

SUMMARY OF EPC CONTRACT FOR RFR WITH SNC/AECON JV

Contract Name:

Engineering, Procurement and Construction Agreement for the Darlington Refurbishment Retube and Feeder Replacement Project

Dates:

Date of Agreement: March 1, 2012
Date of Amendment 1: October 1, 2012
Date of Amendment 2: February 28, 2014
Date of Amendment 3: November 2, 2015
Date of Amendment 4: January 11, 2016
Date of Amendment 5: February 1, 2016
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 Retube and Feeder Replacement Project that was entered into between SNC-Lavalin Nuclear Inc. and Aecon Construction Group Inc. (the "SNC/AECON JV") as the successful proponent/contractor and OPG as of March 1, 2012, and updated to reflect the following amendments thereto: (i) amendment agreement number 1 dated as of October 1, 2012 ("Amendment 1"); (ii) amendment agreement number 2 dated as of February 28, 2014 ("Amendment 2"); (iii) amendment agreement number 3 dated as of November 2, 2015 ("Amendment 3"); (iv) amendment agreement number 4 dated as of January 11, 2016 ("Amendment 4"); and amendment agreement number 5 dated as of February 1, 2016.

The form of agreement is an engineering, procurement and construction contract, and the form of agreement and amendments reflect extensive feedback from the entire OPG project team, external legal counsel (Blake, Cassels & Graydon LLP) and the contractor.

1 Phased Approach to Refurbishment Work

2 The agreement divides the retube and feeder replacement work on the Darlington
3 refurbishment project into three distinct phases – the definition (planning) phase, the
4 execution (doing) phase, and the commissioning phase. The agreement focuses on definition
5 phase and execution phase activities. The commissioning phase work is anticipated to be a
6 relatively minor component of the project.

7
8 The multi-year definition phase was intended to provide the contractor and OPG with
9 sufficient opportunity to plan all of the retube and feeder replacement work for the four
10 reactor units at Darlington. The design, fabrication and testing of all tooling required to
11 perform this work occurred during the definition phase. The mock-ups of the reactor face,
12 which will be used to test the tooling and for worker training purposes, were also completed
13 during the definition phase.

14
15 As part of the definition phase work, the contractor and OPG developed an “execution phase
16 plan”. This included a cost estimate, schedules (milestone, target, submittal) and a risk
17 register for the execution phase. The cost and schedule estimates developed by the
18 contractor were subjected to a P50 analysis, which means that the cost and schedule
19 estimates included contingency amounts required to be added or deducted from the
20 estimates to provide the contractor with a confidence level of 50 per cent of achieving
21 completion of the work at the estimated cost and within the estimated timeline. The P50
22 analysis was the basis for establishing the target cost and target schedule under the
23 agreement. The contractor’s fixed fee for the execution phase work was calculated based on
24 the target cost.

25
26 Consequent to the definition phase work, OPG made a decision, pursuant to Amendment 4,
27 to proceed with the execution phase work with the contractor. This was one of the key
28 inflection points in the agreement. If the contractor and OPG had not agreed on the elements
29 of the execution phase plan, OPG could have decided not to proceed with the execution
30 phase work. The dispute resolution mechanism provided for in the agreement would not
31 have applied to the terms of the execution phase plan, and the contractor would not have

1 been entitled to any extraordinary payment if OPG had decided not to proceed with the
2 execution phase work and elected to terminate the agreement for convenience.

3
4 Target Cost Model for Key Components of the Contract Price

5 The agreement adopts a target cost model for the definition phase work and the execution
6 phase work. Under this model, OPG will pay all of the contractor's actual costs (other than
7 overhead costs) incurred in performing the work. The contractor will be entitled to a fixed fee
8 as compensation for all of its overhead costs, profit and risk. The agreement includes
9 "allowed cost" and "disallowed cost" concepts for reimbursable work, as well as a detailed
10 cost allocation table, to distinguish actual costs that are reimbursable by OPG from actual
11 costs that are to be included in the contractor's fixed fee. To address the risk of cost overruns
12 by the contractor on reimbursable work, the agreement also includes a financial
13 incentives/disincentives mechanism that is tied to the target cost for the definition phase work
14 and the execution phase work. As a result, while the contractor will be reimbursed for all of its
15 actual (allowed) costs, up to 48 per cent of its fixed fee will be at risk if there are cost
16 overruns (up to 80 per cent of its fixed fee in aggregate for cost and schedule overruns). This
17 financial incentive/disincentive mechanism also applies to schedule risk and is described in
18 more detail below.

19
20 The definition phase target cost, the definition phase fixed fee and the execution phase fixed
21 fee percentages were bid by SNC/AECON JV as the successful proponent as part of its final
22 proposal. The amounts proposed by the contractor were incorporated into the agreement
23 and amended to reflect changes in scope.

24
25 Other Components of the Contract Price

26 The design, fabrication and testing of the tooling were done on a fixed price basis. This fixed
27 price was bid by SNC/AECON JV as the successful proponent as part of its final proposal.
28 The fixed price amount proposed by the contractor was incorporated into the agreement and
29 amended to reflect changes in scope.

30

1 The construction of the reactor mock-ups was also done on a fixed price basis. This fixed
2 price was bid by SNC/AECON JV as the successful proponent as part of its final proposal.
3 The fixed price amount proposed by the contractor was incorporated into the separate mock-
4 ups agreement, as amended to reflect changes in scope.

5
6 For all commissioning phase work, the contractor will be entitled to reimbursement of its
7 actual costs, plus a fixed percentage fee. This percentage was bid by SNC/AECON JV as
8 the successful proponent as part of its final proposal. The percentage proposed by the
9 contractor was incorporated into the agreement.

10 11 Tooling Performance Guarantee and Tooling Fixed Price Reduction

12 The agreement requires that the tooling meet the minimum productivity threshold ("tooling
13 performance guarantee") that the contractor provided as part of its final proposal. The
14 agreement contemplated a reduction of up to 10 per cent in the tooling fixed price if the
15 tooling failed to meet this productivity threshold during testing on the mock-ups. However, the
16 tooling met or exceeded the productivity threshold and, therefore, the tooling fixed price did
17 not need to be reduced. If the tooling failed to meet this productivity threshold, the agreement
18 gave OPG discretion to allow the contractor more time to improve the performance of the
19 tooling or, alternatively, to proceed with the execution phase work using the sub-standard
20 tooling.

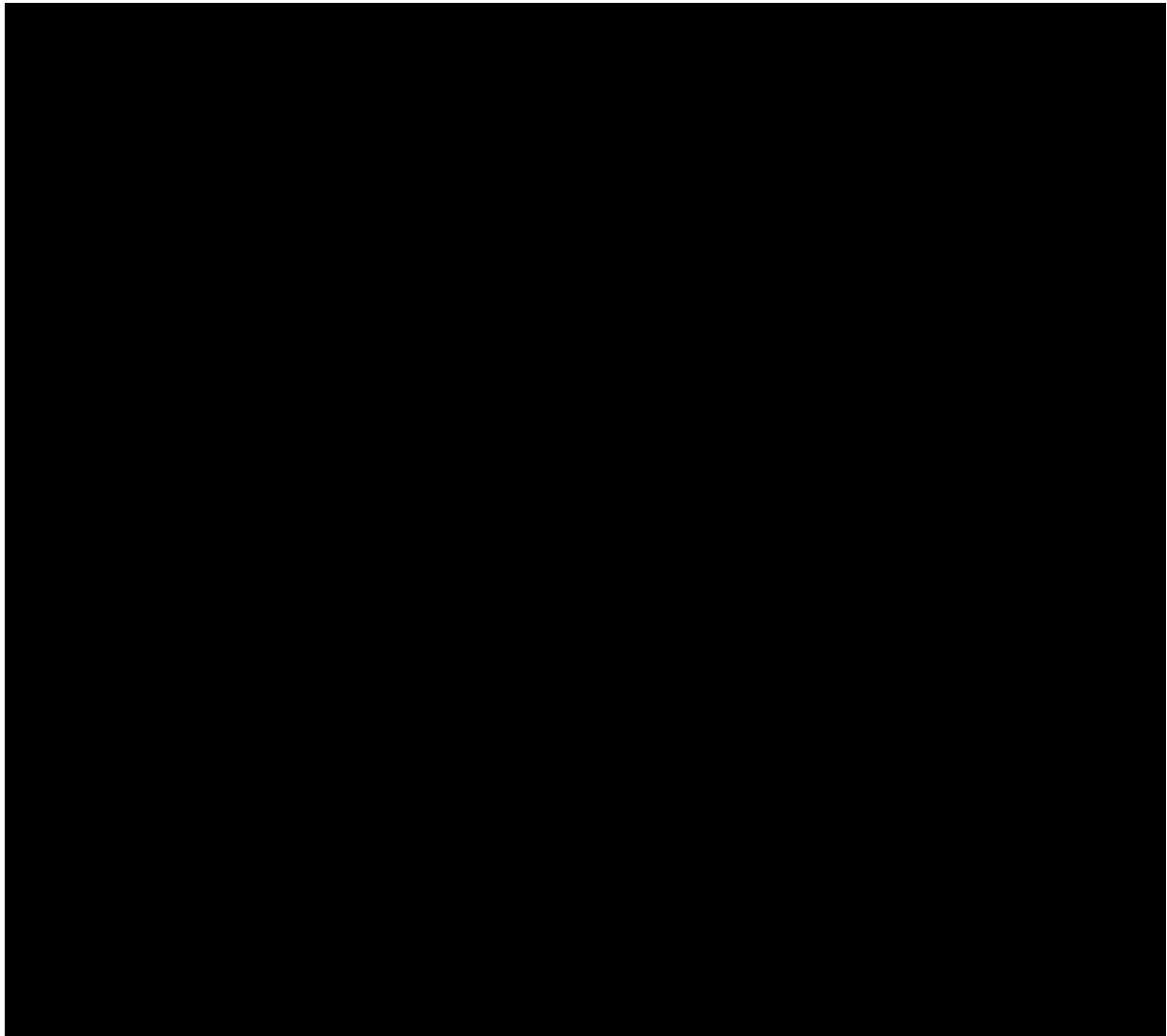
21 22 Schedules

23 Work on the definition phase and the execution phase is governed by a milestone schedule,
24 a detailed target schedule and a submittal schedule.

25
26 The milestone schedule, the target schedule and the submittal schedule for the definition
27 phase were submitted by each proponent as part of its final proposal. The schedules
28 proposed by the contractor and agreed to by OPG were incorporated into the agreement and
29 amended to reflect changes in scope.

1 The milestone schedule, the target schedule and the submittal schedule for the execution
2 phase were developed as part of the execution phase plan, and were incorporated into the
3 agreement by Amendment 4. Certain key dates in the execution phase milestone schedule
4 were established prior to the effective date of the agreement and could not be varied during
5 the development of the execution phase plan, other than by an amendment.

6
7 Productivity Gain Expectations and Experience-Based Schedule Adjustments



Financial Incentives and Disincentives – Cost and Schedule

The 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 commissioning phase.)

For each of the definition phase and the execution phase, the contractor's obligation to pay financial disincentives is capped at 80 per cent of its fixed fee. Conversely, OPG's obligation to pay financial incentives is capped at 40 per cent of the fixed fee. The agreement also includes sub-caps on the total amount of cost disincentives that can be incurred by the contractor during the definition phase and the execution phase (so as to preserve meaningful schedule disincentives).

Definition Phase – Cost Incentives and Disincentives

The agreement establishes a neutral band of \$2,500,000 above and below the definition phase target cost. If the actual amount of reimbursable costs incurred during the definition phase falls outside of the neutral band, either OPG will pay to the contractor (for cost savings), or the contractor will pay to OPG (for cost overruns), a specified percentage (not exceeding 50 per cent) of the total cost savings or cost overruns.

Execution Phase – Cost Incentives and Disincentives

The agreement establishes a neutral band of \$75,000,000 above and below the execution phase target cost. If the actual amount of reimbursable costs incurred during the execution phase falls outside of the neutral band, either OPG will pay to the contractor (for cost savings), or the contractor will pay to OPG (for cost overruns), a specified percentage (not exceeding 50 per cent) of the total cost savings or cost overruns. The calculation and payment of such cost incentives and disincentives will be done on an aggregate basis for all completed units.

1 *Definition Phase – Schedule Disincentives*

2 The agreement requires the contractor to pay to OPG \$100,000 for each calendar day that
3 completion of the definition phase work is delayed past the date specified in the definition
4 phase milestone schedule.

6 *Execution Phase – Schedule Incentives and Disincentives*

7 The agreement requires OPG to pay to the contractor an incentive amount equal to \$125,000
8 multiplied by the number of full calendar days by which the actual duration of the work on
9 each unit is less than the target scheduled duration for such work. The agreement requires
10 the contractor to pay to OPG a disincentive amount equal to \$250,000 multiplied by the
11 number of full calendar days by which the actual duration of the work on each unit exceeds
12 the guaranteed duration for such work, which is 10 per cent above the target scheduled
13 duration. The calculation and payment of such schedule incentives and disincentives will be
14 done on an aggregate basis for all completed units.

16 Rework

17 The contractor is required to perform all work safely and diligently, in an organized and timely
18 manner, and in accordance with the agreement, applicable laws and prudent practices. It is
19 acknowledged in the agreement that, notwithstanding the exercise of prudent practices by
20 the contractor, a certain amount of typical rework is to be expected on a project of this
21 nature. Therefore, the agreement contemplates the inclusion of an allowance equal to three
22 per cent of the labour portion of each of the definition phase target cost and the execution
23 phase target cost for rework. Any actual costs incurred by the contractor for rework in excess
24 of such allowances will be reimbursable by OPG, but such target costs will not be adjusted.

26 Project Change Directives, Excusable Delays and Force Majeure

27 The agreement tightly restricts the ability of the contractor to initiate “project change
28 directives” (change orders) and to make claims for “excusable delay” events and “force
29 majeure” events.

1 An “excusable delay” is a delay that is caused by an OPG breach or a stop work order,
2 emergency or hazardous condition for which OPG is responsible, and which extends the
3 critical path of the Definition Phase Milestone Schedule or the Execution Phase Milestone
4 Schedule, as applicable, by more than three days. Delays due to certain radiation protection
5 activities are also considered “excusable delays” under the agreement.

6
7 Neither party will be held responsible for material delays resulting from certain “force
8 majeure” events, which are restricted to fire, flood, tidal wave, lightening, earthquake,
9 cyclone, tornado, hurricane, explosion, severe ice storm, epidemic or pandemic disease,
10 legal strike or lock-out (other than those caused by the contractor, a subcontractor, or their
11 employees, or work to rule activities), war, riot, sabotage or other acts of public enemies,
12 including terrorists, or site-related blockades (other than labour-related events).

13
14 An “excusable delay” or a “force majeure” event entitles the applicable party to schedule
15 and/or cost relief depending on the type of work (i.e. fixed, firm price or reimbursable work)
16 impacted by the delay or the event.

17
18 The rationale for this restrictive approach is twofold. First, the “functional” scope of work for
19 the Darlington refurbishment project is to be determined (or confirmed) in part by the
20 contractor itself during the definition phase. As a result, the contractor should not be
21 discovering additional scope or encountering delay-inducing “unforeseen risks” as the
22 execution phase work progresses. Second, the contractor should have had sufficient time
23 during the definition phase to fully investigate the site conditions, and should have captured
24 all of the required work when developing the execution phase target cost and the execution
25 phase schedules. The restriction on project change directives and claims for “excusable
26 delay” events and “force majeure” events was intended to give the contractor an incentive to
27 do the best possible planning work during the definition phase. The contractor also enjoys
28 the benefit of a significant neutral band around the target cost that affords protection against
29 erosion of fee for any changes that fall within the neutral band.

1 The agreement also takes a standard approach to scope changes resulting from “concealed
2 conditions” inside the vault and calandria of each unit. The contractor is not able to examine
3 all of these areas prior to commencement of the execution phase work.

4
5 Contractor Personnel

6 The agreement requires the contractor to identify and employ certain key personnel for the
7 duration of the Darlington refurbishment project. This obligation is reinforced with financial
8 penalties if such key personnel are replaced without OPG’s prior consent. The agreement
9 gives OPG certain veto rights over the contractor’s field supervisory staff.

10
11 “Open Book” Approach and OPG Audit Rights

12 The agreement requires the contractor to provide OPG with full and open access to all
13 financial and other records relating to the project. The agreement also provides OPG with
14 extensive audit rights for all financial and other records that relate to work that is performed
15 on a reimbursable costs basis, with few restrictions on the lookback periods for audits and
16 readjustment of contractor cost claims. OPG’s audit rights with respect to payroll burdens (an
17 agreed payroll burden percentage is used as a proxy for actual payroll burden costs) and
18 work that is performed on a fixed price basis or firm price basis are narrower.

19
20 Procurement of Owner-Specified Materials

21 The agreement requires the contractor to procure all “Owner-Specified Materials” for OPG on
22 a cost plus a fixed percentage fee basis. This percentage was bid by the SNC/AECON JV as
23 the successful proponent as part of its final proposal. Owner-Specified Materials include,
24 among other things, the calandria and pressure tubes, all “nuclear material” as defined in the
25 *Nuclear Liability Act* (Canada) in respect of which the duties under section 3 of the *Nuclear*
26 *Liability Act* (Canada) are imposed on OPG, and all nuclear waste containers, racks and
27 flasks.

28
29 Subcontractors

30 The agreement permits the use of subcontractors, but obliges the contractor to “push down”
31 all applicable terms and conditions of the agreement to each subcontractor.

1
2 Cash Neutrality for Contractor

3 The agreement contemplates that OPG will keep the contractor in a “cash neutral” position
4 while the work is being performed.
5

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

7 The agreement provides that OPG is entitled to claim all SRED tax credits generated by work
8 on the Darlington project, including those generated in connection with the development of
9 the tooling.
10

11 Performance Security

12 The agreement obliges the contractor to post a letter of credit in the amount of 10 per cent of
13 the tooling fixed price to support the contractor’s obligations under the tooling performance
14 guarantee and for completion of the tooling by the date specified in the definition phase
15 milestone schedule.
16

17 The agreement also obliges the contractor to post a letter of credit to support its obligations
18 under the agreement and the separate mock-ups agreement, initially in the amount of
19 \$50,000,000 and, on commencement of the execution phase work, increasing to
20 \$100,000,000. This letter of credit amount steps down over time as work on the project is
21 completed and warranty periods expire.
22

23 The contractor provided guarantees in OPG’s standard form from the ultimate parent
24 companies of the contractor in support of all of the contractor’s obligations under the
25 agreement. These guarantees contain ratings-based and/or covenant based tests of the
26 ongoing creditworthiness of the parent guarantors.
27

28 Ownership of the Tooling

29 The agreement requires that ownership of the physical tooling be transferred to OPG as such
30 tooling is completed.
31

1 Intellectual Property

2 The agreement requires the contractor to transfer to OPG, or to license to OPG, all
3 intellectual property required for performance of the work, including all intellectual property
4 associated with the tooling. The agreement also provides for the continuing use of such
5 intellectual property by OPG if the agreement is terminated, either following a contractor
6 default or for convenience.

7
8 Completion Incentives

9 The agreement provides for substantial holdbacks of the contractor's fixed fee and other
10 financial incentives at successive points in the completion of the work on each unit – at "Unit
11 Mechanical Completion", at "Final Mechanical Completion" and at "Final Completion". These
12 holdbacks are primarily intended to ensure that OPG receives all "available for service"
13 documentation that is required for the restart of each refurbished unit.

14
15 Warranty

16 The agreement provides for a warranty of the contractor's work, and obliges the contractor to
17 correct any defective work at its own cost. The warranty period for each unit ends on the
18 earlier of (i) the date that is three months after the actual end date of the first planned outage
19 for such unit, and (ii) the date that is five years from unit mechanical completion for such unit.
20 For work relating to common services for all units, the warranty period will end concurrent
21 with the warranty period for the last unit. If warranty work is performed by the contractor, an
22 extended warranty period also applies. This extended warranty period ends on the earlier of
23 (i) the date that is three months from the actual end date of the next planned outage for such
24 unit, and (ii) the date that is four years from the date on which the corrected work re-enters
25 commercial operation. The warranty period for a unit will not in any event extend beyond nine
26 years from the unit mechanical completion date for such unit.

27
28 Termination for Default

29 The agreement includes standard events of default. If the contractor defaults, OPG will be
30 entitled to terminate the agreement and to exercise a number of self-help remedies.
31 Termination for default would permit OPG to make a claim against the contractor for full

1 contractual damages (subject to a percentage cap formula that is linked to the total contract
2 price and certain other amounts).

3
4 Termination for Convenience

5 The agreement permits OPG to terminate the agreement for convenience at any time.
6 Certain types of direct damages (but not full contractual damages) will be payable by OPG to
7 the contractor in such circumstances.

8
9 Suspension of the Work

10 The agreement permits OPG to suspend the work at any time. Certain types of direct
11 damages (but not full contractual damages) will be payable by OPG to the contractor in such
12 circumstances. If additional activities are added by OPG that are not already being
13 performed by the contractor, and that extend the critical path of the work being performed,
14 OPG and the contractor will follow a specified suspension protocol.

15
16 Dispute Resolution

17 The agreement provides for both informal and formal resolution of disputes. The informal
18 procedure contemplates a staged escalation of disputes within OPG's and the contractor's
19 management structure with a view to achieving a consensual resolution of the dispute. The
20 formal mechanism is binding arbitration under commercial arbitration rules. The agreement
21 limits the recourse of the contractor and OPG to the ordinary courts.

22
23 Other Projects

24 The agreement restricts the contractor from transferring, or permitting any affiliate from
25 transferring, supervisory trade personnel at the superintendent level or higher that have
26 received project-specific training and have been assigned to the project for four months or
27 more to any other nuclear generating station refurbishment project during the term of the
28 agreement without the prior consent of OPG.

1 Other Use of the Tooling

2 Under the agreement the contractor agrees that (i) the tooling, or any component thereof, will
3 not be diverted for use in any other project undertaken by the contractor or any other person,
4 and (ii) the contractor will not use the tooling except at the Darlington nuclear generating
5 station until such time as unit mechanical completion is achieved for the last unit.