Agreement adopts a target cost model for the definition phase work and the
13 execution phase work. Under this model, OPG will pay all of the Contractor's actual costs
14 (other than overhead costs) incurred in performing the work. The Contractor will be entitled to
15 a fixed fee as compensation for all of its overhead costs, profit and risk. The TG EPC
16 Agreement includes "allowed cost" and "disallowed cost" concepts for reimbursable work, as
17 well as a detailed cost allocation table, to distinguish actual costs that are reimbursable by
18 OPG from actual costs that are to be included in the Contractor's fixed fee.

19

20 To address the risk of cost overruns by the Contractor on reimbursable work, the TG EPC
21 Agreement also includes a financial incentives/disincentives mechanism that is tied to the
22 target cost for the definition phase work and the execution phase work. As a result, while the
23 Contractor will be reimbursed for all of its actual (allowed) costs, up to 48% of its fixed fee will
24 be at risk if there are cost overruns (up to 80% of its fixed fee in aggregate for cost and
25 schedule overruns). This financial incentive/disincentive mechanism also applies to schedule
26 risk and is described in more detail below.

27

28 The definition phase target cost, the definition phase fixed fee and the execution phase fixed
29 fee percentages were bid by the SNC/AECON JV as the successful proponent as part of its
30 proposal. The amounts proposed by the Contractor and agreed to by OPG were incorporated
31 into the TG EPC Agreement.

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Other Components of Contract Price

For all dynamic commissioning work, the Contractor will be entitled to reimbursement of its actual costs, plus a fixed percentage fee. This percentage was bid by the SNC/AECON JV as the successful proponent as part of its proposal. The percentage proposed by the Contractor and agreed to by OPG was incorporated into the TG EPC Agreement.

The TG EPC Agreement also includes a fixed/firm price model that the parties can decide to use as appropriate for any contingency or other similar work.

Fixed fees attached to the definition phase and the execution phase target costs are invoiced upon milestone completion. Reimbursable work is invoiced monthly. OPG may review, audit and dispute invoiced costs and has additional audit rights with respect to reimbursable work.

Schedules

The TG refurbishment work is governed by the contract schedule, progress schedules, and submittal schedules. The Contractor is required to adhere to the progress and submittal schedules and provide OPG with progress reports, including any deviations or anticipated deviations from these schedules. If a progress schedule has not been met or is anticipated not to be met, the Contractor must provide OPG with satisfactory cost and recovery plans, showing that the schedule will be restored. Any changes to the contract schedule require an amendment to the TG EPC Agreement. All payments for the Contractor's fixed fee are made in accordance with the milestone payment schedule. These schedules, as proposed by the Contractor and agreed to by OPG, were incorporated in to the TG EPC Agreement.

Financial Incentives and Disincentives – Cost and Schedule

The TG EPC Agreement includes financial incentives and disincentives that apply to both cost and schedule performance during the definition phase and the execution phase. (These incentives and disincentives do not apply to work performed during the dynamic commissioning phase).

1 The incentives and disincentives do not apply within an established neutral band and are
2 triggered only when the neutral band is surpassed. For each of the definition phase and the
3 execution phase, the Contractor's obligation to pay financial disincentives is capped at 80%
4 of its fixed fee for the applicable phase. Conversely, OPG's obligation to pay financial
5 incentives is capped at 40% of the fixed fee for the applicable phase. The TG EPC
6 Agreement also includes sub-caps on the total amount of cost disincentives that can be
7 incurred by the Contractor during each of the definition phase and the execution phase (so
8 as to preserve meaningful schedule disincentives). These sub-caps are set at 48% of the
9 aggregate definition phase fixed fee or the execution phase fixed fee. Similarly, there is a
10 sub-cap on cost incentives to be paid by OPG if the Contractor comes under its target cost of
11 each the definition phase work and the execution phase work, which sub-cap is set at 24% of
12 the aggregate definition phase fixed fee or the execution phase fixed fee.

13
14 The incentives and disincentives are to be calculated and paid after the last unit to be
15 refurbished is commissioned. They will not be payable with respect to a unit where there is
16 early termination of the agreement prior to such unit achieving the available for service
17 milestone.

18
19 *Definition Phase – Cost Incentives and Disincentives*

20 The TG EPC Agreement establishes a neutral band of \$700,000 above and below the
21 definition phase target cost. If the actual amount of reimbursable costs incurred during the
22 definition phase falls outside of the neutral band, either OPG will pay to the Contractor (for
23 cost savings), or the Contractor will pay to OPG (for cost overruns), a specified percentage of
24 the total cost savings or cost overruns. The percentage of total cost savings or cost overruns
25 to be paid by OPG or the Contractor gradually increases with the increase of the cost
26 savings or overruns, but cannot exceed 50%.

27
28 *Execution Phase – Cost Incentives and Disincentives*

29 The TG EPC Agreement establishes a neutral band of 4% of the execution phase target cost
30 above and below the execution phase target cost. If the actual amount of reimbursable costs
31 incurred during the execution phase falls outside of the neutral band, either OPG will pay to

1 the Contractor (for cost savings), or the Contractor will pay to OPG (for cost overruns), a
2 specified percentage of the total cost savings or cost overruns. The percentage of total cost
3 savings or cost overruns to be paid by OPG or the Contractor gradually increases with the
4 increase of the cost savings or overruns, but cannot exceed 50%. The calculation and
5 payment of such cost incentives and disincentives will be done on an aggregate basis for all
6 completed units.

7
8 *Schedule Incentives and Disincentives*

9 The TG EPC Agreement does not provide for any schedule incentives or disincentives for the
10 definition phase work. With respect to the execution phase work, The TG EPC Agreement
11 requires OPG to pay to the Contractor an incentive amount equal to \$10,000 multiplied by
12 the number of full calendar days by which the actual timeline for mechanical completion of all
13 units is less than the guaranteed timeline. The agreement requires the Contractor to pay to
14 OPG a disincentive amount equal to \$25,000 multiplied by the number of full calendar days
15 by which the actual timeline for mechanical completion of all units exceeds the guaranteed
16 timeline. The Contractor is also required to pay to OPG disincentives for late completion of
17 discrete work elements specified in the TG EPC Agreement, on a unit-by-unit basis. The
18 calculation and payment of schedule incentives and disincentives will be done on an
19 aggregate basis for all completed units.

20
21 Rework

22 The Contractor is required to perform all work safely and diligently, in an organized and
23 timely manner, and in accordance with the TG EPC Agreement, applicable laws and prudent
24 practices. It is acknowledged in the agreement that, notwithstanding the exercise of prudent
25 practices by the Contractor, a certain amount of typical rework is to be expected on a project
26 of this nature. Therefore, the TG EPC Agreement contemplates the inclusion of an allowance
27 equal to 4% of the labour portion of the execution phase target cost for the first unit to be
28 refurbished and 3% of the labour portion of the execution phase target cost for each
29 subsequent unit for rework. There is no rework allowance with respect to the definition phase
30 target cost. Any costs incurred by the Contractor for rework in excess of such allowances will
31 be reimbursable by OPG, but the execution phase target cost will not be adjusted.

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Project Change Directives, Excusable Delays and Force Majeure

The TG EPC Agreement restricts the ability of the Contractor to initiate “project change directives” (change orders) and to make claims for “excusable delay” events and “force majeure” events.

An “excusable delay” is a delay that is caused by an OPG breach, a delay in the delivery of Alstom Equipment, a latent defect in turbine hall cranes or a stop work order, emergency or hazardous condition for which OPG is responsible, and which extends the critical path of the contract schedule by more than a threshold amount.

Neither party will be held responsible for material delays resulting from certain “force majeure” events, which are restricted to fire, flood, tidal wave, lightening, earthquake, cyclone, tornado, hurricane, explosion, severe ice storm, epidemic or pandemic disease, legal strike or lock-out (other than those caused by the Contractor, a subcontractor, or their employees, or work to rule activities), war, riot, sabotage or other acts of public enemies, including terrorists, or site-related blockades (other than labour-related events).

Both “excusable delay” and “force majeure” events require the party seeking relief to provide a notice and take steps to minimize the impact of the delay. In the event of an “excusable delay”, the Contractor is entitled to both cost and schedule relief. In the event of “force majeure”, the Contractor is entitled to schedule relief, but no cost relief with respect to fixed/firm price work and reimbursable work, provided that with respect to reimbursable work the Contractor will be entitled to recover its actual costs of the delay.

The rationale for this restrictive approach is twofold. First, the “functional” scope of work for the TG refurbishment project is to be determined (or confirmed) in part by the Contractor itself during the definition phase. As a result, the Contractor should not be discovering additional scope or encountering delay-inducing “unforeseen risks” as the execution phase work progresses. Second, the Contractor should have sufficient time during the definition phase to fully investigate the site conditions, and should be able to capture all of the required

1 work when developing the execution phase target cost and the execution phase schedules.
2 The restriction on project change directives and claims for “excusable delay” events and
3 “force majeure” events is intended to give the Contractor an incentive to do the best possible
4 planning work during the definition phase. The Contractor also enjoys the benefit of a neutral
5 band around the target cost that affords protection against erosion of fee for any changes
6 that fall within the neutral band.

7
8 The TG EPC Agreement also takes a standard approach to scope changes resulting from
9 “concealed conditions” inside each turbine generator system for each unit. The Contractor will
10 not be able to examine all of these areas prior to commencement of the execution phase
11 work.

12 13 Key Personnel

14 The TG EPC Agreement requires the Contractor to identify and employ certain key personnel
15 for the duration of the TG refurbishment project. This obligation is reinforced with financial
16 penalties if such key personnel are replaced without OPG’s prior written consent.

17 18 “Open Book” Approach and OPG Audit Rights

19 The TG EPC Agreement requires the Contractor to provide OPG with full and open access to
20 all financial and other records relating to the TG refurbishment project. The agreement also
21 provides OPG with extensive audit rights for all financial and other records that relate to work
22 that is performed on a reimbursable costs basis, with few restrictions on the lookback periods
23 for audits and readjustment of Contractor cost claims. OPG’s audit rights with respect to
24 payroll burdens (an agreed payroll burden percentage is used as a proxy for actual payroll
25 burden costs) and work that is performed on a fixed price basis or firm price basis are
26 narrower.

27 28 Subcontractors

29 The TG EPC Agreement permits the use of subcontractors, but obliges the Contractor to
30 “push down” all applicable terms and conditions of the agreement to each subcontractor.

1 Scientific Research and Experimental Development (“SRED”) Tax Credit

2 The TG EPC Agreement provides that OPG is entitled to claim all SRED tax credits
3 generated by work on the TG refurbishment project.

4
5 Performance Security

6 The TG EPC Agreement requires the Contractor to post a letter of credit to support its
7 obligations under the agreement, initially in the amount of \$3,000,000 and, on
8 commencement of the execution phase work, increasing to \$10,000,000. This letter of credit
9 amount steps down to \$1,000,000 upon completion of all TG refurbishment work and will
10 stay in place until the expiry of the warranty period on the last unit to be refurbished. The
11 Contractor has an option of amending its letters of credit provided under the retube and
12 feeder replacement project engineering, procurement and construction agreement between
13 OPG and the SNC/AECON JV (the “RFR Agreement”) to also cover the TG refurbishment
14 work instead of delivering separate letters of credit described above. The amounts of the
15 letters of credit under the RFR Agreement are \$50,000,000, \$100,000,000 and \$20,000,000
16 respectively.

17
18 The Contractor provided guarantees in OPG’s standard form from the ultimate parent
19 companies of the Contractor in support of all of the Contractor’s obligations under the TG
20 EPC Agreement. These guarantees contain ratings-based and/or covenant based tests of
21 the ongoing creditworthiness of the parent guarantors.

22
23 Intellectual Property

24 The TG EPC Agreement requires the Contractor to transfer to OPG, or to license to OPG, all
25 intellectual property required for performance of the work. The TG EPC Agreement also
26 provides for the continuing use of such intellectual property by OPG if the agreement is
27 terminated, either following a Contractor default or for convenience.

28

1 Completion Incentives

2 The TG EPC Agreement provides for a final payment holdback in the amount of \$500,000.
3 OPG is entitled to withhold this amount until it has determined that the Contractor completed
4 all work under the agreement.

5

6 Warranty

7 The TG EPC Agreement provides for a warranty of the Contractor's work, and obliges the
8 Contractor to correct any defective work at its own cost. The warranty period for each unit
9 ends on the earlier of (i) the date that is three months after the actual end date of the first
10 planned outage where inspections take place for such unit, and (ii) the date that is four years
11 after the unit in-service date for such unit. If warranty work is performed by the Contractor, an
12 extended warranty period also applies. The extended warranty period ends on the earlier of
13 (i) the date that is three months from the actual end date of the next planned outage for such
14 unit, and (ii) the date that is four years from the date on which the corrected work re-enters
15 commercial operation. The warranty period for a unit will not in any event extend beyond
16 eight years from the unit in-service date for such unit. The warranty for goods will not extend
17 past the warranty provided by subcontractors on those goods.

18

19 Termination for Default

20 The TG EPC Agreement includes standard events of default. If the Contractor defaults, OPG
21 will be entitled to terminate the agreement and to exercise a number of self-help remedies.
22 Termination for default would permit OPG to make a claim against the Contractor for full
23 contractual damages (subject to a percentage cap formula that is linked to the total contract
24 price and certain other amounts).

25

26 Termination for Convenience

27 The TG EPC Agreement permits OPG to terminate the agreement for convenience at any
28 time. Certain types of direct damages (but not full contractual damages) will be payable by
29 OPG to the Contractor in such circumstances.

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1 Suspension of Work

2 The TG EPC Agreement permits OPG to suspend the work at any time. Certain types of
3 direct damages (but not full contractual damages) will be payable by OPG to the Contractor
4 in such circumstances.

5

6 Dispute Resolution

7 The TG EPC Agreement provides for both informal and formal resolution of disputes. The
8 informal procedure contemplates a staged escalation of disputes within OPG's and the
9 Contractor's management structure with a view to achieving a consensual resolution of the
10 dispute. The formal mechanism is binding arbitration under commercial arbitration rules. The
11 TG EPC Agreement limits the recourse of the Contractor and OPG to the ordinary courts.
12 The dispute resolution provisions in the TG EPC Agreement and TG ESES Agreement are
13 consistent and allow OPG to consolidate procedures under these two agreements at OPG's
14 option.