

NOVA SCOTIA UTILITY AND REVIEW BOARD

IN THE MATTER OF THE PUBLIC UTILITIES ACT

- and -

IN THE MATTER OF AN APPLICATION by **Nova Scotia Power Incorporated** for
Authority to Overspend (ATO) - TUC6 Waste Heat Recovery Project - CI#28098

BEFORE: Roberta J. Clarke, Q.C., Member

COUNSEL: **NOVA SCOTIA POWER INCORPORATED**
René Gallant, LL.B.
Rick Janega

CONSUMER ADVOCATE
William L. Mahody, LL.B.

NEWPAGE PORT HAWKESBURY CORP. and
BOWATER MERSEY PAPER COMPANY
David S. MacDougall, LL.B.
James MacDuff, LL.B.

AVON ET AL.
Robert G. Grant, Q.C.
Nancy G. Rubin, LL.B.

NOVA SCOTIA DEPARTMENT OF ENERGY
Stephen T. McGrath, LL.B.

MUNICIPAL ELECTRIC UTILITIES OF NOVA SCOTIA
CO-OPERATIVE
Don Regan

BOARD COUNSEL: S. Bruce Outhouse, Q.C.

HEARING DATE: October 22, 2010

DECISION DATE: November 22, 2010

DECISION: Application is approved

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I INTRODUCTION

[1] On May 3, 2010, Nova Scotia Power Incorporated ("NSPI", the "Utility") submitted a request for Approval to Overspend ("ATO") to the Nova Scotia Utility and Review Board (the "Board") for the Tufts Cove 6 ("TUC6") Waste Heat Recovery Project (the "Project"). The Tufts Cove Generating Station is located at Dartmouth, Nova Scotia. The Project involves the recovery of waste heat from two combustion turbines, which will be used to produce additional electric power. The amount of the request is \$8,699,864. This would bring the total amount of the Project to \$92,996,628.

[2] NSPI stated:

... The forecast cost increase is associated with changes to specific project cost elements unforeseen at the time of NSPI's original capital filing with the Nova Scotia Utility and Review Board (UARB, Board).

[Exhibit N-1, p. 2]

[3] The initial work order (CI# 28098) for the Project was submitted to the Board on September 12, 2007 in the amount of \$66,286,420. By letter dated December 21, 2007, the Board made the following comments:

On September 12, 2007, NSPI submitted the following work order greater than \$1 million for Board approval:

CI#28098	Tufts Cove 6 ("TUC 6") Waste Heat Recovery Project	\$66,286,420
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NSPI also requested Board approval to include a provision that the cost of this project will be recovered from NSPI customers over the remaining useful life of Tufts Cove 4.

In a letter to the Board dated September 18, 2007, Mr. George Cooper, Q.C., on behalf of his clients, Stora Enso Port Hawksbury Limited and Bowater Mersey Paper Company Limited ("SEB"), provided some comments on a NSPI press release on TUC 6. In the letter, Mr. Cooper requested "...that the Board establish some type of visible public process to allow for stakeholder input regarding the need for the expenditure; the reasonableness and transparency of the costs involved; and the resulting benefit to customers of NSPI as a result of the proposed project."

[Board Letter to NSPI, December 21, 2007, p. 1]

[4] The amount approved by the Board on December 21, 2007 was \$55.5 million for the combined cycle component of the Project.

[5] On May 28, 2008, NSPI submitted a request for Board approval of a revised version of this capital expenditure, at a total cost of \$84.3 million. The Board decided that a process which would allow public comment with respect to that application, similar to what had been established for the initial work order, was required.

[6] After receiving submissions from Intervenors and reviewing the application, the Board made the following findings, which were included in a letter dated September 16, 2008 to NSPI:

...The Board is satisfied that the DF [duct firing] addition meets the economic justification criteria based on the immediate and significant fuel cost reductions which are evident in the Hatch Vista analysis. Incremental NPV savings with DF have been estimated to be \$31.6 million (2006 \$).

The Board does wish, however, to make it clear to NSPI that its approval of both components of this project is strictly based on the revised cost of \$84,296,764, and its clear understanding that this project can successfully be completed at or below this approved amount. In this regard, the Board notes that NSPI, in its response dated August 22, 2008, stated that:

NSPI will make every effort to manage this project, once approved, to the lowest reasonable cost to customers... The Company is confident that timely approval will help to ensure the current costs estimated can be achieved.

NSPI should be keenly aware that should the actual cost of this project exceed that amount, the Board will scrutinize an application by NSPI to overspend that amount carefully to ensure that this project continues to be economically justifiable and in the best interest of ratepayers. This review will be conducted in the usual manner, in accordance with the Board's responsibility pursuant to s. 35 of the Act which reads as follows:

35 No public utility shall proceed with any new construction, improvements or betterments in or extensions or additions to its property used or useful in furnishing, rendering or supplying any service which requires the expenditure of more than twenty-five thousand dollars without first securing the approval thereof by the Board. R.S., c. 380, s. 35; 2001, c. 35, s. 30.

The Board is aware that in its submission dated July 4, 2008, NPB stated:

In the circumstances NPB is not convinced that the estimated increase in costs is, in the Board's words in its letter of June 9, "warranted and justifiable". NPB also reserves the right to challenge the prudence of the costs actually incurred by NSPI as this project moves forward.

(NPB letter, July 4, 2008, p. 6)

The Board wishes to point out that, given its authority under s. 35 noted above, in the event an application for approval to overspend is filed in the future by NSPI, the Board will determine at that time whether an opportunity for input by interested parties is appropriate.

[Board Letter to NSPI, September 16, 2008, pp. 9-10]

[7] Because of the comments contained in its September 16, 2008 approval letter, the Board determined that the ATO required a similar review process, with the opportunity for interested parties to intervene. Consequently, the Board sent a letter on May 27, 2010 to the participants in the earlier applications, inquiring whether they wished to intervene in this ATO application.

[8] NewPage Port Hawkesbury Corp. and Bowater Mersey Paper Company Limited ("NPB"), Avon et al. ("Avon"), the Municipal Electric Utilities of Nova Scotia Co-operative ("MEUNSC"), and the Nova Scotia Department of Energy ("NSDOE") (collectively the "Intervenors") advised the Board that they wished to intervene.

[9] The Board then set the following timetable for review of the application:

- | | |
|---|--------------------------|
| • Information Requests (IRs) to NSPI | Wednesday, June 30, 2010 |
| • Responses to IRs from NSPI | Thursday, July 15, 2010 |
| • Written Submissions from Participants | Thursday, July 22, 2010 |
| • NSPI's Response to Submissions | Thursday, July 29, 2010 |

[10] IRs were issued by the Board and NPB on June 30, 2010, and NSPI provided its responses in accordance with the timetable. On the same date, NSPI requested an extension for the filing of its Response to Submissions to August 6, 2010,

which the Board approved. Written submissions were received from NPB, Avon and NSDOE on July 22, 2010. NSPI's reply submission was received on August 6, 2010.

[11] On August 20, 2010, NSPI requested an opportunity to make oral submissions on the application, which would allow Intervenors to make any final representations, and allow the Board to raise any additional questions it might have.

[12] While the request to hold a hearing following the written process was a somewhat unusual manner of dealing with the matter, the Board agreed to the request, as it was consistent with its comments in the September 16, 2008 letter to NSPI indicating that the Board would scrutinize an ATO for this Project carefully. The Board set October 22, 2010 as the date for hearing oral submissions. The Intervenors advised the Board that they would not appear; however, the Consumer Advocate ("CA") requested an opportunity to appear at the hearing, which the Board allowed.

[13] The Board considered that further information was required on a number of aspects of the ATO, and as a result, sent a letter to NSPI on September 23, 2010, identifying several issues which it requested NSPI to address at the hearing. A copy of this letter was sent to all participants.

[14] While MEUNSC did not file a submission in accordance with the timetable noted above, through Board Counsel, it requested the opportunity to file a brief written submission instead of appearing at the hearing. The Board accepted this approach, and the submission was received on October 22, 2010, and provided to all parties.

II ISSUE

[15] The issue before the Board is whether the requested ATO should be permitted as prudent and reasonable for this Project.

III EVIDENCE

[16] As noted in the Board's December 21, 2007 letter to NSPI, Tufts Cove 4 and 5 are simple cycle LM6000 combustion turbines installed in July 2003 and January 2005 respectively. Both units are rated at 50 MW and are fuelled by natural gas. Operating in a simple cycle mode, the heat produced from the combustion is largely exhausted to the atmosphere. Energy is emitted in the waste heat. The Project is designed to recover this waste heat, use it to produce additional electric power and to do so at a much lower plant heat rate (i.e. higher efficiency) than the simple cycle units.

[17] Additional output can be obtained by installing natural gas burners in the duct work. For TUC6, duct firing adds an additional 24 MW of net capacity but results in a higher overall plant heat rate. NSPI's Project includes duct firing.

[18] NSPI states in its ATO application that the operational and economic merits of this Project remain strong and support the increase in costs.

[19] NSPI provided an updated Project economic analysis. As with the May 28, 2008 application, this economic analysis includes the Hatch computed operating cost benefits, adjusted for the later in-service date.

[20] Rick Janega of NSPI provided an update on the progress of the Project:

I would just like to take a moment and give you an update on how the project is proceeding. I think, at this point, it's important because of a lot of the concerns that have been brought to the table around the project – questions around design and execution of it – the balance of plant work is underway, as we speak. We have the Unit 5 gas turbine

actually flowing. The duct now is removed or the exhaust duct is removed and the gas from that unit is flowing through the no. 5 boiler. Unit 4 is being interconnected, as we speak. Those issues are raised as an important matter because we had defined in an earlier description to the Board our concern about if we were not able to achieve that timeline that it would mean we would have take the gas turbines out of service through the winter period – through the peak period – and we don't think the economics would have supported doing it. We wanted to inform the Board we are able to complete that work in advance of the winter, which means that we will be able to complete the commissioning through this winter. The construction is expected to be complete in December. We are going to meet that schedule and the commissioning will proceed through the winter period, hopefully, with completion in February. So, importantly, we were able to – putting the challenges on the project timeline aside – we have been able to complete that important task, with Unit 4 being completed, as I said, at this time.

[Sound File, October 22, 2010, 59:40 - 1:01:16]

[21] NSPI confirmed in its response to Board IRs-2a and b that, except for the updated in-service date and increased capital costs, all other input assumptions remain constant across the economic analyses done in September 2007, May 2008 and May 2010. All these other assumptions were consistent with the 2007 Integrated Resource Plan Report.

[22] Attachment 1 to NSPI's ATO application provided a breakdown of major project items, and contains a summary comparison to the Board approved capital cost estimate. The variances in the costs of the Project, summarized from the Attachment, are detailed as follows:

Description	May/08	May/10	Variance
Harbour Infill, Site Prep and Foundations	\$ 3.82	\$ 7.86	\$ 4.04
Environmental Assessment and Permits	\$ 0.64	\$ 0.67	\$ 0.03
Buildings and Auxiliary Systems	\$ 3.40	\$ 5.03	\$ 1.63
Steam Turbine Generator and Major Components	\$29.43	\$35.03	\$ 5.60
Boilers, Duct Burners and Gas Systems	\$18.35	\$19.38	\$ 1.03
Local Control System Integration with Main Plant	\$ 1.19	\$ 1.96	\$ 0.77
Generator Transformer, Cables, Protection and BOP	\$ 2.66	\$ 3.39	\$ 0.73

Protection	\$ 0.62	\$ 0.62	\$ 0.00
Engineering Design, Procurement and Commissioning	\$ 6.54	\$ 9.04	\$ 2.50
Insurance, AFUDC, Duty and A/O	\$ 9.82	\$ 9.40	-\$0.42
Studies and Preliminary Engineering	\$ 0.61	\$ 0.61	\$ 0.00
Contingency	\$ 7.21	\$ 0.00	-\$7.21
TOTAL PROJECT (in millions)	\$84.30	\$93.00	\$ 8.70

[23] The largest increases arose from three areas: Harbour Infill, Site Preparation and Foundations; Steam Turbine Generator and Major Components; and, Engineering Design, Procurement and Commissioning. NSPI's position was that the increases were associated with changes to specific cost elements which were unforeseen in the earlier filings with the Board.

[24] As indicated in NSPI's response to Board IR-9c, there was a delay in receiving necessary permits from the Department of Fisheries and Oceans, the Navigable Waters Protection Program of Transport Canada, and Nova Scotia Environment.

[25] In the course of information exchanges with those government departments, it became clear to NSPI through detailed engineering that changes were required respecting the harbour infill. Mr. Janega elaborated on this at the hearing:

... if we look at what our original design was and this one being the harbour infill decision to either infill our water lot with a sloping grade out under the water line or to use what is sheet piling to put in place and infill around that and you have essentially a vertical property line. When we looked at infilling it, what was identified was the stability that could be achieved was not sufficient unless we actually went beyond our water lot, which would have meant that we would have been out into the lands beyond our property. It also didn't meet the requirements for the erosion that would be anticipated through some of the experience of hurricanes that were included in the evaluation. DFO's preference and HRM's preference was not the infill approach where it was a sloping toe either, so we ended up, not by requirement from both of those parties, but certainly meeting the expectations of both of them, by going with the

sheet piling versus a sloping toe. But the reason we did it was because, technically, it wasn't going to be a stable enough footprint for the facility. What it resulted in is essentially instead of placing materials into the harbour and just placing it so you essentially build yourself a bed with a grade to the land, you're going out into the harbour, driving in steel barricades and then backfilling in around that. It is a much more expensive approach. It's known to be more expensive but it is a more stable footprint, and it was the only one that would actually allow us to meet the requirements within our property line.

Board: And that would have added to the time, as well and that would have been much more intensive in time?

Mr. Janega: There was a delay in that there was actually about a three month period where we were waiting to get final approval for the project, partly because of this.

[Sound File, October 22, 2010, 48:28 – 50:38]

[26] NSPI indicated in its response to Board IR-10 that in December 2008 (several months after the Board's September approval of the Project) it became aware of changes to the National Building Code which resulted in additional design changes.

[27] Changes in design were also required as a result of detailed engineering to address noise levels, given the proximity of the Generating Station to residences. In response to Board IR-13b, NSPI explained that a by-pass system was required to eliminate extended use of atmospheric vents during "hot" starts. NSPI said that:

- b) ... Minimizing the use of vents is a key design consideration in Tufts Cove efforts to minimize noise impact on the residential neighbourhood.
- c) It became apparent during the detailed engineering phase ...that the atmospheric vents would be utilized for "Hot" starts unless a 100 percent bypass system was installed. Extended or frequent use of the atmospheric vents would not meet the requirements of the Plant's Noise Permit.

[Exhibit N-3, p. 2]

[28] NSPI indicated that this was unknown at the time of the May 2008 application to the Board.

[29] In the Responses to Board IRs-14 and 15, and in its Reply Submission, NSPI provided detail about changes that resulted in the design of the condenser to make it appropriate for minimum load during winter conditions, which then impacted the cooling water pump size, the building foundation and the building size. Again this was identified during the detailed engineering phase.

[30] Increased costs arose from increased automation. NSPI explained in its Response to Board IRs-16 and 17 that this is the first unstaffed plant of its type to be constructed by NSPI and that it had underestimated the extent of automation. In the Response to Board IR-16d, NSPI states that it was not able to obtain design details while developing the Project budget. The Response to IR-17 states that increased cable cost is due to the increased automation.

[31] NSPI's Reply Submission provides an economic analysis of the benefits of increased automation versus increased staffing at the plant. Attachment 2 to the Reply Submission shows an increased automation net present value ("NPV") benefit of \$2.3 million.

[32] Mr. Janega commented on the benefits of automation at the hearing:

The automation that we incorporated into the plant - and there are two aspects of some of the additional costs that were incurred on the electrical side - our first objective when we looked at the automation was to try and identify whether or not we could design a way out of having to staff the plant with essentially an operating person around the clock on five shifts. They rotate through the plant so there is somebody in monitoring continuously. So we incorporated a level of automation that took what is the equivalent of your computer communication link between your computer and the internet - these are essentially the same idea - they are a control between a valve or a motor or an electrical component and it's communicating between the computer and the device. We went from just over 600 to, I believe, over 1200 in the end with the amount of automation and controls. Every one of those requires a device change, so you're automating the piece of equipment instead of it being a manual operation with a valve which is the easiest one to

explain. You're essentially taking away the need for an operator to go out and manually intervene to open it. With what we expect on the unit for flexibility of the operating range, we thought we would be able to get to the point where we would not have to add additional staff for the operation of the steam plant. So the 5 FTE equivalent was a result of going through the automation analysis, increasing the number of automatically-controlled devices, motors, valves or controls on the system where it would be controlling several devices at one time, and all of that being fed back to computer networks requires cabling, cable trays, device changes, adding an automated device instead of a manual device and the electrical and instrument design changes that were included in each of those.

Board

Counsel: Mr. Janega, if I understand your explanation on this item correctly, this was a trade-off between increasing your capital cost above your initial projection to achieve operating savings?

Mr. Janega: To avoid the operating costs that we anticipated with the plant coming in.

Board

Counsel: So, this particular change, I take it then, would have enhanced the net present value of this project?

Mr. Janega: By the 5 FTEs, yes it will, yes.

[Sound File, October 22, 2010, 39:50 – 42:28]

[33] As the Project developed, it became more complex, thus requiring greater commissioning expense. NSPI described in its Response to Board IR-18f-g, the requirement for additional staff for start-up. It noted:

f-g) This is the first plant of this type NSPI has built and there were no similar designs or plants in North America available for comparison when preparing the budget.

[Exhibit N-3, p. 3]

[34] Board IR-20e addressed the contingency amount of \$7,213,207 included in the May 2008 application which NSPI acknowledged was used. NSPI said that the estimated accuracy was +/- 10% in that application. It said:

e) Contingencies are factored into construction projects during the budget development phase to account for project details not yet confirmed. At this stage of the Tufts Cove 6 Waste Heat Recovery project, all the equipment has been purchased and NSPI has a better understanding of the work required to ensure

viable commissioning of the project. The need for a general contingency is now mitigated and the remaining risk has been incorporated into the individual cost component budgets. Given these factors NSPI does not anticipate a requirement for additional project funding.

[Exhibit N-3, p. 2]

[35] The Board questioned Mr. Janega on any need for additional funding:

Board: This is the second request for authority to overspend on this project and, as you will know, the Board was very clear on the last application that it would scrutinize an application to overspend the last amount approved very carefully to ensure that the project continues to be economically justifiable and in the best interest of ratepayers, and you've indicated that you believe that's the case. In IR-20e, the Board had asked what process the company would follow to obtain any additional funds if there is any increase in the capital cost beyond this ATO figure, and the response was that the company "does not anticipate a requirement for additional project funding". What the Board would really like you to do is to assume that there is going to be or there will be a further increase and then tell us what process you would follow in that case.

Mr. Janega: Madam Chair, we are close enough to the finish line on this project that we will not be back seeking another ATO for this project.

[Sound File, October 22, 2010, 1:19:25 – 1:20:30]

[36] Board IR-2 and NPB IR-3 and 4 all questioned the economics of the Project. After providing its updated analyses for the base plan and a high load Plan E, NSPI stated that "the net present value for the project with duct firing remains positive" [Response to IR-2c]. The base plan shows an NPV of -\$1.85 million. In suggesting that the base plan likely understates the benefits, NSPI offered the following reasons:

- The Tufts Cove Units are marginal cost units and thus highly affected by changing fuel price and load assumptions. In an actual production mode, it is likely the Company would be able to extract additional value (e.g. exports) from reduced loading on these units.
- The change in forecast operating mode would likely increase the opportunity to use units 4 and 5 to support wind development over the second decade of operations, and potentially the first decade. This benefit has not been quantified and included in the analysis.
- The savings forecast by Hatch for the duct-firing component continue to be applied only for the first-decade of operations. It is likely these would continue and potentially

be expanded over the second decade as the penetration of wind generation in our Province increases.

[Exhibit N-3, p. 5]

[37] Mr. Janega elaborated in his presentation, and in response to Board

Counsel:

...the Board had asked questions around a couple of specific points. One of them was related to a comment in our information regarding the description of a net positive value. What we were trying to represent was the benefit in that information regarding the duct firing - that it took the otherwise at a low load negative NPV for the stand-alone combined cycle operation, but if you added the duct firing the total project improves. It is a negative \$1.85 million under that scenario, but, again, we caution that's one of many potential future states. But we would always consider this project, and that evaluation of it, as more or less, essentially, a worst case scenario for its operating requirements. What we're seeing today - natural gas prices and the effects on gas-fired generation - that there is a high likelihood that gas will displace coal on a more frequent basis over the next couple of years. The value that could be attributed to that because of the actual gas prices being lower than what's been modeled in the IRP would probably drive a higher capacity factor on this unit than what we have modeled which, in effect, should produce a higher net present value in the early years and a higher value to customers - the benefit being that, regardless of how it's modeled in the IRP, that benefit will flow through the fuel adjustment mechanism for customers.

...

...I think there are other aspects, or other attributes, I guess, that I would look at with a project that's nearing completion, the Tufts Cove 6 project, we have the benefit of being able to look at what we actually expect to occur with that plant over the next couple of years and I think that's a more important factor, given the outlook of natural gas prices. Today, we're seeing prices where it's very competitive with coal. Tufts Cove 6 will be the most efficient unit on our system, so the likelihood of it being dispatched, and providing the economic benefits that are anticipated, are quite high. The flexibility that we expect to get from the project, with about 300 megawatts of intermittent wind on our system, we expect will be able to be delivered in particular with some of the investments around the automation of the unit and the ability for it to achieve lower load operation. As much as Strategist modeling will be of benefit, it would be, I think, more important to look at what we see at this point where the unit is going to be shortly coming in service and we have a higher degree of certainty over what we know is going to occur, as opposed to comparing potential future scenarios. And I think that early value will be important for the customers, both on the renewable load following and on the natural gas benefits versus coal.

Board

Counsel: And you could perhaps help us by comparing that capacity factor to the capacity factor that would be in the reference plan. Because, if I understand you correctly, what you're really saying to the Board is that the reference plan is too conservative. You think this plant will run, certainly in the near term, at a much higher capacity factor than implied by the reference plan, which is why we get that negative NPV.

Mr. Janega: Well, I would say at this point that I believe it can – the unit being available and being able to, would enable it. Right now, the markets wouldn't show that the natural gas prices will fall below coal, because we would have forecast that in the generation, but where I look is to the market relative to a winter condition and what they're forecasting that's still showing pretty conservative gas prices.

Mr. Janega: ... I do have a belief that we undervalue the flexibility in projects like this. And, much like Tufts Cove, and the natural gas firing of the steam units, we don't place a value on the flexibility. As we could measure with Tufts Coves 1, 2 and 3 gas conversions, we've probably exceeded the expectations of that capital work order, I would guess, at least five times the value that we expected.

Board

Counsel: So, you're saying that really there's a bit of a flaw in the methodology that's being used in terms of calculating the NPVs for these capital projects, or at least the ones that enhance flexibility?

Mr. Janega: Yeah. I believe it under-values the flexibility.

[Sound File, October 22, 2010, 1:04:08 – 1:13:45]

IV SUBMISSIONS

[38] Avon, NPB, and the NSDOE provided written submissions prior to NSPI's request for a hearing. All three submissions referred to the same comments from the Board's approval letter of September 16, 2008 (set out in paragraph 6 of this Decision), and the reduction of the contingency to zero in the ATO application.

[39] NPB did not make a recommendation on whether the Project should be approved. It did, however, comment on the benefits to ratepayers lost in 2010 due to

the "...failure to achieve the Project's initial commercial operation date of June 2010, as was forecast in the earlier Applications...", and the loss of the reduction in revenue requirement which had been projected for 2010 [Exhibit N-5, p. 2].

[40] Avon's submission noted that the contingency had been "...burned through..." and that "...NSPI has no general contingency cushion left in its spending." [Exhibit N-4, p. 2].

[41] Avon stated:

The issue for the Board in considering this ATO is whether the Project continues to be **economically justified** and in the **best interest of ratepayers** and, in addition, whether NSPI has **managed the Project** to the **lowest reasonable cost** to customers.
[Emphasis in original]

[Exhibit N-4, p. 2]

[42] Avon raises the question of whether the costs were prudently incurred, and whether NSPI managed the Project diligently, noting that the NPV had "...declined and the fuel cost savings did not materialize in the anticipated time frame". Avon suggested that NSPI's shareholders should bear part of the increased costs. [Exhibit N-4, p. 3]

[43] NSDOE also comments on the increased costs, noting the reduction of the contingency to zero gives a greater effect to the overspend. However, it said:

... NSDOE does not believe that there is any obvious basis for believing that the increased costs are attributable to any imprudence.

[Exhibit N-6, p. 3]

[44] NSDOE recommends the ATO be approved.

[45] In its Reply Submission, NSPI in commenting on these three submissions, states that:

None of the intervenor submissions would suggest denial of full cost recovery...

[Exhibit N-7, p. 1]

[46] MEUNSC's submission, received on the hearing date, said in part:

It is not unusual for construction projects to run over budget. Careful and rigorous planning can reduce the probability of cost overruns occurring and we submit that the Company bears the responsibility of that diligence. Ratepayers should not be exposed to financial risk they cannot control, certainly never to the point where a project no longer has positive NPV.

...
Scrutiny by Board staff, consultants and intervenors cannot expose all deficiencies in any application for capital work orders. The Company holds the responsibility for identifying and planning for capital additions. We submit that the shareholders should properly bear the risk of cost overruns on approved projects except where it can shown that overruns are beyond its control and then not to the point where positive NPV is lost.

[MEUNSC Submission, October 22, 2010]

[47] Mr. Mahody, on behalf of the CA, expressed concerns about what he described as "galloping cost increases" in the Project which would be significant for the ratepayers to bear. He questioned whether the Project would have proceeded using the "perfect science of hindsight".

[48] Mr. Mahody also noted that the changes in engineering design were a concern. He suggested that ratepayers, quite rightly, expect the engineering design and construction of projects to be within NSPI's expertise. He said:

...if there are more unknowns now than there used to be in the engineering design phase - then there appears to be greater risks that are associated with undertaking these projects. And we think that the Board ought to take note of these new planning realities in relation to future capital work improvements and with determining the risks that are associated with power generation. Ultimately, the concern is that if projects cannot be, as they may have once been, accurately estimated, and the situation is such that there are more unknowns now built into the system – unknowns which are eventually going to come home to roost, and it is going to be the ratepayers that are going to have to answer for that – well, that new dynamic, to the extent that it is a new element in engineering design that Nova Scotia Power is experiencing, that new element is going to be something that the Board will need to watch in the future.

[Sound File, October 22, 2010, 1:25:56 – 1:26:56]

[49] In closing argument, Counsel for NSPI stated quite candidly that NSPI was not happy to be asking for an ATO. However, he described this as an unusual and

exceptional situation. He urged the Board to reject a hindsight review and, instead, consider NSPI's position that this continues to deliver an economic project.

[50] In its Reply Submission, NSPI pointed out that there was no evidence before the Board from the Intervenor. NSPI stated that "...the benefits of the Project have been sustained through NSPI's efforts to preserve or increase the otherwise reduced net present value..." [Exhibit N-7, p. 1].

[51] NSPI further notes that while Avon suggests that the costs should be borne by shareholders, Avon did not provide any "...evidence of, nor argued imprudency on the part of NSPI." [Exhibit N-7, p. 7] In response to Avon's questioning on due diligence, NSPI said:

All of the decisions for this Project were made with the technical information available at the time and were considered by teams consisting of design engineers, operating engineers, maintenance staff, and suppliers' technical support staff. While doing its best to maintain the project schedule, NSPI's goal was always to select designs and equipment that would provide the best value over the expected life of the plant, the lowest overall operating cost and deliver significant customer benefits...

[Exhibit N-7, p. 6]

[52] When questioned by the Board on this issue, Mr. Janega said:

...I can assure you that Nova Scotia Power's track record on implementing projects on time, and on budget, is a key measure of ours. Internally, it's something that we take very seriously and overruns at a project undergo scrutiny internally to understand exactly what happened and what indications there would be for us to be able to benefit in future projects to avoid that occurring. This project has been managed effectively within the company. The challenges that we faced on a project we have described to the Board to the best of our ability and during the escalation of concerns and issues that were raised around the project, we actually dispatched additional staff, additional engineering, additional oversight, management and cost control to the project to ensure that whatever we were going to have to do to bring the project in successfully with our forecast was going to be able to be achieved. So I can assure you that we did not just continue on as business as usual as costs started to increase and the challenges were identified. We undertook to try and define and identify better ways to do the work; better ways to schedule and predict what was occurring. We pushed on our engineering and management team to actually be on the same page we were with every step of the way. We have engaged those people at the highest levels of their companies over concerns

about the project and the challenges we're facing to ensure we have the same support from them as you would expect from us on this project.

[Sound File, October 22, 2010, 1:21:06 – 1:22:45]

V FINDINGS

[53] This Project has seen an extraordinary increase in capital costs. The 2007 estimate with duct firing was \$66.3 million. In May 2008 it had increased to \$84.3 million and the present ATO is \$93.0 million. NSPI states that the latest cost increase is due to “changes to specific cost elements unforeseen at the time of NSPI’s May 2008 application”.

[54] A review of NSPI’s responses to IRs demonstrates that this is a case where there was a large number of quite significant changes between NSPI’s original preliminary design and the detailed Project design. Some of these changes were due to environmental permits (Board IR-9), others due to code changes (Board IR-10), but the majority of changes resulted from requirements which were not fully accounted for in the preliminary design and only discovered during detailed design. Specific examples are noted at Paragraphs 23-33 above.

[55] This leads the Board to conclude that a large part of the reason for the underestimate of costs in the May 28, 2008 request is the many changes required to the original preliminary design. As a result, the Board is concerned about the level of planning and design on this Project.

[56] The purpose of a project contingency, as described by NSPI in its Reply Submission [p. 7], is to provide an allowance for items not addressed in the design phase and/or to address normal project cost variances. However, in this Project the full

contingency of \$7.3 million was used and a further \$8.7 million increase is now requested, i.e., nearly 10% above the Board approved amount of \$84 million, which included the original contingency.

[57] The Board notes the comments of Mr. Janega on the subject of engineering and project design:

...Your first assertion is actually correct that based on the turbine design changes there were a lot of additional engineering design considerations that needed to be incorporated to deal with that change. Your physical – and I'll get to the second part of your question relating to the sufficiency of engineering – with most of the work that we're talking about related to the turbine and condenser design and then, in fact the turbine bypass system, the way we would typically approach it on a project would be – 15 or 20 years ago – would be to deal with a very high degree of engineering detail being completed with detail specifications based on a plant that we would have either recently constructed or one that we would be repeating, based on dealing with a supplier who has already produced and manufactured several of them and we might be modifying slightly. In this case, we actually took the services of engineering people that had been involved in the commissioning and development of projects like this. We used their engineering input, but the details of engineering – the final details – would not have been to the level that you essentially would be issuing drawings for construction. So there were changes that had taken place through the course of the construction; in the engineering procuring format today there is a lot less, well, in fact, we have not been able to identify people who are today willing to commit their design and supply and the construction of it at fixed prices without extremely high contingency and risk expense built into the project estimate... So, we today take as much engineering on the front end that we feel will define the scope of it, but knowing that there are detailed engineering requirements that will only be known as you're starting the project and doing final design. It's usually staged so that you're dealing with the first components of work. The civil works would get designed first and those would be completed and known. The latter systems that would be going in service would be the ones that essentially get designed last and it's quite common in the industry today for that to be the case. It typically results in potentials for additional cost, but it's not a cost that you would have been able to avoid – it's simply a cost that you may have known upfront if you had invested additional detailed engineering that would have only have needed to be completed again once the project had been finally designed and constructed with each stage and following after the other...

[Sound File, October 22, 2010, 27:09 – 30:50]

. . .

...The engineering design work and the commissioning timeline that we're dealing with for the project – I'd already described what you had astutely questioned as the degree of preliminary engineering or detailed engineering in place at the time the project was started is not to the point that you would be able to issue drawings and complete the work. So this carries on through the project and a lot of what I've talked about around the design changes, even to the existing building; crane layout; condenser systems; the piping; electrical and instrumentation; all added to the engineering and design work that was required, as well as what we're going to be seeing on the commissioning of the unit.

With a higher degree of automation, there is a higher degree of complexity in getting all of the equipment functioning and operating so that it's able to control the performance of the unit automatically, as opposed to having an operator standing making the adjustments in real time at the site. So it is a more complex approach to start up, but we believe once we're done with it, from our experience, it has paid off and has performed the way we would anticipate the design would deliver the benefit.

[Sound File, October 22, 2010, 50:54 – 52:14]

[58] The Board understands that it is a matter of judgment as to how much effort in, and funding of, engineering design should be put into a project at the preliminary stage as opposed to detailed engineering. More detailed engineering should result in more accurate budgeting, and therefore, a lower total contingency allowance. In this case, hindsight would suggest more effort ought to have gone into the preliminary engineering for a technology that was new to NSPI.

[59] The Board understands that this is the first Project of this type undertaken by NSPI. Despite this large ATO request, the evidence filed by NSPI supports the position that it appropriately dealt with the design problems and changes as they occurred. There is no evidence of any imprudent behaviour on the part of NSPI. The Board concludes that NSPI appears to have made the best decisions based on the evidence before it at the time.

[60] However, the Board accepts the cautionary note sounded by the CA. NSPI should expect even closer examination of future work orders by the Board. Further, the Board expects NSPI to undertake and justify the necessary level of detailed engineering at early stages of projects, especially those that are new to the Utility.

[61] NSPI's economic analyses for the May 2008 application and the 2010 update all used the same assumptions as those in the 2007 Integrated Resource Plan

("IRP"), with the exception of the Project capital cost and in-service date. NSPI's analysis is, therefore, designed to answer the question whether, if NSPI had known the true capital cost and in-service date at the time of the May 2008 application to the Board, the NPV analysis still would have supported the Project. NSPI's answer to this question is "yes", but with a reduced NPV benefit. The Board concludes it would have approved the higher cost Project with a reduced NPV benefit.

[62] The NPV analysis submitted in response to Board IR-2 provides an update based on the 2009 IRP assumptions. These results show, for the base case, a negative NPV, and raise questions about whether or not the Project is economic. However, a higher load growth plan (Plan E) shows Project benefits closer to the 2007 IRP assumption cases, e.g. \$63.3 million for Plan E versus the May 2008 value of \$75.4 million and the May 2010 value of \$67.2 million.

[63] The Board is reluctant to give much weight to the analysis contained in the Responses to Board IR-2 because it looks at assumptions known today, not what was known to NSPI and others in 2008. It is, therefore, using perfect "hindsight" to review the Project economics. Additionally, as noted in NSPI's Response to Board IR-2c, the analysis "...has not been undertaken with the same parameter sensitivities as incorporated into the 2009 IRP".

[64] NSPI comments in its Reply Submission [p. 6] that regulatory approval was obtained approximately three months later than originally anticipated in the Project schedule. It implies that this is a large factor in the delay of the Project in-service date.

[65] The Board finds that NSPI's May 28, 2008 filing requesting a June 30, 2008 approval imposed an unreasonable timeline on the Board. This is particularly true considering the interest in this Project shown by other parties in the September 2007 application and the Board's earlier decision to seek input from these parties. This was noted in the Board's letter of June 9, 2008 to NSPI.

[66] In the Board's view, any "delay" was caused by an original unrealistic Project schedule. The Board directs NSPI to make every effort to submit its capital expenditure requests on a more timely basis, with greater detailed information and more accurate budgets.

[67] As stated by Avon, and consistent with Paragraph 6 of this Decision, the issue to be decided by the Board in this ATO application is:

...whether the Project continues to be **economically justified** and in the **best interest of ratepayers** and, in addition, whether NSPI has **managed the Project** to the **lowest reasonable cost** to customers. [Emphasis in original]

[Exhibit N-4, p. 2]

[68] The Board concludes on the evidence before it that there is nothing in the capital costs which could have been avoided. In part, the issue is one of timing, as NSPI learned of the necessity of design changes and resulting increases in costs as the Project proceeded. While the Board encourages NSPI to give serious consideration to the level of preliminary engineering in projects such as this one, based on the evidence before it in this matter, the Board is unable to find that NSPI acted imprudently or without due diligence.

[69] Therefore, the Board concludes that NSPI has met the test set out above.

[70] Given Mr. Janega's comments as noted above, and the statements of NSPI in its Reply Submissions, the Board understands that, regardless of the final cost, no further ATO application will be filed with the Board with respect to this Project.

VI CONCLUSION

[71] Consequently, the Board approves this ATO request in the amount of \$8,699,864, for a total Project cost of \$92,996,628.

[72] An Order will issue accordingly.

DATED at Halifax, Nova Scotia, this 22nd day of November, 2010.



Roberta J. Clarke •