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February 17, 2022

Residential Consumer Intervener Association
c/o Midgard Consulting Inc.
Suite 828 – 1130 W Pender Street
Vancouver, B.C.
V6E 4A4

Attention: Mr. Peter Helland, Director

Dear Mr. Helland:

Re: FortisBC Energy Inc. (FEI)

Project No. 1599211

Application for a Certificate of Public Convenience and Necessity (CPCN) for Approval of the Advanced Metering Infrastructure (AMI) Project (Application)

Response to the Residential Consumer Intervener Association (RCIA) Information Request (IR) No. 2

On May 5, 2021, FEI filed the Application referenced above. In accordance with the regulatory timetable as amended in British Columbia Utilities Commission Order G-389-21 for the review of the Application, FEI respectfully submits the attached response to RCIA IR No. 2.

If further information is required, please contact the undersigned.

Sincerely,

FORTISBC ENERGY INC.

Original signed:

Diane Roy

Attachments

cc (email only): Commission Secretary
Registered Parties

A. Project Need and Justification

48. Reference: Exhibit B-13, FEI Response to RCIA IR1, IR 5.2 Limited AMR Roll-out

In response to RCIA IR1 5.2, FEI states: "Equipping meter readers with handheld AMR receivers was not considered as an alternative. While such a solution would support reduced estimates it would not address the four drivers for the Project need and would result in AMR deployment costs without the benefit of reduced labour costs. Please refer to Section 4.2.1 of the Application for an overview of the full AMR scenario that was considered as an alternative to the AMI Project."

48.1 Please explain why there would be no benefit of reduced labour costs if there was a limited AMR roll-out.

Response:

FEI assumes that a "limited AMR roll-out" refers to equipping meter readers with AMR handhelds that can read meters for hard-to-access sites. FEI considers its current situation with off-site meter reading as described in RCIA IR1 5.1 to be a limited AMR roll-out.

There would be no benefit of reduced labour or other costs in this scenario because, as is the current situation with off-site meter reading, FEI would still require meter readers to collect those automated reads in addition to requiring meter readers to continue manually reading the majority of meters.

The scope of FEI's current off-site meter reading (approximately 3,500 customers) would have to increase significantly and be concentrated in geographic regions in order to benefit from reduced work hazards, improved efficiency, or reduced labour and other costs.

48.2 Would a limited AMR roll-out result in cost savings due to any of the following factors, either in the current meter reading contract or in future contracts? Please explain why or why not.

- Increased meter-reader productivity (i.e. more meters read per worker per shift).
- Potential for meters to be read from a worker's vehicle in urban areas.
- Decreased management of customer interactions (e.g. keys).
- Lower worker hazards (e.g. fewer interactions with dogs).

Response:

Please refer to the response to RCIA IR2 48.1.

While some benefits in improved performance levels with respect to completed meter reads may be experienced due to the four factors listed in the question, the proportion of AMR meters would need to be high for this to occur. Even in that case, FEI would not expect cost savings because of the need to continue to have a large number of manual meter readers to cover the service territory, the relative cost of AMR meters as compared to existing meters, and the need for a reasonable compensation package to maintain the workforce.

49. Reference: Exhibit B-13, FEI Response to RCIA IR1, IR 5.1; Exhibit B-1, Application, p.14

Project Drivers

In response to RCIA IR1 5.1, FEI states: "FEI has determined automating the meter reading process to be a need for the AMI Project. One of the drivers for this need is that meter automation is more accurate and more convenient for customers. Meter reading access challenges play a part in this; other aspects of the manual meter reading process that contribute to this driver are described in Section 3.1 of the Application."

At page 14 of the Application, FEI states: "In the following sections, FEI will show that:

- Automation is more accurate and convenient for customers than FEI's current meter reading practices, which are highly manual and are vulnerable to errors, and can be inconvenient for customers;
- Automation is becoming the industry standard, thereby changing both market conditions and customer expectations;
- Automation alleviates the cost and service risks of manual reading and provides a cost effective, long-term alternative; and
- Automation provides additional customer benefits as well as operational opportunities that support the safety, resiliency and efficient operation of the gas distribution system."

49.1 Confirm whether the four bullets listed on page 14 of the Application are the project drivers referenced in the response to RCIA IR1 5.1 and 5.2 and elsewhere in the IR responses.

Response:

Confirmed.

49.2 Does FEI consider the project drivers to be the same as project needs?

Response:

Not confirmed. FEI defines the need for the Project to be automation of the meter reading process. This need is driven by the Project drivers (as cited in the preamble).

49.3 Explain whether FEI consider its meter reading needs to be aligned with the following statement: "FEI requires the ability to accurately and safely read meters at the lowest cost."

Response:

One of FEI's commitments to its customers is to deliver energy safely and reliably for the lowest reasonable cost. Meter reading plays an important role in FEI's ability to provide that service. Automation of the meter reading process, which is the need for the AMI Project, further supports FEI's ability to deliver on these commitments while supporting other drivers of the Project need as described in Section 3 of the Application and reiterated in the responses to BCSEA IR1 6.1, BCUC IR1 22.1 and 22.3, and BCOAPO IR 5.1. For more information about the safety and reliability improvements that will come with AMI, please refer to Section 4.3.2.4 of the Application. For information on how the AMI Project provides the most cost-effective and long-term solution to meet the needs of FEI and its customers, please refer to Section 6.3.3 of the Application.

50. Reference: Exhibit B-13, FEI Response to RCIA IR1, IRs 6.2, 7.5, 9.1; Exhibit B-1 1, Application, pp. 34-35

Recruitment and Retention of Meter Readers

In response to RCIA IR1 6.2, FEI states: "As noted in the preamble, the current contract term expires December 31, 2022. To date, Olameter has not indicated to FEI that Olameter is interested in terminating the contract. However, as noted in the response to RCIA IR1 6.1, Olameter has until June 30 of each year through 2025 to provide written notice of its decision to terminate the contract at the end of year.

FEI has not had discussions with Olameter regarding its interest in bidding on future manual meter reading contracts."

In response to RCIA IR1 7.5, FEI states: "FEI's expectation is that Olameter will meet the contracted performance standards every year. FEI has not had any discussions with Olameter (nor any indication from Olameter) regarding their ability to meet the performance standards as set out in the contract in the future."

In response to RCIA IR1 9.1, FEI states: "Meter readers are employed by Olameter, which provides contracted services to FEI. Olameter is therefore directly responsible for the recruitment and retention of meter readers. However, if Olameter is unable to recruit and retain sufficient numbers of meter readers, FEI and its customers are directly and negatively impacted."

At page 35 of the Application, FEI states: "There is a material risk to customers and the Company that the current practice of outsourcing manual meter reading will not be sustainable in the long term. That is, either the existing provider(s) may move on to other lines of business, similar to the case of the manufacturers of the diaphragm meters, or the costs for this third-party support will continue to grow and approach the cost of providing the service in-house."

50.1 Has FEI directly discussed recruitment and retention of meter readers with Olameter?

50.1.1. If yes, provide the details of these discussions (when they occurred, what Olameter stated, how Olameter will remain responsive to FEI's meter reading needs, etc.).

50.1.2. If no, please provide details of the source of FEI's concerns with recruitment and retention of meter readers as discussed at pages 34 and 35 of the Application.

Response:

FEI has contracted with Olameter to provide meter reading services since 2013. Over the course of this contractual relationship, FEI has discussed recruitment, retention, and staffing of meter

readers with Olameter periodically. These discussions have generally taken place in the context of the manual meter reading performance standards set out in Table 3-3 of the Application, and the impact that not meeting these standards has on customers (such as incorrect or estimated bills). FEI does not have details of these discussions, or when they occurred.

FEI's concerns with recruitment and retention of meter readers stem from a combination of sources, including: conversations with Olameter; the nature of the job (e.g., physically demanding, highly repetitive, and with associated safety risks) as described in Section 3.3.1 of the Application; as well as FEI's knowledge of FBC's more recent experience employing meter readers to read electric meters.

50.2 When did FEI last directly employ meter readers?

Response:

Centra Gas BC Inc. and Centra Gas Whistler Inc. both employed meter readers up to 2002. In 2002, FEI acquired these two utilities, and outsourced the meter reading function for these two service areas starting 2003, consistent with its approach to its other service areas. As such, 2003 was the last year that FEI or its predecessor companies directly employed meter readers.

51. Reference: Exhibit B-13, FEI Response to RCIA IR1, IRs 3.6, 3.7 Meter Exchanges and Tests

In response to RCIA IR1 3.6, FEI states: "As discussed in the responses to BCUC IR1 4.2 and 4.2.1, MC compliance sampling of AMI meters will be conducted over a three-year period from 2031 to 2033 at 3,000 meters per year, and again for a three-year period from 2038 to 2040, at 3,000 meters per year (as shown in Confidential Appendix G, Schedule 11)... The total number of AMI meter exchanges and tests over the 20-year period post-deployment is expected to be 28,000 meters.

For diaphragm meters, as shown in Schedule 1 of Confidential Appendix G, FEI would expect to exchange an average of 58,800 meters each year from 2023 to 2043. The total number of diaphragm meter exchanges and tests over the 20- year period is forecast to be approximately 1.2 million meters."

In response to RCIA IR1 3.7, FEI states: "As discussed in Section 3.1.1.2 of the Application, MC is a federal regulatory agency that establishes the requirements for energy metering devices and installations for custody transfer in Canada. The Electricity and Gas Inspection Act (EGIA) and associated regulations and specifications set the rules for the sale of natural gas, and define units for energy measurement. The EGIA requires that:

- natural gas meters be approved for use in Canada;
- only approved and verified meters are used to determine the amount of natural gas consumed; and
- the accuracy of electricity and natural gas meters be verified in accordance with the time periods stipulated in the Regulations.

As per section 19 of the EGIA, FEI samples and tests its meter fleet in accordance with MC specification S-S-06 requirements to ensure that the meters are performing as expected and are providing accurate measurements."

51.1 Explain why AMI meters require fewer samples and tests than diaphragm meters.

Response:

The number of sample tests is defined in the Measurement Canada S-S-06 *Sampling Plans for the Inspection of Isolated Lots of Meters in Service*.

The self-diagnostic capabilities of the advanced meters reduce the risk of failures during normal operations as these meters will be immediately flagged with a meter alarm thereby ensuring these meters are identified earlier and removed from the testing process. This would permit larger meter sample groups during meter testing as potential issues would be identified prior to sampling. This is compared with the current practice where issues with diaphragm meters are not discovered until compliance sampling is conducted for meter accuracy verification testing.

51.2 Has Measurement Canada approved FEI's proposed AMI sampling and testing plan that results in a reduction of meter testing and exchanges from 1.2 million to 28,000 over 20 years?

Response:

As indicated in the response to RCIA IR2 51.1, FEI will conduct sample tests in accordance with Measurement Canada S-S-06 – Sampling Plans for the Inspection of Isolated Lots of Meters in Service. As this is a Measurement Canada mandated sampling plan, no further approvals are required.

51.3 Explain whether the results of the compliance sampling and testing of the 9,000 meters in 2031-2033 could affect the sampling and testing program, such that significantly more meters are required to be sampled and tested, as well as advance the date of the next sampling and testing ahead of 2038-2040?

Response:

The sampling results in 2031-2033 could possibly affect future sampling plans. In addition to the on-board meter diagnostics, and as outlined in the response to BCUC IR1 4.2, FEI will conduct small internal samples of up to 500 meters per year to monitor the performance of the meter fleet for internal information purposes and to aid in planning for the larger Measurement Canada sampling.

52. Reference: Exhibit B-13, FEI Response to RCIA IR1, IR 24.1

AMI Meter Warranty

In response to RCIA IR1 24.1, FEI states: "FEI has negotiated warranties, performance guarantees, and other measures with its AMI vendor and these have been included in the contract between FEI and the vendor. These clauses include mitigation for all potential problems referenced in the question, among many others."

52.1 Confirm whether ratepayers or FEI shareholders will be responsible for the replacement costs of AMI meters if the performance guarantees and warranties negotiated by FEI do not end up protecting customers from early replacement or other costs.

Response:

FEI is confident that the negotiated contract will protect FEI and its customers from early replacement or other unanticipated costs. In the unlikely event the negotiated warranties and performance guarantees are insufficient, FEI would determine how best to recover those costs based on the specific circumstances, including pursuing recovery directly from the vendor.

53. Reference: Exhibit B-13, FEI Response to RCIA IR1, IR 10.1; Exhibit B-6, FEI Response to BCUC IR1, IR 22.1

Competition in Manual Meter Reading

In response to BCUC IR1 22.1, FEI states: "As discussed in Section 3.2 of the Application, the utility industry in North America has been moving away from manual meter reading as a whole. According to the CGA Insights Matter Survey attached as Appendix C to the Application, there is only one other natural gas utility in Canada that continues to read meters manually with an external manual meter reading vendor. With less demand for manual meter reading, there is less competition."

53.1 Explain why FEI does not believe that automation or in-house meter reading provide the competition necessary to constrain contracted reading costs.

Response:

FEI has described the trend toward automated metering across North America, Canada, and British Columbia in Section 3.2 of the Application. The industry is moving into automation, which means there are fewer and fewer meters that will need to be read manually in future, which means there is less need for people to read those meters. In that regard, FEI believes that while the presence of automation and ability to transition to in-house meter reading may continue to be comparisons for contracted meter reading costs in the future, the viability of a market specific to manual meter reading services is uncertain and the ability to enter into a competitive bidding process may be lost. As a result, FEI believes there is limited ability to constrain contracted reading costs through competition.

Please refer to the response to BCUC IR1 22.1 where FEI discusses the reasons that meter reading services may not be viable in the future from a cost and availability perspective, and the response to BCUC IR1 22.3 where FEI discusses the disadvantages of continuing to outsource meter reading and the need to transition to automated metering.

Given the realities above, it is prudent for FEI to transition to an automated meter reading model now, while its future meter reading costs are known, rather than be left in a position in the future where manual meter reading and its costs are uncertain.

54. Reference: Exhibit B-13, FEI Response to RCIA IR1, IRs 23.1, 23.3 Radio-Off Meters

In response to RCIA IR1 23.1, FEI states: "Confirmed. FEI anticipates there will be separate fees for the installation of a radio-off AMI meter and the ongoing monthly manual meter reads."

54.1 Will FEI charge a fee to have the radio functionality turned back on for customers that originally requested a radio-off meter?

Response:

Consistent with the terms and conditions in both the FBC Electric Tariff General Terms and Conditions and Rate Schedules (GT&Cs)[1] and the BC Hydro and Power Authority Electric Tariff Terms and Conditions (T&Cs)[2], FEI anticipates there will be a charge to have the radio functionality turned back on for a customer who originally elected a radio-off meter at the same premise. FEI does not anticipate there will be a charge to turn radio functionality back on for a customers moving into a new dwelling as standard practice will be once a radio-off customer vacates a premise, the AMI meter will be returned to its default setting of radio-on. If a customer who choses radio-off at one premise moves to a new premise, that customer will need to request radio-off at that new premise and incur the associated fees.

54.2 Will FEI charge a fee to have the radio functionality turned back on if the same meter is to be used for a new customer account (e.g. a new customer moves in to a dwelling)?

Response:

Please refer to the response to RCIA IR2 54.1.

[1] FBC GT&Cs, Sections 18.3 Conditions of Service and 18.4 Radio-off Option Standard Charges – Per-Read Fee, ($19.50).

[2] BC Hydro Tariff T&Cs, Sections 4.2.5 Legacy Meter and Radio-off Meter Charges and 11.4 - Radio-off Meter Removal Charge, ($55.00).

54.3 Provide the anticipated fees that FEI will charge for:

(a) installing a radio-off meter

(b) each manual meter reading

(c) turning AMI radio functionality back on

Response:

Should the BCUC approve the AMI Project, FEI will complete the analysis and provide the evidence supporting the costs for FEI's Radio-Off Program and associated fees as part of a future application, as discussed in the responses to CEC IR1 78.2 and CEC IR2 115.1. The Radio-Off Program application will set out the fees for customers who choose to opt out of AMI and will include the fees noted in the question as well as other tariff changes to support AMI. Therefore, at this time, FEI is unable to confirm what the fees associated with its Radio-Off Program will be.

In response to RCIA IR1 23.3, FEI states: "FEI will not allow customers who choose to have a radio-off meter to submit their own meter reads in lieu of paying the monthly meter reading fee.

…

In addition, a register reading for billing is only one part of the data to be manually downloaded. Overall, a customer reading is not an equal substitute for advanced meter reading data collection. The advanced meter collects daily register readings as well as hourly interval data, both of which are stored and collected during the manual meter reading visit."

54.4 Is "hourly interval data" the only additional data that would be downloaded during a manual read? If not, please elaborate on what additional data would be collected.

Response:

No, a manual meter read would also include meter diagnostic information such as gas pressure and temperature readings and historical events and alarms such as low battery or tamper, among others.

54.5 Explain why this additional data (other than the actual meter reading) must be collected each month, and why collecting this data every two, three, or six months is not acceptable to FEI (if, for example, radio-off customers were allowed to submit their own meter readings for the months in between FEI manual meter reads).

Response:

To best alert FEI to various conditions that could impact FEI's ability to deliver safe and reliable service to customers, this additional data should be collected through automation, in the near real-time manner that is only available through AMI. To the extent that customers choose to have a radio-off meter, being able to collect this information in a consistent and relatively timely way (i.e., monthly) allows FEI more opportunity to address any alerts identified more quickly than if the information was collected less frequently.

As described in Section 4.3.2.4.4 of the Application, regular and near real-time capture of hourly interval data also provides near real-time alarms to alert FEI to issues at the meter, allowing FEI to detect potential theft through anomalies in gas usage, tamper alarms, and other alerts communicated by the meter. Awareness of the potential for theft in a timely manner allows FEI to investigate sites and premises to assess if unauthorized alterations have created unsafe conditions. In addition, as described in Section 4.3.2.4.6, other data collected by AMI also enables FEI to detect smaller leaks and unexpected consumption downstream of the gas meter in the customer's house gas lines, which although they may be below the flow rate of the AMI automatic shut-off threshold, would allow FEI to proactively identify and correct these flow anomalies.

To clarify, FEI uses customer-provided meter readings to support bill estimations today. In order for a customer to receive an accurate bill based on an actual meter read, the meter read must be obtained by a qualified meter reader, or through automation. Any meter read provided by a customer is considered an estimated read, resulting in an estimated bill. For additional information about bill estimates (including customer reactions to bill estimates), please refer to the response to CEC IR1 2.3.

Presently, FEI bills its customers monthly and attempts to collect an actual read each month to avoid bill estimates. Any change in process that would result in FEI collecting an actual meter read less frequently than once each month would be a reduction in the meter reading services FEI already provides to its customers. Please also refer to the responses to BCSEA IR1 2.5 and 2.6 where FEI describes the benefits of a monthly billing cycle and having meters read monthly.

55. Reference: Exhibit B-13, FEI Response to RCIA IR1, IR 3.2

Bypass Valve Benefits

In response to RCIA IR1 3.2, FEI states:

"The installation of bypass valves in conjunction with residential meter exchanges has numerous benefits including:

- Increased customer satisfaction by eliminating the inconvenience and disruption associated with having to schedule meter exchange appointments and requiring the customer to be present during a meter exchange in relation to appliance relights;
- Decreased future contact centre costs by removing the requirement to schedule meter exchange appointments;
- Improved employee safety associated with eliminating the occasion to access customer homes and relight appliances; and
- Increased operational efficiencies by reducing the time to complete individual meter exchanges, as well as allowing meter exchange activities to be geographically clustered (reducing the associated time and travel).

With these benefits, the most appropriate long-term decision was to begin installation of bypass valves, and further, to include them in the scope of the AMI Project so that the program's full benefits could be realized sooner."

55.1 Please confirm where the Application (or other evidence) details and lists the costs and benefits (or other quantification) FEI has calculated for the aforementioned bullet points. Please confirm the confidence interval or level of certainty FEI associates with the figures presented.

Response:

FEI clarifies that benefits 2) and 4) as referenced in RCIA IR1 3.2 are quantifiable and therefore included in the financial analysis of the AMI Project. Please refer to Confidential Appendix G-5, Schedule 6, lines 6 and 7 for the incremental capital spending and savings related to bypass valve materials and installations, as well as capital savings for future contact centre costs. In addition, please refer to Confidential Appendix G-5, Schedule 2, lines 6 and 7, where future O&M savings are embedded for the increased operational efficiencies with reduced time to complete each meter exchange. Finally, please refer to Section 6.2.1.1 of the Application where FEI describes the benefits of installing bypass valves as part of the AMI Project. FEI notes the benefits of customer satisfaction (benefit 1) and employee safety (benefit 3) as referenced in RCIA IR1 3.2 have been observed by FEI during meter exchanges that already have a bypass valve; however, FEI has not quantified the benefits to include in the financial analysis.

As stated in Appendix E-3 of the Application, the confidence level used for financial modelling purposes is one standard deviation for the capital costs. Please also refer to the response to BCUC IR1 20.1, where FEI confirms that the expected accuracy range for the AMI Project Class 3 estimate (including contingency), based on AACE recommended practice 18R-97, is -10% to -20% on the low side, and +10% to +30% on the high. In that response FEI also noted that the contingency was determined based on a one standard deviation range from the expected (mean) value of the deterministic estimate (i.e. P68 confidence level in probabilistic terms). Finally, please refer to the response to RCIA IR1 34.1 where FEI notes that it has not included any additional costs for contingency in the O&M forecast costs for either the Baseline or AMI scenarios. No confidence levels have been assumed for benefits realization.

FEI currently installs bypass valves as part of its meter exchange sustainment program. Since the Project will require every meter to be exchanged, FEI will be able to deploy bypass valves for all applicable meters at the same time. This will accelerate the existing meter exchange sustainment program and realize cost savings due to efficiencies gained from the bulk purchase and installation of bypass valves. However, FEI's meter exchange sustainment program is not otherwise dependent on the Project, and FEI would continue installing bypass valves absent the Project.

56. Reference: Exhibit B-13, FEI Response to RCIA IR1, IR 5.1

AMR Limitations

In response to RCIA IR1 5.1 FEI states:

"The downsides of the AMR solution far outweigh this benefit as it would ultimately lock FEI and its residential and small commercial customers into a solution with limited capabilities. AMR would also not support future opportunities to enhance the customer experience or FEI's operations in the same way as AMI technology as shown in Table 4-4."

56.1 Confirm where the Application (or other evidence) details and lists the costs and benefits analysis FEI performed regarding the quantification of "the downsides of the AMR solution" and its "limited capabilities" (as referenced in the statement above).

Response:

FEI confirms that the potential for AMR technology to meet the Project need is fully described in Section 4.2.2 of the Application. The financial analysis is set out in Section 4.2.3.

56.2 Confirm the time period FEI has assumed or calculated that it would be locked into with the AMR solution.

Response:

Given that the expected service life of AMR technology is 20 years (as discussed in Section 4.2.1 of the Application), FEI considers the selection of AMR over AMI would lock FEI and its customers into a solution with limited capabilities for at least 20 years from the time of implementation. FEI also confirms the financial analysis shown in Table 4-2 for the AMR alternative is based an expected life of 20 years.

57. Reference: Exhibit B-13, FEI Response to RCIA IR1, IR 14.4

Service Life

In response to RCIA IR1 14.4 FEI states:

"Changing from a 20-year useful life to a 15-year service life would result in the depreciation rate changing from 5 percent2 to 6.67 percent3 for the AMI and AMR assets. As explained in the response to BCUC IR1 32.1, the financial analysis only includes costs related to one meter fleet lifecycle and as a result changing to a 15-year from 20-year useful life only changes the depreciation rate for the AMI and AMR assets and results in no change to the cost input assumptions. As there are no underlying changes in the inputs, there would be no change to Tables 4-2 or Table 4-3 (Confidential Appendices G-1, G-2). There would also be no change in the Baseline model (Confidential Appendix G-4)."

57.1 Confirm if FEI is using the terms "useful life" and "service life" as having the same meaning.

Response:

Confirmed.

57.2 Confirm that if meters had a service life of ½ what is being assumed in the response, then the capital costs (relating to meter purchases) for the program would be approximately double the baseline estimate over the 20 year time period.

57.2.1. If not confirmed, please explain.

Response:

Not confirmed. The financial analysis discussed in the responses to BCUC IR1 32.1 and RCIA IR1 14.4 as cited in the preamble was based on a single meter fleet lifecycle for both the AMI and the Baseline scenarios. As such, reducing the expected service life from 20 years will only change the depreciation rate for the AMI assets, with no change to the initial capital costs of AMI.

FEI has no evidence to support an AMI service life of just 10 years (i.e. half of what is being assumed). As discussed in Section 4.3.1 of the Application, the expected service life of 20 years is largely based on the capacity of the battery, and as discussed in Section 6.2.1 of the Application, the financial analysis included an annual allowance of 0.5 percent of meter failures that would require premature replacement based on historical failure data provided by the manufacturer. Further, as discussed in the response to BCUC IR1 26.2.1, the AMI meters are covered by a manufacturer's warranty for replacement cost for a period up to 20 years. For the first 10 years of the warranty period, the replacement cost is borne in full by the manufacturer.

Commencing in year 11 of the warranty period to the expiration of the warranty period there is an annual decrease in the amount of the replacement cost that is to be borne by the manufacturer (please also refer to the response to BCUC IR2 44.2 for the percentage of replacement costs covered by the manufacturer's warranty depending on the year in which the AMI meter is to be replaced pursuant to the manufacturer's warranty).

Despite the implausibility of this scenario, FEI has performed the requested calculations, assuming 100 percent of the replacement costs are incurred by FEI without the warranty. Please refer to the table below which shows that the present value of the AMI capital over the 26-year analysis period would increase by approximately 26 percent if the AMI meters were required to be replaced in 10 years instead of 20 years. FEI notes the present value of capital costs over the 26-year analysis period would not double when considering future costs discounted to today's dollars and the fact that the AMI meters are only a portion of the initial total capital costs. Additionally, the AMI meter installation costs would be reduced as the time required to complete the replacement would be reduced with the bypass valves, which would have been installed when the AMI meters were installed initially.

Capital Costs ($000s)	NPV (AMI Meters w/ 20 yrs Service Life) - As Filed	NPV (AMI Meters w/ 10 yrs Service Life)
AMI Meter Capital	349.2	489.8
Non-AMI Meter Capital (Bypass Value, Regulator)	132.1	135.8
Project Management	35.2	35.2
Software Capital	9.1	9.1
Network Capital	17.1	17.1
non-Meter Capital	3.6	3.6
AFUDC	12.7	12.7
Total Capital	**558.9**	**703.3**
% Increase		**26%**