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ORDER NUMBER
G-4-18

IN THE MATTER OF
the *Utilities Commission Act*, RSBC 1996, Chapter 473

and

FortisBC Energy Inc.
2016 Rate Design Application

BEFORE:
K. A. Keilty, Commissioner/Panel Chair
W. M. Everett QC, Commissioner
D. J. Enns, Commissioner

On January 9, 2018

ORDER

WHEREAS:

A. On December 19, 2016, FortisBC Energy Inc. (FEI) filed its 2016 Rate Design Application with the British Columbia Utilities Commission (Commission) and on February 2, 2017, FEI provided a supplemental filing which included a review of the rate design for the Fort Nelson service area (together the Application);

B. On March 2, 2017, by Order G-30-17, the Commission established further regulatory process, which included a procedural conference to be held on July 5, 2017 to seek input from FEI and registered interveners on further regulatory process;

C. On July 18, 2017, by Order G-109-17, the Commission determined that a decision will be issued, following a streamlined review process (SRP) and written arguments, with determinations on the following key topics:

   i. The Cost of Service Allocation (COSA) studies included in the Application; and
   ii. The revenue to cost (R:C) ratio, the margin to cost (M:C) ratio and the range of reasonableness;

D. The streamlined review process on COSA, revenue to cost ratios and the range of reasonableness was held on September 12, 2017, with the Panel, staff and the following participants:

- FortisBC Energy Inc. along with its consultant, EES Consulting Inc.
- Commercial Energy Consumers Association of BC
- BC Public Interest Advocacy Centre, representing British Columbia Old Age Pensioners' Organization *et al.*
- Industrial Customer Group
- BC Sustainable Energy Association and Sierra Club of BC
- Catalyst Paper Corporation
- Elenchus Research Associates Inc. (an independent consulting firm hired by the Commission);

E. FEI and interveners filed final arguments on the key topics on September 18 and 25, 2017 respectively. FEI filed its reply argument on October 2, 2017; and

F. The Panel has considered the submissions of the parties.

NOW THEREFORE, pursuant to sections 58 to 61 of the *Utilities Commission Act* and for the reasons attached as Appendix A to this order, the British Columbia Utilities Commission orders as follows:

1. FEI is directed to use an R:C ratio range of reasonableness of 95 percent to 105 percent to inform rate design and rebalancing proposals in the current Application.

2. FEI is directed to file updates to the Application in response to the findings and directives in this order with reasons, in accordance with a procedural order to be issued subsequent to this order. The electronic versions of the updates should include both a blacklined version and a clean version.

3. FEI is directed to determine a load factor for cost allocation which best reflects the cost to serve Fort Nelson Rate Schedule 25.

4. FEI is directed to file a comprehensive and updated COSA study for each of FEI and Fort Nelson for review by the Commission five years after the release of the final decision regarding this Application.

5. FEI is directed to present both the R:C and M:C ratios for each rate schedule in the next COSA study filing and rate design application.

DATED at the City of Vancouver, in the Province of British Columbia, this *9th* day of January 2018.

BY ORDER

Original signed by:

K. A. Keilty
Commissioner

Attachment

FortisBC Energy Inc.

2016 Rate Design Application

Reasons for Decision

January 9, 2018

Before:
K. A. Keilty, Panel Chair
W. M. Everett, QC, Commissioner
D. J. Enns, Commissioner

FortisBC Energy Inc.
2016 Rate Design Application

REASONS FOR DECISION

Table of Contents

1.0 Background and regulatory process

On December 19, 2016, FortisBC Energy Inc. (FEI) filed its 2016 Rate Design Application (RDA) with the British Columbia Utilities Commission (the Commission or BCUC) pursuant to sections 58 to 61 of the *Utilities Commission Act* (UCA). On February 2, 2017, FEI provided a supplemental filing which included a review of the rate design for its Fort Nelson service area (Fort Nelson). The 2016 RDA is a comprehensive review of the rate design for FEI and Fort Nelson (Application). FEI proposes a number of rate design changes for both FEI and Fort Nelson that are intended to rebalance rates based on updated cost of service allocation (COSA) studies and to realign rate design with accepted rate design principles. A separate COSA study and rate design was executed for Fort Nelson.

This decision addresses the following two key topics in the Application (Two Key Topics) that were identified by the Commission for early resolution through a Streamlined Review Process (SRP):

1. The Cost of Service Allocation (COSA) studies; and
2. Consideration of the use of the revenue to cost (R:C) ratio or margin to cost (M:C) ratio, or a combination of both, as a guide to rate design and the corresponding range of reasonableness of the selected ratio(s).

1.1 FEI's COSA and rate design history

FEI's current rate design was developed in a two-phase rate design process commencing with the 1991 Phase A Rate Design Application, followed by the 1993 Phase B Rate Design Application. Phase A addressed gas costs, and Phase B addressed the allocation of all other utility costs, other than gas supply costs, and rate design.[1] To support the Phase B Rate Design Application, FEI (then BC Gas) filed a COSA study on both a regional and a consolidated basis. BC Gas calculated the allocated cost of service of customer rate schedules and the R:C ratios and proposed that a R:C ratio with a range of reasonableness of 90% to 110% be used as a guideline for setting rates.[2] The Commission addressed the Phase A and Phase B applications through Commission Order G-92-91, dated September 23, 1991 and Order G-68-93, dated August 13, 1993, respectively.

FEI notes that there have been two significant rate design proceedings since the 1993 Phase B rate design proceeding, which occurred in 1996 and 2001 and built on the methodologies established in 1991 and 1993.

In 1996, BC Gas filed a rate design application which included a COSA study and a Minimum System study. BC Gas maintained that a reasonable guide for rate setting between customer classes was a range for R:C ratios between 90% and 110%. A negotiated settlement process (NSP) was undertaken and the resulting negotiated settlement agreement (NSA) was approved by the Commission through Order G-98-96.[3]

In 2001, BC Gas filed a rate design application which included a COSA study. The Commission retained an independent rate design consultant, EES Consulting, to review the 2001 COSA study. The EES Consulting report was circulated to proceeding participants, which was followed by two rounds of information requests, a workshop and then a NSP. The resulting negotiated settlement document was approved through Commission Order G-116-01.[4]

[1] Exhibit B-1, p. 3-10.
[2] Ibid.
[3] Exhibit B-1, pp. 3-11 – 3-12.
[4] Exhibit B-1, p. 3-13.

In 2012, the FortisBC Energy Utilities (composed of FortisBC Energy Inc., FortisBC Energy (Vancouver Island) Inc., and FortisBC (Whistler) Inc.) submitted the 2012 Common Rates, Amalgamation and Rate Design Application to the Commission for the approvals necessary to amalgamate with one another and with Terasen Gas Holdings Inc., and to implement common or "postage stamp" rates throughout the amalgamated entity's combined service area.[5] In support of the 2012 Common Rates, Amalgamation and Rate Design Application, FEI conducted a COSA study that combined each of FEI's utilities into an amalgamated entity and produced postage-stamp delivery, midstream, and commodity rates. Following a Commission denial of the application, a Phase II Reconsideration process was established and new evidence was accepted. Through Commission Order G-21-14, the Commission approved FEI's Reconsideration and Variance application with conditions. The Commission determined that FEI could adopt common rates for the amalgamated entity, subject to the Lieutenant Governor in Council's consent (which was approved by Order in Council (OIC) No. 300 dated May 23, 2014) and subject to confirmation that the amalgamation had been effected. The Commission directed FEI to file a comprehensive rate design application for the amalgamated entity no later than two years after the effective date of amalgamation. FEI filed this Application pursuant to that directive.[6]

1.2 Regulatory process

FEI filed its 2016 RDA on December 19, 2016, and on February 2, 2017, FEI provided a supplemental filing which included the COSA and rate design for Fort Nelson.

The following parties registered to participate as interveners in the proceeding:

- British Columbia Hydro and Power Authority (BC Hydro)
- Access Gas Services Inc. (Access Gas)
- BC Public Interest Advocacy Centre, representing British Columbia Old Age Pensioners' Organization *et al*. (BCOAPO)
- Catalyst Paper Corporation (Catalyst Paper)
- Shell Energy North America (Canada) Inc. (Shell)
- Commercial Energy Consumers Association of British Columbia (CEC)
- Direct Energy Marketing Ltd. (Direct Energy)
- B.C. Sustainable Energy Association and Sierra Club of B.C. (BCSEA)
- Industrial Customer Group (ICG)
- Fort Nelson & District Chamber of Commerce (FNDCC)
- Nicholas Marty
- Absolute Energy Inc. (Absolute)
- Cascadia Energy Ltd. (Cascadia)

On February 21, 2017, the Commission issued a letter (Exhibit A-4) explaining that Commission staff retained an independent consultant, Elenchus Research Associates Inc. (Elenchus), to produce two independent reports, a Cost of Service Allocation (COSA) Report and a Rate Design Report, which would form part of the evidentiary record and be subject to information requests. Elenchus filed its COSA Report on April 26, 2017[7] and its Rate Design Report on June 23, 2017.[8]

[5] In the matter of FortisBC Energy Utilities 2012 Common Rates, Amalgamation and Rate Design Application, Order G-26-13 and Decision dated February 20, 2013, p. 1.
[6] Exhibit B-1, pp. 3-15 – 3-16.
[7] Exhibit A2-2.
[8] Exhibit A2-10.

On March 2, 2017, the Commission issued Order G-30-17, which established a regulatory process for the proceeding and included, among other things, a procedural conference on Elenchus' Rate Design Report key topics, delivery of the COSA Report and the Rate Design Report, and one round of information requests to each of FEI and Elenchus.

On Wednesday, July 5, 2017, a second procedural conference was held to seek input from FEI and interveners on further regulatory process regarding:

a. an early decision on key topics;
a. the review of FEI's Transportation Service Review (Chapter 10 in the Application); and
b. the review of all remaining issues.

On July 18, 2017, the Commission issued Order G-109-17, which among other things, directed that there would be an SRP followed by written arguments from FEI and interveners, a reply argument from FEI and an early decision with determinations on the Two Key Topics addressed in this decision. FEI submitted its written reply argument on October 2, 2017.

2.0 Regulatory framework

The Panel's review of FEI's proposed rate design changes, including rebalancing rates based on an updated COSA study, considers sections 58 to 61 of the UCA as well as accepted rate design principles.

Section 59(1) of the UCA states:

> **59** (1) A public utility must not make, demand or receive
>
> (a) an unjust, unreasonable, unduly discriminatory or unduly preferential rate for a service provided by it in British Columbia, or
>
> (b) a rate that otherwise contravenes this Act, the regulations, orders of the commission or any other law.

The Panel is guided by the rate design principles identified by Dr. James C. Bonbright[9] and discussed by FEI on page 5-2 of the Application and by Elenchus on pages 6 to 8 of its COSA Report. The Panel notes there is generally no hierarchy for the Bonbright principles as the relevance and weight given to principles vary with the circumstance and context of a regulatory application. The Panel considers it appropriate that the principles surrounding fairness and the avoidance of undue discrimination are given weight when reviewing the Two Key Topics in this Decision.

3.0 Approvals sought

On pages 2-3 to 2-5 of the Application, FEI lists the approvals sought for the 2016 RDA, a majority of which are not within the scope of this decision. In this first component of FEI's 2016 RDA proceeding, FEI requests that the Commission, in this decision, approve:

a) FEI's COSA studies for FEI and Fort Nelson, and

[9] *The Principles of Public Utility Rates*, James C. Bonbright, Albert L. Danielsen, David R. Kamerschen (Second Edition, 1988) Public Utilities Reports, pp 383-384.

b) the use of a revenue to cost (R:C) ratio with a range of reasonableness of 90 to 110 percent to guide rate design.[10]

By seeking this approval, FEI is requesting that the Commission determine that the methodologies used by FEI in its COSA studies and its proposed range of reasonableness are reasonable and appropriate for the purposes of FEI's rate design and setting rates for the utility.[11]

4.0 FEI COSA study

4.1 Purpose of the COSA study

FEI states that a COSA study is a fundamental component in the preparation of a utility rate design and provides information for assessing the rate design's effectiveness in recovering the cost of service, providing a fair apportionment of costs among customers, avoiding undue discrimination and providing revenue stability.[12]

Elenchus also outlines the importance of COSA studies and makes the following comments:

- It is standard practice in Canada and in many jurisdictions internationally to rely on COSA studies to apportion utility costs to each of the utility's customer classes.
- Utility costs include the utility's assets which form the utility's rate base and the expenses as identified in the utility's revenue requirement. As these costs are mostly incurred in respect of multiple customer classes, COSA studies apportion the costs among customer classes on a fair and equitable basis as guided by the principle of cost causality.
- Cost causality refers to the principle of identifying the customer classes that "cause" particular costs to be incurred by the utility.[13]

4.2 Overview of FEI's COSA study

FEI utilized the approved 2016 test year revenue requirements from its Annual Review for 2016 Delivery Rates proceeding for allocation within the COSA model. FEI states that these costs reflect current operating conditions, the amalgamation of FEI, FEVI and FEW,[14] and were the most recently available approved costs at the time the COSA study was prepared. FEI's approved revenue requirement for 2016 was $1,237.5 million.[15]

In addition to costs from FEI's approved 2016 test year, FEI's COSA model also includes known and measurable changes for projects expected to be in-service by or soon after January 1, 2018. FEI lists three projects: Lower Mainland Intermediate Pressure System Upgrade (LMIPSU)[16]; Coastal Transmission System Project (CTS); and Tilbury Expansion Project.[17] For each of these projects, FEI included the mid-year rate base and an annual cost of service figure in the COSA model.[18]

[10] FEI Final Argument, p. 1.
[11] Ibid.
[12] Exhibit B-1, p. 6-1.
[13] Exhibit A2-2, p. 3.
[14] FortisBC Energy Inc. (FEI), FortisBC Energy (Vancouver Island) Inc. (FEVI), and FortisBC Energy (Whistler) Inc. (FEW).
[15] Exhibit B-1, p. 6-6.
[16] Approved through C-11-15.
[17] CTS and Tilbury Expansion project were authorized by Direction No. 5 to the Commission, OIC No. 557 (B.C. REG. 245/2013), as amended through OIC No. 749 (B.C. REG. 265/2014).
[18] Exhibit B-1, p. 6-10.

Revenues associated with rate schedule (RS) 22A, RS 22B, bypass customers and large industrial contract customers (Contract Customers) have been treated as a credit to the cost of service and allocated to all other rate schedules in the COSA model. As a result, these rate schedules are not allocated any costs in FEI's COSA model.[19]

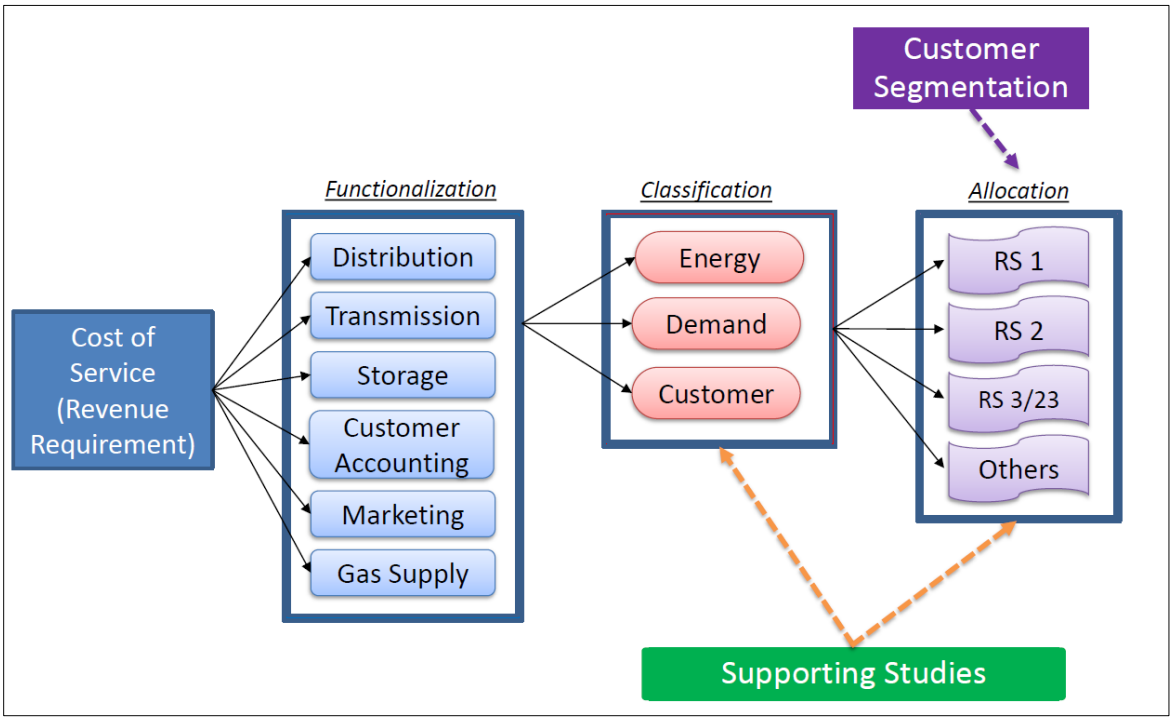
FEI notes that RS 46 – LNG Sales, Dispensing and Transportation Service; and RS 50 – Large Industrial Transportation Service Rate Schedule, were established by Direction No. 5 to the Commission and are therefore not subject to change in this Application.[20] FEI states that both costs and revenues for RS 46 are directly allocated to RS 46 with the net difference between the two being treated as a credit to the cost of service and allocated to all non-bypass customers.[21]

In this Application, FEI's revenue requirement is allocated into two categories: delivery costs and gas costs. FEI's delivery costs are defined as FEI's revenue requirement excluding gas costs and are allocated to rate schedules through a delivery margin COSA model. FEI's gas costs, which is comprised of commodity costs and midstream (storage and transport) costs, are allocated to rate schedules through a gas cost allocation model.[22] FEI's COSA study financial schedules are included in Appendix 6-4 of the Application.

Delivery costs

To allocate delivery costs to customers, FEI uses three standard steps: (1) Functionalization; (2) Classification; and (3) Allocation. Each step is described below.

Figure 1: Cost of Service Allocation (COSA)[23]



[19] Exhibit B-1, p. 6-13 and 6-21.
[20] Exhibit B-1, p. 2-1 and 5-5; OIC No. 557 (B.C. REG. 245/2013), as amended through OIC No. 749 (B.C. REG. 265/2014).
[21] Exhibit B-1, p. 6-12 and 6-21.
[22] Exhibit B-1, p. 6-2.
[23] Exhibit B-2, p. 76.

1. Functionalization

The functionalization step involves separating the test year revenue requirement into the major categories, or functions, that reflect the utility's plant investment code of accounts and different services provided to customers. For FEI, the following functions were used:

i. Gas Supply Operations
ii. Transmission
iii. Distribution
iv. Tilbury LNG Storage
v. Mt. Hayes LNG Storage
vi. Marketing
vii. Customer Accounting

2. Classification

The second step in the COSA study is to classify the functionalized costs into cost-causation categories. These classification categories relate to the reason the costs were incurred by FEI. FEI uses the three following classification categories:

i. Demand – Demand-related costs which are incurred to meet maximum daily gas flow requirements;

ii. Energy – Energy-related costs which vary with the volume of gas delivered to customers; and

iii. Customer – Customer-related costs which are incurred as a result of having a customer attached to the distribution system.

FEI utilizes a Minimum System Study (MSS) to split the costs of distribution mains between demand and customer related components. FEI states that this approach considers that the distribution system is in place in part because there are customers connected to the system and in part because those customers have a peak demand on the system. FEI states that any costs associated with a system larger than this minimum system size are due to the customer's demand, and so are treated as demand related.[24]

FEI also utilizes a Peak Load Carrying Capacity Adjustment (PLCC). In theory, a minimum system exists only to connect customers and not to deliver gas. However, due to the minimum size main used in the study the minimum system has load carrying capacity.[25] FEI's PLCC adjustment is used to more closely match the theoretical customer-related component of the distribution system.[26]

3. Allocation

The third step of the COSA study involves the allocation of the costs to each rate schedule based on appropriate allocators. FEI allocates the costs in the COSA model as follows[27]:

i. Demand – allocated using the coincident peak (CP) approach relying on peak day demand, load factors and regression models;

ii. Energy – allocated using annual demand by rate schedule; and

[24] Exhibit B-1, p. 6-18.
[25] FEI uses 60 mm as the minimum mains size. Exhibit B-1, Appendix 6-5.
[26] Exhibit B-1, p. 6-19.
[27] Exhibit B-1, p. 6-21; p. 6-24; p. 6-26.

iii. Customer – allocated using average customers or allocated using average customer with a weighting factor applied.

The final delivery cost of service allocations for FEI is shown below, as presented in Table 6-16 of Exhibit B-1.

Table 1: FEI delivery cost of service allocation results[28]

Rate Schedule	($000s)	Percentage of total
1	510,654	65.2%
2	129,861	16.6%
3/23	95,247	12.2%
4	51	0.0%
5/25	35,111	4.5%
6	151	0.0%
7/27	1,540	0.2%
22	806	0.1%
22A	6,824	0.9%
22B	2,602	0.3%
Total	**782,847**	**100.0%**

Gas costs

FEI's gas costs, which is comprised of commodity costs and storage and transport costs, are allocated to sales customers and not transportation customers. Sales customers purchase their gas commodity from either FEI directly or from marketers under the Customer Choice Program while Transportation customers source their own gas. Transportation customers do not pay commodity or storage and transport charges to FEI. FEI allocates gas costs as follows:

1. Commodity costs – classified as energy-related and allocated to sales customers based on throughput; and
2. Storage and transport costs – classified as demand-related and allocated to sales customers based on a load factor adjusted volumetric basis.[29]

EES Consulting

FEI retained EES Consulting Inc. (EES Consulting), a third party expert in public utility rate design matters, to review and assist in developing the COSA study and rate design for FEI. EES Consulting assessed the appropriateness of the COSA methodology and rate design, made recommendations for changes it felt were warranted, and reviewed the COSA model created by FEI staff.[30] EES Consulting also prepared a report, which is included in Appendix 6-1 of the Application. EES Consulting concluded that the COSA study in this Application follows standard utility practice and is generally consistent with past practice for the utility and that the results are acceptable for purposes of setting just and reasonable rates for FEI.[31]

[28] Exhibit B-1, Table 6-16, p. 6-27.
[29] Exhibit B-1, p. 6-29.
[30] Exhibit B-1, p. 1-3.
[31] Exhibit B-1, p. 1-2.

Elenchus review of FEI's COSA study

Elenchus reviewed FEI's COSA study for the reasonableness and appropriateness of the topics outlined in Exhibit A-4 and filed its COSA Report on April 26, 2017. Elenchus considered that the functions used by FEI were appropriate and reflected the various activities that FEI is involved in during the delivery of natural gas to its customers.[32]

Elenchus stated that demand, energy and customer are the standard classifications used in COSA studies and that Elenchus is not aware of any other classification method used in cost of service allocation studies. Elenchus further stated that the use of the MSS method with a PLCC adjustment has been accepted as a classification methodology for distribution related assets and costs based on Elenchus' experience. Elenchus noted that the MSS method was applied more often by utilities than the zero intercept method, an alternative FEI considered.[33]

Elenchus agreed with the allocators used by FEI in the COSA study stating that they are the standard allocators used by utilities in COSA studies. Elenchus noted that non-coincident peak (NCP) is used to allocate distribution demand related assets and expenses by electric utilities, whereas FEI opted for the CP approach. FEI had explained that its CP is derived from the sum of the various customer class loads under a design day event, which is similar to the standard approach to developing a NCP based on a measurement of historic system peak day loads. FEI then stated that there was very little difference between the FEI's CP demand and the NCP demand. Elenchus accepted FEI's explanation of the reasons for using CP as an allocator instead of NCP.[34]

Elenchus agreed with FEI's gas cost allocation methodology stating that energy is the allocator that reflects cost causality for commodity gas costs and that the midstream cost allocation methodology is consistent with methodologies used by other Canadian natural gas utilities.[35]

Elenchus also addressed FEI's assumptions and adjustments to the COSA model, including but not limited to the treatment of revenues from bypass and Contract Customers and FEI's treatment of known and measurable changes. Elenchus supported the assumptions and adjustments made by FEI, except FEI's treatment of the costs and revenues associated with the Tilbury Expansion project.[36] Elenchus stated that the 10 year horizon used by FEI in its COSA study to reflect the impact of the Tilbury Expansion project is not consistent with standard practice. This issue, as well as Elenchus' explanation, is further discussed in Section 4.3.1.

FEI final argument

FEI requests that the Commission find that the methodologies of the COSA studies are reasonable, and appropriate for the purposes of FEI's rate design and setting rates for the utility. FEI submits:

- the COSA studies are prepared in accordance with standard utility practice and with stakeholder consultation;
- EES Consulting found the studies to be consistent with standard utility practice, generally consistent with past practice for the utility, and acceptable for purposes of setting just and reasonable rates for the utility; and

[32] Exhibit A2-2, p. 11.
[33] Exhibit A2-2, p. 15; Exhibit B-1, Appendix 4-2, COSA Workshop July 11, 2016, p. 12.
[34] Exhibit A2-2, pp. 17-18; Appendix A, p. 2.
[35] Exhibit A2-2, pp. 18-19.
[36] Exhibit A2-2, p. 22.

- Elenchus' conclusions also support the validity of FEI's COSA study, except for the 10-year levelized treatment of the Tilbury Expansion Project costs and revenues.[37]

Intervener arguments

Interveners generally agreed with FEI's approach to the COSA studies except for the following issues:

1. CEC and BCOAPO argue for a standard approach to the treatment of costs associated with the Tilbury Expansion Project;[38] and
2. Catalyst Paper takes issue with FEI's proposed final COSA and associated R:C ratio as it pertains to the proposed RS 22 and the Vancouver Island Gas Joint Venture (VIGJV).

Commission determination

Subject to the determinations on issues addressed in Section 4.3, the Panel finds FEI's COSA methodology generally follows standard practice, which both EES Consulting and Elenchus view as being reasonable and acceptable for setting just and reasonable rates. The Panel notes that with the exception of the treatment of Tilbury Expansion costs and the VIGJV treatment, none of the interveners oppose the acceptance of FEI's COSA methodology.

In addition to the foregoing issues raised by interveners regarding treatment of the Tilbury Expansion costs and the VIGJV treatment, the Panel also considers, in section 4.3, the following additional issues that were explored during the proceeding:

1. Mt. Hayes LNG storage facility treatment;
2. Rate Schedule 5 load factor treatment;
3. Minimum System Study; and
4. Customer weighting factors.

4.3 FEI COSA study issues

4.3.1 Tilbury Expansion project treatment

The Tilbury Expansion Project is an expansion to FEI's existing LNG facility located in Delta and was expected to be in service in mid-2017. The Project includes additional liquefaction of 35 TJ/Day and a 1 BCF LNG storage tank to serve LNG demand for RS 46.[39] FEI expects that the volume of LNG sales from the Tilbury Expansion Project will grow over time to the full capacity of 35 TJ/day of liquefaction and will provide a net benefit to FEI customers over its useful life. The cost recovery of expenditures associated with the Tilbury Expansion Project was authorized by Direction No. 5 to the Commission as amended (OIC No. 27 557/2013 and OIC No. 749/2014).[40] FEI's forecast demand, costs and revenues for the Tilbury Expansion Project are shown in Table 2: Tilbury Expansion Project Forecast below.

[37] FEI Final Argument, pp. 2-3.
[38] CEC Final Argument, pp. 3-4; BCOAPO Final Argument, pp.9-12.
[39] TJ/Day is Terajoules per day; BCF is 1 billion cubic feet.
[40] Exhibit B-1, pp. 6-11 to 6-1.2

Table 2: Tilbury Expansion Project Forecast[41]

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
RS 46 Demand Forecast (TJ/year)[(1)]	2,956	5,545	6,021	7,998	8,496	12,242	12,242	12,242	12,242	12,242
RS 46 Delivery Revenue[(2)] ($000)	11,220	21,463	23,770	32,204	34,893	51,278	52,300	53,343	54,406	55,490
Total Cost of Service[(2)] ($000)	46,984	46,963	47,241	47,241	47,793	48,727	47,311	46,112	44,716	43,474

FEI's general approach for known and measurable changes has been to include in its COSA model the annual cost of service for 2018 for the CTS projects and the annual cost of service for the first year of operations for LMIPSU.[42] However, FEI adopted a different approach for the Tilbury Project. FEI has included the 10-year levelized cost of service and revenues for the Tilbury Expansion Project in the COSA model stating that this better reflects the medium term impact that the Tilbury Expansion Project will have on FEI's customers.[43]

FEI's rationale is that the Tilbury Expansion Project, which has both incremental costs and incremental revenues associated with volumes, is unlike the LMIPSU and the CTS projects, which have costs but do not have incremental volumes associated with them. FEI further states that for the Tilbury Expansion Project, the incremental volumes are not all realized at the time that the full costs of the Tilbury Expansion Project are included in rate base. Reflecting only the first year of incremental revenues would not therefore be representative of the longer term impact that the Tilbury Expansion Project will have on the revenue requirement.[44]

Elenchus review of FEI's COSA study

Elenchus did not support FEI's treatment of the costs and revenues associated with the Tilbury Expansion project. It states that the 10 year horizon used by FEI in its COSA study to reflect the impact of the Tilbury Expansion project is not consistent with standard practice. Elenchus further states that:

> Utilities undertake new investments on an ongoing basis and as a result the revenue requirement in any year includes costs for older assets that have a diminished impact on the total revenue requirement as well as new assets that have a high initial impact. Except in extraordinary cases, it would be inconsistent to levelize the costs of a single project while not levelizing the costs associated with other investments. Elenchus is not aware of any unique aspects of the Tilbury Expansion Project that make its impact on customers generally, or any class of customers, that justify exceptional treatment of this project in the form of levelizing its costs for purposes of the COSA.[45]

Elenchus later states that FEI should use the standard rolled-in methodology for the Tilbury Expansion Project.[46] In standard rolled-in methodology the utility uses the annual costs and revenues for one year, 2018 only, in the COSA model.

Intervener arguments

CEC submits that that levelized costs should not be utilized and that FEI should use the standard approach for the Tilbury Expansion project. CEC states that it does not consider it appropriate for FEI to manipulate the

[41] Exhibit B-1, Table 6-6, p. 6-12; Exhibit B-5, BCUC IR 9.2, p. 36
[42] See page 4 for definitions of CTS and LMIPSU.
[43] Exhibit B-1, p. 6-11.
[44] Ibid.
[45] Exhibit A2-2, p. 22.
[46] Exhibit A2-8, CEC IR 16.1.1.

modelling of its costs for a COSA in a manner to achieve a particular outcome down the road. CEC further submits that managing stability is a matter of rate design and should not factor into the COSA study inputs prior to the Commission's balancing of the appropriate principles.[47] CEC notes that the use of only the first year of operations changes the allocations marginally.

BCOAPO submits that the Tilbury Expansion Project should be included on the standard rolled in methodology and that the Commission should revisit the issue of inclusion of the Tilbury Expansion Project when it is fully or substantially completed.[48] BCOAPO argues that there is some risk that both the cost and revenue forecasts of FEI will vary significantly and further submits that because both the costs and revenues are untested at this time that it would be imprudent to use the FEI levelized approach. [49]

FEI reply argument

FEI submits that although the costs and revenues associated with the Tilbury Expansion Project will be different than forecast in the Application, using the 10-year levelized approach will be more representative of the impact on customers than the traditional approach. Using 2018 revenues will represent the Tilbury Expansion Project when incremental revenues will be at their lowest and will understate the revenues for all future years.[50]

FEI argues that the impact of the traditional approach would become more inaccurate each year as incremental revenues associated with the project are achieved. FEI states that the 10-year levelized approach leads to COSA results that are more relevant and reflective of the expected circumstances over the next 4 to 6 years. FEI recognizes that its approach is not traditional and points out that the traditional approach is not the only "correct approach."[51] FEI submits that in this case, the unique attributes of the Tilbury Expansion Project make a 10-year levelized approach preferable.[52]

Commission determination

The Panel finds that FEI's proposed treatment of the costs and revenues associated with the Tilbury Expansion Project is acceptable given the unique circumstances associated with the project. The Panel agrees with FEI that a standard approach would not appropriately reflect the forecast revenue increase associated with the Tilbury Expansion project following its ramp up period and this would lead to costs that are forecast to be higher than actual during the expected period until the next rate design proceeding. The Panel considers that the significantly increasing forecast revenues warrant a tailored approach to calculating this known and measureable change rather than using an approach based on the annual costs and revenues for only one year.

The Panel notes that the use of the standard rolled-in approach results in a $15,383 thousand, or 2 percent, increase in the total delivery cost of service used in the COSA model and has only a minor impact on the resulting R:C ratios.[53]

The Panel acknowledges BCOAPO's identified risk that there could be significant variance between the forecast and actual cost and revenues. However, in the Panel's view, this risk does not justify the standard treatment of the project.

[47] CEC Final Argument, p. 3.
[48] BCOAPO Final Argument, p. 12.
[49] BCOAPO Final Argument, pp. 11-12.
[50] FEI Reply Argument, p. 3.
[51] FEI Reply Argument, p. 4.
[52] Ibid.
[53] Exhibit B-1, Table 6-16, p. 6-27; Table 12-2, p. 12-5;Exhibit B-5, BCUC IR 9.3.1, pp. 38-40.

The Panel considers this approach could be explored further in the next COSA study filed with the Commission. By then, FEI will have obtained actual cost and revenue data and will have the opportunity to update its expectations to reflect actual results. The timing of the next COSA study is discussed in section 6.0 of this decision.

4.3.2 Vancouver Island Gas Joint Venture treatment

Large industrial contract customers (Contract Customers) are customers that have historically negotiated their rates with FEI. Contract customers' rates are fixed in their respective transportation service agreements. Contract Customers served from the Vancouver Island transmission system include the VIGJV and the BC Hydro Island Generation (BC Hydro IG).[54]

Prior to any rate design proposals in the Application, FEI's COSA model treats Contract Customer revenues as credits to the cost of service and allocates that credit to each sales and non-contract transportation service rate schedule. The COSA results after FEI's rate design proposals included in Table 12-2 of the Exhibit B-1, do not treat BC Hydro IG and VIGJV as credits to the cost of service. Instead, these customers are grouped together with RS 22 customers and are allocated costs based on their firm demand.[55]

RS 22 customers are located primarily in the Lower Mainland and represent industries varying from refineries, manufacturing, cement, forestry, healthcare, education, food/beverage and greenhouses. These customers generally use natural gas to fuel boilers, kilns and dryers. All RS 22 customers are receiving interruptible transportation service, with the exception of one (Creative Energy[56]) that uses 2,000 GJ/day of firm transportation service and additional volumes on an interruptible basis.[57]

The VIGJV provides for the natural gas needs of five pulp mills and has a service contract for a firm demand of 13,000 GJ per day which expired on December 31, 2017. FEI anticipates, as an interim measure, extending the existing VIGJV contract until the Commission approved Rate Design becomes effective for RS 22.[58]

FEI submits the treatment of industrial customers is appropriate and that any change regarding the proposed RS 22, is a rate design issue that is not within the scope of the COSA component of this proceeding.[59]

Intervener arguments

Catalyst Paper is the only intervener to address this topic in its final argument. Catalyst Paper is part of the VIGJV, which has been a Contract Customer since 1991. Catalyst Paper submits the Commission should "not accept FEI's proposed final COSA and associated R:C ratio as it pertains to the proposed RS22 and the VIGJV."[60] In particular, Catalyst Paper submits that:

- FEI has included distribution costs for the VIGJV while excluding the same distribution costs from similar industrial customers in RS22A and RS22B. Catalyst Paper elaborates that distribution costs have historically been excluded from the COSA for the VIGJV, RS22A, and RS22B, but now FEI is proposing to include distribution costs for the VIGJV and BCH only, and

[54] Exhibit B-1, p. 6-9.
[55] Exhibit B-1, p. 12-5.
[56] Exhibit B-1, p. 9-41.
[57] Exhibit B-1, p. 9-37.
[58] Exhibit B-1, p. 9-39.
[59] FEI Final Argument, p. 12; pp. 14-15; FEI Reply Argument, pp. 7-8.
[60] Catalyst Paper Final Argument, p. 11.

- FEI has omitted VIGJV's interruptible demand and revenue and that this impacts the acceptability of the COSA study from Catalyst's point of view.[61]

Commission determination

The Panel finds the issues raised by Catalyst Paper are not within the limited scope of this decision. Catalyst Paper's issues stem from FEI's industrial rate design proposals for RS 22 and its Contract Customers. The Panel notes that when making its foregoing submissions, Catalyst Paper refers to the "cost allocation in FEI's Final COSA results and R:C ratios."[62] The Application contains two sets of COSA financial schedules: Initial COSA Financial Schedules and Final COSA Financial Schedules. The scope of this Decision is the initial COSA studies and revenue to cost ratios before rate design proposals and rate rebalancing proposals. Both Catalyst Paper and FEI will have an opportunity to address the issues raised by Catalyst Paper in their arguments for the rate design phase of this proceeding.

4.3.3 Mt. Hayes LNG storage facility treatment

The Mt. Hayes LNG facility went into service in 2011. FEI states that the Mt. Hayes LNG facility has a dual purpose of serving as a gas supply storage facility and a transmission facility which provides additional transmission system capacity to serve customers in the same fashion that pipeline looping and compression provide such capacity.[63]

The estimated avoided cost of third-party storage and transportation due to the Mt. Hayes LNG facility, is calculated to be $18 million, credited to Other Revenue and reclassified to FEI's midstream costs. In the COSA model, the annual cost of the Mt. Hayes LNG facility (net of the midstream value of approximately $18 million) is then allocated to all sales and transportation customers on a peak day demand basis.[64]

FEI presents the following options for the allocation of the costs for the Mt. Hayes LNG storage facility within the COSA model.[65]

1. Option A is to continue to separate Mt. Hayes into its storage and transmission components, which is the current method used by FEI.
2. Option B is be to treat Mt. Hayes cost allocation in the same manner as the Tilbury storage cost allocation, whereby all Mt. Hayes costs would be allocated to the delivery margin only. FEI notes that Option B has the benefit of being more straightforward and would recognize that the system capacity and reliability benefits all customers as a result of Mt. Hayes being part of the integrated transmission system.

FEI proposes to continue to use Option A, stating that Option A most closely represents how FEI utilizes Mt. Hayes as both a storage and transmission resource.[66]

[61] Catalyst Paper Final Argument, p. 11.
[62] Ibid.
[63] Exhibit B-1, p. 6-14.
[64] Exhibit B-1, pp. 6-14 – 6-15.
[65] Exhibit B-1, pp. 6-15 – 6-16.
[66] Exhibit B-1, p. 6-16.

Elenchus review of FEI's COSA study

Elenchus states that while FEI's proposed treatment of the costs using Option A is unusual, it understands that the "unique treatment reflects the unique role that Mt. Hayes LNG Storage serves in the FEI system."[67] Elenchus also points out that for other utilities, on-system storage facilities are functionalized based on the purpose of each facility but noted that Mt. Hayes is a single facility that serves multiple purposes.[68] Elenchus acknowledged that FEI's treatment of Mt. Hayes costs is appropriate.[69]

Intervener arguments

CEC accepts FEI's treatment as being appropriate and BCOAPO states that it has no objection to FEI's proposals regarding Mt. Hayes LNG storage.[70]

Commission determination

The Panel approves FEI's proposal regarding the treatment of the cost allocation for the Mt. Hayes LNG facility. FEI's proposal regarding the treatment of the cost allocation for the Mt. Hayes LNG facility is appropriate and reasonable since it reflects how FEI uses the facility in a dual-manner and the treatment is in alignment with cost causation principles. The Panel notes none of the interveners oppose FEI's treatment of costs associated with the Mt. Hayes LNG facility.

4.3.4 Rate Schedule 5 load factor treatment

FEI currently allocates midstream costs to RS 5 – General Firm Sales Service by using a deemed 50 percent load factor, whereas for RS 1, RS 2 and RS 3 FEI uses a three-year rolling average load factor. This deemed 50 percent load factor value was established as part of the 1996 Rate Design Application Negotiated Settlement Agreement.[71] FEI contracts for its midstream resources based on a peak day demand that is derived using a calculated load factor for RS 5, not a deemed load factor. FEI states that the cost of the resources being contracted for is not being allocated to RS 5 in the same way in which they were caused.

FEI is proposing a change in methodology, which would result in FEI utilizing the same approach for allocating midstream costs to RS 5 as it does for RS 1, RS 2 and RS 3, by using a three-year rolling average load factor. Under the proposed methodology, FEI has calculated the current load factor used to allocate midstream costs to RS 5 to be approximately 45 percent. The load factor that would be used to allocate midstream costs to RS 5 would be recalculated annually along with the load factors used to allocate midstream costs to RS 1, RS 2 and RS 3.[72]

FEI presented evidence which shows that the three year rolling average load factor for RS 5 has decreased from 48.2 percent for the three years spanning 2005–2007 to 45.1 percent for the three years spanning 2013–2015.[73] FEI's proposed change would increase an average RS 5 customer's annual bill by 1.0 percent, RS 4 by 1.3 percent and RS 7 by 1.5 percent. RS 1, RS 2 and RS 3 would experience small decreases to their storage and transport charges.[74]

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[67] Exhibit A2-2, p. 10.
[68] Exhibit A2-5, BCUC IR 3.1.
[69] FEI SRP Transcript Vol 5 – Sep 12, p. 430.
[70] CEC Final Argument, p. 6; BCOAPO Final Argument, p. 5.
[71] Exhibit B-1, pp. 6-29 – 6-30.
[72] Exhibit B-1, p. 6-30.
[73] Exhibit B-11, CEC IR 18.2, p. 43.
[74] Exhibit B-1, p. 6-31.

FEI submits that its proposed load factor adjustment to RS 5 customers is based upon "the rate design principles to fairly apportion costs among customers and set price signals that encourage efficient use."[75]

Elenchus review of FEI's COSA study

Elenchus had no issues with FEI's proposed load factor adjustment to RS 5 customers. In response to an information request regarding the number of years used for the average, Elenchus stated that "Where there is past volatility in the load factor that is expected to continue, averaging several years is a method that can be used to provide greater stability and a better forecast for the test year than relying on a single historic year. A five-year average, or an average of some other number of years, cannot be assumed to provide a better or worse forecast than the three-year average unless there is evidence that the additional years are either more or less representative of the test year."[76]

Intervener arguments

CEC supports FEI's proposed load factor adjustments to RS 5 customers. CEC notes that the historical evidence shows that load factors have been generally declining.[77]

BCOAPO submits that FEI's proposed approach appears reasonable and also noted that "it is worth investigating the use of longer period averages to eliminate short term weather variations."[78]

Commission determination

The Panel approves FEI's proposed use of a three year rolling average load factor for RS 5. In the Panel's view this methodology is in alignment with the cost causation principle, consistent with FEI's methodology for RS 1, RS 2 and RS 3, and is more transparent than the use of a deemed load factor determined through a NSA. The evidence shows that the three-year rolling average load factor for RS 5 has declined over time. Although BCOAPO suggests investigating the use of longer periods to calculate the average, the Panel notes that no intervener opposed FEI's proposal.

4.3.5 Minimum System Study

As outlined above, a Minimum System Study (MSS) is used to split the costs of distribution mains between demand and customer related components. This topic was the subject of several information requests which looked at the issue of whether 42 mm pipe or 60 mm pipe best represents FEI's minimum system infrastructure.

FEI submits:

> Using 60 mm pipe is the appropriate approach in this case as it is FEI's minimum standard. Since 2008, FEI's standard has been to connect customers to a new main that is at minimum a 60 mm size pipe, and it is by exception only that a smaller main would be used. As 60 mm pipe is installed more frequently, the costing data for the installation of 60 mm pipe is very good, which results in better estimates for the MSS. [79]

[75] FEI Final Argument, pp. 15-16.
[76] Exhibit A2-8, CEC IR to Elenchus, IR 15.1.
[77] CEC Final Argument, pp. 9-10.
[78] BCOAPO Final Argument, p. 13.
[79] FEI Final Argument, p. 9.

FEI also noted that EES Consulting and Elenchus both support FEI's MSS with the PLCC adjustment.[80] FEI requests that the Commission find that the results of its MSS and PLCC are reasonable for use in the COSA studies.[81]

CEC submits that the Commission should find the results of the MSS and PLCC as reasonable.[82] BCOAPO states that FEI's approach passes both a relevance and consistency test.[83]

Commission determination

The Panel notes the acceptance of the parties and on its own review, **the Panel finds FEI's approach of using the MSS to split the costs of distribution mains between demand and customer related costs is reasonable for use in the COSA studies**.

4.3.6 Customer weighting factors

FEI used two types of weighting factors to allocate customer-related costs in the COSA study: (i) a weighting factor for Meters and Services; and (ii) a weighting factor for Administration and Billing. FEI states that these weighting factors are used to allocate costs based on the concept that larger volume customers require more expensive meter sets, and require a greater level of administrative effort and customer service. FEI states that these factors were developed based on discussions with FEI's customer service managers using their insight and experience, and input from EES Consulting. In developing the weighting factors, FEI's staff considered the frequency of meter reading, the use of remote meter reading via cellular or other communications infrastructure, the method of collecting and retaining load data, the amount of time spent by customer service responding to inquiries, marketing programs and costs for different customer groups, the existence of dedicated account managers for commercial and industrial customers and the number of resources dedicated to each customer class for billing, measurement and marketing. FEI submits that its customer weighting factors are reasonable and appropriate.[84]

CEC notes that both EES Consulting and Elenchus support FEI's customer weighting factors and recommends that the Commission accept FEI's customer weighting factors as being appropriate for use in the COSA. BCOAPO submits that the method for determining customer weights for Administration and Billing is one of the least rigorous parts of its COSA and that the Commission should order FEI to conduct a review of best practice in this area and report or apply its findings in its next COSA.[85]

Commission determination

The Panel finds FEI's customer weighting factors to be reasonable for use in the COSA studies. With respect to BCOAPO's request that FEI conduct a review of best practice for the next COSA, the Panel is not persuaded this is necessary since BCOAPO does not cite any evidence that suggests a review of best practice is warranted whereas both EES Consulting and Elenchus support FEI's approach.

[80] FEI Final Argument, p. 10.
[81] FEI Final Argument, p. 11.
[82] CEC Final Argument, p. 7.
[83] BCOAPO Final Argument, pp. 5-6.
[84] FEI Final Argument, pp. 11-12.
[85] CEC Final Argument, pp. 7-8; BCOAPO Final Argument, pp. 6-8.

5.0 Fort Nelson COSA study

5.1 Overview

Although not a separate legal entity, Fort Nelson has its own rate base and revenue requirements for the purposes of determining rates. The Fort Nelson COSA study model utilizes the approved 2018 test year from Fort Nelson's Revenue Requirements Application. Fort Nelson has an approved 2018 revenue requirement of $3.162 million.[86] In addition to costs from Fort Nelson's approved 2018 test year, the Fort Nelson COSA model also includes one adjustment to account for one of the RS 25 – General Firm Transportation customers that moved to Rate 2.1 (General Service – Small Commercial Service).[87]

The COSA methodology used for Fort Nelson is generally the same as that used for FEI. FEI's COSA methodology was described above in Section 4.2 – Overview of FEI's COSA study. The Fort Nelson COSA, like FEI, includes the three steps of functionalization, classification and allocation. In addition to the three steps, the cost for the industrial customer meter stations has been directly assigned to RS 25 – General Firm Transportation.

The functionalization categories used for Fort Nelson in this Application are consistent with those used for FEI with the exception of the LNG Storage function since Fort Nelson does not have LNG or other storage facilities.[88] The classification categories for Fort Nelson remain the same as that of FEI: Demand, Energy and Customer. An MSS and PLCC adjustment were also utilized. In the Application, the Fort Nelson PLCC adjustment was set to be equal to FEI's PLCC adjustment of 0.205 gigajoules per day per customer. During the proceeding a question was raised on whether there should be a different PLCC value used for Fort Nelson as a separate entity.[89] After consulting with EES Consulting, FEI filed an evidentiary update (Exhibit B-1-1-1) based on a PLCC adjustment calculated exclusively for Fort Nelson. FEI concluded that this would be more appropriate as Fort Nelson has its own MSS and because Fort Nelson is a separate region for rate making purposes.[90] The final delivery cost of service allocations for Fort Nelson is shown below.

Table 3: Fort Nelson Delivery Cost of Service Allocation Results[91]

Rate	($000s)	% of total
1	$1,247	50.1%
2.1	$914	36.7%
2.2	$194	7.8%
RS 25	$134	5.4%
Total	**$2,489**	**100.0%**

FEI proposes a new gas cost allocation methodology for Fort Nelson. Fort Nelson's current gas cost allocation methodology allocates gas costs (both commodity and midstream) to sales customers using forecast annual consumption. FEI's proposed gas cost allocation methodology for Fort Nelson classifies the commodity costs as energy-related and allocates those costs to sales customers based on their forecast consumption. The

[86] Exhibit B-1-1, p. 13-13.
[87] Exhibit B-1-1, pp. 13-13 and 13-15.
[88] Exhibit B-1-1, p. 13-16.
[89] March 9, 2017 Workshop #2 Transcript, p. 196.
[90] Exhibit B-1-1-1, Cover Letter.
[91] Exhibit B-1-1-1, Table 13-10, p. 13-17.

midstream costs are proposed to be classified as demand-related and allocated to all sales customers based on their load factor adjusted volume. This is the same approach as used to allocate midstream costs for FEI.[92]

Elenchus reviewed the Fort Nelson COSA study and states that it is appropriate and consistent with the FEI COSA study. Elenchus also supports the adjustments made to reflect how Fort Nelson is expected to operate in 2018.

Intervener arguments

There were no issues raised by interveners regarding the COSA study for Fort Nelson. Both CEC and BCOAPO support FEI's update to the PLCC used in the Fort Nelson COSA study and CEC is satisfied with the Fort Nelson COSA study. [93]

Commission determination

Subject to the determinations on issues addressed in Section5.2, the Panel finds the Fort Nelson COSA methodology generally follows standard practice which both EES Consulting and Elenchus view as being reasonable and acceptable for setting just and reasonable rates. The Panel identified one issue that was not raised by interveners related to the cost allocation for Fort Nelson RS 25 – General Firm Transportation, which is discussed below.

5.2 Cost allocation for Fort Nelson RS 25

RS 25 is the only transportation service rate schedule for Fort Nelson. Currently, there is one customer that is taking service in Fort Nelson under RS 25 and that customer has a three year average load factor (LF) of 27 percent. This low LF is a result of the customer scaling back on its operations and only using gas for space heating purposes since 2008.[94] FEI states that Fort Nelson's RS 25 is intended to serve process load customers that have higher annual throughput and are less heat sensitive than large commercial customers. FEI has used a LF of 40 percent to allocate costs to RS 25 in accordance with the intended use of RS 25, as opposed to the 27 percent LF.[95]

FEI stated that the single remaining RS 25 customer has permanently closed plant operations. The customer has informed FEI that it will only be using gas for space heating for a few years to preserve its assets but will eventually no longer require gas.[96]

FEI also noted that the customer's other site in Fort Nelson, which was formerly served under RS 25, also closed permanently in 2008 and has already gone to zero gas consumption as of December 2015, and has subsequently switched to Fort Nelson Rate 2.1.[97]

The following table was created using information from FEI's response to an information request and shows this RS 25 customer's load factor since operations ceased in 2008 and it only used gas for space heating.[98]

[92] Exhibit B-1-1, p. 13-18 – 13-19.
[93] CEC Final Argument, p. ; BCOAPO Final Argument, p. 6.
[94] Exhibit B-1-1, p. 13-15; Exhibit B-5, BCUC IR 45.2, p. 212.
[95] Exhibit B-1-1, p. 13-15.
[96] Exhibit B-5, BCUC IR 45.1, p. 211.
[97] Ibid.
[98] Exhibit B-5, BCUC IR 45.2.1, pp. 212-213.

Table 4: Fort Nelson RS 25 Customer Load Factor Since Ceasing Operations in 2008

Year	2008	2009	2010	2011	2012	2013	2014	2015	2016
Load Factor	27%	25%	20%	20%	20%	22%	25%	28%	26%

FEI's use of a load factor of 40 percent for RS 25 results in the allocation of $134 thousand of costs to RS 25, which represents 5.4 percent of the total delivery cost of service for Fort Nelson. By using the lower load factor of 27 percent for RS 25, a larger peak day demand is calculated and subsequently an incremental $29 thousand of costs are allocated to RS 25. RS 25 allocated costs total $163 thousand, based on the 27 percent LF, and this reduces RS 25 R:C and M:C ratios before rate design proposals and rebalancing from 112.1 percent to 92.4 percent.[99]

FEI submits that utilizing a customer with a heat sensitive load profile to design a rate intended for a process load would result in a rate structure that would not be appropriate for any future customers. FEI states that it wants to maintain the Fort Nelson RS 25 option for future customers and to maintain a rate structure for Fort Nelson that would support local economic development for a process load customer setting up business in the Fort Nelson community.[100]

In response to an information request Elenchus stated that it "would not consider it to be equally valid to use a counter-factual forecast load factor rather than the expected load factor based on the best available evidence."[101]

No intervener addressed this topic in their final argument. Similarly, FEI did not address this topic in its final or reply arguments.

Commission determination

The Panel directs FEI to update this Application using a load factor, calculated in a manner similar to the method used for RS 5 in FEI's COSA, that best reflects the cost to serve Fort Nelson RS 25. While FEI's reason for using the 40 percent load factor to allocate gas costs for RS 25 is a valid concern, FEI has not presented evidence of expected new RS 25 customers. The evidence shows that as the costs being allocated to Fort Nelson RS 25 are not representative of the costs to serve the existing RS 25 customer, this impacts the R:C and M:C ratios. Based on the evidence presented, this would continue to occur until there is a new RS 25 customer with a load factor of 40 percent or higher.

The Panel also notes that in the FEI COSA, FEI proposes to use a three-year rolling average load factor in the allocation of midstream costs for RS 5, as opposed to a deemed 50 percent load factor. The Panel considers that the approaches should be consistent. The COSA study is meant to identify the costs to serve each rate class under the principle of cost causation. FEI's use of a 40 percent load factor does not accurately reflect the cost to serve the single RS 25 customer.

6.0 Frequency of COSA studies

Elenchus states that the frequency with which COSA studies are updated varies across jurisdictions and that updates "are typically expected at least every five years."[102] It further states the benefit of performing a COSA

[99] Exhibit B-1-1-1, p. 13-17 and p. 13-20; Exhibit B-5, BCUC IR 45.3, pp. 213-214.
[100] Exhibit B-5, BCUC IR 45.1, p. 211.
[101] Exhibit A2-8, CEC IR 17.2.

study every five years is that if circumstances change, the change can be reflected in the COSA study sooner rather than later and customer rates can be set based on costs causality principles which reflect current circumstances. Elenchus elaborated that this would reduce the probability that some customer classes may be subsidizing other customer classes.[103] Elenchus provided some examples of changes in circumstances as follows:

- customer class load profiles change resulting from demand management initiatives;
- loss/addition of customers reflecting economic activity change;
- utility standards on assets used to provide services to customers; and
- utility expenditure priorities.

Elenchus also notes that the disadvantage of performing a COSA study every five years as opposed to less frequently is that it is a resource intensive exercise. [104]

FEI discussed the advantages and disadvantages of performing a COSA study every five years and every 10 years.[105] FEI concluded:

> FEI is of the opinion that a COSA study that is completed every 4 to 6 years is a reasonable time period to consider if there are issues that need to be raised in a regulatory proceeding, but that significant changes in FEI's business may require more frequent examination of specific limited scope issues. These issues could be raised by FEI, by the Commission or by interveners.[106]

In order to prepare the COSA studies for the Application, FEI estimates that 2,000 labour hours and 900 labour hours were used for FEI and Fort Nelson respectively and states that the "internal fully-loaded labour cost is estimated in the range of $275 thousand."[107] FEI noted that Fort Nelson will receive 0.00244 percent of FEI's labour costs through the shared services allocation. In addition to internal labour, FEI states that it has incurred $100 thousand of external consultant costs associated with the COSA and supporting studies for FEI and $5 thousand for Fort Nelson to date.[108] In its Final Argument, FEI restates its expectation that it will conduct a COSA study every 4 to 6 years.[109]

No intervener took a position on how often FEI should perform COSA studies. However, when discussing rate rebalancing CEC noted that there is a risk that a COSA study may not be undertaken for some time.[110]

Commission determination

The Panel directs FEI to file a comprehensive and updated COSA study for each of FEI and Fort Nelson for review by the Commission five years after the release of the final decision on FEI's 2016 RDA. Prior to this Application, FEI completed a COSA study in 1993, 1996, 2001 and 2012.[111] The interval between each COSA study grew from 3 years between 1993 and 1996 to 11 years between 2001 and 2012. The Panel notes the 2016 Rate Design Application and supporting COSA studies stemmed from a Commission directive in the Phase II reconsideration decision regarding FEI's 2012 Common Rates, Amalgamation and Rate Design Application. The

[102] Exhibit A2-2, Elenchus COSA Report, p. 5.
[103] Exhibit A2-5, BCUC IR 1.1.
[104] Ibid.
[105] Exhibit B-5, BCUC IR 12.3, p. 52.
[106] Ibid.
[107] Exhibit B-5, BCUC IR 12.2, pp. 51–52.
[108] Ibid.
[109] FEI Final Argument, p. 8.
[110] CEC Final Argument, p. 22.
[111] Exhibit B-1, pp. 3-9 – 3-16.

Panel considers that the advantages of performing a COSA study every five years outweigh the potential disadvantages. Any supporting studies that inform the COSA should be updated and filed along with the COSA studies. If there are significant changes in circumstances or FEI's business, the Panel expects FEI to file its updated COSA studies earlier than five years in order to reflect these changes.

7.0 Revenue to cost ratios and the corresponding range of reasonableness

FEI states once the COSA study is complete, the allocated costs by rate schedule are compared to the revenue collected by rate schedule to calculate the revenue to cost ratio for each rate schedule. The revenue to cost ratio shows whether the rates charged to each rate schedule adequately recover the allocated cost of service for each rate schedule. For most rate schedules, FEI assesses the revenue to cost ratios based on whether or not they fall within an established range of reasonableness and this informs FEI's rate design and rate rebalancing proposals.[112] FEI notes that RS 4, RS 22 and RS 7/27 do not drive system capacity additions and are not allocated any demand-related costs. RS 4 is for seasonal service (firm in the summer, interruptible in the winter), RS 22 is predominantly interruptible and RS 7/ RS 27 is fully interruptible. The rates for these rate schedules are not set using their allocated costs from the COSA model. However, FEI provides their revenue to cost ratios in tables throughout the proceeding.[113]

7.1 Use of R:C or M:C ratios

FEIs provides the following types of revenue to cost ratios:

1. Margin to cost (M:C) ratio – Calculated by dividing the delivery margin revenue by the allocated delivery cost of service.
2. Revenue to cost (R:C) ratio – Calculated by dividing the sum of the delivery margin revenue and the gas cost recovery revenue by the sum of the allocated delivery cost of service and the allocated gas costs.

For sales customers, gas costs are a flow-through to the gas cost recovery revenue. Since transportation customers do not incur gas costs, FEI estimates gas costs in order to determine their R:C ratios. For FEI's transportation rate schedules that have companion sales rate schedules (RS 23, RS 25 and RS 27) FEI imputes a cost of gas using the companion sales rate schedules (RS 3, RS 5, RS 7) so that when the R:C ratios are calculated the final R:C ratio is on the same basis (delivery margin plus cost of gas) as for the sales rate schedules. For transportation rate schedules that do not have a companion rate class (RS 22A and RS 22B), FEI states that the cost of gas for RS 22A and RS 22B is equal to these rate schedules allocation of unaccounted for (UAF) gas from FEI's test year revenue requirement. FEI notes that the UAF gas cost is small so the R:C ratios are nearly equal to the M:C ratios for RS 22A and RS 22B. [114]

FEI pointed out that since the same cost of gas amount is added to both the numerator and denominator in the R:C ratio for each rate schedule it is a mathematical certainty that the M:C ratio would be less than the calculated R:C ratio for the same rate schedule if the R:C ratio is less than 1.00 and the M:C ratio would be greater than the calculated R:C ratio for the same rate schedule if the R:C ratio is greater than 1.00.[115]

FEI notes that either an R:C ratio or M:C ratio needs to be used as a primary guide for rate design and rate rebalancing and points out that one ratio must be chosen so that rates can be balanced together to approach

[112] Exhibit B-1, p. 6-32.
[113] Exhibit B-1, p. 6-35.
[114] Exhibit B-1, p. 6-31; p. 6-34.
[115] Exhibit B-5, BCUC IR 15.3, pp. 62-63; Exhibit A2-2, p. 28.

1.00.[116] FEI submits that it is preferable to be consistent with past practice and continue to use the R:C ratio and that using the M:C Ratio instead of the R:C ratio could potentially result in rate instability over time for customers. FEI submits that the R:C ratio should be used to guide rate design and rebalancing stating that there is no compelling reason to depart from the existing practice.[117]

Elenchus review of FEI's COSA study

Elenchus stated that one measure should be considered to be the primary basis for determining when rate rebalancing is to be considered and the second measure, if used, would be considered to be for informational purposes only.[118] Elenchus notes that since there is a consistent relationship between R:C and M:C ratios there is essentially no difference in using either of the ratios as the benchmark. [119] Elenchus elaborated that for the range of reasonableness of the R:C ratio to be applied in a manner equivalent to a range of reasonableness for the M:C ratio, the R:C ratio range would have to be narrower than the equivalent M:C ratio range. [120]

Elenchus performed a review of the use of R:C and M:C ratios in other jurisdictions.[121] Elenchus' review revealed that:

- Union, Enbridge and Centra Gas include commodity, storage and transport costs in their COSA model and their revenue to cost ratios would be calculated in the same manner as FEI's R:C ratio.
- AltaGas and ATCO do not include commodity, storage and transport costs in their COSA model and would have a revenue to cost ratio calculated in the same manner as FEI's M:C ratio.
- SaskEnergy excludes commodity costs but includes storage and transport costs in its delivery service rate application. This has less costs than FEI's R:C ratio but more costs than FEI's M:C ratio.

Within Canada, Elenchus also pointed out that Gaz Metro and Gazifere in Quebec were not included in the review because documents related to these two utilities were only available in French.[122]

Elenchus states that the most important consideration in choosing an approach is consistency and elaborates that the same ratio and the same range should be used as the primary reference point on an on-going basis. Elenchus concludes that M:C ratio has merit as a primary reference since it excludes flow-through costs and further point out that it is used in other jurisdictions.[123]

Intervener arguments

CEC agrees with FEI's position that the R:C ratio is the appropriate method to determine COSA study results.[124]

BCSEA states their preference is for adopting the M:C ratio, elaborating that the M:C ratio conveys the revenue to cost concept more directly. However, BCSEA acknowledges that the two measures are equivalent, except in terms of the size of the range of reasonableness.[125]

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[116] FEI Final Argument, p. 28.
[117] FEI Final Argument, p. 28.
[118] Exhibit A2-5, BCUC IR 9.2.
[119] Exhibit A2-2, p. 28.
[120] Exhibit A2-5, BCUC IR 9.1.
[121] Exhibit A2-10, p. 33; Exhibit A2-11. BCUC IR 17.1.
[122] Exhibit A2-10, p. 1.
[123] Exhibit A2-10, p. 35.
[124] CEC Final Argument, p. 3; p. 10.
[125] BCSEA Final Argument, p. 1.

BCOAPO supports the use of the R:C ratio. BCOAPO submit that while there might be some arguable merit in using an M:C ratio because it eliminates flow-through costs, the end results for either measure is the same and the only difference is the range of reasonableness that is attached to either ratio.[126]

ICG supports the use of the M:C ratio. ICG submits that flow-through cost items should be excluded since they do not reflect the cost of serving a customer.[127] ICG also makes reference to Elenchus' position that the M:C ratio has merit as a primary reference and cites Elenchus statement that "The advantage of that, as pointed out in the report, is one, the margin – the pass-throughs vary across different classes. So using an M:C ratio for all the classes as the primary measure, in a sense, makes more sense when you're comparing classes."[128]

FEI reply

FEI reiterates its position that the R:C ratio is reasonable and appropriate and its use should be continued. FEI points out that the evidence shows that the use of the R:C ratio is an acceptable practice in the industry.

Commission determination

The Panel finds that the R:C ratio should be used to inform rate design and rate rebalancing proposals.

The Panel acknowledges that either of the two ratios could be used as the benchmark to guide rate design. The R:C ratio can be applied in a manner equivalent to the M:C ratio, once the appropriate range of reasonableness is used. The four interveners weighing in on this topic are divided equally: two interveners prefer the R:C ratio and two prefer the M:C ratio. In addition, three of the six Canadian natural gas utilities in Elenchus' jurisdictional review use an R:C ratio, whereas the other three use a ratio similar to or equal to FEI's M:C ratio.

The Panel notes that FEI has already been using a range of reasonableness for its R:C ratio, but an equivalent range has not been determined for the M:C ratio. Since the M:C ratio would be applied in an equivalent manner once an appropriate range of reasonableness has been calculated, the Panel considers that consistency with past practice is appropriate. The Panel places weight on Elenchus' view that the most important consideration in choosing an approach is consistency and that the same ratio and the same range should be used as the primary reference point on an on-going basis. While consistency is an important factor in the Panel's decision, it does not preclude the Commission from considering alternatives to the R:C ratio in future applications.

The Panel directs FEI to present both the R:C and M:C ratios for each rate schedule in the next COSA study filing and rate design application. While the R:C ratios will inform rate design and rate rebalancing, the M:C ratios will provide useful context for stakeholders.

7.2 The appropriate range of reasonableness

FEI assesses the R:C ratios of each of the rate schedules based on whether or not they fall within an established range of reasonableness. The range of reasonableness is used to consider whether a rate schedule requires re-balancing. A rate schedule with an R:C ratio that falls within the range of reasonableness is deemed to be recovering its fair cost and indicates that no rebalancing may be required. If a rate schedule falls outside the range of reasonableness, it indicates that revenues are either insufficient in recovering the cost of service or exceed the cost of service for that rate schedule and that rebalancing may be required.[129]

[126] BCOAPO Final Argument, pp. 14-15.
[127] ICG Final Argument, p. 8.
[128] ICG Final Argument, p. 8; FEI SRP Transcript Vol 5, p. 436.
[129] Exhibit B-1, p. 6-32.

FEI states that "[i]n theory, the R:C ratio should equal 100% for each rate schedule, indicating that the revenues recovered from each rate schedule would equal the indicated cost to serve them."[130] FEI states that achieving unity, an R:C ratio of 100 percent, implies a level of precision that does not exist with any COSA study due to the necessary assumptions, estimates, simplifications, judgements and generalizations involved. As a result, a range of reasonableness is warranted and accepted when evaluating the appropriateness of the R:C ratios.[131]

FEI submits that the appropriate range of reasonableness for evaluating its R:C ratios is 90 percent to 110 percent. This range was first established for FEI in the BC Gas 1993 Phase B Rate Design proceeding and has been utilized by FEI in all subsequent applications since then.[132] FEI considers that the Commission's acceptance of a 90 percent to 110 percent range of reasonableness for R:C ratios in the Phase B Rate Design proceeding relied on previous precedent and represented an established practice for the Commission at the time.[133]

FEI submits that the precedent for a range of reasonableness of 95 percent to 105 percent in the case of BC electric utilities is not appropriate for natural gas utilities and discusses the difference in certainty in load research analysis between natural gas and electric utilities.[134]

FEI's expert consultants, EES Consulting, did not do a jurisdictional review of the range of reasonableness. In EES Consulting's experience the range typically is either 95 percent to 105 percent or 90 percent to 110 percent and the range of reasonableness generally reflects specific circumstances for the utility and jurisdiction.[135]

FEI presents the R:C and M:C ratios after the COSA study and before rate design proposals and rebalancing in the following two tables. FEI notes that all the R:C ratios are within a range of 95% to 105%, except for RS 6 and RS 22A.

[130] Exhibit B-1, p. 6-32.
[131] Exhibit B-1, p. 6-32.
[132] Exhibit B-1, p. 6-34.
[133] Exhibit B-5, BCUC IR 14.1, p. 55.
[134] Exhibit B-1, p. 6-33.
[135] Exhibit B-11, CEC IR 6.1, pp. 17-18.

Table 5: FEI R:C and M:C Ratio Results Before Rate Design Proposals or Rebalancing[136]

Rate Schedule	R:C	M:C
Rate Schedule 1 *Residential Service*	95.6%	93.1%
Rate Schedule 2 *Small Commercial Service*	101.3%	102.5%
Rate Schedule 3/23 *Large Commercial Sales and Transportation Service*	101.6%	103.3%
Rate Schedule 5/25 *General Firm Sales and Transportation Service*	104.9%	112.2%
Rate Schedule 6 *Natural Gas Vehicle Service*	131.2%	159.1%
Rate Schedule 22A *Transportation Service (Closed) Inland Service Area*	109.5%	109.8%
Rate Schedule 22B *Transportation Service (Closed) Columbia Service Area*	99.7%	99.7%

As stated in Section 7.0, FEI excluded RS 4, RS 22 and RS 7/RS 27 from the table above because the charges within these rate schedules are not set using their allocated costs from the COSA study. The R:C and M:C ratios for these rate schedules are shown separately in the table below.

Table 6: FEI R:C and M:C Ratio Results for Rate Schedules Not Set Using COSA Allocations[137]

Rate Schedule	R:C	M:C
Rate Schedule 4 *Seasonal Firm Gas Service*	147.4%	550.9%
Rate Schedule 7/27 *General Interruptible Sales and Transportation Service*	139.6%	712.3%
Rate Schedule 22 *Large Volume Transportation Service*	1425.5%	1864.4%

FEI also utilizes the 90 percent to 110 percent range of reasonableness for the Fort Nelson service area. The following table shows the R:C and M:C ratios for Fort Nelson before rate design proposals and rebalancing.

Table 7: Fort Nelson R:C and M:C Ratios Before Rate Design Proposals or Rebalancing[138]

Rate	R:C	M:C
Rate 1 Domestic (Residential) Service	90.5%	88.0%
Rate 2.1 General (Small Commercial) Service	108.3%	110.7%
Rate 2.2 General (Large Commercial) Service	113.2%	118.2%
Rate Schedule 25 General Firm Transportation Service	112.1%	112.1%

FEI notes that Rate 2.2 and RS 25 in Fort Nelson are above but near the upper boundary of the range and that rebalancing may be necessary.

[136] Exhibit B-1, Table 6-18, p. 6-35.
[137] Exhibit B-1, Table 6-19, p. 6-36.
[138] Exhibit B-1-1-1, Table 13-12, p. 13-20.

Quality of load and costing data

FEI discussed the quality of its customer data, load data and costing data since the 1993 Phase B Rate Design Application. FEI stated that customer data has improved since the Phase B Rate Design, in particular, for RS 5 and RS 25, but submits that customer data has not sufficiently improved for Residential and Commercial customers which account for approximately 57 percent (121,480 TJ) of the total forecast (214, 640 TJ) to warrant changing the range of reasonableness.[139]

FEI also stated that the meters for customers served under RS 1, RS 2, RS 3, RS 4 and RS 6 are manually read monthly and that this is an improvement from 1993 when residential and commercial customer meters were typically read every second month. FEI pointed out that, even with these improvements the necessary data to know what actual customer consumption is during peak conditions is not available and so the load factors of individual customers, and even the residential and commercial classes as a whole, continue to be estimates. FEI elaborated that this means that there is still uncertainty in the demand allocators in the COSA. [140]

FEI stated all RS 5 – General Firm Service customer volumes are now being read on a daily basis, as opposed to monthly meter reads in 2001, and states that this is an improvement on the customer load data which allows for considering alternate methods of determining daily demand. [141]

From 1996 to 2016 total peak demand on FEI's system in gigajoules decreased by 13 percent while:

- the percentage of industrial customers (RS 5 and RS 25) with demand meters increased from 60 percent to 100 percent indicating that all RS 5 and RS 25 customers have demand meters; and
- the percentage of large commercial customers (RS 3 and RS 23) with demand meters increased from 1.5 percent to 25 percent.[142]

FEI stated that demand meters include telemetry or automated meter readers (AMR) devices and that these provide daily measurement data. FEI further stated that customers served under RS 5, RS 7, RS 23, RS 25, RS 26, RS 27 and RS 22/22A/22B as well as Contract Customers have AMR devices. Some customers served under RS 3 also have demand meters. The total peak demand of RS 5, RS 25, RS 3 and RS 23 customers with demand meters represents 12 percent of FEI's 2016 total peak demand and the total peak demand of all customers with demand meters represents a higher percentage.[143]

FEI made investments in tracking cost data when it switched its accounting and management systems to SAP, several years after the 1993 Phase B Rate Design. FEI stated that this system tracks costs on an activity basis and these activities cover an array of capital and operating activities. [144]

Impact on FEI of using 95 percent to 105 percent R:C ratio range of reasonableness

The impact of using a 95 to 105 percent R:C ratio range of reasonableness, instead of 90 to 110 percent, was explored for both FEI and Fort Nelson during the proceeding. Use of a 95 to 105 percent R:C ratio range has no impact to FEI's rate design proposals and only impacts FEI's rebalancing proposals. Rebalancing to a 95 to 105 percent R:C ratio range would:

[139] Exhibit B-5, BCUC IR 14.2, p. 59.
[140] Exhibit B-5, BCUC IR 14.2, p. 59; Exhibit B-8 BCOAPO IR 3.1, p. 7.
[141] Exhibit B-5, BCUC IR 14.2, p. 59.
[142] Exhibit B-15, BCUC Technical IR 5.1, pp. 10–11.
[143] Exhibit B-5, BCUC IR 14.2, p. 59; Exhibit B-8 BCOAPO IR 3.1, p. 7; Exhibit B-15, BCUC Technical IR 5.1, pp. 10-11.
[144] Exhibit B-1, BCUC IR 14.2, p. 59.

- result in an increase to RS 1 delivery rates;
- result in a decrease in delivery rates for RS 6/6P, RS 5/25, RS 7/27 and RS 4; and
- not have an impact to RS 2 or RS 3/23.[145]

FEI stated this rebalancing would result in a $1.743 million shift in revenue to RS 1 and in an annual bill increase of approximately 0.2 percent to a RS 1 customer. RS 5/25 customers would experience a reduction of 1.2 percent in their annual bill, RS 6 a reduction of 20.3 percent, RS 7/27 a reduction of 1.6 percent and RS 4 a reduction of 1.3 percent.[146] The delivery rates for RS 7/27 and RS 4 are not cost-based, but are derived from the rates for RS 5/25 and so would decrease due to the decrease in RS 5/25.

Impact on Fort Nelson of using 95 percent to 105 percent R:C ratio range of reasonableness

In the Application where FEI uses a 90 percent to 110 percent R:C ratio range of reasonableness, FEI does not propose to rebalance Fort Nelson RS 25 down from 111 percent to the R:C ratio range limit of 110 percent.[147] Use of a 95 to 105 percent R:C ratio range has no impact to Fort Nelson's rate design proposals and only impacts the rebalancing proposals. Rebalancing to a 95 to 105 percent R:C ratio range would result in:

- an increase for RS 1 customers; and
- a decrease for RS 2.1, RS 2.2 and RS 25 customers.[148]

FEI states that rebalancing RS 2.1, RS 2.2 and RS 25 to 105 percent would shift $24 thousand, $33 thousand and $8 thousand, respectively, from those rate schedules to RS 1 for a total RS 1 rebalance amount of $65 thousand. This would result in an R:C ratio of 95 percent for RS 1. Rebalancing and the shifting revenue responsibility would equate to an average annual bill:

- increase for RS 1 of 5.3 percent;
- decrease for RS 2.1 of 1.3 percent;
- decrease for RS 2.2 of 7.6 percent; and
- decrease for RS 25 of 3.3 percent.

FEI states that "When considering the revenue requirement rate change of nearly 7 percent for 2018, Rate 1 Fort Nelson customers would experience an approximate 12 percent rate change in 2018."[149]

Elenchus review of FEI's COSA study

Elenchus states that:

> …revenue to cost ratios that are within a range of acceptable values are considered to indicate that the customer class is paying its fair share of costs and that there is no need to realign cost responsibility. The usual revenue to cost range of acceptable ratios that Elenchus has observed is between 0.90 and 1.10 or a narrower range of 0.95 to 1.05. A narrower range of 0.95 to 1.05 is usually used by regulators and utilities in instances when there is good load and costing data

[145] Exhibit B-15, BCUC Technical IR 7.2, pp. 18-21.
[146] Exhibit B-15, BCUC Technical IR 7.2, pp. 18-21.
[147] Exhibit B-1-1-1, pp. 13-50 – 13-51.
[148] Exhibit B-15, BCUC Technical IR 12.1, p 28.
[149] Exhibit B-11, CEC IR 67.1, p. 154.

> available to be used in a COSA study and the utility and regulator have had experience and history in using COSA studies in order to set rates.[150]

Elenchus performed a review of the use of R:C and M:C ratios in other jurisdictions. Elenchus' review revealed that Union, Enbridge and Centra Gas use an R:C ratio and target of unity or have a range of reasonableness smaller than 95 percent to 105 percent. AltaGas, ATCO and SaskEnergy use a M:C range of reasonableness of 95 percent to 105 percent.[151]

Table 8: Elenchus' Jurisdictional Review of R:C and M:C Ratio Range of Reasonableness

Utility	Range of Reasonableness
AltaGas[61]	95% to 105%
ATCO[62]	95% to 105%
Union Gas[63]	Close to unity[64]
Enbridge[65]	Close to unity
Centra Gas[66]	100%
SaskEnergy[67]	95% to 105%

Elenchus expects that FEI's data quality is similar to the data quality of other utilities. Elenchus elaborated that "FEI has been operating in a regulated environment for many years, its evidence has been subject to review by the Regulator, Stakeholders have had opportunities to review FEI's data and FEI's data has been accepted for Cost Allocation and Rate Design purposes."[152]

Elenchus "believes appropriate load and costing data has been used by FEI and is not aware of any better data that is available to FEI that could be used to improve the COSA significantly."[153] Regarding FEI's experience and history, Elenchus stated "[i]t is Elenchus understanding that FEI is familiar and has used COSA studies in the past and that the COSA studies have been used to set rates. In addition, Elenchus has reviewed the work of EES Consulting, FEI's consultant for this work, and has found the [company] to be consistently competent and professional."[154]

FEI final argument

FEI requests that the Commission approve a range of reasonableness of 90 to 110 percent for the R:C ratio as the appropriate guideline for rebalancing in FEI's rate design. FEI states that the range of reasonableness is a guideline, in that the Commission may determine that rebalancing is not required even if an R:C ratio is outside the range of reasonableness. FEI further states that if rebalancing is determined to be appropriate, rebalancing should be to the nearest boundary of the range of reasonableness only, as the COSA results provide no evidence to justify further rebalancing.[155]

FEI argues that a range of reasonableness is required because the numerous assumptions, estimations, simplifications, judgements and generalizations in the COSA study make the results uncertain. As a result there is no true cost allocation result but a range of values that could be considered the true value. [156]

[150] Exhibit A2-2, p. 29.
[151] Exhibit A2-10, p. 33; Exhibit A2-11. BCUC IR 17.1.
[152] Exhibit A2-5, BCUC IR 9.4.
[153] Exhibit A2-8, CEC IR 18.1.
[154] Exhibit A2-8, CEC IR 18.2.
[155] FEI Final Argument, p. 17.
[156] FEI Final Argument, p. 18.

FEI argues that an R:C ratio range of reasonableness of 90 to 110 percent has been consistently used by the Commission in past rate designs for natural gas utilities, including FEI, and that consistency with past practice is the most important consideration. FEI refers to Pacific Northern Gas' 1991 Rate Design Application; BC Gas' 1993 Phase B Rate Design; BC Gas' 1996 Rate Design; FEI's 2001 Rate Design and FEI's 2012 Amalgamation Application. FEI argues that there is no evidence that there has been any material improvement in the data or change in circumstances that would warrant deviating from the Commission's past approvals of a 90 to 110 percent range of reasonableness. [157]

FEI argues that the "precedents for a range of reasonableness of 95 percent to 105 percent in the case of BC electric utilities are not appropriate for natural gas utilities."[158] FEI explains that BC electric utilities have relative certainty in load research analysis with respect to the coincident and non-coincident peak demand calculations. FEI states that the equivalent level of certainty does not exist for natural gas utilities because natural gas utilities only have daily system data whereas electric utilities have hourly system data. FEI argues that this point indicates that a wider range of reasonableness is warranted for FEI, as opposed the 95 to 105 percent range applied to BC electric utilities.[159]

FEI states that both EES Consulting and Elenchus agree that the 90 to 110 percent range is reasonable and often used in industry. FEI referred to Elenchus' jurisdictional review of R:C and M:C range of reasonableness and provided several reasons why the Commission should not follow the practice in other jurisdictions. FEI states that the survey of the six jurisdictions is not comprehensive; there is no evidence showing the certainty in the data or assumptions used in the COSA by other utilities; there may be factors influencing the range of reasonableness that are not applicable to FEI and there may be circumstances of FEI that are not applicable to the utilities surveyed.

Intervener arguments

CEC

CEC does not support the use of a range of reasonableness in determining the appropriateness of rate rebalancing and particularly does not support the use of a 90 to 110 percent range of reasonableness. CEC submits that:

1. The Commission deny the use of the range of reasonableness and instead apply its judgement to the appropriate timing for rebalancing;[160]
2. The Commission undertake to rebalance the rate classes to unity at this time;[161] and
3. If the Commission determines that a range of reasonableness is appropriate then the range of reasonableness should be reduced to the greatest extent possible.[162]

CEC states that an R:C ratio of 1, or unity, is indicative of a customer recovering its cost of service and that the appropriate principle is to use the best information available without bias to any rate class over time. CEC argues that the application of a range of reasonableness results in the dismissal of important cost and revenue

[157] FEI Final Argument, pp. 19-21; pp. 25-28.
[158] FEI Final Argument, p. 21.
[159] FEI Final Argument, pp. 21-22.
[160] CEC Final Argument, p. 2.
[161] CEC Final Argument, p. 23.
[162] CEC Final Argument, p. 23.

considerations that have been made using the best available information and appropriate judgement, and without bias. CEC submits that FEI can be considered to have good load and costing data. CEC refers to Elenchus response to an information request that states that Elenchus is not aware of any better data that is available to FEI that could be used to improve the COSA significantly. CEC notes that the COSA studies utilize the best available data and that the costs are calculated to two, three or four decimal places. [163]

CEC recognizes that the most recent relevant evidence of Canadian regulators dealing with natural gas utilities is to move to targeting unity as evidenced by the Elenchus jurisdictional survey, which shows that Union Gas, Enbridge and Centra Gas have an R:C ratio range of reasonableness of either unity or close to unity. [164] CEC also argues that the Panel should not accept the evidence of PNG's 90 percent to 110 percent range of reasonableness having stemmed from a Commission decision, because it is not a proper jurisdictional comparison and the decision is nearly 20 years out of date.[165]

CEC points out that the cost of service, revenue requirement, return on equity calculations, DSM effectiveness calculations and other inputs to Commission decision-making employ significant estimates in the form of forecasts, judgements, depreciation, risk and inflation rates. CEC further states that there are no correct answers in these types of determinations and that the inputs used to derive these determinations are not adjusted with a range of reasonableness before they are used. Rather, they are accepted as the best information, relied upon, and then balanced at the end with other considerations in the art and science of regulation. CEC submits that embedding a range of reasonableness to the R:C ratio is knowingly employing less than the best information and judgements available.[166]

CEC submits that the residential class has been consistently under-recovering its cost of service since 1993 and that the persistent over and under-recovery of rate classes has resulted in significant unfairness and should be addressed by the Commission. Based on CEC's calculations using information from the evidentiary record, small commercial customers (RS 2) will have over-paid their costs by nearly $100 million over the last 20 years and large commercial customers (RS 3/23) will have over-paid their costs by nearly $150 million over the last 20 years.[167]

BCSEA

BCESA submits that the range of reasonableness should be narrower than FEI's proposed 90 percent to 110 percent R:C ratio range. BCSEA believes that consideration of rate rebalancing should be triggered where R:C or M:C ratios vary from unity. Alternatively, BCSEA supports Commission approval of range of reasonableness of 95 percent to 105 percent for either M:C or R:C ratios.[168] BCSEA noted that narrowing the range of reasonableness would increase the number of situations in which the utility would consider whether or not to propose rate rebalancing and further noted that the utility has ample room to refrain from proposing rate rebalancing.[169]

BCSEA states that FEI acknowledged that it is not making the argument that its proposed 90 percent to110 percent range is warranted because its own revenue cost analysis is less accurate than the analysis used by the other utilities. BCSEA states that if the Commission agrees with FEI's acknowledgement that the method it has chosen to implement is the best method for FEI to use under all of the circumstances, and approves FEI's

[163] CEC Final Argument, pp. 10–11; p. 19.
[164] CEC Final Argument, pp. 11–12.
[165] CEC Final Argument, p. 30.
[166] CEC Final Argument, p. 15.
[167] CEC Final Argument, pp. 21–22.
[168] BCSEA Final Argument, p. 1.
[169] BCSEA Final Argument, p. 3.

revenue to cost methodology then it follows that the R:C (or M:C) ratios are the best estimate of the extent to which each rate class is paying its share of its costs.[170]

BCSEA submits that

> the farther away a rate class's R:C ratio is from unity the stronger the weight of evidence that the class is paying more, or less, than its share of costs. Elenchus acknowledged during the SRP that for R:C ratios that are outside the range of reasonableness there is directionality: the farther from unity the more, or less, the share of costs is being paid. Asked about a hypothetical situation where rate classes have R:C ratios of 5% and 89% (with a 90%-110% range of reasonableness) Mr. Todd said that the former would require more adjustment than the latter[171]

BCSEA submits that the same directionality applies to R:C ratios that are within the range of reasonableness.[172]

BCOAPO

BCOAPO submits that FEI's proposed R:C ratio range of reasonableness of 90 percent to 110 percent R:C Ratio is reasonable.

BCOAPO argues that attempts to use a tighter range of reasonableness imply accuracy that does not exist. COSA studies, by their nature, contain many points of ambiguity for which judgement is required. BCOAPO states that:

> …it is misguided to, as some have suggested, consider that the residential class is 'subsidised' by some other classes based on R:C ratios. The fact is that the entire distribution system of FEI would not exist without the infrastructure which services and is paid for by the residential and small commercial classes. In this sense at least the large number of small volume customers subsidize the small number of large volume customers.[173]

BCOAPO states that they agree with Elenchus and FEI who have noted that consistency and symmetrical treatment are important factors in using revenue-to-cost ratios whether one is considering the type of metric or its range of reasonableness. BCOAPO concludes that the range used by FEI has been used historically and has strong roots in acceptable industry standards and there is nothing persuasive on the record to indicate another approach is necessary.[174]

ICG

ICG submits that the range of reasonableness should be set to unity; 100 percent. ICG argues that FEI's range is based on historic precedent and can no longer be justified on principles of fairness. ICG states that historic precedent has no weight as an argument. [175]

ICG states that in 1993 the existing technology and information relevant for a COSA study was far less than today. It also quotes Elenchus expressing an expectation that utility load and costing data would improve over

[170] BCSEA Final Argument, p. 4.
[171] BCSEA Final Argument, p. 4.
[172] BCSEA Final Argument, pp. 4-5.
[173] BCOAPO Final Argument, p. 16.
[174] BCOAPO Final Argument, p. 16.
[175] ICG Final Argument, p. 1; pp. 3-4.

the years and this would also apply in British Columbia. ICG argues that FEI's and the Commission's experience with COSA studies and rate-setting has also developed greatly over the last 25 years. [176]

ICG submits that the argument that an R:C ratio of 90 is the same as an R:C ratio of 110 ignores the economic reality that the customer at 110 percent is paying higher rates than necessary based on the COSA results. ICG elaborates that the wider the range of reasonableness the greater the inequity between rate classes.[177] Based on FEI's response to an information request, ICG states that the historical pattern shows that the residential group (RS 1) has historically been below 100 percent in all the FEI COSA studies since the early 1990s. ICG submits that the consistency of this pattern reveals a systemic bias.[178]

ICG refers to Elenchus' jurisdictional review pointing out that other jurisdictions and the Commission are moving towards a narrower range of reasonableness and that fairness supports this trend.[179]

Cascadia

Cascadia submits that rates should be adjusted to unity, where each class pays 100 percent of the calculated costs. Cascadia supports its position by stating that:[180]

- FEI argues that the correct basis for calculating and assigning delivery costs is the methodology that they have used in this filing;
- FEI's proposed range of reasonableness is not based in logic or fact but on historical precedent;
- FEI through historical cost accounting, detailed experience in engineering design, extensive facility construction costing and other detailed knowledge and information, has access to sufficient data to produce exceedingly accurate data inputs to the COSA study models;
- FEI has the expertise and access to experts consultants to complete a robust COSA that is accurate and complete; and
- The rate study shows that each customer class is paying rates different from the cost for the class, with industrial rates generally cross-subsidizing residential rates by an excess of $25 million annually.

FEI reply argument

FEI maintains its position that an R:C ratio range of reasonableness of 90 to 110 percent is reasonable and appropriate. FEI notes that BCOAPO agrees with FEI while BCSEA, CEC, ICG and Cascadia argue for a narrower or no range of reasonableness. FEI provides several arguments in support of its position, some of which have built upon statements made in FEI's Final Argument.

FEI states that while the Commission is not legally bound by past precedents, it should seek to be consistent rather than have decisions that vary arbitrarily. FEI then quotes Elenchus regarding the importance of consistency in rate design, as well as justices of the Supreme Court of Canada and administrative law textbook authority that that all stress the importance of consistency in decision-making.[181]

[176] ICG Final Argument, pp. 3-4.
[177] ICG Final Argument, p. 5.
[178] ICG Final Argument, p. 5.
[179] ICG Final Argument, p. 6.
[180] Cascadia Final Argument, pp. 1–2.
[181] FEI Reply Argument, pp. 9-10.

FEI submits that intervener submissions to the effect that FEI's COSA is more accurate today than it was in 1993 are not supported by evidence and that the evidence shows that the accuracy of the COSA is the same as it was in 1993. In support of this argument, FEI submits the adoption of demand meters has not occurred for the great majority of small volume customers, and the data available for the cost allocation process has not improved. FEI states that there are multiple reasonable allocation methods to come to acceptable results, and any method will involve judgement and estimations. FEI points out the estimate in peak day demand to be a known uncertainty in the COSA. [182]

FEI states that jurisdictional evidence does not support a directional trend in Canada to rebalance to unity or an increasing rejection of the range of reasonableness as CEC and ICG claim. FEI notes that Elenchus' jurisdictional review only covered six utilities in Canada. FEI then provides examples of regulators and jurisdictions from case law using both the 90 to 110 percent range and the 95 to 105 percent range to support its reference to statements from Elenchus and EES Consulting that both ranges are used in the industry. FEI's examples of a 90 percent to 110 percent range of reasonableness were regarding Hydro One Networks Inc., Newfoundland Power Inc., Maritime Electric Company and Yukon Energy Corporation. FEI also points out that the Ontario Energy Board uses a range of reasonableness of wider than 90 to 110 percent for electric utilities other than Hydro One Networks.[183]

FEI responded to arguments regarding bias present in historical R:C ratios by stating that any consistent pattern in the COSA results over time can be explained by FEI conducting COSA studies consistent with past practice.[184] FEI states that CEC, Cascadia and ICGs' arguments regarding historical overpayment are incorrect since these rates were determined to be just and reasonable by the Commission and rates within the established range of reasonableness are determined to be recovering their fair share of costs[185]

Commission determination

The Panel directs FEI to use an R:C ratio range of reasonableness of 95 percent to 105 percent to inform rate design and rebalancing proposals in the current Application. FEI is directed to file updates to the Application in response to the findings and directives in this order with Reasons, in accordance with a procedural order to be issued subsequent to this order. The electronic versions of the updates should include both a blacklined version and a clean version.

To set just, reasonable and not unduly discriminatory rates, utility costs must be fairly allocated to customers groups. The apportionment of shared utility costs to each of the rate classes through the COSA studies depends on assumptions, estimates and judgements. The Panel accepts that in theory an R:C ratio of 100 percent for each rate schedule would indicate that the revenues recovered from each rate schedule are equal to the cost to serve them. However, due to the assumptions, estimates and judgements involved in a COSA study, the Panel considers it appropriate to use a range of reasonableness. In the Panel's view, the size of the range of reasonableness depends on the precision of the cost allocation estimates and the stability of those estimates over time.

The Panel finds the precision of the estimates have improved sufficiently so that it is appropriate to reduce the range of reasonableness at this time, for the following reasons:

[182] FEI Reply Argument, pp. 13-15.
[183] FEI Reply Argument, pp. 20-23.
[184] FEI Reply Argument, pp. 23-24.
[185] FEI Reply Argument, pp. 24-25.

- Improvements in cost data – the quality of FEI data used in COSA studies has improved over time. FEI has good costing data available. FEI has made investments in SAP tracking costing data since 1993. The Panel notes that there was no dispute that this has resulted in the improvement of costing data.
- Improvements in customer load data – the Panel notes FEI raises the estimate of peak day demand due to the lack of demand meters as a primary example of marginal improvement in data since the 1993 COSA study. However, FEI acknowledges that customer data has improved since all industrial customers and some large commercial customers now have demand meters, which allows for daily consumption data. While FEI argues the load factors of individual customers and the residential and commercial classes as a whole, continue to be estimates, the Panel notes that Elenchus confirmed that other utilities do not have demand meters for residential or small commercial customers and have the "same difficulty as that FEI is having in estimating the peak demand of the lower volume customers … Every utility has to address it. Some do it through regression, the way FEI is doing it, some do it through load research. Some will do a combination of both. … the regression technique is different than the load research technique. Either one is going to give you an estimate. Either one is going to be imperfect."[186]
- FEI's revenue cost analysis is not less accurate than other utilities – the Panel notes the jurisdictional review reveals that other gas utilities are using the 95 percent to 100 percent range of reasonableness. FEI acknowledges that it is not making the argument that its proposed 90 percent to 110 percent range of reasonableness is warranted because its own revenue cost analysis is less accurate than the analyses used by other utilities.[187]
- FEI and the Commission have experience using the COSA studies to set rates – the Panel places weight on Elenchus' view that a range of 95 percent to 105 percent is usually used by regulators and utilities in instances when there is good load and costing data available to be used in a COSA study and the utility and regulator have had experience and history in using COSA studies in order to set rates. The Panel notes that the 1993 Rate Design Phase B Application was the first rate design application by the then recently formed BC Gas that focused on the allocation of utility costs other than gas supply costs. BC Gas, created in 1989, was the result of the amalgamation of three formerly affiliated companies (Inland Natural Gas Co. Ltd., Columbia Natural Gas Limited, and Fort Nelson Gas Ltd.) with the former Gas Division of British Columbia Hydro and Power Authority.[188] As described in the Background section of this decision, this is FEI's fifth COSA study and rate design application over the last 24 years since the deregulation of natural gas markets in BC in 1985. Independent expert consultants have been used on two occasions to verify the robustness of FEI's COSA studies. It is reasonable to expect that this experience leads to the use of appropriate assumptions, estimates and judgements used by the utility based on its specific circumstance. As such, the Panel is convinced that FEI is more experienced in performing COSA studies now than it was in 1993.
- FEI has access to expert consultants to assist in completing it COSA study – as noted above, FEI has used expert consultants which over time should lead to improvements in COSA methodologies and techniques and should also lead to the more appropriate assumptions, estimates and judgements used by the utility based on its specific circumstances.
- The estimate of peak day demand is only used to allocate a portion of costs – while FEI focuses on the lack of improvement in the estimation of peak day demand, in the Panel's view, peak day demand information is only used in the allocation of a portion of the costs: (i) costs classified as demand-related in the delivery COSA model; and (ii) midstream costs, in the gas COSA model. The evidence shows that demand-related costs account for 50 percent of the costs in the delivery COSA model and midstream

[186] SRP Transcript for Sep 12, 2017, pp. 527-529.
[187] BCSEA Final Argument, p. 4; SRP Transcript for Sep 12, 2017, p. 497.
[188] Exhibit B-1, p. 3-7; p. 3-10; Commission Decision for G-22-92, dated February 21, 1992, p. 4

costs account for 23 percent of the costs in the gas COSA model. The remaining costs are allocated based on annual demand and average number of customers, with a weighting factor applied in some cases.[189] In addition, the Panel expects that the availability of more load data through more frequent meter reads and more daily data would result in improved regression models and improved annual demand forecasting techniques. As such, the Panel places less weight on FEI's statement regarding the estimation of peak demand.

The Panel finds a 95 percent to 105 percent R:C ratio range of reasonableness is appropriate, for the following reasons:

- Gas utilities in Elenchus' Canadian jurisdictional review use a range of 95 to 105 percent or smaller – this is the case regardless of whether or not commodity costs are included. FEI has proposed and the Panel has approved the use of the R:C ratio, which include commodity costs. Elenchus' jurisdictional review shows that when utilities use the R:C ratio range of reasonableness they either target unity or close to unity, which Elenchus describes as a range smaller than 95 percent to 105 percent. While FEI argues that its circumstances may not be the same, the Panel notes that a 95 percent to 105 percent R:C ratio range of reasonableness would be larger than the R:C range of reasonableness for all of the utilities provided in Elenchus' jurisdictional review. The Panel also notes that EES Consulting states that FEI's COSA follows standard practice. In order to determine if FEI's COSA follows standard practice EES Consulting would have to compare FEI's approach to the approach of comparable utilities in other jurisdictions, while being aware of differing circumstances.
- Elenchus and EES Consulting use a consistent sample of Canadian natural gas utilities – Elenchus' jurisdictional review of range of reasonableness included all Canadian natural gas utilities included in EES Consulting's jurisdictional review of COSA Methodology. FEI argues that Elenchus' jurisdictional review is not comprehensive, but FEI has not provided any examples of natural gas utilities, other than PNG, that employ a R:C ratio range of 90 percent to 110 percent to support its position. The Panel considers that FEI's reference to PNG is circular in nature since FEI also states that its own 90 percent to 110 percent range possibly stemmed from a 90 percent to a 110 percent range established for PNG prior to FEI's proceeding.[190]
- Inappropriate to compare to electric utilities' range of reasonableness – the Panel also notes that in its Reply Argument, FEI provides examples of electric utilities in other jurisdictions that utilize a 90 percent to 110 percent range of reasonableness to support its point that this range is used in the industry. In contrast, in its final argument, FEI argues that the "precedents for a range of reasonableness of 95 percent to 105 percent in the case of BC electric utilities are not appropriate for natural gas utilities."[191]

  On one hand FEI provides reasons why the range of reasonableness for BC electric utilities is inappropriate but on the other hand FEI has not stated why the range of reasonableness for electric utilities outside of BC is appropriate. The Panel places more weight on the evidence regarding the range of reasonableness for natural gas utilities in other relevant jurisdictions than it does for FEI's examples of electric utilities in other jurisdictions.
- Impact of rebalancing all rates to within the 95% to 105% – in determining an appropriate R:C ratio range of reasonableness to inform rate design, the Panel also considered the impact on customers if FEI were to rebalance all the rates to within the 95% - 105% range. The evidence shows marginal rebalancing would occur to bring all of FEI's rate schedules within the range of reasonableness. [192] In the

[189] Exhibit B-1, p. 6-21; p. 6-24; p. 6-26; p. 6-29; Table 6-17, p. 6-31; Appendix 6-4
[190] Exhibit B-5, BCUC IR 14.1, pp. 55-58.
[191] FEI Final Argument, p. 21.
[192] Exhibit B-15, BCUC Technical IR 7.2, pp. 18–21.

> case of Fort Nelson there is the potential for some customers to experience larger rate impacts in 2018 if FEI were to rebalance all rates to within the 95% - 105% range of reasonableness. The Panel notes that such rate impacts can be mitigated as described by Elenchus in the Rate Design Report by spreading the full impact of the rebalancing over two or more years.[193] The Panel expects that proposals regarding rate impact mitigation will be submitted with any updates to this Application as a result of this Decision.

For the reasons outlined above, the Panel considers it appropriate to reduce FEI's current R:C ratio range of reasonableness of 90 percent to 110 percent to an R:C ratio range of reasonableness of 95 percent to 105 percent. This range is to be used to inform rate design and rebalancing proposals in the current Application. Since other considerations are made in rate design and rebalancing, FEI is free to propose whether or not they will rebalance rates.

As indicated by FEI, the Commission is not bound by historical precedent. The Panel agrees with FEI that the Commission should seek to be consistent in its decision making and should not vary its decisions arbitrarily. However, since FEI's circumstances have changed over time, the Panel considers it appropriate to place less weight on consistency. The Panel considers that the circumstances surrounding FEI's COSA studies have changed enough in the last 24 years to warrant a narrowing of the estimated the range of reasonableness to 95 percent to 105 percent.

[193] Exhibit A2-10, p. 7.