

SUPREME COURT OF YUKON

Citation: *North America Construction (1993) Ltd. v. Yukon Energy Corporation*, 2021 YKSC 5

Date: 20210201
S.C. No. 11-A0114
Registry: Whitehorse

BETWEEN:

NORTH AMERICA CONSTRUCTION (1993) LTD.

PLAINTIFF

AND

YUKON ENERGY CORPORATION

DEFENDANT

Before Chief Justice S.M. Duncan

Appearances:

H. David Edinger and
Talya Nemetz - Sinchein
Morgan L. Burris and
Todd Shikaze

Counsel for the Plaintiff

Counsel for the Defendant

REASONS FOR JUDGMENT

Introduction

[1] This case demonstrates the perils of parties to a complex construction contract relying on ongoing negotiations while the contractual obligations are being fulfilled, to finalize pricing, design and scheduling. It also demonstrates the additional costs resulting from a deteriorating contractual relationship in which the trust between the parties is lost.

[2] Yukon Energy Corporation (“YEC”) entered into a contract with North America Construction (1993) Ltd. (“NAC”) in 2010, for work at the Aishihik Generating Station (“AGS”), located on the Aishihik River, 120 kilometres northwest of Whitehorse (“the Contract”). The purpose of the Contract was to install a third turbine generator and

related switchgear and equipment, as well as to install additional power cables for redundancy in order to reduce future reliance on thermal power (liquid natural gas or diesel). The project was called Aishihik Third Turbine and Redundancy Installation Project and was a major capital project for YEC.

[3] Work began in August 2010, before the Contract was finalized. The parties had not yet agreed upon schedules, including the timing of necessary shutdowns of the generating station by YEC to allow certain work under the Contract to be concluded. Designs of the major project equipment were not yet completed. Final pricing was dependent on scheduling and consequent timing and it also was not established before the contract work began.

[4] Various disputes arose over the course of the Contract, which was eventually completed in December 2011. Many of these disputes were settled. Those that could not be resolved went to trial, then appeal. The Court of Appeal of Yukon sent four issues to this Court for re-trial.

[5] YEC has paid to NAC a total of \$8,058,173.48. This consists of the Contract payments of \$7,463,570, less \$746,357 in holdback, for an initial amount of \$6,717,213. At the first trial, YEC was ordered to and did pay to NAC \$1,682,470.48. This amount was reduced by the Court of Appeal of Yukon by \$341,510, which NAC returned to YEC.

[6] This second trial was conducted as a partial summary trial on consent. All examination-in-chief, barring some introductory evidence, was provided in the form of affidavits and exhibits. Cross-examination occurred of certain witnesses by both parties. The parties filed five volumes of a Revised Common Book of Documents, as well as

written submissions. The summary trial was conducted in one week, unlike the first trial which occurred over a period of twenty days.

[7] In order to arrive at the conclusions below, I have reviewed the evidence filed in this trial, and considered the evidence provided on cross-examination of the *viva voce* witnesses, as well as the helpful submissions of counsel. It is impossible given the technical and detailed nature of the evidence to refer to all of it below. I have restricted my references to the salient points that led to my conclusions.

[8] The outstanding issues to be determined are:

- a) NAC claim for \$633,000 for additional work as a result of the change in shutdown periods and new completion date;
- b) NAC claim for \$119,000 for costs incurred from cables added by YEC during the start-up and commissioning project phase;
- c) YEC counterclaim for costs of \$206,971 for replacement of two electrical cabinets with open backs as specified by the Contract; and
- d) YEC counterclaim for damages for deficiencies in the range of \$713,688 and \$738,864.

Background Facts

Introduction

[9] The parties provided a detailed agreed statement of facts. The following sets out those that are most relevant from the agreed statement of facts, as well as from the undisputed facts from the various affidavits filed for this summary trial.

[10] YEC is a Crown corporation. It owns and operates the AGS, functional since 1975. YEC's financial performance is approved by the Yukon Utilities Board which

determines rates to be charged for electricity. YEC must justify its expenditures to the Yukon Utilities Board.

[11] Aishihik Lake allows for the AGS to be the main water storage facility for the Yukon electrical grid. It stores water that is available to generate electricity during the peak demand period of winter, and during years that are dry. It is an essential facility to fulfill YEC's obligation to generate power for the Yukon, especially during the winter.

[12] An important contextual fact is that Yukon is not connected to any other electrical grid, unlike most other jurisdictions in North America. As a result, if the YEC facilities fail, there is no ability for Yukon to purchase electricity from other utilities outside the territory. The reliance of the Yukon population for their electricity on the proper functioning of the YEC facilities is complete.

Overview of Project

[13] Before this 2010-11 construction, the AGS had two turbine generators, uniquely located in a powerhouse 120 metres underground. It was the first underground power plant constructed north of 60 in the western world.

[14] The underground part of the plant is connected by a vertical shaft enclosing an elevator, to an above-ground building containing communication and control equipment, including switchgear. There is also an above-ground switchyard, where the outdoor part of the substation is located.

[15] The two turbines generate electricity which is transmitted through power cables housed in the vertical elevator shaft, to power transformers in the substation. The voltage of the electricity is adjusted by the transformers and then transmitted into the Yukon electrical grid for distribution.

[16] In 2009, YEC decided to build a third turbine generator, referred to as AH3, which was contemplated by the original design of the power plant in the 1970s. This additional turbine was to meet the increasing demand for power in the Yukon in an affordable way.

[17] At the same time, YEC planned to twin the power cables connecting the generating floor underground, with the surface, and add separate connections for the power transformers. The purpose of this was to minimize the likelihood of a plant outage and consequent Yukon power grid outage. An eight-hour territory-wide outage had occurred in early 2006, when one of the primary power cables at the AGS failed. The problem was solved by shutting down the AGS for several days and transferring to diesel power generation for the following six months.

[18] The current cost to replace power generated by AGS with thermal power (that is, diesel or liquid natural gas) is approximately \$9,250/hour.

[19] This redundancy project was planned to allow for the new and old cables to operate in parallel to transmit energy. If one of the parts failed, it could be isolated off-line, replaced or repaired, while the other cables continued to operate to maintain power service to the grid. The redundancy project also included upgrading the switchgear.

Contract Process and Relevant Provisions

[20] In January 2010, YEC put the two projects out for tender. The proposed contract included the installation of AH3, to be supplied by YEC, in a tunnel 120 metres underground; the supply and construction of associated civil, structural, mechanical and electrical systems, including a YEC supplied modular, pre-engineered building, new switchgear, and interconnecting cable, electrical and controls systems.

[21] After receiving a number of bids, all exceeding the available budget, YEC cancelled the tender. It decided to negotiate directly with three of the bidding contractors, including NAC.

[22] NAC is an Ontario company with experience in the construction of dams and generation plants.

[23] In August 2010, YEC accepted NAC's proposal of \$7,136,885 excluding GST, (the "Contract Price") subject to finalization of:

- a) the fan wall design and costs;
- b) the size of the camp;
- c) the penstock design and costs; and
- d) the schedule.

[24] The fan wall was the air handling unit needed to prevent AH3 from overheating while operating. The penstock was the pipes used to transport water into the turbine. The designs were to be completed by other contractors to YEC.

[25] The Contract Price was based on a substantial completion date of June 19, 2011, with one shutdown of six weeks, commencing May 1, 2011. Shutdown, meaning de-energizing and dewatering the plant, was required in order to do certain work.

[26] YEC carefully planned the timing and length of shutdown periods at the AGS in order to minimize the costs of thermal power that had to be used during shutdowns to generate power, especially in the winter. Generally, YEC shuts down the AGS during the summer months as much as possible and stores water there. While the AGS is shut down, the output of the other two power generation facilities (located in Whitehorse and

Mayo) is increased and may require diesel or liquid natural gas generation. The AGS is relied on more in the winter months because of its greater efficiencies.

[27] NAC began work in August 2010, after YEC issued a limited notice to proceed. Contract negotiations were ongoing at that time. The Contract was finally executed in December 2010. It provided for substantial completion by November 30, 2011.

[28] YEC also advised NAC on October 27, 2010, that there would now be two shutdown periods: first, from June 1-30, 2011, and second, from October 1-21, 2011, with the hope that the October shutdown could be moved to September or eliminated altogether. YEC acknowledged that NAC was required to be on site for the two shutdown periods.

[29] The contractual provisions reflecting this revised agreement were as follows:

3.3. Completion Date

The Contractor will complete the Work on or before November 30, 2011 (the “**Completion Date**”), unless otherwise agreed to in writing by the Agreement Manager, at which time the Aishihik power generating station (including the Work) will be available for commercial operation, that being ready for use or is being used for the purpose intended. Prior to the Completion Date, YEC will facilitate two shutdowns of the entire facility (the “**Shut Down Windows**”) in order to permit the tie-in of the penstock and substation retrofit work:

- (a) The first Shutdown Window will commence on June 1, 2011 and be completed on June 30, 2011. This shutdown will include a penstock dewatering for the purpose of connecting the penstock to the existing upstream plug. With dewatering/watering up of the tunnel shaft and isolation requirements, available working time is reduced by approximately four (4) days.
- (b) Subject to the status of [the] Mayo outage, the second Shutdown Window is tentatively

scheduled to start on October 1, 2011 and be completed on October 31, 2011. YEC would prefer that a second penstock dewater be avoided if at all possible due to stresses imposed on the shaft rock during the dewatering process. Early completion of the Mayo plant outage may allow for an earlier start/finish to the second Shutdown Window.

The Price is based upon a Completion Date of June 19, 2011 with a six-week Shutdown Window commencing May 1, 2011. The Price is subject to adjustment under Schedule D.

[30] Schedule D was added to the Contract because NAC advised that the change from one shutdown window to two had additional cost implications, which were at that time unable to be calculated. Schedule D provided:

1. **The Price will be adjusted to reflect the Contractors [as written] actual costs caused by the new Completion Date of November 30, 2011 under Section 3.3.** The Price at Section 8.1 is based upon the original completion date of June 19, 2011 with a six week shut down window commencing May 1, 2011 [emphasis added].

[31] It was understood by the parties in December 2010 that further changes to the scope of work would be needed as the project progressed and price adjustments would follow. Sections 4.5 and 4.6 of the Contract allowed for these price adjustments as a result of changes to the work.

[32] The parties exchanged numerous change orders throughout the course of the contract (“CRXs”), all of which were resolved, except for those that are the subject of this litigation. These CRX claims started as early as November 2010.

[33] The actual shutdowns occurred between June 1-19, 2011, and October 1-19, 2011. NAC remained on site during the summer months of 2011, although they had

originally planned to be off-site after post-shutdown activities in July and August 2011, and before pre-shutdown activities in September 2011.

[34] As the parties were discussing the change in shutdown periods, NAC provided to YEC an estimate of their daily costs of remaining on site longer than originally contemplated by the Contract Price. On September 27, 2010, Lou Landry, NAC's Vice President-Risk Management estimated NAC's expected additional costs at approximately \$278,000 for six weeks' work (approximately \$6,620/day).

[35] The project was substantially complete in early December 2011. AH3 began generating power on December 6 or 7, 2011. NAC demobilized shortly after that.

[36] Although YEC noted a number of deficiencies and defects in the completion of the Contract, they refused to allow NAC to remedy them due to their loss of confidence in NAC's capabilities. This position was upheld on appeal.

[37] The deficiencies and defects form part of the dispute to be resolved here.

Overview of the Work

[38] The key mechanical and civil components of the project were:

- a) a new above-ground building to house the new switchgear;
- b) excavation and civil work to prepare the underground tunnel to house the AH3 turbine-generator and associated equipment;
- c) installation of the penstock which brought water to the AH3 turbine;
- d) installation of the turbine inlet valve ("TIV"), which controlled the amount of water flowing to the AH3 turbine;

- e) installation of the hydraulic pressure units - the high pressure unit (“HPU”) and low pressure unit (“LPU”) - which controlled the TIV and other components of the AH3 turbine;
- f) installation of the AH3 turbine and generator;
- g) installation of the tailrace, the pipe that transported the water leaving the AH3 turbine;
- h) installation of the knife gate, which allowed the flow of water in the tailrace to be stopped downstream of the AH3 turbine; and
- i) installation of the fan wall air handling unit, needed to prevent AH3 from overheating when in operation.

[39] The key electrical components of the project were:

- a) new power cables connecting AH3 to the substation;
- b) new switchgear;
- c) new control and protection panels (referred to as the 6F and 6R panels) and cabinets for AH3; and
- d) inter-connection of the AH3 unit and its ancillary equipment with the new switchgear and new and existing control, protection and communications systems.

Overview of Milestones in the Project and Dates of Completion

[40] YEC and NAC considered the following steps to be part of the critical construction path:

- a) the delivery, installation and tie-in of the penstock pipe, part of which had to be below the tunnel floor - **completed by October 2011**;

- b) the installation of the new switchgear in the new switchgear building - **completed on or about March 9, 2011** - and required communication and control work for the switchgear - **completed by October 2011**;
- c) the installation of the new feeder cables in the elevator shaft - **completed by April 2011**;
- d) the tunnel floor construction - **completed by July 11, 2011**, followed by turbine, generator and related equipment installation - **completed by end of August 2011**;
- e) delivery and installation of the 60" knife gate, which allows the flow of water in the tailrace (where the water exits after going through the turbine) to be stopped downstream of the AH3 turbine - **completed by October 2011**;
- f) final shutdown activities, including penstock and tailrace final connections, switchyard work - **completed by October 2011**;
- g) post-shutdown activities, including rewatering of the plant, testing, commissioning and start-up of AH3 - **completed by December 6-7, 2011**.

Sources of Conflict

Penstock Design and Installation and Thrust Block Redesign

[41] YEC contracted with AECOM Canada Ltd. ("AECOM") for the design of the penstock. Its purpose was to bring water to the AH3 turbine. Due to design changes, the design was not finalized until December 2010. The penstock was ordered and arrived earlier than anticipated, in early February 2011. However, NAC anticipated it would

have to remain on site during the summer months when it had originally planned to be off site because of the penstock design and subsequent installation delays.

[42] The design included the construction of two concrete thrust blocks intended to support the penstock and absorb the force of the water travelling inside the pipe.

[43] The thrust blocks were provided to NAC later than originally anticipated, also as a result of a re-design. The design was finalized and issued to NAC on March 26, 2011. NAC and YEC ultimately agreed that the thrust block re-design caused 21 days of delay. NAC was compensated according to the Contract, through two change orders – CRX 32 to address the direct construction costs incurred as a result of the change in work and CRX 34 to address the associated schedule delay costs.

[44] The penstock pipe was divided into nine pieces. Pieces three to eight were to be installed and tested before the thrust blocks were constructed. After the thrust block construction and after the concrete floor was poured over pieces three to eight, NAC would install piece nine. The original plan, as of February 2011, considered the baseline schedule, was to install the TIV (which controlled the amount of water going to the AH3) onto the downstream end of piece nine of the penstock, and then connect pieces eight and nine. Finally, piece one of the penstock was to be connected, or tied in, to the main intake penstock for the plant, while the plant was dewatered during the June shutdown. The final work to connect pieces one through three was also to be completed at this time.

[45] Pieces three to eight of the penstock were positioned, welded and installed by April 18, 2011.

[46] In April 2011, a decision was made not to use the TIV as the isolation point for the new penstock for AH3 after the rewatering of the plant in June. Instead, NAC was directed to install a blind flange (also referred to as a dished head) on the downstream end of piece one (not piece nine) of the penstock. This resulted in a change of plans. Pieces one and two of the penstock would now be connected during the October shutdown, at which time the blind flange would also be removed. It was still planned to complete the balance of the penstock work during the June shutdown.

[47] Ultimately, this is not what took place. The penstock was not connected until the October shutdown, four months later than planned in February.

Concrete Fill for the Tunnel Floor Slab Construction

[48] The AH3 generator and turbine equipment could not be lowered into the turbine gallery and positioned until the concrete floor was poured. Before the pour, concrete fill needed to be placed and compacted around the penstock to create a base for the floor.

[49] The Type 4 concrete fill was placed during the week of May 9, 2011. Several days later, it became clear that it was not setting properly as a result of errors made by the supplier of the fill. The concrete pour for the tunnel floor could not proceed.

[50] The Type 4 fill had to be dug out and replaced. This was completed in early July 2011. As a result, the tunnel floor slab was not poured until July 11, 2011, and the generator, turbine and other equipment could not be lowered and installed until August 1-28, 2011, approximately six months later than planned according to the baseline February 2011 schedule.

[51] NAC brought in its subcontractor to perform the final alignment of the generator, turbine and TIV once it was lowered and in place. This work started on September 15, 2011, and had originally been planned for May 2011, based on the February schedule.

[52] Three CRX claims were brought by NAC against YEC for extra work NAC was required to perform related to the installation of the turbine and generator. This extra work was performed after August 2011, and as late as November 2011.

[53] NAC was compensated in the amount of \$50,000 by its insurer as a result of a claim made for delay and lost productivity from the Type 4 fill issue. It caused a delay of two months, according to NAC, and required them to be on site during the summer months from July 15 to September 14, 2011.

General

[54] YEC was unhappy with the work done by NAC, starting in the spring of 2011. YEC was particularly concerned during the June shutdown with NAC's failures of workmanship, safety, and efficiencies. A stop work order had been issued to NAC by a regulatory agency on June 9, 2011, for failure to maintain a safe workplace underground. It was in place until June 20, 2011. NAC's safety officer resigned around this time.

[55] At a meeting held with NAC on June 19, 2011, YEC expressed their concerns and requested and received copies of the CVs for all NAC supervisory personnel on the project. NAC replaced its site supervisor in June 2011. Thereafter, mechanical work improved but there were still problems with the electrical work, outlined below.

[56] Some of the problems with NAC's work were outlined in a deficiency list prepared by YEC in November 2011. After several exchanges with NAC and modifications of this

deficiency list, representatives from YEC and NAC conducted a walk-through of the site in March 2012, to confirm their respective positions on the deficiency list. Three more versions of this list were prepared. On July 20, 2012, YEC provided its final response to NAC's comments on the deficiency list. Seventy-nine items were identified and agreed to by NAC as constituting deficiencies or defects in the work required to be performed by NAC pursuant to the Contract.

[57] At trial, the number of outstanding deficiencies claimed by YEC was 82 or 83, based on YEC expert Doug Mortimer's review of the list, and his site visit in July 2012.

[58] Section 12.1 of the Contract contained an indemnity in favour of YEC for failure of NAC to comply with the terms of the contract. Section 12.1 provides:

12.1 Indemnity

The Contractor will indemnify YEC and its respective directors, officers, employees, and agents from and against all costs, expenses, and liabilities;

- (a) Arising out of the failure of the Contractor, the Subcontractors, or the Employees, to comply with this Agreement;
- (b) Arising out of or in connection with, whether directly or indirectly, the performance of the Work by the Contractor, the Subcontractors, or the Employees in such manner that is negligent, or a default under this Agreement; and
- (c) By the Contractor's Subcontractors or Employees against YEC, except to the extent YEC has been negligent, or in default under this Agreement.

12.2 Exceptions

Notwithstanding Section 12.1 above, the Contractor will not, in any case, be liable to YEC for consequential damages or

loss, including but not limited to, loss of use, loss of profit,
loss of business opportunity, goodwill, revenue or downtime.

I. NAC's Claim for \$633,000 in Costs Pursuant to Schedule D

Issue

[59] NAC claims \$633,510.48 for general conditions costs attributable to 14.5 weeks/102 days of extra time it was on site up to and including November 30, 2011.

The issue is the interpretation of Schedule D and whether NAC is required to prove on a balance of probabilities that its claimed Schedule D costs were incurred because YEC changed the schedule to require two shutdown periods and a consequent new completion date. YEC says NAC has not shown, as required, that its reason for being on site for the additional 102 days was because of the new Completion Date created by the two shutdown windows and that this claim should be dismissed entirely.

[60] Schedule D, replicated at para. 30 above, provides that the Contract price will be adjusted **"to reflect the Contractors [as written] actual costs caused by the new Completion Date of November 30, 2011 under Section 3.3"** of the Contract, replicated at para. 29 above. The addition of Schedule D was a result of YEC's change in the shutdown schedule from one six-week shutdown in May/June to two shutdowns – one in June and one in October. Section 3.3 of the Contract addressed the shutdown window changes. Schedule D was an acknowledgement by YEC that NAC would incur certain additional costs as a result of being on site for a longer period of time than originally anticipated.

[61] The difference in interpretation of the parties revolves around the connection between Schedule D compensation and the shutdown windows. YEC urges an interpretation focussed on its understanding of the reason for the Completion Date

change – that is, any costs legitimately claimed under Schedule D must have been incurred as a result of work attributable to the change to shutdown windows, and not for any other reason. In particular, costs are not compensable if they are due to the extended Completion Date (November 30, 2011) for reasons other than the change to shutdown windows. NAC, on the other hand, urges a linear approach – that is, once the contract Completion Date was extended from June 19, 2011, to November 30, 2011, every day spent on site by NAC was to be counted towards costs reimbursement under Schedule D. NAC argues it is not required to show that the only reason it was on site for those extra days was because of the change to shutdown windows.

Brief Conclusion

[62] Schedule D is to be interpreted to allow compensation of general condition costs for work done as a result of the change to shutdown windows and consequent new Completion Date. NAC is entitled to be compensated under Schedule D for the 30 days they spent during the October shutdown, doing shutdown activities that, for the most part, could not have been done at other times. The 7% overhead costs and the 7.5% vacation pay costs are not recoverable. The daily calculations are based on NAC's calculation of \$6,210.89/day, revised from the original estimate provided by Lou Landry in 2010. NAC is entitled to recover \$164,940.02 in costs under Schedule D.

Analysis of Schedule D Issue

Legal Principles Applicable to Interpretation of Schedule D

[63] The Supreme Court of Canada in *Sattva Capital Corp. v. Creston Moly Corp.*, 2014 SCC 53, set out the principles applicable to the interpretation of commercial contracts. As stated by Justice Rothstein:

[47] ... The overriding concern is to determine “the intent of the parties and the scope of their understanding” (*Jesuit Fathers of Upper Canada v. Guardian Insurance Co. of Canada*, 2006 SCC 21, [2006] 1 S.C.R. 744, at para. 27, per LeBel J.; see also *Tercon Contractors Ltd. v. British Columbia (Transportation and Highways)*, 2010 SCC 4, [2010] 1 S.C.R. 69, at paras. 64-65, per Cromwell J.) To do so, a decision-maker must read the contract as a whole, giving the words used their ordinary and grammatical meaning, consistent with the surrounding circumstances known to the parties at the time of formation of the contract. Consideration of the surrounding circumstances recognizes that ascertaining contractual intention can be difficult when looking at words on their own, because words alone do not have an immutable or absolute meaning:

No contracts are made in a vacuum: there is always a setting in which they have to be placed... . In a commercial contract it is certainly right that **the court should know the commercial purpose of the contract and this in turn presupposes knowledge of the genesis of the transaction, the background, the context, the market in which the parties are operating.** (Reardon Smith Line, at p. 574, per Lord Wilberforce)

[48] The meaning of words is often derived from a number of contextual factors, including the purpose of the agreement and the nature of the relationship created by the agreement (see *Moore Realty Inc. v. Manitoba Motor League*, 2003 MBCA 71, 173 Man. R. (2d) 300, at para. 15, per Hamilton J.A.; see also *Hall*, at p. 22; and *McCamus*, at pp. 749-50). As stated by Lord Hoffmann in *Investors Compensation Scheme Ltd. v. West Bromwich Building Society*, [1998] 1 All E.R. 98 (H.L.):

...

[57] **While the surrounding circumstances will be considered in interpreting the terms of a contract, they must never be allowed to overwhelm the words of that agreement (*Hayes Forest Services*, at para. 14; and *Hall*, at p. 30). The goal of examining such evidence is to deepen a decision-maker’s understanding of the mutual and objective intentions of the parties as expressed in the words of the contract. The interpretation of a written**

contractual provision must always be grounded in the text and read in light of the entire contract (Hall, at pp. 15 and 30-32). While the surrounding circumstances are relied upon in the interpretive process, courts cannot use them to deviate from the text such that the court effectively creates a new agreement (Glaswegian Enterprises Inc. v. B.C. Tel Mobility Cellular Inc. (1997), 101 B.C.A.C. 62).

[58] The nature of the evidence that can be relied upon under the rubric of “surrounding circumstances” will necessarily vary from case to case. It does, however, have its limits. **It should consist only of objective evidence of the background facts at the time of the execution of the contract (King, at paras. 66 and 70), that is, knowledge that was or reasonably ought to have been within the knowledge of both parties at or before the date of contracting. ... Whether something was or reasonably ought to have been within the common knowledge of the parties at the time of execution of the contract is a question of fact.** [emphasis added].

[64] Schedule D must be interpreted according to its text, in the context of the whole contract, and the surrounding circumstances.

Purpose of Schedule D

[65] The purpose of Schedule D was articulated by witnesses from both YEC and NAC. Edward Mollard, Chief Financial Officer at YEC, said:

264 Q ...

A ... There was a change to the schedule. The contractors suggested that there was a cost with that. We wanted to - - we wanted the project to not be held up by it, so that was our remedy in this case, that we could agree to adjust for actual costs subject to the determination of what that was. We couldn't determine the number at the time, so that was the fallback position that we took. [Read-Ins of the Plaintiff, Tab 2, p. 14]

[66] Patrick Maloney, the NAC Senior Project Manager, described the purpose of Schedule D as:

71. ... intended to cover NAC's actual general conditions (project specific overhead) costs incurred **for the extended time it would be required to operate on site as a result of Yukon Energy's October 27, 2010 requirement that the shutdown windows be changed from the original window of May 1, 2011 to June 19, 2011 to two separate windows (June 1, 2011 to June 30, 2011 and October 1-31, 2011) with Substantial Completion on November 30, 2011.** [emphasis added] [para. 71 of Affidavit #1 of Patrick Maloney].

[67] Schedule D was drafted in a necessarily general way because the parties were unable to determine the costs at the time of drafting.

[68] Schedule D was not the only contractual provision related to cost recovery for changes to the Contract. Other contractual provisions provided compensation for extra work and delay such as ss. 4.5 and 4.6. These provisions included overhead costs/general conditions in the compensation amount. Schedule D provided another contractual mechanism for compensation for additional costs incurred for a particular reason. Schedule D compensation is restricted to general condition costs.

Surrounding Circumstances of the Contract Negotiation

[69] Surrounding circumstances at the time of negotiating the Contract (August-December 2010) included:

- a) The Contract Price of \$7,136,885 was based on a substantial completion date of June 19, 2011, with a six-week shutdown window starting May 1, 2011, until that understanding changed in October 2010 (outlined below).

- b) Shutdown of the AGS involved two components: mechanical and electrical. Mechanically, the shutdown required dewatering the shaft to relieve the water pressure so that the connection work between the penstock and the existing pipe could be done. With no water flowing to the turbines, the electrical would also necessarily be shut down. Without electricity, the installation of the disconnect switches in the switchyard and the overall tie-in of the new turbine generator to the existing turbine generators could be done.
- c) YEC had the exclusive ability to decide the dates of the shutdown windows. YEC had an interest in minimizing shutdown times, especially in October, for cost reasons. YEC hoped that the October shutdown may be moved to September or eliminated.
- d) YEC was concerned about undue delay to the project.
- e) YEC recognized that NAC would have to be on site for both shutdown windows.
- f) NAC began the contract work in August 2010, well before the Contract was finalized. At the time of the change to the shutdown windows, NAC was in the midst of work that they could not stop.
- g) There was a logical sequencing to the work activities. For example, the penstock had to be connected before the concrete floor was poured; the fill had to be added before the concrete floor was poured; and the concrete floor had to be poured before the turbine generator and related

equipment could be lowered. If there was a delay in one of these activities, it necessarily caused a delay in the ones that followed.

Position of NAC on Schedule D

[70] Contrary to Patrick Maloney's statement that compensation to NAC under Schedule D is for additional costs as a result of the change to the shutdown windows schedule and consequent extension of the Contract completion date, NAC's arguments suggest that they only have to show additional costs as a result of the new completion date.

[71] NAC does not identify what time they spent on site beyond June 19, 2011, for reasons other than the change in the shutdown windows. In other words, NAC's arguments assume that all of their time spent on site after June 19 for which they claim under Schedule D is not only because of the change in the shutdown windows, but also for other reasons. These other reasons still entitle them to compensation under Schedule D. NAC is not claiming under Schedule D for the summer months.

[72] NAC says Schedule D shows that YEC accepted the extension to the Completion Date caused by the change to the shutdown windows would increase NAC's costs. NAC notes that the costs claimed do not include the costs of labour and materials as they are provided for under the Contract.

[73] NAC says Schedule D does not preclude them from being compensated through other mechanisms in the Contract – for example for extra work or delays caused by YEC - occurring during the same time period as NAC claims compensation under Schedule D. NAC notes that none of these resolved CRX claims referred to Schedule D. Compensation under Schedule D is not precluded by NAC's own delays or

poor quality work. YEC's concerns about NAC's delay or workmanship may be addressed by claiming against NAC for loss, damage, delay, or failure to complete the Contract on time, all provided for through other sections of the Contract (4.3, 4.2, 8.3, 16.7, 16.8). Schedule D is meant to prevent YEC from keeping NAC on site for longer (inadvertently or not) at no cost to YEC. In other words, NAC's interpretation of Schedule D is very broad.

[74] NAC alternatively argues that because it largely completed its work on schedule and the **predominant reason** it was on site during the Schedule D claimed period was for the work planned to be done during the shutdowns, it is entitled to compensation under Schedule D.

[75] In NAC's alternative argument, they said that non-shutdown activities did not extend their time on site. Even if these activities occurred during the Schedule D claimed period, they were still compensable because they were consistent with NAC's ability under the Contract to sequence its work as appropriate, as long as the work was done by the Completion Date.

[76] NAC says that YEC has failed to show that NAC's alleged failures of workmanship, poor planning and safety record, and lack of proper tools and equipment, caused delays requiring NAC to be on site for longer for reasons not related to the change in shutdown periods.

Position of YEC on Schedule D

[77] YEC says that NAC is claiming under Schedule D for work done over the same time period for which they have already been compensated under other Contract provisions and this is not the purpose of Schedule D. NAC has failed to prove that all

102 days on site, for which they claim Schedule D costs, were a result of the extension of the Contract Completion Date due to the change in shutdown windows from one to two.

[78] Specifically, YEC says NAC was already compensated, including profit and overhead costs, for extra work and delays caused by YEC under other sections of the Contract during the same time period covered by the Schedule D claim. Section 4.5(d) allowed NAC to request a “fair adjustment” to the price on a “time and materials basis” if YEC changed the work in any way that increased NAC’s costs by more than \$1,000. Claims by NAC under s. 4.5 were compensated at force account labour rates, which include overhead and profit, that is, the same costs included in Schedule D. Section 4.3 of the Contract allowed NAC to be reimbursed for reasonable costs incurred as a result of delay caused by a breach of the Contract by YEC.

[79] NAC claimed costs under these Contract provisions through the submission of 73 CRX claims amounting to \$1.4 million or 20.5% of the Contract Price. NAC calculated it spent a total of 4,279 hours on extra work (s. 4.5). As well NAC claimed damages of over \$795,000 for delays caused by YEC (s. 4.3). Those claims were settled in 2016.

[80] In addition, NAC calculated it spent 2,182 additional hours completing the base Contract work because of the changes to the scope of work and claimed \$244,165 in damages (s. 4.5). This claim was also settled in 2016.

[81] Patrick Maloney of NAC admitted that these 6,461 hours (4,279 + 2,182) for which NAC was compensated under other sections of the Contract were unrelated to the Schedule D claim. He further testified there was no way of identifying how much of the work done during these hours was done during the Schedule D claimed period.

[82] YEC concluded on review of the CRX claims that just less than approximately one third of the 73 CRX claims were for extra work done during the Schedule D claimed period. Specifically, 21 CRX compensable claims, amounting to 929 hours, were for work done during September, October and November 2011.

[83] YEC also noted that three significant events, unrelated to the change in shutdown windows, created delay and contributed to NAC working during the Schedule D claimed period. First, the penstock design delay and significant changes resulted in extra work (s. 4.5 of the Contract - CRX 15) and meant that NAC could not demobilize over the summer as originally planned. Second, the thrust block design changes caused 21 days of compensable delay (by agreement after NAC's submission of a CRX claim). This delay meant that the penstock work could not be done during the June shutdown, as planned in February. Instead, the penstock work was done from October 1-10, 2011, during the Schedule D claimed period. Third, the Type 4 concrete fill that had to be placed around the penstock and compacted to create a base for the tunnel floor slab, failed to set properly when it was poured in May (later than the February scheduled date of end of March). As a result, it had to be dug up and replaced with new fill, which occurred in early July. The tunnel floor slab was not completed until July 11, 2011, instead of in April, as planned in the February schedule. The turbine and related equipment could not be lowered until August 1-28, 2011, instead of in April, as planned in February. Related alignment work could not be started until September and finished in early October 2011, during the Schedule D claimed period. None of these delays was related to the change in shutdown windows from one to two, or the extension of the Completion Date.

[84] YEC further noted that certain electrical activities, including installation of vibration equipment, termination of the sump pumps and controls, and installation of the AH3 remote UMC panel, were done in late September and early October 2011, because they could not be done until the turbine generator equipment had been lowered into place. Originally, as of the February schedule, these activities were planned for April.

[85] YEC noted other activities were done during the Schedule D claimed period that were not shutdown activities. They included the installation of the tailrace piping - originally scheduled as of February to be done in April, and in fact not done until between late September and late October 2011; and the installation of the fire system, originally scheduled as of February, to be completed in April, and not started until September 15, 2011. Both of these activities could have been done at any time during the project and were not shutdown activities. Also, mechanical work occurred between September 30 and November 30, 2011 that had been scheduled to be completed by June.

[86] YEC further argued that NAC lacked proper staffing, tools and equipment, safety processes, and planning skills, all of which contributed to schedule delays, not related to the change in shutdown windows. It was clear during the June shutdown that NAC did not understand how to install the new switchgear properly, start it up and test it, or synchronize it with existing plant electrical systems. If delays caused by NAC were the reason for NAC remaining on site, compensation under Schedule D was not possible, as it was only intended to compensate NAC for costs caused by YEC's change to the schedule.

[87] Even if some of NAC's costs were legitimately claimed under Schedule D, the overhead cost calculation is unfairly calculated and constitutes double counting because the Contract Price includes profit and overhead.

[88] YEC noted that Patrick Maloney made the following admissions on cross-examination at trial: "other factors [than the Schedule D factor] did force us to be there till later"; and "we knew from early on [since the change in penstock design] that we were not going to meet the June 19 Completion Date."

YEC's Interpretation of Schedule D Prevails

[89] I accept YEC's interpretation of Schedule D. It was intended to compensate for actual general conditions costs incurred by NAC, caused by YEC's changes to the shutdown window schedule and consequent extension of the Completion Date to November 30, 2011. These costs were not to be claimed if they were otherwise covered by the Contract Price or any other compensation mechanisms in the Contract. Schedule D must be read with the rest of the Contract, which contains provisions that compensate for extra work and delay for reasons other than as set out in Schedule D.

[90] The entire Schedule D clause must be interpreted, including the reference to s. 3.3, which sets out the specific dates of the new shutdown windows, and YEC's preference to avoid a second penstock dewater in October 2011. Section 3.3 also provides that early completion of the Mayo plant outage may allow for an earlier start/finish to the second shutdown window. The November 30, 2011 Completion Date is clearly connected on the wording of the Contract to the two new shutdown windows.

[91] Under this interpretation, any days spent by NAC on site during the claimed Schedule D period that are **not** attributable to the change in shutdown schedule and

consequent later Completion Date, cannot be compensated for under Schedule D. As YEC rightly notes, Schedule D does not provide for damages, but instead for actual general conditions costs incurred because of extra time spent on site for a specific reason.

[92] NAC emphasizes its satisfaction of the contractual obligations by the new Completion Date and disregards the limiting provision of Schedule D to activities connected with the shutdown window change. NAC also disregards the double recovery situation resulting from their claims under Schedule D, as well as their claims for extra work or delays under other CRXs for work done during the same time period. Creating this double recovery situation cannot have been the intent of Schedule D.

[93] Schedule D recovery is limited to shutdown window change activities, and to costs incurred that are not compensated elsewhere.

NAC Failed to Prove its 102 Days On Site Entitle Them to Compensation per Schedule D

[94] I accept YEC's arguments that NAC has failed to prove it is entitled to compensation under Schedule D for an additional 102 days spent on site. YEC has demonstrated through the evidence at trial, including the cross-examination of Patrick Maloney, that NAC worked through much of the claimed Schedule D period not because of the change to shutdown windows.

[95] More specifically, I find the following facts:

- a) NAC submitted 73 CRX claims for costs as a result of changes to the scope of work by YEC, amounting to \$1.4 million or 20.5% of the Contract and an additional 4,279 hours. Out of 73 CRX claims, at least 21 of those,

amounting to 929 hours, were for work completed during the Schedule D claimed period, according to YEC's assessment. These claims were unrelated to the Schedule D claim. Compensation for those CRX claims was provided by YEC to NAC at force account labour rates, meaning that overhead and profit were included.

- b) NAC claimed \$244,165.80 for an additional 2,182 hours that they spent on site because changes to the scope of work took them longer to complete the base Contract work than originally estimated. This damage claim was settled in 2016. The work was unrelated to the Schedule D claim, and some of the 2,182 hours may have been spent during the Schedule D claimed period. NAC has not attempted to separate the Schedule D claimed costs from the costs compensated for the 2,182 hours and as well as the 4,279 hours of extra time spent on site. Patrick Maloney admitted they have no way of doing so. In addition to the 929 hours of work done under CRX claims during the Schedule D claimed period, identified by YEC, it is likely that some of the other 6,461 hours represented work done during the Schedule D claimed period.
- c) The three significant events occurring after February 1, 2011, contributed to the situation where NAC needed to be on site for longer than originally estimated. The penstock design delay, the thrust block re-design delay, and the Type 4 fill error all resulted in mechanical and electrical work being done during the Schedule D claimed period as a result of

consequential delays in other earlier sequenced activities. This work was not related to the Schedule D claim.

- d) NAC saved certain work that could be done at any time until the Schedule D claimed period. These non-shutdown activities included tailrace piping installation, the fire system installation, and mechanical work that was planned to be done in June. This work was not related to the Schedule D claim.
- e) The NAC performance issues described by YEC's Contract Administrator, Robert Simonson, as well as other YEC supervisors and managers, included lack of proper staffing and equipment, tools and planning skills, as well as the absence of effort to maintain the schedule. These likely contributed to some delay in the work. However, it is difficult to assess and calculate the extent to which these delays caused the continued NAC presence on site during the Schedule D claimed periods. It is more appropriate for YEC to claim under other provisions of the Contract – for example, deficiencies - instead of attempting to reduce the amount of NAC's compensation under Schedule D.

[96] Having found these facts, I note that some of NAC's work could only be done during the second shutdown. This included connecting the final part of the penstock, some of the electrical switchgear and connection work, start-up and commissioning. These activities were planned for the October shutdown when the February schedule was built, the first schedule to incorporate the two shutdown periods.

[97] A comparison of the February schedule with the October 3, 2011 schedule and the November 2011 planning aid shows there were certain activities done before and during the October shutdown which had been planned since February. Those activities, with the February time estimates were:

- a) modification to existing controls (6R and 6F) - 5 days;
- b) pre-shutdown check out - 15 days;
- c) programming supplied controls - 2 days;
- d) penstock dewater and rewater - 2 days;
- e) generator start-up - 3 days;
- f) turbine start-up - 3 days;
- g) TIV Valve start-up - 2 days;
- h) HPU start-up - 3 days;
- i) TIV Accumulator skid start-up - 1 day;
- j) LPU Unit start-up - 5 days;
- k) commissioning support of generator/turbine - 1 day;
- l) generator station start-up - 1 day; and
- m) modification and addition to vibration system - 3 days.

[98] Many of the time estimates in the October 3, 2011 schedule for these activities were much longer. The November 2011 planning aid also showed longer periods of time to do this work. The reasons for this are not clear from the evidence. It is also unclear whether there was overlap in some of these activities. I have made calculations on the basis of the estimates made in the February schedule and assumed there was no overlap in the days identified for the activities.

[99] The pre-shutdown activities (15 days) were done from mid-September 2011 to early October 2011. NAC had to be on site anyway during that time in order to do the work as described above in paras. 82 and 83 that had been planned much earlier. These 15 days are not compensable under Schedule D.

[100] The time estimated in the February schedule for the shutdown activities amounts to approximately 30 days of extra time that NAC would remain on site as a result of the two shutdowns. The nature of these activities, which are clearly shutdown activities; the original plan, as of February, for NAC to do this work during the October shutdown; and the acceptance by YEC that some additional costs would be incurred by NAC as a result of the second shutdown, all support compensation to NAC under Schedule D.

[101] The overlaps in the Schedule D claimed period noted by YEC for the CRX activities, the non-shutdown activities, and the activities that were delayed for reasons other than the shutdown window schedule change are difficult to calculate with accuracy. In argument, the parties referred to the time spent on these activities by hours, not days. There was no evidence on the number of hours that would constitute a day in this context, with multiple workers doing multiple activities. NAC's claim under Schedule D is calculated by days, not hours.

[102] It is clear from the evidence that NAC spent far fewer than 102 days on site doing work only required by the change to shutdown windows. The best evidence for NAC's compensation under Schedule D is the actual work done that had originally been planned for the October shutdown once that shutdown was scheduled. NAC failed to prove on a balance of probabilities that it was required to be on site for a full 102 days under Schedule D. It did not identify the work it did during the Schedule D claimed

period that was caused by the change in shutdown windows. It did not respond specifically to the arguments raised by YEC, supported by evidence from the schedules and affidavits, that much more work was done during those periods that was not related to the change in shutdown windows.

Quantum of Schedule D Claim

[103] NAC claims an average daily cost of \$6,210.89 for project logistics costs and project specific overhead costs.

[104] Project logistics costs consisted of:

- a) camp operators, who did the cooking, cleaning and grocery runs for the personnel who worked on site;
- b) on-site equipment rental including NAC owned equipment and rental from Driving Force;
- c) off-site equipment rental for three trucks for the managers/supervisors;
- d) fuel and maintenance for the vehicles;
- e) insurance – for liability and commercial general liability (CGL); and
- f) bonding expense.

[105] Project specific overhead costs consisted of:

- a) management salaries over the relevant time period, with Patrick Maloney's reduced to 50% because he was working on a mining project in Ontario;
- b) meals;
- c) management travel;
- d) pension plan contributions and group health benefits percentages; and
- e) head office overhead.

[106] YEC disputes:

- a) the head office overhead costs;
- b) the 50% of salary claimed by Patrick Maloney from September to November 2011; and
- c) the 7.5% vacation pay amount for employees.

[107] NAC's claim for overhead costs is based on its support team at its corporate head office in Ontario. NAC calculated the overhead amount based on the Hudson Formula, adopted by the Court in *Bianchi Grading Ltd. v. University of Guelph* (2006), 61 C.L.R. (3d) 199 (O.N.S.C.). NAC used 7% of the contract value as the head office overhead percentage. NAC chose 7% because it is the lower end of the 7% - 10% fluctuation range of overhead costs, and the range amount NAC uses for bidding purposes.

[108] YEC disputes the applicability of this amount for a number of reasons:

- a) The Hudson Formula does not represent actual costs, which is what Schedule D in this case compensates for. The Hudson Formula is calculated by multiplying the original contract price divided by the original contract period, by the head office overhead percentage under the original contract, and then multiplying this figure by the period of delay (I.N. Duncan Wallace, Q.C., *Hudson's Building and Engineering Contracts*, 11th ed. (London, England: Sweet & Maxwell, 1995) at 1076). This formula does not produce actual costs. Schedule D of the Contract allows for compensation for actual costs.

- b) NAC has not provided any evidence that it included 7% overhead in the Contract Price. In fact, NAC provided no evidence other than Patrick Maloney's affidavit assertion that its 7% claimed for overhead costs is reasonable. Other courts have dismissed claims for overhead costs where there is insufficient evidence in support, such as revenue, expenses and lost opportunity [see *Dirm Inc. v. Dalton Ltd.* (2006), 67 C.L.R. (3d) 59 (O.N.S.C.)].
- c) The Hudson Formula inflates overhead costs by using in its calculation the total contract price which already includes overhead and profit. Overhead and profit should be deducted from the full contract amount before the overhead percentage is applied.

[109] I agree with YEC that the overhead costs of 7% claimed by NAC are not substantiated or justified. There is "no detailed examination of the individual items of claimed overhead increase" (Duncan Wallace – pp. 1080-81). This claim is not permitted.

[110] YEC disputes the 50% claim for Patrick Maloney's salary because he was working as construction manager on a mine site in Ontario beginning in August 2011, and did not keep track of his hours. He became involved at the YEC project only when Laith Hamad, who had become the commissioning and close-out manager, escalated the matter to him.

[111] During this period there is evidence that Patrick Maloney built the August 2011 schedule, was included in emails about various aspects of the project, and was required

to give approvals. He was still involved in the management of the project, although not on a day-to-day basis as he had been.

[112] Although the evidence from NAC is thin to support the claim for 50% of Patrick Maloney's salary, given the absence of any other proposed calculation and noting that there is evidence of his continued involvement in the project, this claim is allowed.

[113] YEC disputes the 7.5% of the staff salary claim that NAC says is paid out as vacation pay for the employees. YEC says there is no evidence from NAC that vacation pay was paid out to any of these employees. I agree and this claim is disallowed.

Conclusion on Schedule D

[114] To conclude, NAC is entitled to 30 days of extra time under Schedule D as claimed, based on the \$6,210.89/day, less overhead costs of 7%, less the 7.5% vacation pay, plus management travel of \$5,630.72 during the first two weeks of October. This amounts to \$164,940.02.

II. CRX 100

Issue

[115] This is a claim by NAC for \$119,004.95 representing costs of 860 hours of labour incurred to procure and install electrical cables that were not shown on YEC's Issued for Construction (IFC) drawings. These cables were installed during the start-up and commissioning phase of the project. The work included new cable runs, new cable support assembly, and new connections. The claim is made pursuant to the scope of work or change of work section of the Contract – s. 4.5.

[116] NAC claims the work on CRX 100 was performed between May 2011 and the end of the project and does not include additional cable procurement. The NAC claim includes:

- a) the costs to terminate the cables added in February 2011;
- b) the costs of changes created by the May 16 Cable Schedule Package;
and
- c) the costs of further changes requested by YEC after May 16, 2011 and in particular during the October shutdown.

[117] YEC objects to this claim for four reasons:

- a) NAC is inconsistent about the scope of the claim;
- b) NAC's evidence to substantiate the claim is unreliable;
- c) the changes described and claimed by NAC appear to duplicate other CRX claims for which NAC was compensated through a settlement agreement in 2016; and
- d) there is no actual evidence of the hours NAC spent doing the work.

[118] Section 4.5 of the Contract states:

- (d) if a Change to the Work ... increases or decreases the cost to the Contractor by more than \$1,000, the Parties will agree in writing upon a fair adjustment to the Price on a time and materials basis as per Schedule B: ...

[119] Schedule B sets out the force account labour rates based on NAC's calculation of an hourly rate for that employee level, plus NAC's overhead, including travel costs, camp allowance, and profit. Schedule B provides a 10% mark-up on any subcontracted work.

Brief Conclusion

[120] I find that NAC has not clearly articulated or substantiated its claim under CRX 100. While there is some evidence of changes that were made during the October shutdown at the instruction of YEC, the identification of those changes, the work they entailed, and whether that work was compensated for by other CRX claims is not clear. The time NAC spent on any such changes is not properly isolated or calculated. Not only has NAC not proved on a balance of probabilities its costs for the changes referred to in CRX 100, but YEC has demonstrated through its evidence the high likelihood that nowhere close to 860 hours were spent by NAC on changes deserving of independent compensation. This claim is dismissed.

Background

[121] This project required the installation of multiple electrical devices including 3,000 different pieces of instrumentation equipment, 300 control panels, two high voltage generators, four high voltage transformers, distribution panels, different motors and motor control centres, switchgear and other accessories. It also included approximately 30,000 metres of cable. The cables included larger high-voltage power cables and smaller control and interconnection cables.

[122] YEC contracted with AECOM to provide IFC cable schedule drawings to NAC and YEC. These included drawings of the positions of the buildings, tunnels and equipment on site. The drawings were necessary to determine the types, lengths and routes for the cables for procurement purposes. Revisions were done after NAC requested further information in December 2010. Clarification was still required and a meeting between AECOM and NAC was held in January 2011, to discuss the cable

schedules. On February 1, 2011, AECOM issued a revised cable list, called Revision B Cable Schedules. NAC ordered cables based on that list, which required additional cables from the original contract work. Further changes to the list were made subsequently.

[123] In April 2011, YEC and NAC agreed that the Revision B Cable Schedules and subsequent changes were a change to the work from the original scope of work in the contract. NAC was required to purchase additional cables and provide increased labour to run the cables between the relevant pieces of equipment. YEC agreed to pay NAC \$46,000 for the additional costs of this change to the work (CRX 24).

[124] There is a dispute between the parties about whether CRX 24 included the cost of additional terminations resulting from the additional cables. Termination means doing the necessary steps to complete the connection of the cables, including stripping the end of the conductor so it can be connected, identifying the cable, labelling its function, and attaching it to the end point on the equipment through a breaker or a block. This work was done during the October shutdown.

[125] NAC says that the compensation under CRX 24 did not include the costs of the new terminations required, but only the cost of additional material and running the cable between relevant equipment. NAC says they were unable to quantify the complete number of terminations required. YEC disagrees, through Operations Manager Edward Peake, who testified that he would not have approved a CRX 24 settlement unless it included all of NAC's costs arising from the change of work. He recalls no discussion about CRX 24 excluding the terminations. YEC notes there is no note in the minutes from the April 2011 meeting where CRX 24 was resolved, indicating terminations were

excluded from CRX 24. The Revision B Cable Schedules allowed NAC to estimate the maximum number of terminations required, which NAC could have compared to their original cost estimate, and included any additional costs in CRX 24.

[126] In mid-April 2011, NAC, Orbis Engineering Field Services Ltd. (“Orbis”), YEC, AECOM and CAP Engineering (YEC’s consultant) met about the design of the control system for the new turbine/generator. Orbis had been hired by NAC in mid-March 2011, to program the control and protection system. Orbis was also hired by YEC to prepare the input/output schedule (“I/O Schedule”). The I/O Schedule shows the specific termination or interconnection details, including a listing of the commencement and termination of each cable related to the new equipment that was required to be installed by NAC. It was based on the IFC drawings.

[127] On or about May 16, 2011, YEC provided to NAC a detailed wiring design package (“May 16 Cable Schedule Package”), identifying the quantity, type and location of cables to be supplied and installed by NAC. This cable schedule was based on the Revision B Cable Schedules. It re-assigned some of the cable connections identified in the Revision B Cable Schedules; identified the cables that had been included in the Revision B Cable Schedules that would not be required in the final design; identified the additional cables and changes to the Revision B Cable Schedules in a consolidated list; and included termination sheets that identified the cable connections and terminations among the equipment and electrical systems. YEC also included in the May 16 Cable Schedule Package the I/O Schedule prepared by Orbis. This document was produced by YEC and identified as Tab 347 of the common book of documents at the first trial of this matter.

[128] In addition to the May 16 Cable Schedule Package, YEC provided NAC a clean updated cable list, showing the changes to the Revision B Cable Schedules in the May 16 Cable Schedule Package, as well as electrical schematics and logic diagrams.

These combined documents incorporated all the changes required up to May 16, 2011.

[129] Laith Hamad, an electrical engineer, and the Electrical Operations Manager and later the Commissioning and Close-out Manager for NAC, said the first ten days of the October shutdown were spent doing wiring work or installing equipment at YEC's request that was not planned. NAC said they kept track of these changes through marking up a copy of a termination sheet, also called a cable list extract, in each room showing which cables needed to be pulled and the terminations required. The changes were identified by Laith Hamad using the termination sheets/cable list extracts and the May 16 Cable Schedule Package and comparing them to the I/O list. NAC said they kept count of the changes by looking at the number of terminals added, the number of extra cables they had to pull, and the number of conductors that were changed from one location to another after installation. The termination sheets/cable list extracts used to identify these changes were not produced, although Laith Hamad said he had them "at the time". The actual changes made were not listed or itemized, either in the actual CRX 100, or in the affidavit evidence of Laith Hamad.

[130] The labour costs of these changes were estimated by NAC, as they did not track the actual time spent. In fact, on cross-examination, Laith Hamad testified there was no way to distinguish or isolate the costs of the changes that make up CRX 100. The estimate was based on the time for the activities set out in the NECA book, an estimating standard tool used in the industry, multiplied by the NAC labour rate. Laith

Hamad estimated 600-700 hours based on his understanding of the activities performed. The estimate was also based on a “high level breakdown of hours for work done on changes during the October shutdown period at the request and direction of Yukon Energy”, stated by Laith Hamad in his Affidavit #1, September 20, 2019. That “high level breakdown” was set out in an email attachment to Laith Hamad’s Affidavit #1, from the Electrical Supervisor, Martin Hurrell. His email set out a total of 70 hours, plus 80% of two other workers’ hours, the total of which was not included. Two additional pieces of work were identified as outstanding, without any estimate of hours. Martin Hurrell begins his email with “[w]ell I am out of hours now.”

[131] Laith Hamad concluded in his affidavit “we often had three electricians performing these changes all day for about 20 days before, during and after the October shutdown”, as a further justification for the 600 hours claimed. There is no other evidence to support this statement.

[132] YEC agreed there were changes because of errors in the original design; existing equipment was not as expected; extra functions on new or existing equipment. However, YEC says NAC’s claim is not substantiated.

Analysis of CRX 100

Scope of NAC’s Claim not Clearly Articulated

[133] In its third amended statement of claim, dated September 13, 2019, NAC claims for costs incurred to procure and install electrical cables not shown on YEC’s IFC drawings, and required to be added during the start-up and commission phase of the project.

[134] The actual scope of the claim is unclear because of the absence of reliable evidence from NAC about the changes made during the October shutdown. The lack of clarity stems from inconsistencies in the articulation of the baseline to which the changes are compared. NAC has provided the following options of baselines for the changes made during the October shutdown:

- a) the differences between the May 16 Cable Schedule Package and the Revision B Cable Schedules (Laith Hamad);
- b) the May 16 Cable Schedule Package (Laith Hamad);
- c) the I/O Schedule prepared by Orbis (Laith Hamad);
- d) the Revision B Cable Schedules (Patrick Maloney Affidavit #1); and
- e) the terminations resulting from the Revision B Cable Schedules, not captured by the compensation provided by CRX 24 (Laith Hamad).

[135] NAC also claims generally for changes YEC instructed them to make during the October shutdown. NAC does not provide a baseline document for these changes in the affidavit material. It does refer in its third amended statement of claim to the start-up and commissioning document prepared by NAC with significant input from YEC and finalized as Revision 6 on September 29, 2011. It is an agreed fact that this was the final version of the commissioning plan. Any changes requested by YEC during the October shutdown must logically be changes from the Revision 6 document. NAC does not articulate specific changes from the Revision 6 document, dated September 29, 2011 to the October shutdown.

[136] These inconsistencies in NAC's articulation of the scope of its claim, stemming from an absence of clear evidence in support of the changes, affect the assessment of NAC's reliability related to this claim.

NAC's Claim for Costs of Electrical Changes Unsubstantiated

[137] NAC was unclear and inconsistent in its evidence of the material it used, as well as who prepared it and when, to identify the changes made during the shutdown. The changes claimed included changes to the new control and protection panels (6F and 6R), the new switch gear, the existing control and protection panels and the HPU and governor.

[138] Laith Hamad testified that from the time the parties agreed on the updated cable list and I/O Schedule until the end of the project, any additional cables and terminations, or moving a cable on YEC's directions that had been landed in accordance with the I/O Schedule, constituted a change or addition to NAC's work.

[139] At various times, NAC gave the following additional explanations of how they identified the changes:

- a) Laith Hamad compared the document at Tab 347 (May 16 Cable Schedule Package including the I/O Schedule from Orbis) and the termination sheets (unclear whether these were the termination sheets provided by YEC in May 2011, or the ones NAC said they created during the shutdown) to the I/O Schedule created by Orbis and provided to NAC by YEC in May 2011 (Laith Hamad Affidavit #1 of September 20, 2019). It is unclear how comparing the Tab 347 document, which included the I/O Schedule, to the I/O Schedule could identify any changes.

- b) NAC generated a final cable list on site during the October shutdown from the manually marked-up termination sheets at every panel. It was compared to earlier drawings to identify the changes (Laith Hamad on discovery in 2015). This list was never produced.
- c) Tab 347 was NAC's as-built cable list and the changes referred to in CRX 100 were identified by comparing the Tab 347 document to the May 16 Cable Schedule Package provided by YEC. However, YEC has demonstrated through unchallenged evidence that Tab 347 was the same document as the May 16 Cable Schedule Package. It was created and produced by YEC and not by NAC, as testified by Edward Peake and Michael Tilbrook, and by Laith Hamad at the first trial.
- d) NAC pleaded in its second amended pleading before the second trial that it created an as-built cable list which it used to identify the changes from earlier documents. YEC brought an unsuccessful application to have this pleading struck based on the previous unchallenged evidence about Tab 347 and no further evidence produced by NAC. After the application, NAC amended its pleading on September 13, 2019, and removed the claim that it created an as-built list (NAC second amended pleading, June 2019).
- e) Tab 347 was the final cable list received from YEC on May 16, 2011, confirming all the changes made to that date. In his affidavit and on cross-examination Laith Hamad testified that the Tab 347 document is

effectively the as-built Electrical Major Power Cable Schedule (Laith Hamad Affidavit #1, September 20, 2019).

- f) A final cable list was generated in the field by YEC and AECOM in October-November 2011, during the start-up and commissioning period. The changes for which compensation was sought through CRX 100 are derived from comparing this list to the February 2011 list (not the May 16 Cable Schedule Package). Tab 347 is not referenced in this explanation (Patrick Maloney Affidavit #1, September 20, 2019).

[140] It is clear on all of the evidence that there was no as-built cable list. The closest document to one was the May 16 Cable Schedule Package, prepared by YEC and Orbis, not NAC. All agree there were changes between the issuance of that document and the completion of the project.

[141] NAC's changing evidence on whether or not there was a final cable list, whether or not it was an as-built cable list, who prepared it, and when it was prepared is troubling, especially since it is an essential document to support their proof of the CRX 100 claim. In the end it is clear that NAC did not prepare the document.

[142] Further, NAC's failure to produce the marked-up termination sheets is a significant gap in NAC's evidence, as these sheets appear to have been used to identify changes claimed.

[143] The ongoing apparent confusion within NAC from 2015 to the second trial about the existence of the final cable list and its author, combined with their failure to produce the termination/cable list extract sheets prepared by NAC, results in an absence of reliable evidence in support of NAC's claim under CRX 100.

CRX 100 Duplicates Other Resolved CRX Claims

[144] Another reason to deny NAC's CRX 100 claim is the duplication of recovery.

There is persuasive evidence that costs claimed under CRX 100 were covered by other resolved CRX claims. NAC and YEC agree that NAC prepared and submitted CRX claims 79, 80, 85, 86 and 100 at the same time, in early January 2012. Laith Hamad was unable to say on discovery the time period over which the work compensated for in CRX 79, 80, 85 and 86 was done.

[145] NAC argues that the other CRX cost recoveries were for programming changes made by Orbis, the costs of which were charged to NAC. When a wire was changed as a result of YEC's changes, Orbis implemented the programming and updated the I/O Schedule. Orbis did not make the physical changes to the cables or terminations. The changes NAC is claiming under CRX 100 are for changes caused by YEC instructions and directions before, during and after the October shutdown, separate from those costs caused by the Orbis changes to the I/O Schedule.

[146] Further, in most of the other CRX claims referenced by YEC, there is a note from NAC stating "additional cables not included". NAC says this note shows the intention of compensation for work on additional cables be done separately.

[147] A description of the other CRX claims, evidence of their overlap with CRX 100 and NAC's responses are:

- a) CRX 79 - \$41,600 to NAC for costs of completing wiring and termination changes on the new switchgear equipment, per YEC mark-ups. Orbis programming work in the amount of \$20,233 was included in the recovery under CRX 79. The remainder of the claim, \$21,367, is attributable to NAC

labour costs for 160 hours. NAC could not say whether these hours were from time sheets or an estimate.

NAC says these CRX 79 changes were different than the changes to the switchgear protection circuits set out in Tab 347, which were captured in CRX 100. There is no evidence other than this assertion.

- b) CRX 80 - \$33,000 to NAC for costs of completing electrical work on existing electrical control and protection panels, specifically conducting synchronization termination changes and additions not in NAC's scope of supply. The CRX 80 changes were based on schematic marked-up drawings YEC provided to NAC. Part of the Orbis invoice was allocated to this CRX. The claim for the Orbis work was in addition to 100 hours of NAC labour. NAC could not say if these hours were from time sheets or an estimate.

NAC asserted that these changes were different than those changes set out in Tab 347, and also noted the amounts attributable to Orbis.

- c) CRX 82 - \$16,500 for costs of installing a new panel enclosure and components of a communications panel and to terminate fibre optic and communication cables.

NAC did not respond to this.

- d) CRX 85 - \$11,400 for costs of completing the electrical modifications required to the L&S governor. The governor controls the speed of the generator by communicating with the HPU which activates the TIV and the wicket gates that control the amount of water flowing to the turbine. The

accumulator is the back-up system that allows the TIV to close in an emergency stop situation. The programmable logic control (“PLC”), designed and implemented by Orbis, is used to control how and when the governor directs the HPU and accumulator. When the PLC was not ready at the time of shutdown, temporary modifications were required to ensure the HPU and accumulator could be activated and the TIV closed until the PLC was ready. CRX 85 was compensation for these temporary modifications. An invoice from Orbis was part of this compensation. NAC claimed for 70 hours of labour. NAC could not say if these hours were from time sheets or an estimate.

NAC says these changes are not reflected in the termination sheets in Tab 347 and are not part of CRX 100. NAC noted the payment for Orbis programming changes, which were not part of CRX 100.

- e) CRX 86 - \$52,000 for costs incurred in completing electrical modifications to the Unit Control Module (“UCM”) panel as well as the new control protection panels (6F and 6R) supplied by REV Engineering. These new panels were not supplied as specified by the contract. YEC instructed NAC to add devices into 6R and 6F. The payment to Orbis was \$19,000. The balance of \$33,000 represented 260 hours of NAC labour. NAC could not say whether these hours were from time sheets or an estimate. NAC says these costs included Orbis programming changes, which were not part of CRX 100.

- f) CRX 94 - Unknown amount for cost of installing an additional junction box and pulling and termination of the spare cables.

NAC did not respond to this.

- g) CRX 96 - \$1,600 for costs to add switches and items to the accumulator panel.

NAC did not respond to this.

- h) CRX 98 - \$6,500 for costs associated with installation of the electrical system of the fanwall equipment.

NAC did not respond to this.

[148] NAC's primary argument that the other CRX recoveries were primarily to cover the costs of Orbis and not NAC labour, is not borne out by the evidence. While Orbis programming costs were included as part of the CRX recoveries, NAC labour costs incurred were also reimbursed, and were the larger portion of the reimbursement.

[149] In further support of their claim of overlap of the CRX 100 claim with other CRX claimed work, YEC provided affidavit evidence from Michael Tilbrook, their electrical engineer, and Edward Peake, the Operations Manager for the project.

[150] Michael Tilbrook in his detailed review noted twelve significant changes from the May 16 Cable Schedule Package to the completion of the project that would have an impact on NAC. Michael Tilbrook reviewed each electrical drawing or schematic of the system provided to NAC and noted any changes, with the addition of labour hours where applicable. Where he was unsure, he deferred to Edward Peake, who was more knowledgeable about the day-to-day operations. Michael Tilbrook's estimate of total hours of labour for these twelve significant changes was between 30 and 54. This did

not include approximately nine additional installations in which there were changes; however, what they were or who did the work was unclear, so no estimate was given.

[151] Edward Peake compared the changes identified by Michael Tilbrook to the changes for which compensation was provided through other CRX claims, identified above, for costs incurred by NAC to complete modifications and wiring changes on specific electrical equipment and systems.

[152] Edward Peake testified that ten of the twelve changes identified by Michael Tilbrook were to accommodate YEC's control and protection panels, including termination changes. Three changes included additions to synchronization circuits, and were covered by CRX 80. One change included modifications to the 6F panel, covered by CRX 86. Four changes required modifications to the existing control and protection panels and termination changes and were covered by CRX 79.

[153] Other smaller changes noted by Michael Tilbrook were changes to the 6F, 6R, and UCM panels, covered by CRX 86; changes to the L&S governor and the HPU, covered by CRX 85 and 96; and adding junction boxes to terminate spare cables, covered by CRX 94.

[154] Edward Peake also reviewed the "high level" hours NAC claims to have spent, as provided in the email dated October 9, 2011, from Martin Hurrell. In summary, in Edward Peake's view, the hours claimed were all covered by other CRX claims as follows:

- a) Bryan re-doing 6R and 6F panels - claimed under CRX 85;

- b) Jagpal on Michael and Doug's changes, which were adjustments to synchronizing circuits on the new switchgear units - claimed under CRX 79;
- c) 60 hours on new wires for the governor/HPU changes - claimed under CRX 85, which included 70 hours of NAC labour;
- d) 10 hours for ACC new buttons and connecting new wires, which was installation of new push-buttons on the accumulator panel as part of the governor /HPU modifications - claimed under CRX 96, which included ten hours of NAC labour; and
- e) the last two items were still to be done and there was no evidence on whether they were done and at what cost.

[155] NAC's claim that the termination changes that could not be identified at the time of the CRX 24 claim for changes made in February 2011, and for which NAC received compensation in April 2011, is not relevant. Any termination changes required by the Revision B Cable Schedule, from February 2011, were set out in later schedules, and in particular the NAC start-up and commissioning schedule dated September 29, 2011. Thus those CRX 24 termination changes were subsumed in the later schedules and are not entitled to independent compensation.

[156] To conclude on the argument of overlap with other CRX claims, I accept YEC's identifications and explanations of the overlaps. There is insufficient evidence from NAC to refute YEC's argument, supported by evidence, that the work claimed under CRX 100 was already compensated under other CRX claims.

No Evidence of Actual Hours Spent Doing the Work

[157] NAC admitted they did not keep track of the hours spent doing the work claimed under CRX 100. Their claim is based on estimates, using NECA, a standardized book of construction labour time estimates, as well as the rough calculation from Martin Hurrell, who wrote in response to Laith Hamad's request to him "I am out of hours now." This comment suggests that all hours spent by NAC during the shutdown had been claimed elsewhere. It is not clear how NAC arrived at approximately 600 hours for the changes, except for Laith Hamad's general statement that NAC "often had three electricians on site working 20 days", before, during and after the shutdown. This does not assist with substantiating their claim, which appears to be limited to the first ten days of the October shutdown. In any event, there is no supporting documentation provided for these hours.

[158] Michael Tilbrook of YEC estimated 30-54 hours of labour in his detailed review of the changes made to the electrical design of the project after the May 16 Cable Schedule Packages. Those hours were subsumed in other CRX claims as noted above.

[159] There is insufficient evidence in support of NAC's claim for 680 hours of labour under CRX 100.

Additional Requirements Not Substantiated

[160] NAC claims for additional requirements including crane/hoist, supervision, testing, clean-up, as-builts, consumables, demolition, warranty and wire labels/markers. These claims are predicated on the establishment of the original labour and materials claim, which has not been done.

[161] In any event, the crane time was not substantiated, after specific requests on cross-examination; the as-builts were never produced; consumables are included in the force account rates so cannot be charged separately; there was no evidence for the costs of the wire labels/markers. The supervision, testing, clean-up and warranty were dependent on proof the work being done.

Conclusion on CRX 100

[162] NAC has failed to articulate the scope of its claim clearly, failed to provide reliable evidence to substantiate the nature of the changes and the hours spent working on them, and failed to show how compensation under CRX 100 would not amount to duplicative compensation given the other CRXs. NAC's claim under CRX 100 is dismissed.

III. CRX 111

Issue

[163] This is a counterclaim by YEC for indemnification or damages resulting from NAC's failure to supply the cabinets to house the new control protection electrical panels (6R and 6F) with open backs, as required by YEC and specified by the Contract. NAC agrees that they did not supply the cabinets as required by YEC and the Contract. The only issue is the valuation of the claim.

[164] YEC claims \$206,971, the amount set out in NAC's tender document for supplying, installing and commissioning the cabinets. This amount was also included in the Schedule C Price Matrix, used for billing purposes. Alternatively, YEC claims \$100,000, the estimate of costs to fix the deficiency made by Edward Peake, based on his experience and his assessment of the work required.

[165] NAC opposes the claim for \$206,971 because it does not accurately represent YEC's loss or damage arising from the deficiency. NAC's initial position is opposition to the \$100,000 alternative as they said they offered to mitigate the problem before or during the October shutdown, when it would have taken less time and money. As a result, damages should be nominal.

[166] In the alternative, NAC says damages should be limited to \$100,000. NAC refers to the purchase order for the cabinets of \$127,225 plus GST and suggests that the labour could be done by local contractors or internally at costs of \$50/hour for approximately 50 hours. Engineering design costs are not included in this estimate.

[167] As a second alternative, NAC submitted in argument that the correct valuation should be the diminution in value to the property caused by the defect (*Alex Gair & Sons Ltd. v. Lepinski*, [1998] B.C.J. No. 494 ("*Gair*"); *0867740 B.C. Ltd. v. Quails View Farm Inc.*, 2014 BCCA 252, ("*Quails View Farm*"). This is a concept of valuation that is applied when there is evidence that the plaintiff is unlikely to carry out the remedial work if awarded damages.

Brief Conclusion

[168] YEC's estimate of \$100,000 on a time and materials basis is the most reasonable assessment of costs to remedy the deficiency. There is no basis for an award of the original tender amount. Mitigation during the shutdown was unreasonable. There is no basis for an amount calculated on the diminution of value to the property on the evidence.

Background

[169] The purpose of the grey metal cabinets supplied by a subcontractor to NAC, REV Engineering, was to house the new electrical control panels, 6F and 6R. They were designed to be the main distribution point for the circuits that control and synchronize the AH3 unit, and the protection circuitry for AH3 and the T1 and T3 transformers for the power station. These panels also control the power distribution to the transmission line that supplies electricity to Haines Junction.

[170] The cabinets are located in the control room in the main above-ground building. They are situated in two rows, facing outward. The backs face each other. All the cabinet backs are open and accessible from the corridor between the rows.

[171] The purpose of this configuration is to facilitate the maintenance, testing, troubleshooting and repair work on the cabinet panels. Wiring inside the cabinets can be accessed easily through the open backs and is especially important if an electrician needs to check the operation of equipment where there is a connection between two different panels. The open backs allow measurements and checking to be done more efficiently, safely and easily.

[172] The Contract contained an indemnity in favour of YEC in the event that NAC failed to comply with the terms of the Contract. There are exceptions that are not applicable in this case. The indemnity clause is set out above at para. 58.

Analysis of CRX 111

[173] The failure to deliver the open-backed cabinets was a failure of NAC to comply with the Contract. YEC is entitled to an indemnity under s. 12.1. To correct the deficiency will require a complete reinstallation of the 6F and 6R panels.

Mitigation During Shutdown Not Appropriate

[174] There is conflicting evidence on what occurred when the cabinets were delivered on September 29, 2011, two days before shutdown, and the deficiency noticed. NAC says they offered to do the work, which they say would have reduced the cost likely to one extra day's work, but YEC declined the offer.

[175] YEC disagrees that NAC made any kind of proposal, formal or informal, to do the work. Instead, Edward Peake said there was a general brainstorming session to consider alternatives, one of which was a brief consideration of the possibility of cutting the backs off immediately. However, any option of fixing the deficiency immediately was dismissed because of the concern that there was insufficient time to do the work, at least a five-day process in YEC's view, during the available shutdown period. YEC testified that they did not have confidence in NAC's ability to do the work even in four or five days. When YEC made the decision to proceed to install the cabinets and address the deficiency later, NAC did not object.

[176] YEC did not fail to mitigate by refusing to have NAC do the work during the shutdown. REV Engineering, not NAC, was the supplier, and as a result NAC may not have had the knowledge and ability to do the necessary work. The cabinets arrived only two days before the scheduled shutdown, not leaving time to do the necessary repair work and the shutdown work. Although the configuration of the cabinets made maintenance and repair work difficult, they were functional. For these reasons, YEC's decision to install and commission the 6F and 6R control panels as delivered in October 2011, was reasonable.

NAC's Original Tender Amount of \$206,971 is Not Appropriate

[177] This amount does not represent the costs, expenses and liabilities of fixing the deficiency. It was used for the original tender and billing purposes and contained amounts not directly related to the costs to repair the deficiency.

Nominal Damages are Not Appropriate

[178] NAC argues that because the 6R and 6F panels are fully functional, and maintenance has been rarely required to date, making operational difficulties minimal, replacement of the cabinets is unnecessary. As a result, only nominal damages would be appropriate.

[179] I do not agree. Maintenance and repair may be more likely in future. Even if the maintenance is annual, the inefficiencies and difficulties caused by the absence of open backs require deficiency repair.

Diminution in Value of Property is Not Applicable

[180] NAC further argues that because YEC has not made any attempt to remedy the deficiency in almost ten years, there is some doubt as to whether they will actually use any monies provided to them for that purpose. NAC relies for this argument on *Quails View Farm* in which the trial judge (upheld on appeal) awarded an amount to the plaintiff equivalent to a diminution in value of the property because she was unconvinced that they would actually do the repairs. She relied on the *Gair* decision for this conclusion.

[181] I do not agree that there is evidence in this case that YEC will not do the work if provided with the funds. YEC's reasons for not proceeding to date included budget, other more pressing priorities, and human resources. There is nothing in the evidence to suggest that if they had the funds they would not proceed with the work.

Estimate of \$100,000 in Costs is Appropriate

[182] Edward Peake provided a detailed description in his affidavit of the panels and the effect of the cabinets with backs on YEC's work. He also provided a detailed explanation on cross-examination of the steps in the work to be done. Those steps were:

- a) planning - which requires drafting as-built drawings by engineers in order to get engineering approval;
- b) removal of existing cabinets;
- c) physical modification or building replacement cabinets; and
- d) reinstall cabinets.

[183] Edward Peake estimated 100 hours of planning and five ten-hour days of one person to do the removal and re-installation. He agreed that YEC employees could do the labour and it was possible to source the new cabinets locally. He set out details of the work in his cross-examination. Given his clear understanding of the work to be done, his experience at YEC, and the local available resources, his estimates can be relied on. I prefer the reliability of his estimates over those of NAC. The estimates from Patrick Maloney and Laith Hamad varied from 40 to 100 hours. Patrick Maloney is not an electrician or familiar with electrical work; his expertise is with the mechanical aspects. Laith Hamad, an experienced electrical engineer, underestimated the time required.

Conclusion on CRX 111

[184] To conclude, YEC is entitled to \$100,000 from NAC for the costs of removing the two cabinets that did not comply with the Contract and reinstalling two new compliant

cabinets. YEC's decision to install the non-compliant cabinets was reasonable at the time. YEC's estimate of the costs of \$100,000 is reliable and reasonable.

IV. The Deficiency Claims

Issue

[185] YEC counterclaims against NAC for indemnification under s. 12.1 of the Contract for deficiencies and defects in the work performed by NAC. Alternatively, YEC claims special and general damages for breach of contract or in negligence. These deficiencies and defects were not in compliance with the terms of the Contract and Specifications.

[186] The claim under s. 12.1 of the Contract consists of reimbursement for costs - both known costs and unknown costs - already expended by YEC to repair some deficiencies; costs estimated to be spent in future to repair the outstanding deficiencies.

[187] YEC also claims general damages based on the inconvenience and loss suffered as a result of NAC's poor workmanship to compensate for costs that are unable to be recovered.

[188] Alternatively, YEC claims damages for breach of contract or in negligence in the range of \$713,688 to \$738,864 or alternatively, 10% of the total contract price.

[189] NAC does not dispute that YEC is entitled to indemnification under s. 12.1 of the Contract for costs incurred in rectifying certain deficiencies. However, NAC disputes the amounts claimed by YEC, both for costs already incurred and estimated costs to be incurred for rectifying future deficiencies. The basis for NAC's objection is threefold: i) some of the deficiencies claimed are not actually deficiencies or defects; ii) YEC has failed to mitigate its costs; iii) YEC claims are inflated. The defence of failure to mitigate does not relate to YEC's decision not to allow NAC to return to the worksite to fix any of

the deficiencies, as that matter was resolved at the first trial and upheld on appeal. NAC proposes the appropriate amount owing by them is in the range of \$34,344 to \$152,379, excluding GST. NAC says only nominal damages are recoverable for costs that cannot be known, or as general damages for loss and inconvenience.

[190] The issues are whether the deficiencies are properly claimed; whether the costs estimates are reliable, including their accuracy and whether reasonable alternatives were considered. This requires an assessment of the evidence from the expert witnesses and witnesses involved in the project, as well as an understanding of the context of this Contract.

Brief Conclusion

[191] YEC is entitled to indemnification under s. 12.1 of the Contract. The deficiencies show a failure to comply with the terms of and standards required by the Contract. YEC is entitled to its known costs claimed for deficiencies it has remedied in the amount of \$35,882.89, and \$134,623.24 for Item #24 for a total of \$170,506.13. YEC is entitled to \$26,910 for its unknown costs that have already been expended. YEC is further entitled to \$310,945 in costs estimated to remedy outstanding deficiencies. YEC is not entitled to general damages for costs unable to be recovered attributable to loss and inconvenience. The total recovery for deficiency claims is \$508,361.13.

Background and Context

Contract

[192] The Contract and specifications set out the standard of work expected of NAC:

3.1 Standard of Work

The Contractor will perform the Work diligently, in a workmanlike manner, and in accordance with the highest industry practices used in Canada.

1.5 WORKMANSHIP AND MATERIAL

.1 All work shall be performed by competent tradesmen, be executed in a workmanlike manner and present a neat, mechanical appearance when completed. [Schedule A, Specification 26 05 01]

[193] Section 12.1 quoted above at para. 58 sets out the indemnity provision in favour of YEC for the failure of NAC to comply with Contract terms. It is agreed that YEC's counterclaim does not contain any claim for consequential losses itemized under s. 12.2.

Context of Contract

[194] The contractual requirements must be considered in the circumstances in which the parties entered into the Contract, including the nature of the project, and the practical consequences of non-compliance with the contractual requirements.

[195] Yukon's electrical grid is isolated from any electrical grids in other jurisdictions. This means Yukon must produce, manage and back up all of its own power. The grid extends from Dawson City and Keno towards the north of Yukon, to Carcross and Teslin in the south. It provides electricity for approximately 90% of Yukoners. Only five communities are not connected to the grid. YEC generates approximately 98% of the power accessible through the grid, through the operation of three hydro-electric generating stations: Whitehorse Rapids, Mayo and AGS.

[196] The AGS is a crucial asset in YEC's power generating system. It is the only facility that has multi-year water storage, for use in dry years when water flow at the

other two facilities is low. It is comparatively efficient, because its underground design allows the water to reach high speeds by the time it hits the turbines, thereby using only 1/10th of the water to produce the same amount of electricity as the Whitehorse facility. It is the primary facility relied upon by YEC for power production in the winter, when the water flows are low at the Whitehorse and Mayo facilities. AH3 is the most efficient of the three generators at the AGS because of its modern design and it is relied on during the shoulder seasons at its peak efficiency operating range. The AGS is shut down as much as possible during the summer, while water is stored for use in the winter and spring.

[197] YEC's electrical generating system is automated and centralized. The whole grid is monitored and controlled from a single system control centre in Whitehorse. This control centre oversees the electrical output and manages the distribution of power during outages.

[198] Unplanned power outages can occur where there is an electrical fault or mechanical failure in the system that causes certain equipment, such as the AH3 turbine or generator, to shut down. Unplanned power outages, especially in the winter months have significant consequences for the Yukon as, for example, they affect heating in many homes and businesses, and can result in pipes freezing. If the AGS shuts down, YEC has to turn to thermal power to produce power, at a cost that is two to three times higher than hydro. As a public utility, YEC's costs are ultimately borne by the taxpayer.

[199] The ability of YEC to maintain their facilities to a high standard, and successfully complete troubleshooting operations reduces the number of unplanned outages or at

the very least their length. Quality of workmanship on the equipment and systems in turn affects this work. Well-built systems that comply with the applicable construction codes are less likely to fail. When there are the inevitable failures, it is essential for YEC to identify quickly and efficiently the problem and implement a solution. Accurate documentation and labelling provide significant and necessary tools for this work.

Quality of NAC's Workmanship

[200] The evidence showed that the quality of NAC's workmanship in general was poor. Concerns were expressed by various supervisors, managers and those with technical expertise at YEC about NAC's abilities to do the necessary work on the project at the expected standard (see affidavits and exhibits of Edward Peake, William McKenna, Bob Toms, Michael Tilbrook, Robert Simonson, William Haydock). For example, in June 2011, after the planned shutdown, YEC met with NAC to express concerns about the lack of expertise of the electrical, mechanical and civil crews affecting NAC's completion of the necessary work on time and in accordance with the expected standards. NAC replaced its site supervisor as a result of this meeting.

[201] Edward Peake, Robert Simonson and Bob Toms prepared reports for their manager setting out the issues after the June shutdown. All gave specific examples of their concerns about deficiencies. Bob Toms prepared an overview report in July 2011, entitled "A Critical Assessment of Contractor Performance Relating to the Aishihik Third Turbine Installation Project" in which he concluded "[t]he quality of work performed has been substandard in places, progress is slow and there have been far too many safety issues." He provided nine recommendations of the steps NAC needed to take in order to address the deficiencies.

[202] Regular inspections throughout the project by YEC supervisors and managers revealed poor quality work that required correction.

[203] NAC's evidence is that they were frequently given incomplete or incorrect information, instructions or designs to work from. While this may explain some of the issues, there is no question that there were deficiencies that NAC agreed to by the end of the project that are now the subject of this claim.

Deficiencies Identified at the End of the Project

[204] The deficiencies currently at issue were identified after a lengthy process that began with a preliminary deficiencies list prepared by YEC in November 2011. After some revisions as a result of NAC's input, a walk-through by representatives of YEC and NAC to finalize the list occurred in March 2012. After several more revisions, on July 20, 2012, YEC and NAC agreed to a deficiencies list.

[205] Since that time, many of those items have been fully or partially completed. NAC has agreed to pay the costs of some of these completed items but disputes others. The number of outstanding items claimed by YEC has been reduced from the table attached at Schedule 1 to the amended counterclaim to 82 or 83 items.

Expert Witnesses

[206] YEC relies on the expert reports of Doug Mortimer and Adam Pawlikewich, both independent from YEC. NAC relies on the report prepared by Craig Miller, an employee of NAC.

[207] At trial, Doug Mortimer was qualified as an expert in industrial electrical installations and industrial electrical contracting. He has a degree in Applied Mathematics and as well a certificate in Electrical Power Technology from the British

Columbia Institute of Technology. He is a licensed Class A Electrical Contractor and is certified as an Interprovincial Master Electrician. He is currently employed by Orbis and in 2011-2012 was its President. He testified that he has over 40 years of experience in the service and operating capacities in power generating facilities across Canada, including in many northern and remote areas such as Iqaluit, Pond Inlet, and Clyde River in Nunavut, and Hay River and Inuvik in Northwest Territories. He has also worked in Mayo, Dawson City, Faro, Beaver Creek and Destruction Bay in Yukon.

[208] Doug Mortimer prepared a report dated September 20, 2019. It was based on his review of the deficiency list containing comments from both YEC and NAC in July 2012, and his visit to the AGS for five days from July 17-21, 2012, to verify the information on the list and assess the scope of work needed to fix the deficiencies. He also relied on the following documents: March 2012 deficiency list; Amended Schedule 1 to the Amended Counterclaim dated May 31, 2019; Contract excerpts; internal YEC memo from Justin Kolla to Edward Peake dated December 12, 2011 about the Aishihik Elevator Cable Tray Inspection; estimating spreadsheets created by Doug Mortimer; field notes and photographs taken at site visit by Doug Mortimer on July 7-12, 2012; and Canadian Electrical Code (“the Code”) excerpt.

[209] Adam Pawlikewich provided a report for YEC and evidence that was limited to Deficiency Item #24. As this item is addressed separately, I will comment on his qualifications in that section.

[210] Craig Miller was the Operations Analyst for NAC. He is a licensed electrician with over 25 years’ experience. He has an inter-provincial electrician licence (Red Seal) and a Master Electrician Licence from Ontario. Most of his work has been for water

treatment and bio-waste facilities in Ontario and British Columbia, and not hydro-electric generation. He has not worked on any projects in the north other than this one. He has worked for NAC since 2000 in various roles mostly in the area of electrical estimating. He has performed electrical estimates for approximately 12 projects for NAC and was the electrical bid estimator for the AH3 project.

[211] Craig Miller made one site visit to the AGS for one day before preparing the estimate. He underestimated the electrical labour for the AH3 project bid by approximately \$535,000 of the \$7,136,885 contract. The underestimation was attributed by Laith Hamad to Craig Miller's failure to account for site-specific conditions such as:

- a) increased costs of working in cold temperatures in a remote location;
- b) increased safety obligations when working in a power station;
- c) the constraints of the elevator and shaft work; and
- d) the critical importance of technical and supervisory staff, among other things.

[212] To prepare his report on the deficiencies, Craig Miller did not re-attend the AGS. Rather he was provided with documents to review including: the deficiency list dated July 6, 2012, reviewed by Doug Mortimer; the Counterclaim Schedules 1 and 2; the Report and Supplemental Report by Amin Kassam of Orbis dated December 19, 2012, and February 28, 2016; photographs of the site taken by NAC employees in March 2012; IFC drawings dated October 25, 2010; Contract excerpts; and the NAC field cable list.

[213] There are difficulties with Craig Miller's report from 2016 that became apparent on cross-examination. They are:

- a) his information is based on second-hand information including unverified NAC comments from unknown sources, and unidentified photographs taken by unknown persons in March 2012;
- b) the IFC drawings prepared on October 25, 2010, show how the project was intended to be built, not how it was actually built;
- c) the field cable list produced by NAC was not identified or produced;
- d) the reports of Amin Kassam were not tendered in evidence at this trial and Amin Kassam was not a witness. Craig Miller's critiques were directed toward Amin Kassam's reports, not Doug Mortimer's report which was relied on by YEC at this trial;
- e) Craig Miller did not make a site visit for the purpose of verifying the deficiencies;
- f) Craig Miller, as an ongoing employee of NAC for 19 years at the time of trial, cannot be considered an objective third party witness, and especially given his bid underestimation of the cost of the electrical work for the project; and
- g) Craig Miller was not aware of how the absence of site-specific considerations in his AH3 electrical bid estimate for the initial Contract likely caused an underestimation, and he likely made the same errors and omissions in his estimates for deficiencies. There is no evidence in his report or affidavit of his consideration of the factors relating to the site.

[214] As a result of these difficulties, I do not accept Craig Miller's estimates on the deficiencies as reliable. However, I have referred to his estimates below for comparative

purposes. I have also relied on some of the challenges NAC makes to Doug Mortimer's estimates, partially on the basis of Craig Miller's work.

[215] I find Doug Mortimer's estimates reliable for the most part. NAC, not only through the evidence of Craig Miller but also through cross-examination of him and other YEC witnesses, (Michael Tilbrook, Edward Peake) has raised some legitimate questions about Doug Mortimer's estimates and I address those below.

Breach of Section 12.1 of the Contract

[216] Generally, I accept Doug Mortimer's assessment that NAC's work performance fell below the expected standard set out in the Contract. This is supported by the YEC employee observations of Edward Peake, Guy Morgan, William McKenna, Robert Simonson, Michael Tilbrook. The evidence of NAC to refute this focussed for the most part on the subjectivity of the assessments and differences of interpretation of the expected standards. I find the evidence provided by YEC on this issue through their own employees and their expert witnesses more persuasive. As a result, YEC is entitled to indemnification of costs, expenses and liabilities from the identified failures of NAC to comply with the Contract, under s. 12.1.

YEC's Known Costs to Remedy Deficiencies, Already Expended

\$35,882.89

[217] NAC does not dispute the amount of \$35,882.89 YEC claims for the correction of various safety items, the repair of the HV cable jacket of the station service cable, partial correction of cable tray fasteners and attachments and correction of the cable tray grounding system.

\$134,623.24 - Item 24 - Elevator Shaft Cable Installation

[218] NAC disputes the amount of \$134,623.24 claimed by YEC for the Elevator Shaft Cable Installation Deficiencies. NAC says the entire claim must fail, because YEC accepted and approved the mode of installation proposed by NAC and stamped by Quest Engineering.

[219] YEC relied on the opinions of Adam Pawlikewich, the independent engineering consultant and expert witness, and Doug Mortimer, expert witness, that this method was contrary to the Code. NAC does not accept this view. In any event, NAC argues that a Code violation is insufficient to impose responsibility upon them, because of YEC's approval of the methodology of installation here. Alternatively, NAC disputes the quantum of costs claimed, providing other options of much lesser amounts, set out below.

[220] YEC says their approval of NAC's mode of installation that violated the Code does not absolve NAC because they failed to comply with the Contract. Their work did not meet the highest industry practices. The costs expended are for the amount spent for the consultants hired to recommend solutions to the problem; plus labour, materials, travel and accommodation. Deductions were made because the same consultants also did work and made recommendations about the original feeder cables. YEC submits the amount claimed is a conservative estimate.

Background of Item #24

[221] This was part of the redundancy project. Nine new power feeder cables were installed, parallel to the existing original power feeder cables. The purpose of these cables was to bring the electrical power generated by the three turbine generator units

underground to the surface. They were installed on the inside wall of the existing elevator shaft, along with a new station service cable to supply power to the station, some communication cables, low voltage and control cables. The original feeder cables were also installed in the elevator shaft, but they were separated from the elevator by a wall of cable trays. They were installed on the exterior side of the cable trays.

[222] NAC proposed a methodology plan that was essentially the same method YEC used to install the original feeder cables. The original plan did not work as it interfered with the elevator car, as discovered by YEC Contract Administrator, Robert Simonson on inspection. The revised NAC plan was to install new cable trays, and secure the cables to the cable tray using ty-wraps, a kind of cable tie, at 1.5 metre intervals. The cables were to be supported by attaching Kellems grips, a kind of wire grip, at the top of the cables and using them to suspend the cables from a cinder block at the top of the elevator shaft. YEC had concerns about this plan, so they requested and obtained from NAC an engineering stamp.

[223] YEC advised NAC in April 2011, of the variance and clearance requirement they had obtained from the Elevator Inspection Authority for Yukon Building Safety. The variance allowed YEC to install the cables inside the elevator shaft (normally not permitted under the Yukon building code) as long as a minimum clearance of 63 mm was maintained between the cable installation and the elevator car.

[224] I accept Edward Peake's evidence that YEC had concerns during the process of installation between April and June 2011. Edward Peake inspected three times and noticed each time deficiencies in the installation of the cable tray, deficiencies in the way in which the cables were secured to the cable tray, and failures to comply with the

clearance requirement. Edward Peake testified that NAC was aware of this failure to comply with the clearance requirement as Martin Hurrell, electrical supervisor at NAC, told him that he had to ask his crew more than once to modify the installation to address the clearance issue. YEC, through Michael Tilbrook and Justin Kolla, inspected the elevator shaft in December 2011 and noted a number of deficiencies including a failure to meet best work practices and six different Code violations.

[225] In September 2013, YEC hired Orbis to begin to address the deficiencies in the elevator shaft cable installation. Orbis installed cable covers on the cable trays to provide mechanical protection to the cables. After this work was done, a bolt on the elevator car struck one of the cable covers. During the investigation of this issue, the cable tray covers were removed and it was discovered that the clearances within the elevator shaft did not meet the required 63 mm clearance. The bolt had protruded between the walls of the cable tray so that there was no clearance between the bolt and the walls of the cable tray. The problem did not become apparent until the cover was installed over the tray, causing the bolt to strike it. The covers did not create the problem, but were a trigger to uncover the problem caused by NAC's failure to install the cables with the minimum clearance.

[226] The Yukon Workers' Compensation Health and Safety Board ("YWCHSB") investigated as a result of this incident and ordered, among other things, an evaluation report of the 2011 cable installation in the elevator shaft to be done by an independent qualified engineer and provided to YWCHSB.

[227] YEC retained KGS Group ("KGS"), an engineering consulting firm, for this purpose. Two reports were prepared, dated November 29, 2013, and January 27, 2014.

Adam Pawlikewich was one of the authors of both of them. He was a Senior Electrical Engineer at that time, and as of September 2019, holds the position of Associate Principal and Hydro-Electric department head at KGS. He was qualified in this trial as an expert in electrical engineering and design of hydro-electric projects. He concluded:

- a) the ty-wrap supports installed by NAC provided insufficient support to withstand the mechanical forces that may occur on the cables if there is a fault;
- b) ty-wraps are no longer accepted by Canadian regulatory authorities for vertical support of cables because of their deterioration over time; and
- c) the Code Rule 12-014 required cable in elevator hoistways to be armoured, not unarmoured cables.

Remediation of Item #24 Deficiencies

[228] The remediation work recommended by Adam Pawlikewich included replacing the ty-wrap support system with cable clamps and repairing the cable jackets that had been damaged by the Kellems grips installed by NAC. Included in this work was the replacement of the ty-wraps with clamps on the original feeder cables and work related to the condition of the structural steel frame supporting the elevator hoistway. This work was completed in 2014, primarily by local contractors, Ben's Electric and ThyssenKrupp, as well as YEC employees.

[229] YEC deducted from these labour costs any labour unrelated to the Item 24 deficiencies, and then divided the balance in half to account for the cable clamps that were installed on the original feeder cables. Similarly, only half of the travel and accommodation costs were attributed to Item 24. Similar deductions were made to the

materials and invoices costs, with adjustments for the purchase of the cable tray covers which were only added to the NAC installed cables. All of the contractors' invoices were restricted to work done for Item #24.

Analysis of Item #24

Code Violation

[230] Adam Pawlikewich and Doug Mortimer, both independent experts, agreed with Michael Tilbrook of YEC that ty-wraps and Kellems grips were no longer Code compliant. Adam Pawlikewich opined that the cable clamping portion of the suspension system did not comply with s.12-2202(4) of the 2009 Code. That Code provision required cable supports sufficiently strong to withstand the significant electromagnetic forces and resulting large lateral forces that can develop where a circuit is comprised of a number of individual conductors as in this case. Ty-wraps did not meet this requirement because they were not strong enough to withstand these forces. Doug Mortimer agreed with this view in his cross-examination.

[231] NAC argued, based largely on Craig Miller's assertions, that the Code does not specify how cables in an elevator shaft are to be attached or fastened. The Code sets out the result expected, which is that the cables should be fastened to prevent excessive movement due to fault-current magnetic forces. Craig Miller explained his view that ty-wraps were still acceptable as a result of a different interpretation of the Code from Adam Pawlikewich and Doug Mortimer.

[232] I agree that YEC's expert evidence supports the view that the NAC proposed methodology for securing cables in an elevator shaft with ty-wraps and Kellems grips was a violation of the 2009 Code. While YEC can authorize a deviation from the Code

because they are the Electrical Permit Authority, this did not occur here as it required written notice and a deliberate authorization. In this case, YEC did not know that the NAC plan violated the Code.

YEC's Acceptance of NAC's Plan Does Not Absolve NAC

[233] NAC's claim that YEC's approval of their proposed method of installation absolves them from responsibility, even if there were a Code violation, ignores their contractual obligations.

[234] YEC noted the following applicable contractual provisions:

The supply and installation of the 15 kV cable between underground T-G gallery, above-ground switchgear building and switchyard, including all associated support and protective measures. [Contract, Specification 01 11 00, s. 1.1.4.10]

...

The majority of the 15 kV cable installation is inside the elevator shaft. The Contractor should submit cable installation procedures to Engineer for approval before construction starts. [Contract, Specification 26 05 01, s. 1.2.6]

...

The electrical installation shall comply with the latest edition of the Canadian Electrical Code, and all applicable municipal and local codes and the regulations of local inspection authorities. [Contract, Specification 26 05 01 s. 1.4.2]

[235] In addition, the Contract included the following terms:

3.1 The Contractor will perform the Work diligently, in a workmanlike manner, and in accordance with the highest industry practices used in Canada.

...

3.5 The Contractor will perform the Work...in accordance with:

- (a) the Specifications;
- (b) the terms of applicable permits and licenses relevant to the Work as issued by a Regulatory Authority;
- (c) and all lawful directions, guidelines and other requirements of any Regulatory Authorities;

...

[236] Section 01 33 00 (Submittal Procedures) of the Contract Specifications specifies that NAC will:

.5 Review submittals prior to submission to Engineer. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and co-ordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated...will be returned without being examined and considered rejected.

.6 Notify Engineer, in writing at time of submission, identifying deviations from requirements of Contract Documents, stating reasons for deviations.

...

.8 Contractor's responsibility for errors and omissions in submission is not relieved by Engineer's review of submittals.

[237] The Contract clearly requires compliance with the Code, and compliance with highest industry practices. Any deviation from these requirements must be signed off in writing by YEC. Engineering approval does not relieve NAC from errors and omissions under the Contract.

[238] NAC additionally argued that the Contract specifications did not provide detail or direction on the methodology to attach cable trays or secure the cable in the shaft. NAC further noted that the original feeder cables were secured with ty-wraps and Kellems grips and YEC made no attempt until recently to fix the original feeder cables.

[239] I conclude that NAC is liable to YEC for this deficiency. NAC's requirement to comply with the Code, along with their other contractual obligations as noted above are sufficient to hold them responsible. Code requirements change over time, as new information is learned and in response to new situations. What was once acceptable can become unacceptable. While the ty-wraps and Kellems grips used to secure the original feeder cables became unacceptable over time, and needed to be corrected, the safety concerns were not as urgent. The risk of the collision of elevator parts with the new cables because of the failure to ensure the clearance requirement was not present with the original cables. They were not adjacent to the elevator because they were separated by a wall of cable trays.

[240] This situation is distinguishable from *Beta Construction Inc. v. Chiu*, 2015 ONSC 5288. In that case there was no suggestion that the alternative presented was a deficiency, a Code violation or unsafe.

Quantum of Item #24 Deficiency Remediation

[241] NAC argues one of the following three cost alternatives should be selected by the Court instead of the \$134,623.24 claimed by YEC:

- a) Doug Mortimer's estimate of 500 hours of labour to source, engineer, plan and install the saddle clamps performed by YEC employees at the

blended hourly rate of \$54 amounts to \$27,000 plus \$5,000 in materials for a total of \$32,000;

- b) No costs or modest costs should be included for KGS because NAC's installation did not require the independent engineering report of KGS; instead, the KGS report was due to actions taken by YEC and Orbis; and
- c) KGS invoice for two structural engineers to attend the site for work unrelated to Item #24 should be deducted, as well as a 50% reduction of the KGS cable invoices because the same work was relied on by YEC to upgrade the original feeder cables to the same cable clamps.

Conclusion on Item #24

[242] The first proposed alternative of Doug Mortimer's 500-hour estimate is inappropriate because it was an underestimate, given the cost of the KGS engineering consultation services, as well as the cost of the remediation itself. There is evidence of the actual costs. These actual costs should form the basis of any cost recovery, rather than an estimate.

[243] The second proposed alternative of deducting or reducing the KGS costs is also not appropriate. NAC's installation of the cables was in fact the cause of the incident that occurred when Orbis put on the cable covers. Neither YEC nor Orbis created the problem that caused the elevator bolt to strike the cable covers. This was caused by the lack of clearance deficiency of NAC. YEC did not know about the clearance deficiency when they hired Orbis to add the cable covers. Orbis did not know about it either. The YWCHSB order for an independent engineering report as a result of the bolt incident

was directly related to the insufficient clearance issue, caused by NAC. The costs of KGS are properly attributable to NAC.

[244] The third proposed alternative is also not appropriate. YEC accounted for the small amount of time in the claimed invoices spent by the structural engineers on work not related to the Item #24 deficiencies, by not claiming for the KGS invoices for the elevator shaft structural steel frame work. It was not disputed that some of that time was spent on work related to the Item #24 deficiencies. Further, the fact that some of the work done was also used for the original cables does not entitle NAC to a discount of 50% because that same work was done to remedy the Item #24 deficiency. The invoice represents the actual cost of the necessary work related to this deficiency; the fact that the same work was used to fix another issue is not a reason to discount the initial cost.

[245] YEC is entitled to its claimed amount of \$134,623.24.

Conclusion on Known Costs to Remedy Deficiencies, Already Expended

[246] YEC is entitled to the full amount of its claim for known costs of \$170,506.13.

YEC's Unknown Costs to Remedy Deficiencies, Already Expended

[247] YEC claims for costs of deficiency remediation work performed during their regular maintenance and capital work activities at the AGS since 2012. The remediation work was done incidentally to the regular work, so the costs were not tracked or isolated from the regular work activities.

Corrected Deficiency List, Costs Unknown

[248] Edward Peake listed the deficiency items that were fully or partially corrected in this manner. Doug Mortimer reviewed each of these 45 items and estimated 268 hours for the completion of the work. The internal costs of YEC electricians and engineers

who carried out this work are \$79.52 and \$96.16 per hour, or a blended rate of \$85 per hour. Materials were estimated by Doug Mortimer at \$1,155, for a total of \$23,935. YEC relies on these estimates for their claim for the corrected items, costs unknown.

[249] NAC argued that if the actual costs could not be calculated accurately, they were not recoverable.

[250] Alternatively, NAC relies on Craig Miller's report in which he responds to the estimate of hours done in 2012 and 2016 by Amin Kassam of Orbis, not Doug Mortimer's estimated spreadsheet in 2019. However, Doug Mortimer's 2019 estimated hours for these items are virtually identical to the 2016 Orbis estimate.

[251] Craig Miller's estimated hours for these items is 138.5, calculated using Appendix A to YEC submissions and Exhibit 7 in this trial. He estimates a blended hourly labour rate of \$54 for YEC employees, based on an 80/20 split between labourer and supervisor, for a total of \$7,479. His estimate of the cost of materials is \$7,525. The total estimate of labour and materials by Craig Miller is \$15,004.

[252] NAC noted that 26 of the 45 items amounting to 53.5 of the 138.5 hours are classified as workmanship-related. NAC argued that a determination of these as deficiencies was a subjective exercise, and disagrees they are all deficiencies.

Analysis of Corrected Deficiencies, Costs Unknown

[253] I outline below at paras. 270-275 the reasons why I have accepted the subjective views of Doug Mortimer in arriving at his estimates on workmanship deficiencies. Those same reasons apply here and I see no reason to reduce his estimate on the basis of subjectivity.

[254] Only two of the 45 items are documentation related, with a small number of hours, and an immaterial difference between the estimates by Doug Mortimer and by Craig Miller. The remainder of the 45 items are a combination of installation and re-testing and although Craig Miller's estimates are lower than Doug Mortimer's, they are not substantially so, making the difference in the estimated number of hours relatively small. There are two Code violations, but NAC's estimate of hours to remedy the deficiencies was higher than YEC's estimate.

As-built drawings prepared by William Haydock

[255] William Haydock, the Mechanical and Civil Engineering Supervisor at YEC at the time of the project, testified he spent 35 hours of work, including two days on site, preparing sketches for the accusonic flowmeter, the penstock and tailrace piping, and the fanwall cooling supply and return piping, in the absence of as-built drawings for these items. His hourly rate of \$85 makes the claim for his time \$2,975.

[256] NAC does not refute this hourly rate or the time spent by William Haydock.

[257] I agree that YEC is entitled to recover this amount from NAC.

Conclusion on Corrected Deficiencies, Costs Unknown

[258] Seeing no further basis to dispute the estimated hours for this work, or the proposed internal YEC labour rates, I agree YEC is entitled to the amount of \$26,910 claimed for monies expended to fix the deficiencies, costs unknown.

YEC's Costs to Remedy Outstanding Deficiencies

Issue

[259] The parties stated in the agreed statement of facts that the 79 items described on the Agreed Deficiencies list, prepared in July 2012 were deficiencies or defects in the

work required to be performed by NAC under the Contract. NAC however in this trial raised concerns about the subjectivity of YEC assessment of some of the deficiencies, suggesting that they may not be deficiencies (addressed below). YEC also appeared to rely on Doug Mortimer's identification of deficiencies amounting to 83 items, not 79.

Craig Miller also responded to the 83 items identified by Doug Mortimer.

[260] The basis for recovery is the cost of remediation of the deficiencies. There is no question in my view that given the nature of these deficiencies YEC is likely to undertake the work if provided with the compensation to do so (*Quails View Farm*, para. 35). In this case the main dispute lies in the valuation of these costs of remediation.

[261] Doug Mortimer divided the outstanding deficiencies into six categories: documentation, labelling, installation, workmanship, code violation, re-testing. He estimated 2,580 hours of labour to complete the outstanding deficiencies. He estimated a three-person crew working ten-hour days could complete the work over a period of three months, or 86 crew-days, to coincide with the AGS summer slowdown or shutdown. He further estimated that the labourers would be contracted from outside Yukon, and thus estimated air travel costs at \$2,500 each; nine flights per person because of ten-day shifts, resulting in 27 flights; and meals and accommodation at \$200/day (single occupancy) for 258 person days (86 x 3). He estimated a flat blended labour rate of \$125/hour. The amount for labour is \$320,875 and materials is \$6,100 with logistical costs of \$67,500 for flights and \$51,600 for accommodation and meals, for a total of \$446,075.

[262] By way of comparison, Craig Miller used five categories of deficiencies for his analysis: documentation, labelling, general workmanship, code compliance and incomplete work. He did not identify installation and re-testing as separate categories. His objections to Doug Mortimer's estimates included the following arguments: i) some of the deficiencies identified were complete; ii) some of the deficiencies identified were not required pursuant to the Contract specifications or the Code; iii) some of the deficiencies identified were not within NAC's scope of work. All of these serve to reduce the estimate of hours for remediation of the deficiencies.

[263] Craig Miller estimated in his 2016 report the labour hours and costs to remedy the 138 deficiencies. A revised estimate for the cost of repairing 83 deficiencies taking into account the deficiencies that were fully or partially completed, and using the same hourly estimates as in the 2016 report, amounted to 780 labour hours and 156 supervisory hours, for an amount of 936 hours in total. Craig Miller's estimate was based on a four-person crew working ten-hour days for a 21 day shift and a 16 day shift; eight round trip flights at \$1,000 per flight. Accommodation costs were estimated at \$100/night (double occupancy) and meals at \$50/day. At rates of \$116/hour (labour) and \$125/hour (supervisory) the total cost was \$109,356. The materials and logistical costs was \$43,025, for a total of \$152,379.

[264] NAC argued that further reductions were appropriate on the basis that YEC employees could do much of this work, at a blended hourly rate of \$54.

[265] Finally, NAC also argued that not all of the deficiencies were deficiencies because they were not required by Contract specifications or the Code or they were not

within NAC's scope of work. Applying all of these reductions resulted in costs ranging from \$34,344 to \$50,544.

Analysis of Costs of Outstanding Deficiencies

[266] I generally accept Doug Mortimer's estimates, even those that are based on subjective opinion and Code interpretation. His expertise is noted above. His thorough site visit, combined with his past experience working in similar facilities in the north enhances the reliability of his assessments. I also note he has appropriately included planning and design in his estimates.

[267] The objections of Craig Miller of completed deficiencies, not required by the Code or Contract specifications or not within NAC's scope of work were opinion and not well-explained. The concerns with his opinion set out above cause me to reject these objections.

[268] However, NAC did make some valid arguments through cross-examination that provide a basis for some reduction of Doug Mortimer's estimates. The following sets out the reasons for my acceptance of Doug Mortimer's subjective views, as well as the reasons why there should be some reduction of his estimates.

[269] I have not addressed the deficiency categories of installation and re-testing identified by Doug Mortimer specifically. These do not appear to have been challenged specifically by NAC either through Craig Miller's report or in submissions. I have accepted Doug Mortimer's estimates in these categories.

Subjective Views of Deficiencies in Workmanship

[270] NAC objects to many of the deficiencies in the workmanship category because they constitute matters of subjective opinion and are not objectively required to be remedied under the Contract.

[271] Doug Mortimer conceded that many of the deficiencies in the workmanship category can be “highly subjective and vary widely in the eyes of the beholder.” For example, when questioned on cross-examination about the deficiency related to the tidiness of wiring, he wrote that he had “tried to be reasonable and provide estimates based on what is a realistic expectation of neatness from the point of view of a subject-oriented viewer looking at a new industrial installation of this type for the first time.”

[272] Doug Mortimer clarified on cross-examination that the AH3 generator and turbine was a new installation in a new area in an older plant and it should look “nice and neat” when seeing it for the first time. As well, s. 1.5 of the Contract and Specification 26 05 01 described the standard required as “[a]ll work shall be performed by competent tradesmen, be executed in a workmanlike manner and present a neat, mechanical appearance when completed.”

[273] The neatness or tidiness required in the facility is not only for aesthetics. It has a functional aspect. As described by Edward Peake, where wires are messy and unlabelled, it is difficult for a technician to follow the path of any given wire to discover its termination point and functionality, making maintenance, upgrades and troubleshooting more time consuming. This also applies to cable trays overfilled with too many cables. Not only can this be a Code violation, but an overfilled tray also makes it

very difficult to follow a cable visually throughout the plant, especially when the trays are along ceilings or through walls.

[274] This lack of tidiness in the wiring is one example of a workmanship deficiency, but it permeates many of the deficiency items. The subjectivity used in determining other deficiencies in workmanship items can be addressed by the more general considerations of Doug Mortimer's evidence.

[275] Doug Mortimer was qualified as an expert, in part because of his significant experience in a service and operating capacity on all types of power generating equipment, especially in the areas of large diesel and hydro-electric grid-connected and prime power applications, and in troubleshooting. His 40 years of experience with many hydro-electric projects, some of them in northern locations with similar challenges to Yukon, combined with his five-day visit to the AGS in July 2012, during which he took many photographs to support his conclusions, make his subjective opinion reliable. He testified on cross-examination that despite the subjectivity involved in this exercise, his assessment of the failure of NAC to meet the workmanship standards was reasonable and would be agreed to by anyone walking through the project and charged with inspecting or quality maintenance.

[276] I have noted above the difficulties with Craig Miller's Report and evidence. Another example of the reliability concerns arises from Craig Miller's criticism in his affidavit of Doug Mortimer's estimate based on comments he made on Exhibit C. Doug Mortimer testified that Exhibit C was an initial draft, never intended to be a final product and that was superseded by his report. The list and his estimates changed significantly between Exhibit C and his final report. For good measure, Doug Mortimer did respond

in his affidavit to the criticisms from Craig Miller of Exhibit C. These responses enhanced Doug Mortimer's credibility and reliability by demonstrating his greater knowledge of the project, greater understanding of the work required to remedy the deficiencies, and greater appreciation of the industry standards expected in carrying out the Contract obligations. More generally, he also has a clear understanding and appreciation of the increased time and costs of working in northern remote locations.

[277] I accept Doug Mortimer's evidence on the subjectively determined deficiency items, based on his experience and expertise. His estimates will not be reduced on this basis.

Canadian Electrical Code Violations

[278] NAC emphasized the Code is subject to interpretation. NAC does not agree with some of the Code violations set out by YEC on its deficiency list.

[279] YEC, through Doug Mortimer, responded that in fact the Code sets a minimum standard of compliance. He testified that he knew of no situation where work on a contract achieved an acceptable standard if a Code violation occurred. In any event, s. 3.1 of the Contract requires NAC to comply with the highest industry practices. This includes Code compliance. Even if a Code violation is not accepted or agreed to, compliance under the Contract is the operative standard. Thus, even if something is not a pure Code violation, it may still not meet the Contract requirements and is still a deficiency.

[280] I accept Doug Mortimer's explanation of how Code violations interact with Contract standards, based on his expertise. His estimates will not be reduced on his interpretation of the Code violations or Contract standards.

Reduction of Doug Mortimer's Estimate on Remediating Outstanding Deficiencies

[281] In my view, the following factors serve to reduce Doug Mortimer's estimate:

- a) there is information available to assist with some of the documentation and labelling issues that Doug Mortimer did not take into account;
- b) YEC employees on site are capable of doing some of the deficiency work, including during regular maintenance checks, rather than hiring outside contractors; and
- c) fewer hours of labour may be required and costs of travel, accommodation and meals reduced if outside contractors do all the work in one block of time over several weeks, instead of more gradually; the travel costs of outside contractors in Doug Mortimer's estimates may be reduced.

Information About Cable Connections and Equipment

[282] The labels, lamacoids, and tags are all identifiers that contain information to enable a technician to know what a wire does, and what it connects to. These identifiers are essential for technicians to know the functions of each part of the equipment.

Without this information, the technicians need to do careful testing before working on any of the equipment. The absence of wire labels, lamacoids and cable tags increases the difficulties and time spent carrying out maintenance and troubleshooting activities.

This can increase costs if the troubleshooting is related to a power outage.

[283] As-built drawings are the revised set of drawings submitted by a contractor upon completion of a project. Their purpose is to document any changes to the original design (as set out in the IFC drawings) made during construction. Once again, their purpose is to assist with modification, maintenance or troubleshooting of the equipment.

The as-built drawings provide technicians with a necessary road map showing how the components of the equipment function. Without the as-built drawings, there is uncertainty about the operation of the equipment, and a consequent higher risk of error. In a live plant, an error resulting from incomplete information can result in a shutdown and loss of power generation. The absence of the as-built drawings also increases the time spent in any modifications or maintenance.

[284] In Doug Mortimer's estimates for remedying deficiencies related to documentation and labelling, he assumed all labels, tags, lamacoids were missing; and no information, such as termination sheets or cable lists or vendor drawings, was available as a starting point for the remedial work.

[285] As noted above, termination sheets record the steps taken to complete the connection of the cables, including identifying the cable, labelling its function, and the end point to which it is attached. These sheets are of assistance in completing missing labels, lamacoids or tags.

[286] Doug Mortimer agreed on cross-examination that if there were termination sheets or cable lists or schedules, it would be much easier to check the labels and tags, and this would take less time. He agreed that the first document listed at Tab 91 of the Revised Common Book of Documents ("Tab 91") was a cable list and the documents following were termination sheets. He agreed that, assuming these were accurate, the ability to use them would reduce the time estimates for some of the deficiency items.

This applied to the following deficiency items:

- a) wire labels missing or incorrect (281 hours);
- b) lamacoids and device labels missing (70 hours);

- c) tidy the wiring, including labelling of spare cables and wires (160 hours);
and
- d) as-built drawings, including cable and termination schedules for all electrical control panels (648 hours), and 25-cable tags missing or inadequate throughout the project (59 hours).

[287] These deficiency items total 1,218 hours of labour and comprise 47% of the hours estimated by Doug Mortimer.

[288] Doug Mortimer also agreed that information from vendors about the equipment would be useful to have as a starting point for the as-built drawings and would reduce the time required to create the as-built drawings for those pieces of equipment. He did not take into account the availability of any vendor drawings for this work in arriving at his estimates.

[289] A concern with this evidence is the assumption of accuracy of Tab 91 and any other pieces of information. Tab 91 was identified by Laith Hamad as the same document as the Revision B cable list prepared in February 2011. Changes were made to that list before the end of the project and it is not clear whether they are captured on this list. Even if there were changes to that list, however, it does provide some information, which is preferable to no information.

[290] No specifics were provided by NAC about any reduction in the Doug Mortimer estimate of hours and consequent costs as a result of the availability of this additional information. As noted, it was unclear on the evidence whether the information in Tab 91 was accurate. However, it is appropriate to reduce some of Doug Mortimer's estimates on the documentation and labelling items, given the existence of Tab 91 documents,

and evidence from NAC that some of the as-built drawings had been submitted or were available from vendors.

[291] The question is how to calculate the reduction of the Doug Mortimer estimates on the basis of the evidence that I accept, without the benefit of a certain percentage or number proposed by the parties or counsel. As noted by the Court in *McLachlan v. Canadian Imperial Bank of Commerce* (1987), 13 B.C.L.R. (2d) 300 (S.C.), a judgment in which damages arising out of a trespass were being assessed, “the many assumptions and almost arbitrary opinions inevitable in a judgment of this kind are an example of the principle that a Court must assess damages, no matter how difficult to do so with logical precision, on such evidence as it has” (p. 22).

[292] Other courts have followed this principle in breach of contract cases in the construction context where several estimates are provided but contain gaps or are disparate. The Court wrote in *A.L.Sott Financial (FIR) Inc. v. PDF Training Inc.*, 2004 BCSC 1646, at para. 227 (upheld on appeal), “[w]ith such disparate estimates, scientific precision in assessing damages is impossible. Assumptions and arbitrary opinions are inevitable: *McLachlan* (B.C.S.C.) at 198”.

[293] In *Quails View Farm Inc.* in which the trial judge awarded \$30,000 in damages and described it as arbitrary, the Court of Appeal explained:

[40] ... when the quantification of damages is difficult or uncertain, judges exercise their judgment based on the circumstances before them. That is what the judge did in the present case.

[41] Although the \$30,000 award was described as “arbitrary”, the judge observed at paras.102-103:

[102] ... [T]here is evidence of deficiencies and that the [appellants] have suffered a loss. ... [E]ven though it is impossible to achieve any precise monetary

amount for the appropriate award, that should not prevent an award from being made.

[103] In this case, there is evidence that the lifespan of the roads has been shortened as a result of the deficiencies. As a result, I am of the opinion it is appropriate to make an arbitrary award to compensate the [appellants] for the shortened life span of the roads of \$30,000.

[42] In my view, this is a classic approach to the assessment of damages where assessment is difficult. The award was based on the evidence before the Court. It was not arbitrary.

[294] Similarly, in *A.L. Sott Financial (FIR) Inc. v. PDF Training Inc.*, 2004 BCSC 1646, at para. 235, the Court considered the estimates of one party to be “too generous” and discounted them. The Court stated they were forced to provide an “arbitrary estimate of the costs of upgrades, due to the competing evidence of the experts (para. 235)”. This decision was upheld on appeal (2008 BCCA 35).

[295] Another example of this was the Court’s award in *Doug Desruisseau Carpentry Inc. v. Davitt*, 2018 NBQB 74, an action brought by a builder against a homeowner for the cost of remedying alleged deficiencies. The trial judge generally accepted the defendant’s expert’s approach to costing, but he believed his assessment was too high because he viewed costs “through the lens of a builder of luxury homes with exacting standards.” In the trial judge’s view, this justified discounting his estimate by 25% (para. 46).

[296] Here, there is a wide disparity in the valuation of the costs of remedying the deficiencies between the experts. While I generally accept the estimates of Doug Mortimer, I agree that his estimates in the documentation and labelling categories, including as-built drawings, are too high because of his incorrect assumption that no

information is available as a starting point for the technicians. In my view, a discount of 20% in the 1,218 hours estimated by Doug Mortimer for the documentation and labelling items is reasonable. A 20% discount of those hours amounts to 975 hours. This leaves 1,362 undiscounted hours, based on the original 2,580 hour estimate.

YEC Employees Instead of Contractors; Remediating Deficiencies During Regular Maintenance or in a Fixed Block of Time

[297] Doug Mortimer agreed on cross-examination that much of this remedial work could be done by YEC employees already on staff. While I accept this evidence, I recognize that the difficulty for YEC is capacity. The amount of work required to remedy the deficiencies would take the YEC employees away from their regular duties. The time period during which the work can most efficiently be done is during the 12-14 week summer period.

[298] YEC already completed some of the deficiencies (as noted above) during their regular maintenance work or because they were urgent. There is no suggestion from YEC that this will not continue as is practical. To expect that all of the remedial work be completed by YEC employees, however, is unrealistic.

[299] It is reasonable to estimate that some outside contractors will be required. However, the numbers of people required, the time required, and the flight costs estimated by Doug Mortimer are unreasonably high.

[300] The new reduced basic labour costs based on the 20% discount above are 2,337 (1,362 + 975) x \$125 for a total of \$292,125.

[301] The evidence from Edward Peake, Lawrence Joudry and Doug Mortimer was that YEC employees were capable of doing the work, with some help available from

local contractors such as Ben's Electric. Some of the work will be able to be continued to be done during regular maintenance. As a result, the outside contractor hours should be reduced to two-thirds of the new amount which is 1,542 hours. Accepting Doug Mortimer's estimate of \$125/hour, this amounts to \$192,750 for outside contractors

[302] The work that can be done by YEC reflects the remedial work continuing to be done during ongoing maintenance by YEC employees, and assistance that can be provided to outside contractors during the shutdown periods by YEC employees. At the rate of \$85/hour, representing the blended rate of YEC electricians and engineers as expressed by Doug Mortimer, who have done most of the remediation work to date, those costs would be 795 hours x \$85 for an amount of \$67,575. The total amount of labour with these reductions is \$260,325.

[303] I accept Craig Miller's estimate of four outside contractor crew members, working longer shifts over a block of time thereby decreasing air travel costs. The crew days would be 38.65, based on ten-hour days.

[304] The estimate of \$2,500 round trip airfare for one person is high, while the \$1,000 estimate is low. I estimate \$1,700 round trip for transportation. Based on a four-person crew working ten-hour days for a 21-day shift and an 18-day shift; eight round trip flights at \$1,700 per flight amounts to a total of \$13,600.

[305] I agree with Doug Mortimer that Craig Miller's estimate of accommodation and meals in the Yukon outside of Whitehorse in the summer is low, and accept Doug Mortimer's estimate of \$200/day for meals and single-occupancy accommodation.

Conclusion on Outstanding Deficiencies

[306] The total costs of transportation (\$13,600), accommodation and meals (\$30,920) is \$44,520.

[307] The total labour costs for the outstanding deficiencies is reduced to \$304,845. The materials costs remain at \$6,100 for a total recovery of \$310,945.

Deficiencies Not Capable of Repair

[308] YEC claims general damages in the amount of \$96,373, or 15% of the total quantum of deficiencies, for foreseeable inconvenience and loss caused by NAC's poor workmanship. Another way of characterizing this claim is as an award for the diminution of value of the facility, due to the expenses YEC has incurred for the additional time spent on work because of the poor workmanship and possible reduction of operational life of the equipment.

[309] NAC disputes this claim on the basis that there is only speculative evidence from YEC on the possible diminution of value of the facility. YEC has not provided specific evidence about how the absence of documents or initial test data will detrimentally affect the operations and maintenance in future. NAC says that any award made to YEC should be nominal.

[310] YEC relies on cases in the residential construction context. In many of these cases, it was clear to the courts that the deficiencies caused emotional distress or physical inconvenience to the individual who had to live with the deficiencies. These factors do not apply in this case. In a commercial context, compensation for the personal impact on individuals of deficiencies of construction is not applicable or appropriate. Similarly, the characterization of the damages as diminution of value of the

property is more apt in the residential context, and not in the context for a public utility facility for which there is no market.

[311] For these reasons, this claim is denied.

Conclusion on Deficiency Claims

[312] The total recovery for the deficiency claims is \$508,361.13 .

Conclusion

[313] For the reasons noted above, NAC is entitled to \$164,940.02 under Schedule D. NAC's claim under CRX 100 is dismissed.

[314] YEC is entitled to \$100,000 for its claim under CRX 111 and \$508,361.13 for its deficiency claims.

[315] Costs and interest may be spoken to in case management if the parties are unable to agree.

[316] My thanks to counsel for their careful preparation and organization of the voluminous material in this trial, and for their very helpful submissions.

DUNCAN C.J.