

**WRITTEN EVIDENCE OF
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PRESIDENT
EMRYDIA CONSULTING CORPORATION (U.S. AND CANADA)**

**ON BEHALF OF THE
NOVA SCOTIA ENERGY BOARD**

**IN THE MATTER OF
NOVA SCOTIA POWER INC.
2026-2027 GENERAL RATE APPLICATION**

**NOVA SCOTIA ENERGY BOARD
M12451**

EMRYDIA

DECEMBER 2, 2025

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Exhibit DMM-5	NBP1.67 - Appendix AMi - Depreciation Study Report 2024 - NB Power Distribution
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Exhibit DMM-7	2020-Depreciation-Study-filed-July-29-2021
Exhibit DMM-8	From NP - 2022-2023 General Rate Application - Volume 3 - 2021-05-27

1 Introduction

Q: State your name and occupation.

A: My name is Dustin M. J. Madsen. I am the President of Emrydia Consulting Corporation (Emrydia). Emrydia is a consulting firm providing services to parties participating in the electric, gas and water utility industry in North America. Emrydia is incorporated in both Canada and the United States. Emrydia's business addresses are as follows:

304 8 Ave SW Suite #620
Calgary, AB T2P 1C1

401 Ryland St. Suite 200-A
Reno, NV 89502

Q: Summarize your educational background and professional experience.

A: I have more than 20 years of experience in auditing, accounting, and regulated utility businesses. I received a Bachelor of Commerce, majoring in accounting, awarded with Great Distinction from the Edwards School of Business at the University of Saskatchewan. I am a Canadian Chartered Professional Accountant and Chartered Accountant registered with CPA Alberta, as well as a US Certified Public Accountant registered with the Illinois Department of Financial and Professional Regulation. I am also a Certified Depreciation Professional with the Society of Depreciation Professionals and a Certified Rate of Return Analyst with the Society of Utility and Regulatory Financial Analysts.

My curriculum vitae is attached to this evidence and provides a complete description of my qualifications, regulatory and professional experience. I have provided services in several jurisdictions in Canada and the United States. In Canada, I have provided services in Alberta, British Columbia, Manitoba, New Brunswick, the Northwest Territories, Nova Scotia, Ontario, and Quebec. In the United States, I have provided services in Arizona, Delaware, Maryland, Mississippi, New York, North Carolina, Ohio, and South Carolina. I have provided services to consumer advocates, utilities, regulators, and other interested parties in regulatory applications. For customer groups, I have represented small residential customers, small and medium sized commercial customers, large industrial electric

1 customers, and large industrial gas customers, as well as landowners and public advocates
2 who represent broad customer bases.

3 In Canada I have testified before the Alberta Utilities Commission, the New Brunswick
4 Energy and Utilities Board, and the Northwest Territories Public Utilities Board on several
5 occasions and have also testified before the Manitoba Public Utilities Board and Ontario
6 Energy Board. In the United States, I have testified before the Arizona Corporation
7 Commission, Mississippi Public Service Commission, the Public Utilities Commission of
8 Ohio, and the New York Public Service Commission.

9 Formerly I was a manager and consultant with two large regulated electric utilities. I have
10 testified and presented expert evidence on virtually every aspect of utility revenue
11 requirements and related issues, including but not limited to depreciation, cost of capital,
12 capital structure, income taxes, operating costs, capital, prudence issues, deferral accounts,
13 reserve accounts, cost-of-service, revenue allocation, rate design, cost allocation, corporate
14 allocations, accounting and finance issues, incentive-based regulation, formula-rates, audit
15 matters, and best practices for utilities to minimize costs.

16 Finally, I have maintained an active presence in the industry having presented at various
17 conferences and was appointed to be the Vice President of the Society of Depreciation
18 Professionals beginning January 1, 2025.

19 **Q: On whose behalf are you testifying in this proceeding?**

20 A: In this matter, I have been retained by the Nova Scotia Energy Board (Board) Counsel in
21 relation to Nova Scotia Power Inc.'s (NS Power or the Company) 2026-2027 General Rate
22 Application (the Application).

23 **Q: Summarize the instructions you received from your client.**

24 A: I was retained to perform the following work per the signed Engagement Letter and Work
25 Task Order with the Board:

- 26 a. Review application, prepare, issue and review responses to Information Requests.
- 27 b. Provide expert analysis, recommendations, and testimony on NS Power's
- 28 depreciation practices, including reviewing and revising assumptions for average

1 service lives and net salvage, assessing the Equal Life Group method, reviewing
2 deferral amortization and securitization proposals.

3 c. Preparation of written evidence for submission, to be filed on Dec 2, 2025.

4 d. Preparing for and testifying in hearing.

5 **Q: Have you previously prepared evidence and testified before the Board in relation to**
6 **matters relevant to the issues being considered in this Proceeding?**

7 A: No. This is my first time testifying before the Board. However, as explained above, I have
8 testified before many other Canadian and U.S. regulators. In respect of depreciation
9 matters, I have been qualified as an expert in Canada and testified on those matters before
10 the Alberta Utilities Commission, New Brunswick Energy and Utilities Board, the
11 Northwest Territories Public Utilities Board, and the Ontario Energy Board. I have also
12 testified on depreciation matters before U.S. regulators, am a frequent speaker at the
13 Society of Depreciation Professionals and the current Vice President and incoming
14 President.

15 **Q: Confirm that your opinion evidence is fair, objective and non-partisan and would not**
16 **change were you retained by another party in this proceeding.**

17 A: Confirmed.

18 **2 Executive summary**

19 **Q: Summarize the key areas of your testimony.**

20 A: The focus of my testimony is on applied for depreciation expense, including net salvage, as
21 well as securitization and deferral account matters. Specifically, I comment on the
22 following areas in the sections that follow:

- 23 • Use of the Average Life Group (ALG) versus Equal Life Group (ELG) procedure
24 to calculate depreciation expense.
- 25 • Specific changes to the currently approved average service lives and survivor
26 curves for certain accounts.
- 27 • Applied for net salvage rates.

- Resolution of differences between the book and calculated accumulated depreciation reserve balances.
- The reasonableness of the Company's proposed deferral account balances and amortization periods.
- The reasonableness of the Company's proposed securitization of certain amounts.

Q: Should the Board approve the Company's requested relief in relation to depreciation expense?

A: No. I recommend the following adjustments to the applied for depreciation expense and net salvage calculations:

- Use of the Average Life Group Procedure instead of the Equal Life Group Procedure.
- The following revised service lives:

Table 1 – Emrydia summary of service life recommendations

Account Number	Account Name	Investment at Dec 31, 2023	Emrydia Recommended Life Estimate	Emrydia Recommended Curve Estimate
TRANSMISSION ASSETS				
353	STATION EQUIPMENT	586,908,962	50	R2.5
354	TOWERS AND FIXTURES	111,028,870	No Change	No Change
355	POLES AND FIXTURES	268,176,042	50	R2.5
356	OVERHEAD CONDUCTORS AND DEVICES	178,454,463	52	R3
DISTRIBUTION ASSETS				
364	POLES, TOWERS AND FIXTURES	646,990,061	45	R1.5
365	OVERHEAD CONDUCTORS AND DEVICES	329,509,672	45	R2
367	UNDERGROUND CONDUCTORS AND DEVICES	75,012,364	No Change	No Change
368	LINE TRANSFORMERS	555,455,934	36	R1
GENERAL PLANT ASSETS				
390.1	STRUCTURES AND IMPROVEMENTS	184,609,960	No Change	No Change

- I also recommend additional reporting as part of the next depreciation study as set out in further detail below as well as the filing of depreciation studies no less than every five years, and in the case of the next depreciation study no later than after the next GRA filing.

Q: Should the Board approve the Company's requested relief in relation to deferral amortization and securitization?

A: I have no proposed changes to NS Power's requested deferral amortization. For securitization, I am unable to specifically comment on the reasonableness of the securitization arrangement as it has not yet been completed. However, I am not in principle opposed to securitization as an option in this case. Finally, I recommend the Board deny NS Power's request to recover its weighted average cost of capital on any balances that arise due to a delay in securitization.

3 Depreciation and net salvage expense concepts

Q: Briefly explain the concept of depreciation expense.

A: Depreciation expense is an estimate of the consumption of the economic value of an asset over its expected service life. Assets with an expected service life greater than one year are capitalized and depreciated over the expected life. All other costs are expensed in the period incurred.

Fundamentally, depreciation is an accounting concept that seeks to ensure the future economic values of an asset are consumed over a systematic period.¹ This accounting concept is supported by extensive literature and research on the fundamentals and systems related to depreciation expense. While there are numerous texts that depreciation experts cite and properly rely upon, five of the core texts that address the relevant concepts of concern in the NS Power Application are as follows:

- i. Depreciation Systems by Frank K. Wolf and W. Chester Fitch (*"Depreciation Systems"*).
- ii. Iowa Engineering Experiment Station Bulletin 125, "Statistical Analyses of Industrial Property Retirements" by Robley Winfrey.

¹ A systematic period is a period that is reflective of the consumption of the value of the assets over the expected useful life. Generally, this systematic period is on a straight-line basis and thus does not vary significantly from year-to-year.

- 1 iii. Iowa Engineering Experiment Station Bulletin 155, "Depreciation of Group
- 2 Properties" by Robley Winfrey.
- 3 iv. Engineering Valuation and Depreciation by Anson Marston, Robley Winfrey, and
- 4 Jean C. Hempstead.
- 5 v. Public Utility Depreciation Practices, Compiled and Edited by Staff
- 6 Subcommittee on Depreciation of The Finance and Technology Committee of the
- 7 National Association of Regulatory Utility Commissioners.

8 My evidence is informed by the concepts contained within the above texts, as well as

9 others, and is also informed by my experience and expertise in Canadian and U.S.

10 accounting standards, and testimony before Canadian and U.S. regulators.

11 **Q: Briefly explain the approach employed by Gannett Fleming in its depreciation study**

12 **and the impact that approach has on the forecast depreciation expense.**

13 A: Depreciation expense for NS Power is comprised of both a depreciation and net salvage

14 component. However, in this evidence, I sometimes refer to the recovery of depreciation as

15 recovering the original cost of the investment. This simplification is not intended to

16 confuse the Board and interested parties. Rather, it is important to address each component

17 of overall depreciation expense separately, and any reference to depreciation expense in the

18 context of the recovery of the original cost is only made for simplicity.

19 Depreciation recovers the original cost of any investment added into utility rate base, such

20 recovery occurring over the expected useful life of the assets. Net salvage recovers the

21 expected future costs to salvage and remove those assets, including any salvage proceeds,

22 such recovery also occurring over the expected useful life of the assets.

23 As explained at page iii (PDF page 6) of the Gannett Fleming December 31, 2023

24 Depreciation Study for NS Power, Gannett Fleming has proposed the Equal Life Group

25 (ELG) procedure combined with the straight-line method and remaining life technique to

26 determine depreciation. While not explicitly stated, Gannett Fleming also applies what is

27 known as the Traditional Method for the recovery of net salvage.

28 The Traditional Method of recovering net salvage costs embeds the recovery of net salvage

29 costs over the life of the assets based on the approved depreciation parameters. The net

1 salvage parameter in this case is set as either a positive or negative percentage based on the
2 original cost of the asset. As an example, if the original cost of an asset is \$1,000,000, the
3 average service life is 10 years, and the Average Life Group (ALG) procedure is used, then
4 the utility would recover \$100,000 of depreciation expense per year. Assuming the net
5 salvage rate was -50%, the utility would also recover an additional \$50,000 per year of net
6 salvage over the life of the assets, or \$500,000 in total. These calculations change under the
7 ELG procedure as I discuss below, with more depreciation and net salvage recovered
8 earlier in the life of the assets, and less later in the asset's life.

9 A key component influencing the amount of both depreciation and net salvage expense
10 being recovered are the average service lives and survivor curves which Gannett Fleming
11 has selected for the assets with the largest level of investment.² For example, if an asset
12 represents 10% of the total investment at NS Power, then small changes in life or net
13 salvage parameters can have a material impact on the reported depreciation expense.
14 Conversely, if an asset represents only 1% of the investment at NS Power, then significant
15 changes may have an immaterial impact on depreciation expense. Ultimately, the goal of
16 setting depreciation expense should be to both get it right, but also to propose changes that
17 are gradual and moderate within the context of the selected depreciation procedure,
18 technique and method. I briefly explain the process of selecting an average service life and
19 Iowa curve below.

20 **Q: What is an “Iowa curve” and how is it used in calculating depreciation expense?**

21 A. Iowa curves were first developed by Robley Winfrey at the Iowa State University with
22 input and assistance from several others including Edwin Kurtz and Harold Cowles. Much
23 of this work is available as part of the Bulletins 125 and 155 referred to above. Data for
24 each of the Iowa curves is also included in *Depreciation Systems*, though some caution is
25 required as certain of the data points contain errors.

² Certain accounts apply amortization accounting as set out in the Concentric 2021 depreciation study at page 4-3. Amortization accounting, which can also be referred to as a square curve (SQ) as in the Concentric report, is typically employed for accounts with a smaller investment balance relative to larger accounts, and where there are numerous assets without distinguishable life characteristics, such as laptops.

1 The Iowa curves were based on a comprehensive study of the lives of different types of
2 assets. Based on the study of those lives, a series of curves were developed that provided
3 for a statistical fit to the various lives of the assets studied. There are four classes of curves,
4 including S-curves, L-curves, R-curves, and O-curves. These curves are broadly accepted
5 and tested in North America and have been consistently accepted by regulators for
6 determining a reasonable depreciation expense.

7 The most used Iowa curves for regulated utility plant are R-curves (right-modal), S-curves
8 (symmetric) and L-curves (left-modal). R-curves tend to be the most used curves for
9 regulated utility investment as they reflect relatively few retirements in the earlier years of
10 the asset's useful life and greater retirements occurring after the average service life of the
11 assets. This pattern of retirement is logical as most electric infrastructure is operated
12 through to the end of its physical useful life with few interim retirements. However, S- and
13 L-curves are also common for certain accounts.

14 The following figures provide illustrations of both the survivor and frequency curves for S-
15 curves, R-curves, and L-curves. The survivor curves should be viewed with the y-axis as
16 the percentage surviving depicted between 0 and 100, and the x-axis as the percentage of
17 the remaining average life. The frequency curves depict the retirement ratio on the y-axis
18 and the percentage of the remaining average life on the x-axis.

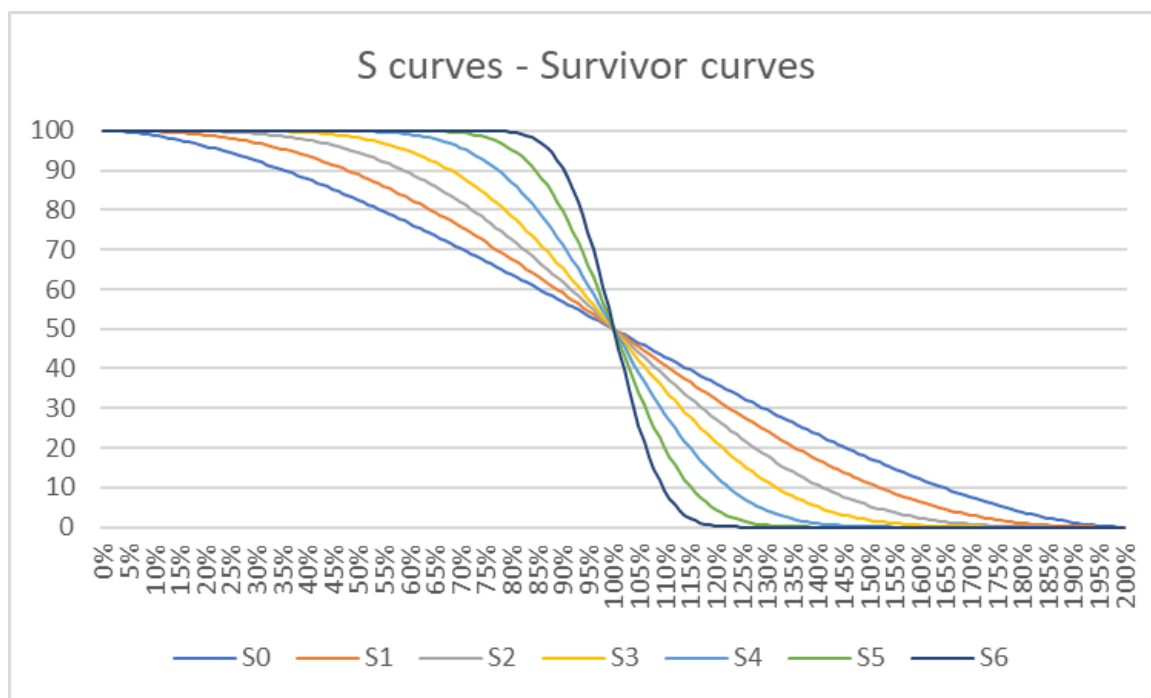
19 A survivor curve illustrates over time the percentage of the assets that are expected to
20 continue to be in service, whereas a frequency curve provides the expected rate of
21 retirement over time. As an example, assume that a 10-year average service life is assumed
22 for an S6 Iowa curve. Once the average service life is selected, that life replaces the x-axis
23 with "100%" becoming the average service life of 10 years. Therefore, using Figure 1
24 below, the S6 curve would suggest that 100% of the investment would remain in the
25 account through approximately "80%" or 8 years of the asset's life. In other words, no
26 assets would be expected to be retired until approximately year 8, after which point the
27 assets would retire quickly through to "120%" of the remaining life or by 12 years.

28 The frequency curve reflects the frequency of retirements as shown by the survivor curve.
29 Specifically, looking at Figure 2 for the S6 curve, there are once again few retirements
30 expected until approximately "80%" or year 8 in the above example. At this point the

frequency curve peaks very quickly to reflect an increased frequency of retirements from approximately age 8 through to age 12. In summary, the survivor and frequency curves are two different ways of depicting the same information.

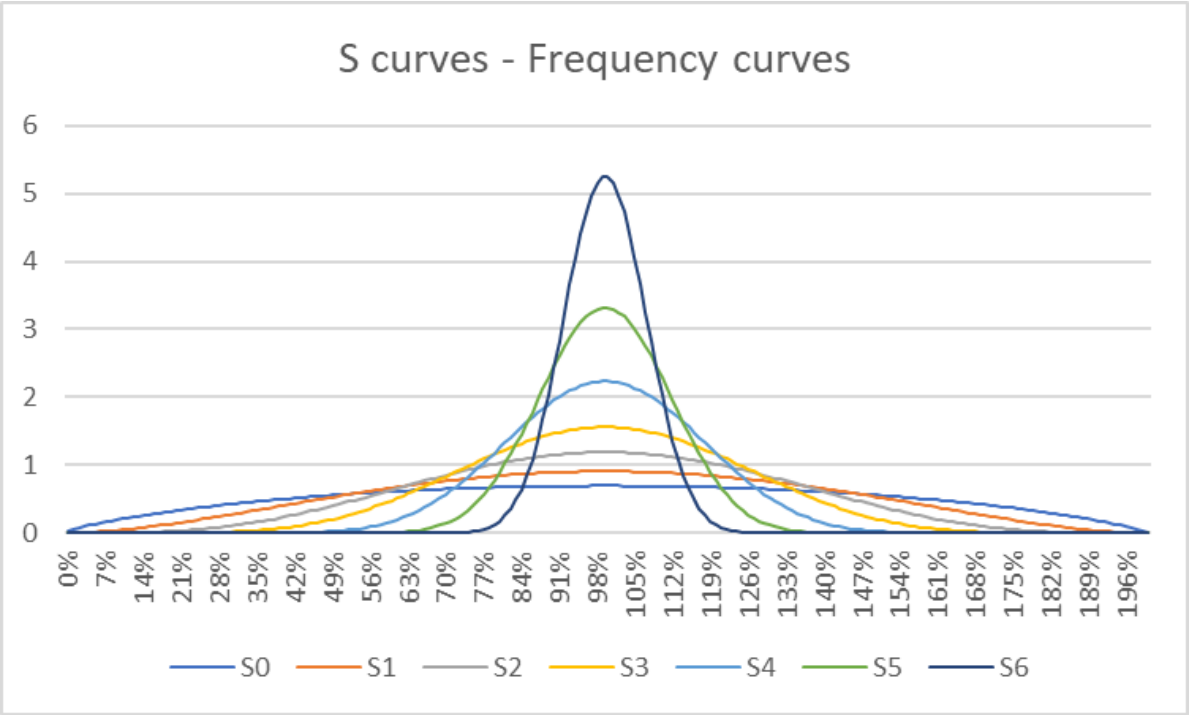
The selection of a specific survivor curve (i.e., S6 or R5) is informed by the depreciation expert's judgment regarding the visual and mathematical fit, peer data, and discussions with management and operations staff as I discuss below.

Figure 1 – S-curves – survivor curves



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Figure 2 – S-curves – frequency curves

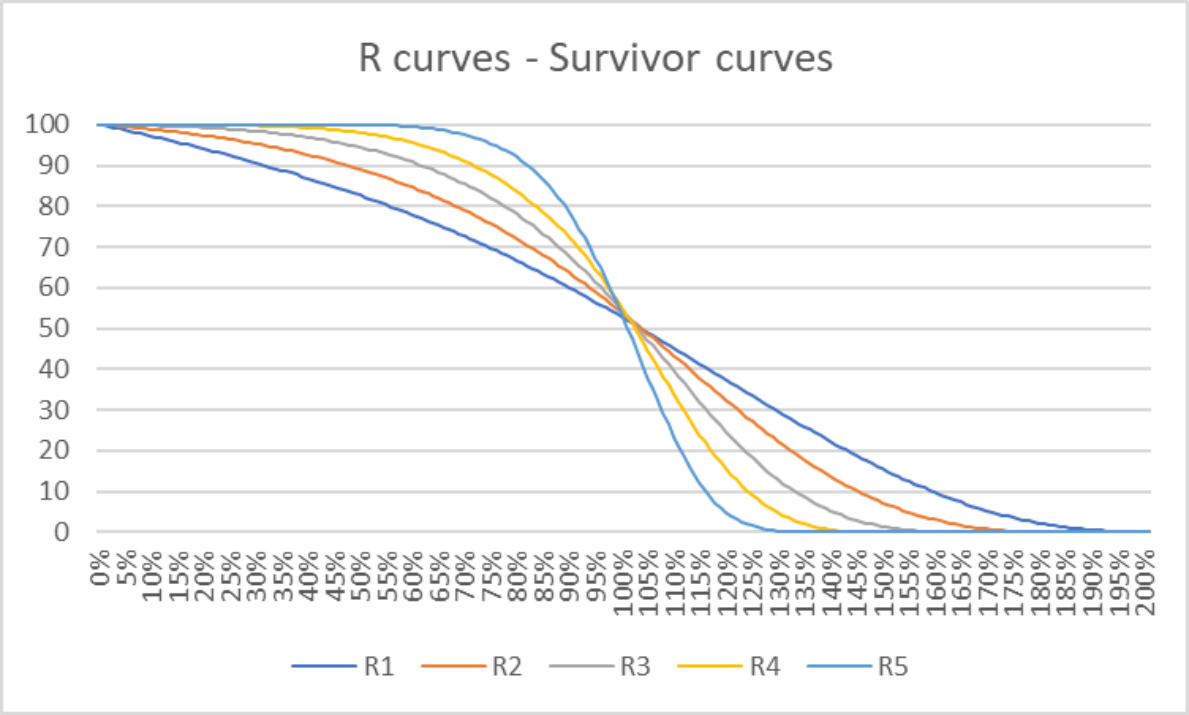


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Figure 3 – R-curves – survivor curves

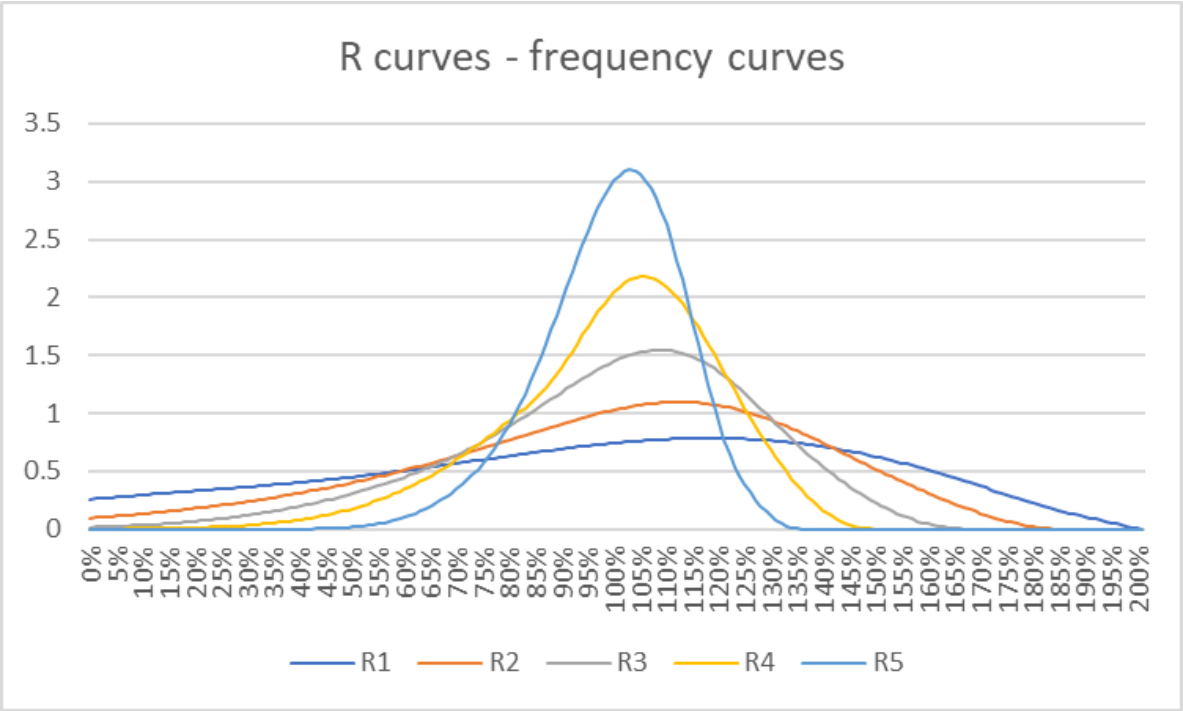


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Figure 4 – R-curves – frequency curves

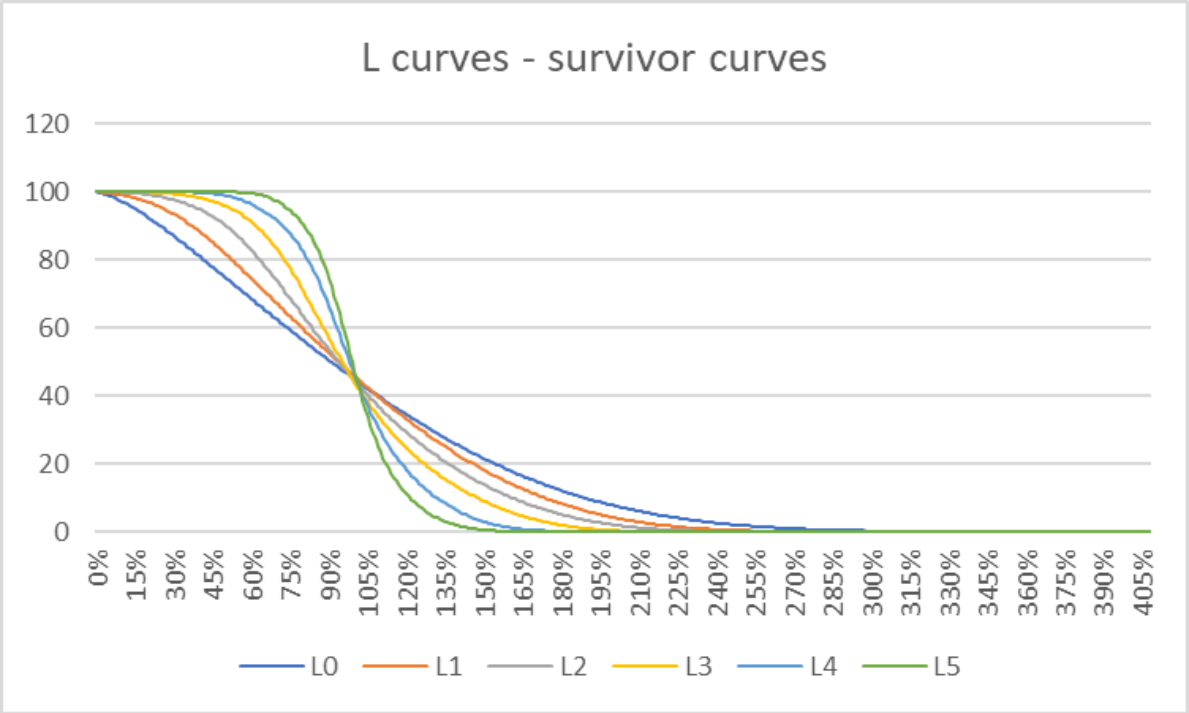


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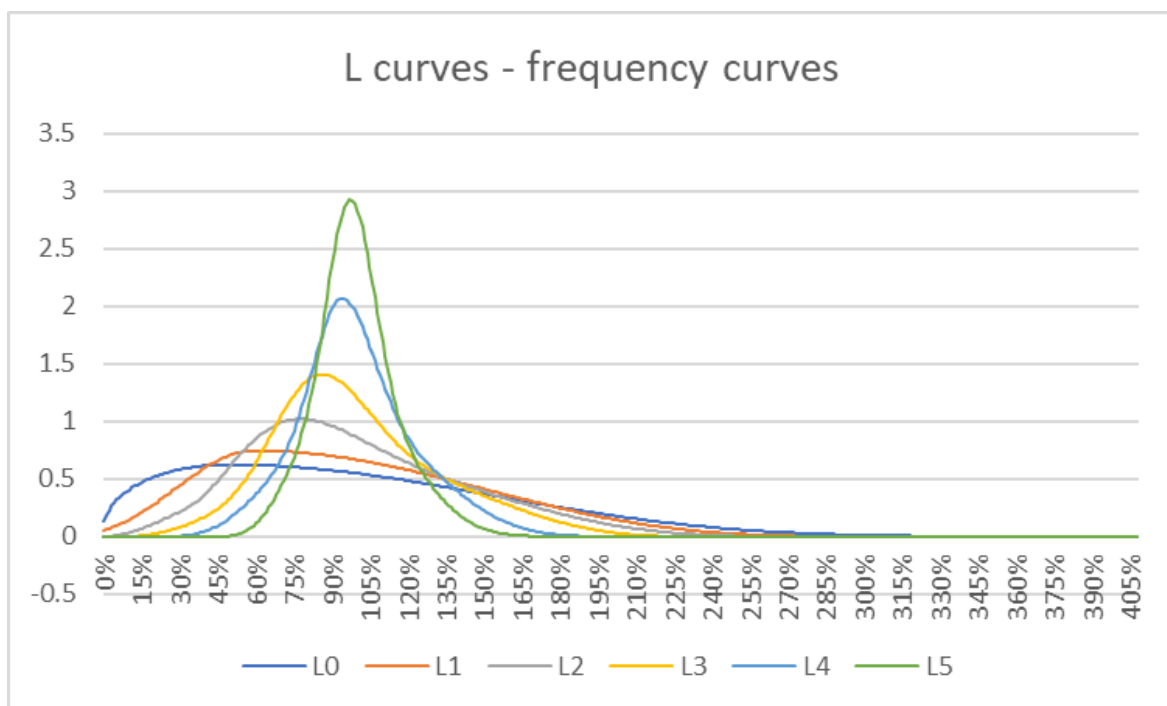
Figure 5 – L-curves – survivor curves



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Figure 6 – L-curves – frequency curves



In addition to the above curves, depreciation experts have also calculated and relied upon half-curves such as an R2.5 curve which is calculated by taking the average of the data points for both the R2.0 and R3.0 curves.

Q: Are Iowa curves utilized in both ALG and ELG procedure calculations?

A: Yes. Both the ALG and ELG procedures are based on actuarial analysis of mortality patterns to estimate how long an asset will be in use. In both Canada and the United States, and particularly for regulated utilities, experts tend to rely largely on the Iowa survivor curves to assess the mortality characteristics of assets.

3.1 Depreciation expense for NS Power

Q: Briefly expand on your primary concerns with NS Power's applied for depreciation expense.

A: My primary concerns with NS Power's applied for depreciation expense for 2026 and 2027 are as follows:

- NS Power's use of the ELG procedure to depreciate its assets.

- NS Power's selection of certain life parameters for certain accounts.
- NS Power's selection of certain net salvage rates for certain accounts.

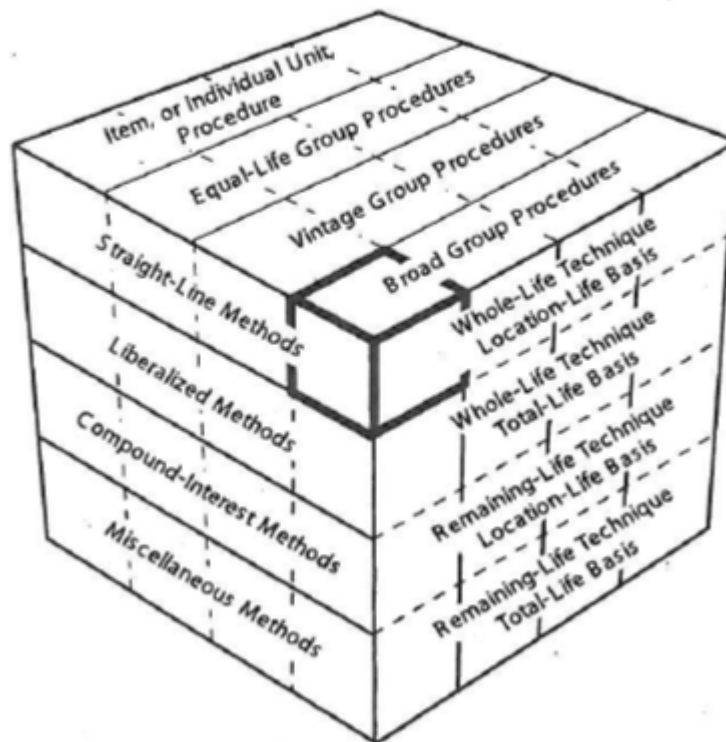
Additionally, I briefly comment on certain of NS Power's other proposals, including the suspension of recovery of net salvage for certain assets and proposed changes to amortization accounts. I also briefly address matters pertaining to the difference between NS Power's calculated and book accumulated depreciation reserve accounts for each account. Finally, I propose some additional reporting and studies that would be beneficial as part of the next depreciation study and recommend that more frequent depreciation studies be prepared in future years.

3.1.1 Summary of the ELG and ALG procedures

Q: Please describe the ELG and ALG procedures.

A. Determination of an appropriate approach to depreciation requires significant judgment to be exercised by an expert in the selection of a procedure, a method, and a technique. These choices from among alternatives, more than one of which may be valid for different reasons, can materially impact the calculated depreciation expense. The American Gas Association and Edison Electric Institute previously prepared the following figure to illustrate the different procedures, methods and techniques:

Figure 7 – AGA and EEI “Depreciation Cube”



The three shown faces of the cube represent procedures, methods and techniques, respectively. To calculate depreciation expense, at least one procedure, one method, and one technique must be selected. As noted earlier, for NS Power, Gannett Fleming has selected the ELG procedure, straight-line method, and remaining life technique.

Procedures are employed to systematically allocate an asset or assets into subgroups. For example, a vehicle would be considered an individual unit group and depreciated accordingly. The use of amortization accounting where all assets retire after a certain period of time is common for utilities and is also proposed for NS Power with certain general property accounts. The following figure as presented at page V-8 of the Gannett Fleming depreciation study summarizes the accounts NS Power seeks approval of amortization accounting for:

Figure 8 – Gannett Fleming summary of accounts proposed to apply amortization accounting

	<u>Account</u>	<u>Amortization Period, Years</u>
391.10	Furniture and Equipment	20
391.31	Computer Equipment - Hardware	5
391.32	Computer Software	10
394.00	Shop Equipment	20
398.00	Miscellaneous Equipment	20

Amortization accounting, which can also be referred to as a square curve (SQ) as in the Gannett Fleming depreciation study, is typically employed for accounts with a smaller investment balance relative to larger accounts, and where there are numerous assets without distinguishable life characteristics, such as laptops. This was confirmed to be the case for these assets by Gannett Fleming at page V-8 of its study.

The amortization period is commonly determined based on the average expected life of the group of assets either based on management and engineering data or other information such as contractual lives for certain assets such as software. Other common procedures employed are the ELG and ALG procedures as noted earlier. The ELG and ALG procedures rely on actuarial analysis to assess whether the observed retirement data aligns with one of the several Iowa curves available to depreciation experts.

The depreciation method determines how the depreciation expense will be allocated over the life of the asset. The simplest and most common example is straight-line depreciation, which provides for an even charge each year. Other methods that accelerate or decelerate the depreciation are more commonly used for tax purposes.

Finally, a technique is selected to determine the specific asset life to be used in the depreciation formula. The two techniques most frequently employed by depreciation experts are the whole life and remaining life techniques. The whole life technique calculates depreciation expense over the entire life of the asset from inception to retirement. For example, if an asset went into service in the year 2000 and has a life of 50 years, the depreciation would be calculated by taking the initial investment divided by 50

1 years assuming no half year rule. The remaining life technique calculates depreciation
2 expense over the expected remaining life. For example, if an asset went into service in the
3 year 2000, and 20 years had passed, then the remaining life technique would take the
4 existing unamortized balance in the account and depreciate it over the remaining life (i.e.,
5 30 years if unchanged from the initial estimate). Generally speaking, both techniques
6 should arrive at the same level of depreciation expense, all else being equal.

7 The ALG procedure, sometimes referred to as the Average Service Life procedure (ASL),
8 calculates depreciation expense based on the theoretical average life of the assets based on
9 proposed survivor curves. For example, assume an average life of 10 years for an account
10 and thus an annual depreciation accrual rate of 10%. The same accrual rate would be
11 theoretically applied to each asset in the account regardless of its actual life. The ALG
12 procedure can be applied on either a broad group or vintage group basis. The broad group
13 considers all plant in a single account or subaccount to be one group. For example, all
14 distribution poles added into service would be considered a single broad group. The
15 vintage group basis considers the vintage years for each asset in a group. Therefore,
16 distribution poles would be further separated into vintage years based on the date the asset
17 went into service. The vintage group approach can identify differences in the life
18 characteristics of different vintages (i.e. generations) of assets.

19 The ELG procedure, also referred to as the Unit Summation procedure, calculates
20 depreciation expense based on a similar approach to ALG, but in theory calculates a
21 different depreciation rate for each subgroup of assets. For example, if an asset lives five
22 years in the group it would be depreciated at a rate of 20%, whereas an asset with a 10-year
23 life would be depreciated at a rate of 10%.

24 Of the two procedures, the ALG procedure is the more commonly understood approach to
25 depreciating assets, which is a pure straight-line approach, and is most used by industries
26 outside of the regulated utility and railroad industry.

27 A depreciation procedure is selected to provide for a reasonable and systematic allocation
28 of the cost of an asset over time. Regardless of the depreciation procedure selected, the
29 purpose of the exercise is to depreciate the same amount of investment over the expected

1 life of the asset. While the amount charged in any one period may vary by virtue of the
2 procedure selected, the total amount depreciated will not.

3 In summary, the differences that exist between the ELG and ALG procedures represent the
4 theoretically different approaches to calculating depreciation expense by each procedure.
5 Regardless of the procedure employed, each procedure is ultimately designed to provide a
6 reasonable estimate of the recovery of the investment over its expected life, and thus both
7 procedures are appropriate to use.

8 **Q: Please confirm that altering the depreciation procedure does not alter the total**
9 **amount of depreciation that is recovered over the full life of the assets.**

10 A: Confirmed. Altering the amount of depreciation recovered by changing the depreciation
11 procedure does not alter the total amount of depreciation that should be recovered over the
12 life of the assets. This is why it is important to set the depreciation rate at a level that best
13 reflects the actual use of the assets over their lives.

14 **3.1.2 Clarifications regarding the reasonableness of both the ALG and ELG** 15 **procedure**

16 **Q: Does the ELG procedure provide for a more theoretically accurate calculation of**
17 **depreciation expense?**

18 A: The ELG procedure provides for a theoretically more accurate calculation of depreciation
19 expense only where simple examples are relied upon. In practice, it is impossible to
20 demonstrate objectively that the ELG procedure will always provide a superior estimate of
21 the actual recovery of an investment as compared to the ALG procedure. This is because
22 such an assessment or conclusion would need to have perfect knowledge of the future. In
23 reality, what often happens under the ELG procedure for electric utility assets, as I
24 demonstrate below, is that the depreciation expense is over recovered in rates.

25 For clarity, I am not speaking to whether the ELG procedure provides for a mathematically
26 superior calculation of depreciation expense in theory but whether that mathematical
27 calculation will better fit the actual retirement pattern of the assets than the ALG procedure
28 calculations would. This is because the estimate is subject to change over time and

1 regardless of the procedure selected, future changes will require a rebalancing of the
2 depreciation expense calculated.

3 Take for example a single asset with a value of \$1,000 and a life of 10 years. Under the
4 ELG and ALG procedure the asset would be depreciated over 10 years, assuming no
5 changes, and the depreciation estimates would both be found to be accurate.

6 Now if we have two assets worth \$1,000, and one has a 5-year life and the other has a 10-
7 year life, then the ELG procedure would depreciate the 5-year asset over 5 years, and 10-
8 year asset over 10 years, while the ALG procedure would depreciate both assets over their
9 average life of 7.5 years. Under this example, the ELG procedure would match the
10 depreciation of the assets with their expected life and provide for a more accurate estimate
11 of depreciation. Comparatively, the ALG procedure would under recover depreciation on
12 the first asset by the time it is retired after 5 years. Both procedures recover the same
13 amount of depreciation over the entire life of both assets and the recovery is merely a
14 matter of timing.

15 Now, assume the same example as above, but that it is determined after year 2 that the
16 lives of both assets have increased by 3 years. Under this scenario, the ELG procedure
17 would have resulted in a significant over collection of depreciation, and the ALG
18 procedure would have provided a better indication of the recovery of the assets over their
19 useful lives. In my experience, electric utility assets, particularly transmission and
20 distribution assets, are experiencing longer lives on average over time due to improved
21 technology, maintenance practices, and stronger assets.

22 In any event, for the ELG procedure to provide the best estimate of depreciation expense
23 over the life of the assets, the actual retirement pattern of the assets would need to perfectly
24 match the expected retirement pattern assumed in the selected Iowa curve. It is never the
25 case that the actual retirement experience will perfectly match the expected retirements.
26 This is why depreciation professionals perform curve fitting and seek to determine the best
27 mathematical fit of the selected curve to the observed retirement data.

28 Additionally, any change in the observed pattern of historical retirements going forward
29 will also impact the degree of accuracy of the ELG procedure because it is so heavily
30 reliant on the retirement data. For example, if the pattern of retirements slows and a

different curve must be chosen under the ELG procedure, then this may have a material impact on the future depreciation rate and the overall accuracy of the ELG procedure. Conversely, the ALG procedure is a pure straight-line method that does not place excessive reliance on the expected or observed retirement patterns when calculating the depreciation rate.

Q: Do you agree that if lives are shortened rather than lengthened the ALG procedure risks under recovery of cost of the assets and may require a catch up in later years?

A: Notionally if lives are shortened and those lives do not reflect the actual experienced lives of the assets, then there is a risk of under collection of depreciation over the life of the assets. The opposite is also true for the ELG procedure.

Notwithstanding, I do not consider this risk to be significant and certainly not more significant than the risk of over recovery under the ELG procedure. The purpose of a depreciation study should always be to set lives based on the most appropriate procedure that best reflects the expected loss of service value of the assets. Electric utility lives have been generally increasing over time particularly for larger dollar value accounts.

When the ELG procedure is used considering this trend there will be a greater over collection of depreciation under the shorter lives, only to return that over collection in the future when the lives are lengthened. The result is that current generations of customers pay more than they should and future generations pay less. The ALG procedure is less aggressive on the front end and thus any over collection would be less significant. This more moderate and gradual approach to collecting depreciation allows the Board to fully consider all facts over the very long life of the assets to ensure the best decisions are made regarding the recovery of investment.

Importantly, the long life of the electric utility assets, and the expectation those assets will be replaced in the future yields a time frame for the life of the electric system that can best be characterized as in perpetuity. This significant time frame and the fact that the majority of electric utility investment is aggregated in several major accounts greatly reduces any risk of error in estimating depreciation. If better information is obtained that the lives of assets are shortening and there is a risk of under collection of depreciation, then that risk can be addressed as part of a future depreciation study through life shortening.

1 Finally, considering the extensive reliance on the ALG procedure across North America, I
2 can confirm that electric utilities frequently experience both reserve surpluses and
3 deficiencies under the ALG method. Just because the ALG procedure is used, does not
4 mean that a utility will perpetually under recover depreciation, which is often an
5 unsubstantiated suggestion of proponents of the ELG procedure.

6 **Q: Are you aware of any significant risk of under-recovered investment or stranded**
7 **investment for NS Power?**

8 A: No. I am not aware of any material broad-based risk of stranded assets or the need to
9 accelerate recovery of investment for NS Power as a result of the energy transition, outside
10 of specific generation assets that are addressed in NS Power's application.

11 For clarity, while the energy transition may impact generation lives, I am not aware of any
12 regulator accepting evidence from a utility that the energy transition will have a major
13 impact on the lives of electric transmission and distribution assets. Indeed, I consider that
14 the possibility that assets lives will lengthen in the future is as likely if not more likely than
15 lives shortening. This is because most utilities are forecasting to replace significantly older
16 assets with much newer assets, often with much longer services lives.

17 While this increased pattern of retirements may suggest a need to accelerate lives in the
18 future for the remaining investment, many utilities are forecasting to double or triple the
19 size of their rate base in the near term. This new investment would need to be assessed
20 separately from the older investment that is being replaced and that new investment would
21 likely drive depreciation estimates and services lives longer for the majority of the
22 remaining investment in the accounts.

23 Having reviewed numerous electric transmission and distribution infrastructure investment
24 plans across North America, my understanding is that electric transmission and distribution
25 utilities are expected to both expand and replace aging infrastructure to address emerging
26 energy transition needs, if they begin to clearly materialize. I am unaware of any
27 transmission and distribution utilities suggesting that the energy transition will cause them
28 to retire material amounts of investment much earlier than the expected useful life of those
29 assets. I am, of course, aware of the need to retire certain generation investment earlier
30 than forecast. This is also the case for NS Power. The ELG procedure would not address

1 the under-recovery of this investment if used in place of the ALG procedure. I discuss the
2 intergenerational impacts of this consideration in further detail in Section 3.1.8

3 My experience is that many utilities and independent system operators across Nor.th
4 America are forecasting significant load increases to occur in the near term within nearly
5 every rate application. While many of those increases have yet to materialize, there are
6 exceptions. For example, in Ohio several utilities have been connecting major new loads to
7 the system in the form of data centers, with a data center specific rate having recently been
8 approved for several utilities. In this case the new investment is often an expansion of the
9 existing transmission system for much larger connections or the optimized usage of the
10 existing transmission system. Generation resources are of course a concern unless they are
11 unregulated, which is not the case for NS Power. In any case, I am not aware of any major
12 stranded investment having occurred for electric utilities assets merely due to the use of the
13 ALG procedure. Notably the vast majority of North American electric utilities, by both
14 total investment and overall count, rely on the ALG procedure.

15 In summary, if stranded investment risk does indeed materialize as a result of the energy
16 transition for NS Power that risk is likely to be narrow in focus, predictable well in
17 advance, and can be addressed through several other means available to the Board. Some
18 of these means, such as securitization of unrecovered investment or the potential
19 securitization of future salvage costs, are being considered in this case. The mere risk of an
20 isolated event that causes the risk of stranded investment or the need to accelerate recovery
21 of a specific investment, should not dictate the use of a specific depreciation procedure.
22 These one-off considerations are best addressed on a one-off basis by for example setting
23 up a new asset class for the earlier retiring assets and planning how best to recover those
24 specific assets over the new remaining life, rather than accelerating recovery of all assets in
25 the class.

26 **Q: Please provide further examples demonstrating the difference between the ELG and**
27 **ALG procedures.**

28 A: All the following tables and figures, including detailed supporting calculations, are
29 included in Exhibit DMM-2. The tables and figures are intended to illustrate both the

1 impact of the chosen depreciation procedure (i.e., ALG versus ELG) on the depreciation
2 accrual as well as the impact on accumulated depreciation over time.

3 The examples all assume that there are two assets added into service in the same account
4 and both assets have an original cost of \$1,000. Within the first example, Asset #1 is
5 expected to be retired in five years, while Asset #2 is expected to be retired in 15 years. On
6 average, in this example, the average life of the two assets is 10 years $[(5 \text{ years} + 15$
7 $\text{years})/2]$. The first example and related calculations and figures reflect no change in life
8 over the entire life of the assets.

9 With this contest, the following table provides a summary of the calculations performed
10 under both the ALG and ELG procedures using the same sets of facts:

1 **Table 2 – Madsen Example 1 – Illustrative ALG and ELG procedure calculations**

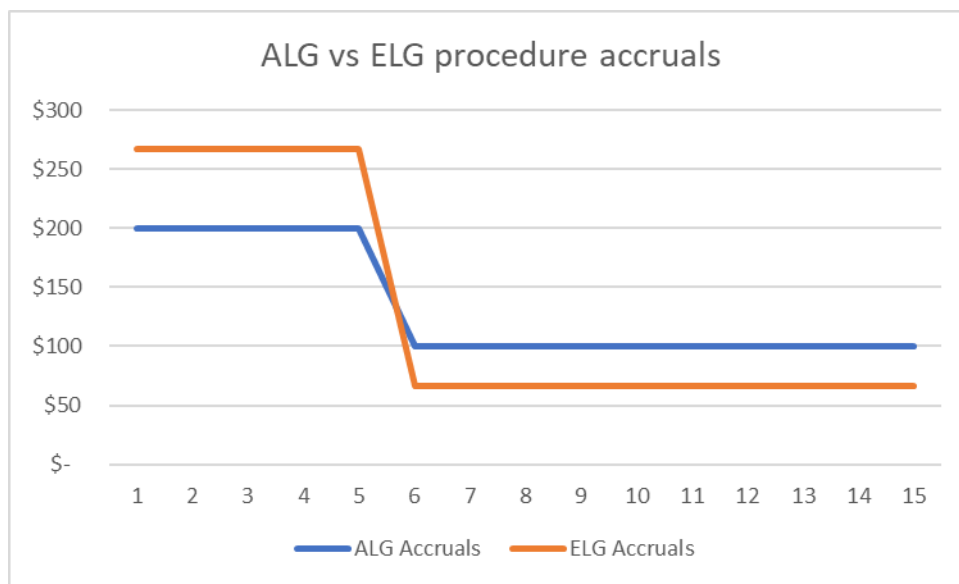
Average Life Group Procedure							
Year	Total Cost Asset 1 (\$)	Total Cost Asset 2 (\$)	Total Accruals (\$)	Total Acc. Dep Balance (\$)	Depreciation Rate Asset #1 (%)	Depreciation Rate Asset #2 (%)	Composite Depreciation Rate (%)
1	1000	1000	200	200	10.00%	10.00%	10.00%
2	1000	1000	200	400	10.00%	10.00%	10.00%
3	1000	1000	200	600	10.00%	10.00%	10.00%
4	1000	1000	200	800	10.00%	10.00%	10.00%
5	1000	1000	200	0	10.00%	10.00%	10.00%
6		1000	100	100		10.00%	10.00%
7		1000	100	200		10.00%	10.00%
8		1000	100	300		10.00%	10.00%
9		1000	100	400		10.00%	10.00%
10		1000	100	500		10.00%	10.00%
11		1000	100	600		10.00%	10.00%
12		1000	100	700		10.00%	10.00%
13		1000	100	800		10.00%	10.00%
14		1000	100	900		10.00%	10.00%
15		1000	100	0		10.00%	10.00%
Total			2000	0	50.00%	150.00%	150.00%

Equal Life Group Procedure							
Year	Total Cost Asset 1 (\$)	Total Cost Asset 2 (\$)	Total Accruals (\$)	Total Acc. Dep Balance (\$)	Depreciation Rate Asset #1 (%)	Depreciation Rate Asset #2 (%)	Composite Depreciation Rate (%)
1	1000	1000	267	267	20.00%	6.67%	13.33%
2	1000	1000	267	533	20.00%	6.67%	13.33%
3	1000	1000	267	800	20.00%	6.67%	13.33%
4	1000	1000	267	1067	20.00%	6.67%	13.33%
5	1000	1000	267	333	20.00%	6.67%	13.33%
6		1000	67	400		6.67%	6.67%
7		1000	67	467		6.67%	6.67%
8		1000	67	533		6.67%	6.67%
9		1000	67	600		6.67%	6.67%
10		1000	67	667		6.67%	6.67%
11		1000	67	733		6.67%	6.67%
12		1000	67	800		6.67%	6.67%
13		1000	67	867		6.67%	6.67%
14		1000	67	933		6.67%	6.67%
15		1000	67	0		6.67%	6.67%
Total			2000	0	100.00%	100.00%	133.33%

2
3

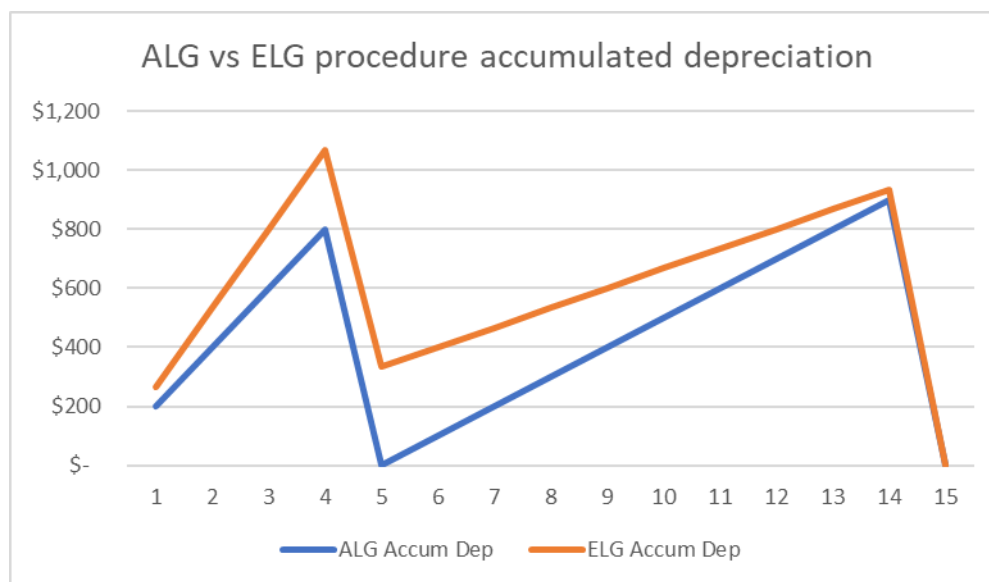
As shown in the above table, while the depreciation accruals differ under the two procedures from year-to-year, the total amount of depreciation recovered is the same, \$2,000. However, the profile of both the accruals and the accumulated depreciation balance vary considerably. This trend is depicted in the following two figures:³

Figure 9 – Madsen Example 1 Comparison of ALG vs ELG procedure accruals



³ In both figures the X-axis reflects years and the Y-axis reflects the calculated dollar value.

Figure 10 – Madsen Example 1 Comparison of ALG vs ELG procedure accumulated depreciation



As Figure 9 shows, the depreciation accrual is much higher under the ELG procedure in the earlier years and then declines in later years. By comparison, the ALG procedure accrual has a less pronounced change in year 5 when the first asset retires. Many depreciation experts argue that the trend in the ALG procedure provides for a more balanced recovery of the cost of both assets over the combined life than the ELG procedure does. I agree.

Further as Figure 10 shows, under the ELG procedure the total accumulated depreciation remains higher than the ALG procedure for the entire life of the assets until the final year of retirement. This means that customers pay more on the front end and less in the final years. A common argument against the ELG procedure, which again I agree with, is that the ELG procedure ignores that the benefits of most electric utility assets with regular maintenance do not decline considerably in later years as the ELG procedure suggests.

As noted above, several of these principles change when the lives of the assets change. The following example uses the same facts as outlined above, but in Year 3 it is determined that the life of Asset #1 will be 6 years and Asset #2 will be 18 years. This change in life expectancy requires a depreciation analyst to recover the difference in the book versus calculated accumulated depreciation reserve over the remaining life of the assets so that

1 there is not an over or under-recovery of the value of the assets. These calculations are
2 what is referred to as the remaining life technique as outlined by Gannett Fleming in its
3 depreciation study.

4 The following table illustrates the results of this expanded analysis with the detailed
5 calculations again provided as Exhibit DMM-2. The calculations require both the
6 calculation of the book and calculated accruals and accumulated depreciation reserve for
7 each asset over its life:

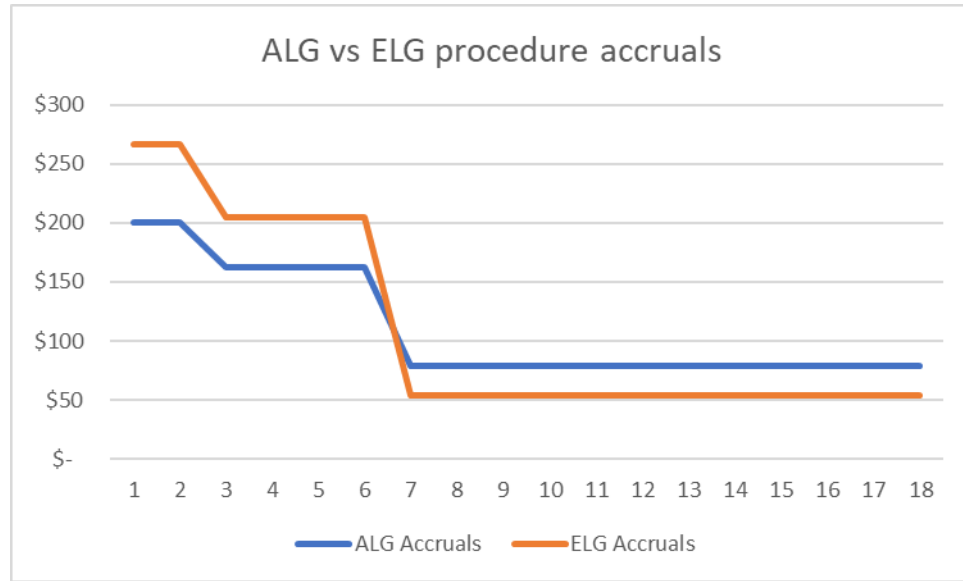
1 **Table 3 – Madsen Example 2 – Illustrative ALG and ELG procedure calculations**

Average Life Group Procedure						
Year	Total Cost Asset 1 (\$)	Total Cost Asset 2 (\$)	Total Accruals (\$)	Total Book Acc. Dep Balance (\$)	Total Calc Acc. Dep Balance (\$)	Composite Depreciation Rate (%)
1	1,000	1,000	200	200	167	10.00%
2	1,000	1,000	200	400	333	10.00%
3	1,000	1,000	163	563	500	8.13%
4	1,000	1,000	163	725	667	8.13%
5	1,000	1,000	163	888	833	8.13%
6	1,000	1,000	163	50	-	8.13%
7		1,000	79	129	83	7.92%
8		1,000	79	208	167	7.92%
9		1,000	79	288	250	7.92%
10		1,000	79	367	333	7.92%
11		1,000	79	446	417	7.92%
12		1,000	79	525	500	7.92%
13		1,000	79	604	583	7.92%
14		1,000	79	683	667	7.92%
15		1,000	79	763	750	7.92%
16		1,000	79	842	833	7.92%
17		1,000	79	921	917	7.92%
18		1,000	79	- 0	-	7.92%
Total			2,000	- 0	-	147.50%
Equal Life Group Procedure						
Year	Total Cost Asset 1 (\$)	Total Cost Asset 2 (\$)	Total Accruals (\$)	Total Book Acc. Dep Balance (\$)	Total Calc Acc. Dep Balance (\$)	Composite Depreciation Rate (%)
1	1000	1000	267	267	222	13.33%
2	1000	1000	267	533	444	13.33%
3	1000	1000	204	738	667	10.21%
4	1000	1000	204	942	889	10.21%
5	1000	1000	204	1,146	1,111	10.21%
6	1000	1000	204	350	333	10.21%
7		1000	54	404	389	5.42%
8		1000	54	458	444	5.42%
9		1000	54	513	500	5.42%
10		1000	54	567	556	5.42%
11		1000	54	621	611	5.42%
12		1000	54	675	667	5.42%
13		1000	54	729	722	5.42%
14		1000	54	783	778	5.42%
15		1000	54	838	833	5.42%
16		1000	54	892	889	5.42%
17		1000	54	946	944	5.42%
18		1000	54	- 0	-	5.42%
Total			2,000	- 0	-	132.50%

2

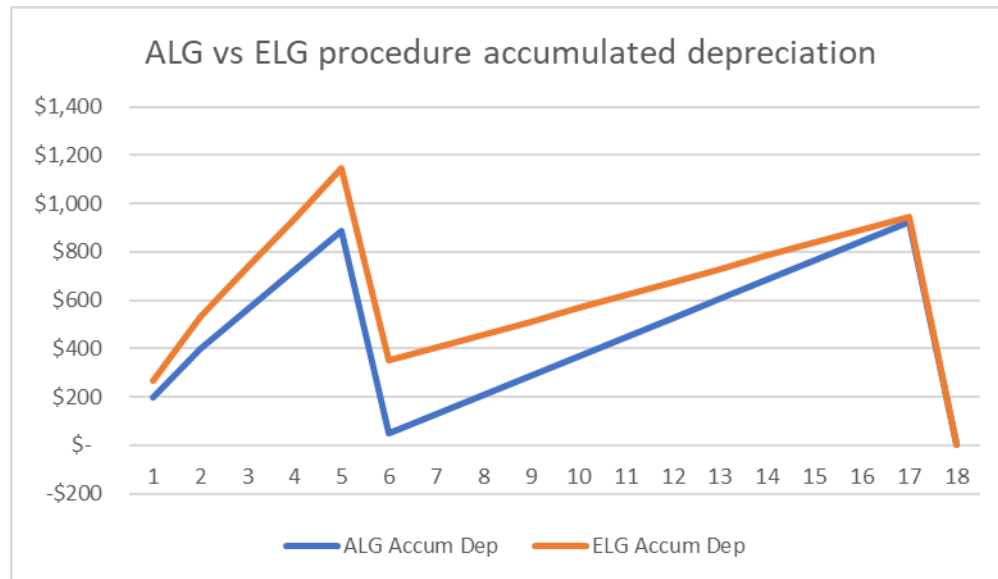
As shown in the above table, as was the case in Example 1 the depreciation accruals differ under the two procedures from year-to-year, but the total amount of depreciation recovered is the same, \$2,000. However, the profile of both the accruals and the accumulated depreciation balance vary even more with the lengthening of the lives of each asset. This trend is depicted in the following two figures:⁴

Figure 11 – Madsen Example 2 Comparison of ALG vs ELG procedure accruals



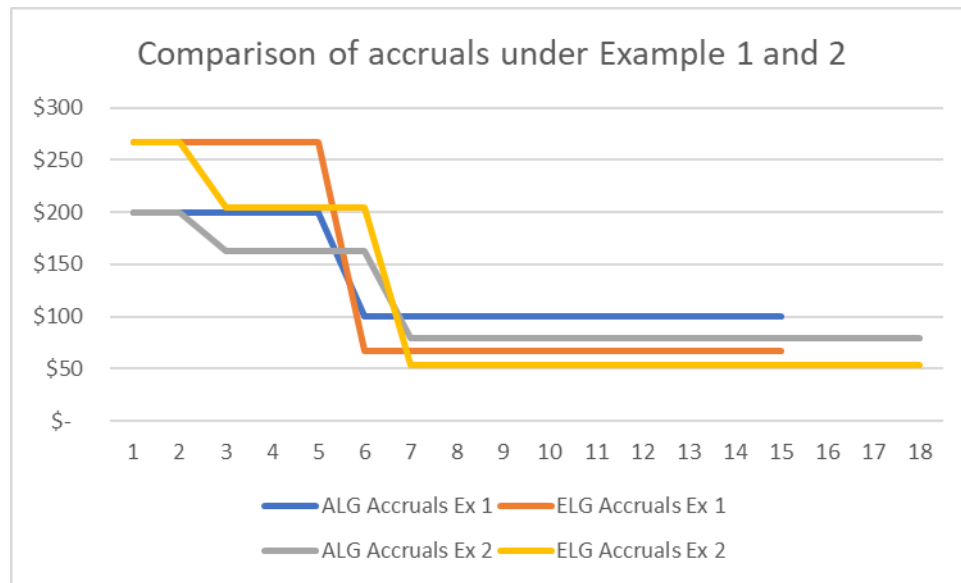
⁴ In both figures the X-axis reflects years and the Y-axis reflects the calculated dollar value.

Figure 12 – Madsen Example 2 Comparison of ALG vs ELG procedure accumulated depreciation



As in Example 1, the accruals in Example 2 are all significantly higher in the earlier years under the ELG procedure than under the ALG procedure. This trend also holds with a higher accumulated depreciation balance through the life of the assets. However, as can be seen by comparing Figure 9 and Figure 11, the trend in the accruals under the ELG procedure compared to the ALG procedure with this life lengthening demonstrates that the ALG procedure provides for a much more balanced recovery of the asset costs over their lives. To facilitate this comparison, I have combined these two figures into the following figure:

Figure 13 – Comparison of ALG and ELG accruals under Madsen Example 1 and 2



As shown above, the grey line in the above figure remains more consistent with the original blue line which reduces potential rate volatility when there is a change in life estimate for an account. Put differently, the ELG procedure exacerbates the required correction in the depreciation accrual in later years, while the ALG procedure already mitigates some of the expected change by being more moderate at the outset.

Q: Please provide your concluding remarks on the results of the examples highlighted above.

A: Regardless of the depreciation procedure employed, neither procedure will perfectly mirror the actual lives of the assets. This is because the assets being considered in this case are physical in nature and subject to numerous forces of retirement which cannot be perfectly predicted by any expert. The goal should be to ensure the depreciation expense reflected is gradual and moderate, while not unduly shifting the burden of costs from one generation to another. As explained earlier, this goal is best achieved by the ALG procedure.

The above examples provide an illustration of the theoretical differences between the two procedures, but the example operates on the assumption that in year 1 there is a perfect forecast of the lives of each of the assets. If the first asset does not actually retire until year 10 (or year 7, or year 8, or any year beyond year 5), then under the ELG procedure, much more depreciation is claimed on the assets with the first asset having been fully depreciated

1 by year 5. This would result in a need to recalculate the depreciation expense as shown in
2 Example 2 and begin amortizing a difference through the remaining life of the assets. The
3 difference that would need to be amortized would be greater under ELG than under ALG.

4 The point is that under both procedures there is a potential for error. This potential for error
5 is acceptable and expected when determining an estimate for depreciation expense related
6 to assets with lives that are often measured in decades. Under conditions where electric
7 utility lives are generally lengthened on average, the ELG procedure will persistently over
8 recover the depreciation in earlier years only to return that over collection to future
9 generations of customers who already benefit from lower depreciation expense as shown
10 above. The opposite is also true.

11 While the ELG depreciation procedure assumes that each asset is separately depreciated
12 within its equal life group, the actual physical assets owned by NS Power are not separated
13 into such distinct groups. For example, under the ELG procedure, assets expected to
14 survive 1 year are grouped together within the same vintage and account, and assets that
15 are expected to survive 2 years are similarly grouped and so on.

16 NS Power does not separately identify in its accounting records each asset that is included
17 in each category and depreciate those assets based on their specific group and rate. Rather,
18 NS Power has a single depreciation rate for each account and does not physically identify
19 and tag each asset in its system to group that asset into an equal life group with other like
20 assets. Such an effort would be exceptionally costly, subject to significant judgment, and
21 not likely to be much more accurate relative to a more general approach to depreciating
22 assets.

23 Even if NS Power tracked and depreciated each asset separately, aggregated those assets
24 into distinct equal life groups, and finally tracked the depreciation of each group using the
25 rate required by the ELG procedure, there would still be differences between the detailed
26 depreciation estimate calculated on the actual group of assets and the notional equal life
27 groups. This difference would exist unless the actual depreciation expectation based on
28 physical asset tagging and tracing perfectly matched the selected Iowa curve for the entire
29 life of the assets. This is, of course, mathematically impossible.

1 For this reason, no depreciation estimate will ever be perfect, including any estimate
2 derived using the ELG or ALG procedures. The test that the Board should employ is
3 whether the result provides for a reasonable estimate of the recovery of the forecast
4 depreciation expense over the expected useful life of the assets.

5 This test is met by both the ELG and ALG procedures. That the ELG procedure is more
6 mathematically accurate, while theoretically true, fails to account for the entire service life
7 of the assets, or that in practice this result may not play out. If it does not, then current
8 customers under the ELG procedure are far more likely to overpay on existing assets in
9 place than are future customers. Put differently, the increased theoretical accuracy of the
10 ELG procedure, if it is not reflective of the actual retirements, will in fact increase the
11 volatility of the depreciation expense and the intergenerational equity experienced between
12 customers, rather than reduce it. This is particularly the case where investment is expected
13 to grow in the future, as it is for NS Power. I further discuss the implications of the
14 balancing of intergenerational equity by shifting from the ELG procedure to the ALG
15 procedure in the context of the securitization proposal in Section 3.1.8.

16 In summary, no depreciation expert can conclude definitively that depreciation rates
17 determined under the ELG procedure will provide for a better reflection of the actual
18 service life of the assets over their entire life than an alternative procedure such as ALG.
19 To do so would require perfect knowledge of the future that does not exist. Regardless of
20 whether the ALG or ELG procedure is used in combination with the remaining life
21 technique, each depreciation estimate will be subject to change in the future. For this very
22 reason, frequent updates to depreciation studies are best practice and to be expected.

23 **3.1.3 Use of simulated retirements by Gannett Fleming and its impact on** 24 **reliance on the ELG procedure**

25 **Q: What is simulated plant data and retirements in the context of estimating**
26 **depreciation expense?**

27 **A:** As explained in the NARUC Manual – Public Utility Depreciation Practices as pages 81 to
28 109, simulated data is used when the depreciation analyst only possesses unaged data. It is
29 customary in these situations to simulate the “age” of the unaged data rather than analyze
30 unaged data from a depreciation perspective.

The NARUC Manual at page 109 also outlines some of the limitations of relying on simulated data, including the following:

Limitations

As discussed above, the aging of annual activity begins with an initial age distribution of survivors. The development of the initial age distribution may be a problem if the vintage additions that would most likely contribute to the initial age distribution are not available.

A common complaint about the STAGE model is that it does not provide an indication of curve shape; instead, the curve shape must be specified. The use of the SPR model to assist in developing a curve shape is popular but may distort the STAGE results if the SPR model is applied to accounts for which the assumptions of the SPR model are not satisfied. It is suspected that specifying curve shape may be tantamount to predetermining the results. [Emphasis added]

Q: Is reliance on simulated plant data reasonable?

A: Yes. Indeed, it is preferable to reliance only on unaged data, which provides no indication of the age of the retirements or survivors, and thus is of no significance to the actuarial analysis that is completed as part of a depreciation study. However, as noted by the NARUC Manual there are limitations on placing undue reliance on simulated plant data in lieu of aged data.

Q: Does Gannett Fleming rely upon simulated retirements for its depreciation study?

A: Yes. As explained at pages II-22 and II-23 of Gannett Fleming's depreciation study (Appendix 8A):

The computed mortality method of life analysis as used in this study is a procedure for statistically aging annual retirements of property and analyzing the statistically aged retirements by the retirement rate method. In this procedure, an aged plant balance is developed for the year prior to and for each test year during the given term of comparison. Each given

1 balance is aged by a simulation procedure which applies a series of
2 successive survivor curve trials using a specified Iowa type curve. The
3 Iowa type survivor curve specified for each account is based on judgment
4 incorporating the results of the simulated plant record analyses, a
5 knowledge of the property, and the type curves estimated for the account
6 in other electric companies. Each trial consists of constructing a specific
7 survivor curve at one-year intervals beginning with age $\frac{1}{2}$. From this curve,
8 survivor ratios are computed and applied, by vintage, to the previous year's
9 aged ending balance and the current test year's given gross addition. The
10 resultant aged surviving balances also produce the aged retirements which
11 are the differences between successive aged balances. The aged data are
12 then analyzed by the retirement rate method as described above.

13
14 Additionally, in NS Power's response to Emrydia's Information Request IR-9, Gannett
15 Fleming stated the following when asked to confirm that it relies on simulated plant data:

16 Confirmed. The life analysis performed by Gannett Fleming uses
17 simulated aged balances and retirement data for transmission, distribution
18 and general plant accounts. Company specific unaged retirement data for
19 the years 1942 through 2023 were statistically aged using the computed
20 mortality method. Once the initially unaged data are statistically aged (i.e.,
21 the computed mortality data), the statistically aged data can be analyzed
22 using actuarial techniques. The process of statistically aging unaged data
23 reflecting actual plant additions and retirements is called the computed
24 mortality method and has been used and accepted in Nova Scotia (and in
25 other jurisdictions) for many years. The life tables supporting the estimated
26 survivor curve are set forth in the depreciation study report in Part VII,
27 Service Life Statistics.

28 Aged data was used in the selection of interim survivor curves for
29 Production Plant related to Steam, Hydro and Other Production assets.

30

In NS Power's response to Emrydia's Information Request IR-10, NS Power provided the following further information regarding when NS Power began tracking aged data for its assets:

The year in which NS Power began tracking actual retirement data for Production Plant varies based on the electricity generating station type, as noted in the table below:

Generating Station Type	Year
Steam Production	1952
Hydraulic Production	1920
Other Production – Combustion Turbines (CTs)	1973
Other Production – Combined Cycle (CC)	2003

For most transmission, distribution and general plant accounts, the initial recording of unaged plant activity (additions, retirements, etc.) began in 1942. All the transmission, distribution and general plant accounts were studied for life analysis purposes using simulated aged data for the period 1942-2023. NS Power began tracking aged data for this group in 2009 with the implementation of a new fixed asset system, but the data was not used in the service life analysis.

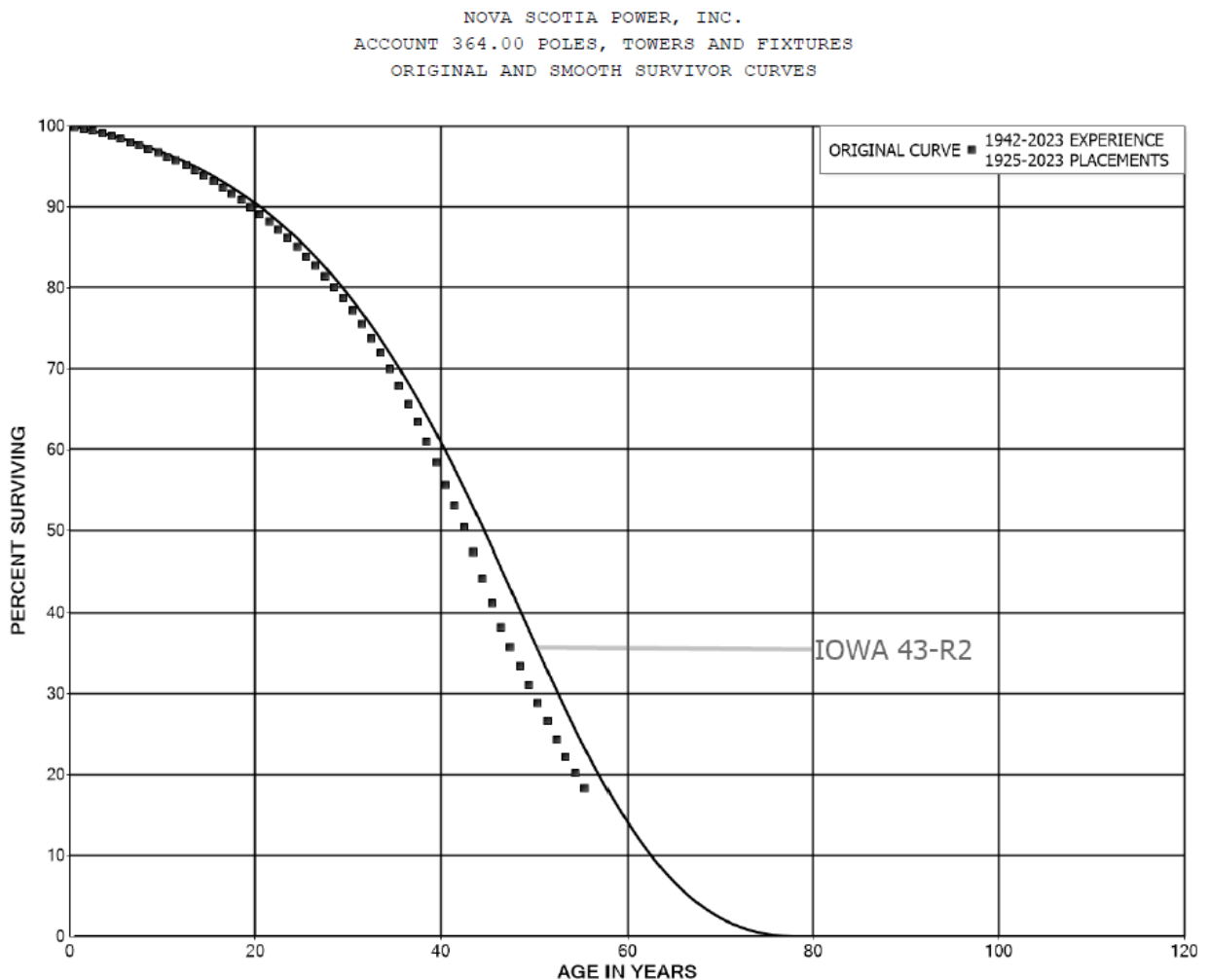
As explained above, NS Power began tracking actual retirement data for Production Plant between 1920 and 2003. For transmission, distribution and general plant accounts, NS Power began tracking aged data in 2009. Prior to these periods, simulated data would have been created and broadly Gannett Fleming confirmed that its studies were based on simulated aged data for these accounts from 1942 to 2023.

Q: Does reliance on simulated retirements have an impact on whether the ELG procedure should be relied upon?

A: Yes. While the ELG procedure can still be used with simulated plant data, the ELG procedure, as explained earlier, places significant emphasis on the retirement data, actual or simulated, in the calculation of a depreciation rate. Certainly, the ELG procedure relies much more on the fit of the observed retirement data to the selected Iowa curve than the ALG procedure does. This is because the ELG procedure calculates the depreciation of each group based on the selected Iowa curve, not the observed retirement data. Thus, it stands to reason that the more reliable the retirement data is (i.e., more reflective of the actual historical pattern of retirements), the more accurate the ELG procedure may be based on those results.

To illustrate the difference between reliance on simulated aged data and tracked aged data, I have provided two figures below. The first is the proposed Iowa curve for Account 364.00 for NS Power which is provided at page VII-44 of the Gannett Fleming depreciation study (Appendix 8A):

**Figure 14 – Gannett Fleming recommended Iowa 43-R2 curve for Account 364.00
Poles, Towers and Fixtures for NS Power**



As explained earlier in the quote from Gannett Fleming to the response to Emrydia's Information Request IR-10, the retirement data, depicted by the squares on this figure, is simulated data. For this reason, it is observable that the retirement data appears to closely approximate the selected survivor curve with minimal variation throughout the full curve until after 50 percent surviving.

Conversely, the following figures are from a Concentric Energy Advisors (Concentric) depreciation study, recently filed in Matter EL-003-2025 for New Brunswick Power Corporation (NB Power) for Poles (Account 130.00) and Fixtures (Account 150.00):

Figure 15 – NB Power aged retirement data and Iowa curve for Account 130.00

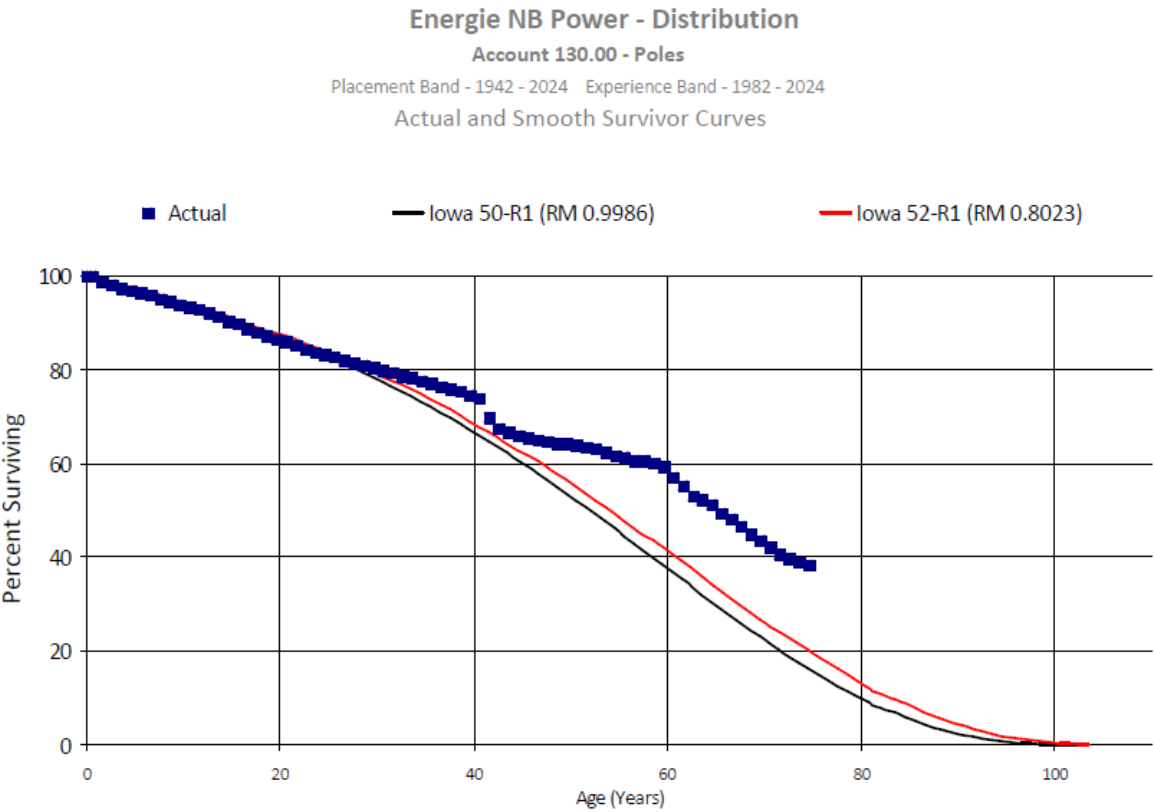
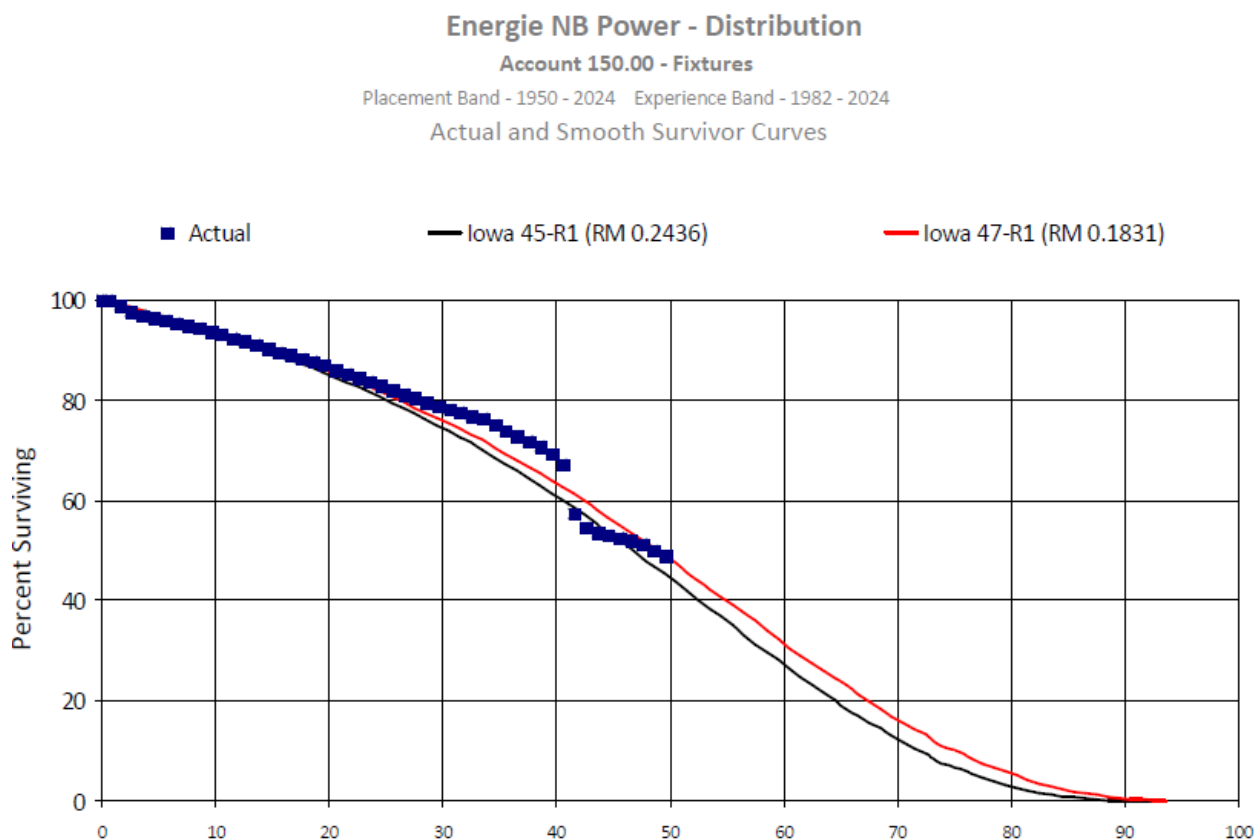


Figure 16 – NB Power aged retirement data and Iowa curve for Account 150.00



I have used NB Power as an example as both NS Power and NB Power have closely related operations in several areas. I have also testified on depreciation-related matters before the New Brunswick Energy and Utilities Board on several occasions. First, I note that NS Power and NB Power do not account for their costs the same. That said, the combined investment in these two accounts for NB Power is approximately 24%.⁵ Comparatively, NS Power's reported costs for account 364.00 are \$646,990,061 per page VI-5 of the Gannett Fleming report (Appendix 8A), which is approximately 30% of the \$2,137,686,386 of total depreciable distribution plant reported on the same page. Thus, while I cannot say these accounts are perfectly representative of one another, they do

⁵ See Matter EL-002-2025, Exhibit NBP 1.67 PDF page 59, addition of \$162,135,009 and \$211,076,315 for account 130.00 and 150.00, respectively, against total distribution depreciable plant of \$1,370,909,812.

1 reflect a significant portion of the same investment in these comparable distribution
2 accounts.

3 NB Power, to my knowledge, does not rely on simulated plant data. As shown by the
4 figures above, the aged data reported by NB Power against the proposed Iowa curves
5 suggests that there is significant variation between the actual retirement data and the
6 selected Iowa curve. This is common when actual aged data is available. It is equally
7 apparent that the simulated aged data relied upon by Gannett Fleming has far less
8 variability which may be leading Gannett Fleming to arrive at certain conclusions that
9 would not be supported if actual aged data were present.

10 Setting aside operational and geographic differences between the two utilities, of which
11 there are admittedly potentially some, I note that NB Power for the equivalent assets based
12 on its own observed retirement history is proposing lives of 52-R1 for Account 130.00
13 Poles and 47-R1 for Fixtures. Both of these estimates appear to be conservative relative to
14 the observed retirement data. Nevertheless, NB Power has proposed life extensions for
15 these accounts, and in both cases the life-curve being proposed is significantly higher than
16 the 43-R2 curve proposed by NS Power.

17 These results signify why reliance on simulated plant data may result in recommendations
18 that are predetermined by the data. Before the Board is evidence of two utilities, operating
19 in somewhat similar geographic locations, with significantly different proposed lives for
20 assets that likely have quite similar operating conditions and characteristics considering the
21 somewhat integrated nature of the two systems.⁶ Notwithstanding, based on the ELG
22 procedure, NS Power is proposing to accelerate depreciation expense in Nova Scotia at a
23 rate that significantly exceeds the rate proposed by its neighbor, and a utility that I
24 understand Nova Scotia Power collaborates with on electric projects.

⁶ For clarity, this is not a definitive statement. However, when assessing peer utilities to compare NS Power to, NB Power and other maritime utilities would be reasonable peers to compare to from a depreciation perspective.

1 For all these reasons, the use of the ELG procedure exacerbates the potential error when
2 simulated aged data is relied upon as the conclusions that are drawn are less likely to be
3 based on the actual history of retirements had they been tracked.

4 **3.1.4 Both the ALG and ELG procedure are acceptable for estimating**
5 **depreciation expense, but only one procedure, the ALG procedure,**
6 **provides for a gradual and moderate level of depreciation expense**
7 **under changing circumstances**

8 **Q: Are ALG and ELG both acceptable procedures to use to recognize depreciation**
9 **expense?**

10 A: Yes. Both ELG and ALG are used in North America and are also commonly employed and
11 accepted by regulators in Canada. The ALG procedure is much more common in the
12 United States as are other methods of depreciating assets. I have been involved in several
13 recent cases in the United States and Canada where requests to convert from the ALG
14 procedure to the ELG procedure have been denied. This includes Manitoba, Ontario, New
15 York, and Mississippi, as well as other jurisdictions. I have not witnessed a regulator
16 approving use of the ELG procedure for an electric utility unless it is already in place
17 currently (i.e., continuation of its use).

18 The purpose of a depreciation procedure is to develop a reasonable and systematic estimate
19 of the consumption of the value of an asset over time. This estimate is developed in
20 conjunction with a depreciation method (i.e., straight-line, declining balance, or unit of
21 production) and technique (i.e., remaining life and whole life) to determine the amount of
22 depreciation expense to record for an asset. I discussed this process above.

23 Notwithstanding the above, only the ALG procedure provides for a more gradual and
24 moderate recovery of depreciation expense, which allows for some moderation of potential
25 changes in the depreciation recovered over the life of the assets, particularly as lives are
26 lengthening.

3.1.5 Pros and cons of the ALG and ELG procedures

Q: What are the pros and cons of the ALG and ELG procedures?

A: As discussed earlier it is impossible for any depreciation expert to conclude that one depreciation procedure will, with certainty, provide for a better and more accurate recovery of depreciation expense over the actual life of the assets. The ELG or ALG procedure may provide a better estimate for certain individual accounts and overall, after a review of all available data upon the conclusion of the lives of all assets. However, any result will simply be by happenstance. For this reason, it is best to focus on the mechanical considerations of each of the procedures, and in any event, I already acknowledge above the theoretical advantage the ELG procedure has in the determination of depreciation expense estimates.

First, I will review the pros and cons of the ELG procedure followed by the pros and cons of the ALG procedure.

- **ELG procedure pros:**

- **Accuracy** – The ELG procedure is dependent on the selected survivor curve, which can significantly influence the amount of depreciation expense. For example, shifting a curve from a 15-R2.5 curve to a 15-R2.0 curve may provide for a refined amount of depreciation expense and increase accuracy. This permits more variation in the depreciation expense charge than is permitted under the ALG procedure.
- **Improved cash flows** – The ELG procedure accelerates the collection of depreciation expense when a utility is building its rate base investment, thus improving cash flow metrics in the short-term. While depreciation is a non-cash item, its inclusion in rates improves cash revenues, and thus improves overall cash flow.

- **ELG procedure cons:**

- **Variability** – Differences in the selected survivor curve can have significant impact on the depreciation expense in a negative manner as well. Assuming a 15-year average life but selecting either an L1.0, S1.0 or R1.0 Iowa curve

1 can have a material impact on the amount of depreciation expense charged
2 and the timing of that expense despite the consistent use of a 15-year
3 average life. While this can improve accuracy, it can also increase
4 inaccuracy if the curve is not reasonably reflective of the future retirement
5 patterns for the assets. It can also create significantly greater period to
6 period variability due to simultaneous changes in life estimates and curves.

- 7 ○ **Complexity** – The ELG procedure is a complex procedure to employ
8 requiring a significant number of detailed calculations which are made
9 easier by complex computer models. Given the current processing power of
10 many PCs and laptops, this is not a significant limiting factor in adopting
11 the ELG procedure. However, the ELG procedure can continue to be
12 difficult for some parties to understand if they are unfamiliar with
13 depreciation procedures, the derivation of Iowa curves, and the importance
14 of retirement data. It is unlikely that many customers of NS Power will
15 understand the calculations required by the ELG procedure and why those
16 changes are having an impact on the rates they pay. To that end, I note one
17 of the key rate design criteria is understandability. While this generally
18 applies to the rates themselves, I consider it important that the factors
19 contributing to those rates also be understandable for customers to the best
20 extent possible.

- 21 • **ALG procedure pros:**

- 22 ○ **Simplicity** – The ALG procedure is simple to apply and understand.
23 Complex models are not required to understand or perform the individual
24 calculations. As explained earlier, if a 45-R1 or 45-L2 life curve is selected
25 for an account, under both conditions the assets will be depreciated over 45
26 years.
- 27 ○ **Less potential volatility** – Changes from year-to-year in the retirement data
28 are less likely to influence a change in the ALG procedure unless those
29 changes suggest a change in the average service life.

• **ALG procedure cons:**

- **Lower cash flows** – Cash flows under the ALG procedure will be lower as the non-cash depreciation charge is reduced as compared to the ELG procedure, at least in the earlier years of investment. In the later years the depreciation charge would be higher at least notionally.
- **Accuracy** – The ALG procedure does not result in significant variation due to the selection of the survivor curve, and thus tweaks or refinements to the amount of depreciation expense charged may not be as easy to implement.

Regardless of the procedure selected, there are pros and cons. No single procedure will be perfect, and no single procedure can ensure the forecast depreciation expense will be perfectly representative of the actual depreciation expense. Indeed, the pros of the ALG procedure are the cons of the ELG procedure, and vice versa, which makes the selection of the proper procedure based on these factors important.

As a final point, the amount of depreciation expense forecast to be recovered under the ELG procedure increases as compared to the ALG procedure. Some parties may prefer a lower current depreciation expense to permit additional time to refine the estimate over the long lives of the assets. Other parties may prefer an acceleration of the depreciation expense to permit additional recovery in the near term, reduce debt and equity financing levels in the short to long-term and permit less potential for under recovery of investment. That said, the Board should consider the potential impacts of accelerating depreciation on the incentives to the utility.

As this Board understands, the return on investment for a utility is dictated by the level of its unrecovered net investments in the utility. This is commonly referred to as the utility rate base. Some utilities may be incentivized to spend more on new capital if the recovery of their existing investment is being recovered too quickly. Notably, recovery of existing investments, as explained earlier improves cash flow, and potentially allows a utility to replace that infrastructure without issuing new debt or equity. Indeed, many regulated utilities are strongly disincentivized to pay dividends from the recovery of capital particularly if those payments erode the level of equity invested to support rate base.

1 As a simple example, assume a utility has \$1 billion in rate base and is recovering that rate
2 base through depreciation at a rate of \$100 million per year. Under this scenario, in order
3 for the utility to make the same amount in return next year as it did this year, the utility
4 must reinvest no less than \$100 million in its assets to replenish the recovered rate base. If
5 it wants to earn more, it must spend more. Conversely, if the utility is recovering only \$50
6 million in rates per year, then it needs only spend \$50 million to earn the same amount.

7 In my opinion and based on my experience working in two regulated utilities, this
8 incentive is strong. I do not recommend the Board discount this incentive for a utility.
9 While a prudence assessment is of course an important tool of the Board, it is often a
10 difficult test to meet, which is why it is important to ensure that the estimate of
11 depreciation expense is as reasonable and accurate as possible, but also not overstated. This
12 goal is achieved by the ALG procedure.

13 Ultimately the selection of a reasonable depreciation expense is heavily dependent on the
14 assessment of intergenerational equities between generations of customers. The total
15 amount of depreciation expense is unchanged over the life of the assets as only the amount
16 collected in each year under the procedures is changed. Therefore, whether the increase in
17 depreciation expense is a positive or negative consequence of adopting the ELG or ALG
18 procedures is subjective.

19 The ALG procedure lowers depreciation expense in the test period and provides some
20 ability for parties to “wait and see” what happens in the future before accelerating the
21 recovery of current period depreciation expense.

22 **3.1.6 Conclusion on the use of the ALG or ELG procedure for NS Power**

23 **Q: Please provide your recommendation in respect of the proper depreciation procedure**
24 **for NS Power.**

25 A: I recommend that the Board direct NS Power to utilize the ALG procedure for all assets. I
26 am also supportive of continuing to use the remaining life technique at this time.

Q: What is the impact of your recommendation on the applied for rates of NS Power in the test years.

A: The following table was provided by NS Power in response to Emrydia's Information Request to NSPI IR-27:

Table 4 – NS Power table summarizing the impacts of the ALG procedure by group of assets for 2026 and 2027

Depreciation and Accretion Expense			
(\$ Millions)	Per GRA Settlement Agreement		Per Depreciation Rates calculated under ALG
	2026	2027	2026
Steam	48.0	49.9	48.7
Gas Turbine	9.9	10.6	8.9
Wind Turbine	13.3	13.3	13.3
Hydro	16.6	17.3	17.9
Solar	0.1	0.1	0.1
Transmission	47.7	52.1	46.7
Distribution	85.4	89.6	64.6
General Property	61.5	67.9	59.0
Total	282.4	300.8	259.1

As shown above, a transition to the ALG procedure for NS Power would either increase or decrease the amount of depreciation expense recovered for certain categories of assets in 2026 and 2027. For example, Hydro assets experience an increase in depreciation, while transmission and distribution assets experience a decrease. Overall, these changes amount to \$23.3 million and \$24.3 million, respectively. NS Power did not provide me with its detailed calculations of these impacts and thus I was unable to verify the accuracy of the calculations. However, based on my review of the overall magnitude of the ALG calculations by account from Gannett Fleming, I consider these impacts to be reasonable.

Q: Do you consider this reduction in depreciation to be reflective of a gradual and moderate reduction in depreciation expense?

A: Yes. The assessment of depreciation expense must be on an account-by-account basis. At this level, the changes are not so drastic as to imply that the principles of gradualism and moderation are being violated by the change in procedure.

As further evidence of the reasonableness of this change, as I discuss further below, the book accumulated depreciation reserve for all accounts at NS Power is \$3,516,988,310.

1 This amount is detailed in Exhibit DMM-3, which was created based on the information
2 provided by NS Power to Emrydia IR-7. The book accumulated reserve reflects the amount
3 of depreciation already recovered in rates from customers and reflects both the
4 accumulated depreciation and net salvage to date. We can compare this balance to the
5 calculated accumulated depreciation reserve balance, which is the amount that NS Power
6 should have recovered in rates based on the applied for depreciation and net salvage
7 parameters. This calculation varies significantly based on the chosen depreciation
8 procedure.

9 Again, referring to Exhibit DMM-3, the calculated accumulated depreciation reserve under
10 the ALG procedure for all assets is \$3,620,097,681. This means that NS Power has under
11 collected its depreciation and net salvage under this calculation by \$103,109,371. This is a
12 significant amount, but it is only 2.9 percent of the total book accumulated reserve balance
13 of \$3,516,988,310. This is generally referred to as a reserve deficiency.

14 Comparatively, the calculated accumulated depreciation reserve under the ELG procedure
15 for all accounts is \$4,057,451,300, which means that the difference from the book reserve
16 is \$540,462,990, or a difference of 15.4 percent.

17 What these two amounts show the Board is that if the ELG procedure is chosen this
18 difference will need to be recovered from future customers putting further upwards
19 pressure on rates in later years. On the other hand, while still in a reserve deficiency, the
20 ALG procedure results reflect a much closer result compared to the book accumulated
21 depreciation reserve, which again reflects the more moderate nature of the ALG procedure.

22 It is reasonable to expect that there would be changes in depreciation expense when the
23 procedure is changed as it is a fundamental driver of the amount of depreciation that will
24 be recovered. Differences in the depreciation between the two procedures will be adjusted
25 and normalized over the remaining life of the assets due to the use of the remaining life
26 technique.

Q: Do you recommend a phase in of the change from the ELG to ALG procedure in the test year?

A: No. As explained above, I consider this change to be reasonable, and the impacts on overall depreciation to be gradual and moderate. However, if the Board felt it necessary, then a phase-in of the change could be completed over a period of two years to mitigate some impact of the rate change on customers. For example, half the reduction calculated above could be reflected in 2026 and the full reduction in 2027. I do not recommend this as it would require varying the depreciation rates by year and would increase administrative costs for NS Power, while delaying the full transition to a far superior procedure for NS Power to calculate depreciation expense for its customers.

3.1.7 Impact of change in procedure on the difference between calculated and book accumulated depreciation reserves

Q: What is the book and calculated accumulated depreciation reserve?

A: As briefly mentioned above, in preparing a depreciation study, a depreciation expert ordinarily calculates both the depreciation rates for each asset type as well as the calculated accumulated depreciation reserve for each asset. These calculations serve to assist the depreciation expert in identifying any variances between the calculated accumulated depreciation reserve and the book accumulated depreciation reserve. The book accumulated depreciation reserve reflects the actual accumulated depreciation recovered for each asset over time. Therefore, the difference between these two amounts reflects either an over or under collection of depreciation expense to date.

Q: Do you recommend any special adjustments to the depreciation reserve balances at this time?

A: No. However, I do note from the following table, presented as Exhibit DMM-3, that the reserve deficiencies and surpluses vary considerably between different asset types:

Table 5 – Exhibit DMM-3 Comparison of Book and Calculated Accumulated Depreciation Reserve by Account Under ALG and ELG

NOVA SCOTIA POWER, INC.
COMPARISON OF BOOK RESERVE AND CALCULATED ACCRUED DEPRECIATION AS OF DECEMBER 31, 2023

DEPRECIABLE GROUP (1)	BOOK RESERVE AS OF DECEMBER 31, 2023 (2)	CALCULATED ACCRUED DEPRECIATION ALG PROCEDURE (3)	DIFFERENCE ALG PROCEDURE (4)	CALCULATED ACCRUED DEPRECIATION ELG PROCEDURE (5)	DIFFERENCE ELG PROCEDURE (6)
DEPRECIABLE PLANT					
310.99 STEAM PRODUCTION PLANT					
TOTAL STEAM PRODUCTION PLANT	1,189,415,418	1,559,332,573	(369,917,156)	1,638,670,269	(449,254,852)
330.99 HYDRAULIC PRODUCTION PLANT					
TOTAL HYDRAULIC PRODUCTION PLANT	167,856,071	190,979,517	(23,123,447)	255,756,492	(87,900,422)
340.96 SOLAR PRODUCTION PLANT					
TOTAL SOLAR PRODUCTION PLANT	98,009	97,340	669	109,111	(11,102)
340.99 OTHER PRODUCTION PLANT					
TOTAL OTHER PRODUCTION PLANT	184,208,655	201,904,942	(17,696,287)	219,308,771	(35,100,116)
TRANSMISSION PLANT					
TOTAL TRANSMISSION PLANT	513,076,344	495,195,600	17,880,744	572,621,573	(59,545,229)
DISTRIBUTION PLANT					
TOTAL DISTRIBUTION PLANT	1,107,501,816	839,394,608	268,107,208	1,011,603,059	95,898,757
GENERAL PLANT					
TOTAL GENERAL PLANT	287,433,514	265,794,617	21,638,897	291,983,541	(4,550,027)
FULLY AMORTIZED GENERAL PLANT ^d					
TOTAL FULLY AMORTIZED GENERAL PLANT	67,398,483	67,398,483	-	67,398,483	-
TOTAL DEPRECIABLE PLANT STUDIED	3,516,988,310	3,620,097,681	(103,109,371)	4,057,451,300	(540,462,990)

Under both the ALG and ELG procedures, most of the reserve deficiency rests in the Steam Production Plant accounts. Comparatively, most of the reserve surplus rests in the Distribution Plant accounts.

Regarding the Steam Production Plant, while NS Power confirmed that its depreciation study recommended a rate of 6.47% for these assets at page 40 of its GRA (Figure 8-1), the applied for rate is 2.62% per page 41 (Figure 8-2). This is a significant change for an account that represents the largest account balance for NS Power. Point Aconi, which represents one of the largest calculated accumulated depreciation balances under the ALG procedure of \$444,292,346 (See Exhibit DMM-3) is one of the assets NS Power plans to securitize per page 52 of the GRA. The total reserve deficiency for these assets is also \$200,582,122 under the ALG procedure, which represents more than half of the combined reserve deficiency for Steam Production Plant of \$369,917,156. Thus, if these assets and the relative deficiency are securitized as is proposed by NS Power, then the differences would be removed from the above Table, with the remaining reserve difference being a reserve surplus of nearly \$100 million. Adding in Trenton, Point Tupper Marine Terminal, Sydney International Coal Pier, and steam general assets would further reduce the reserve deficiency for Steam Production Plant and shift the overall reserve difference under the

1 ALG procedure to a large reserve surplus. For clarity, the reserve deficiency for these
2 assets does not go away. It must still be addressed by future customers through
3 securitization, the context for which I discuss in Section 3.1.8.

4 In summary, the currently reported reserve surpluses and deficiencies are unlikely to be
5 indicative of the future expected reserve surpluses and deficiencies once certain asset
6 balances are securitized and if there is an ultimate determination not to salvage certain
7 assets based on current estimates.

8 For these reasons, I recommend that the Board direct NS Power in its next GRA to file an
9 updated depreciation study showing the revised calculated and book accumulated reserve
10 balances for each account after considering the above factors. This information is required
11 because if the overall revised balances indicate a large reserve surplus under the ALG
12 procedure, then it is possible that alternative means of recovering that surplus could be
13 assessed by the Board in the future. Notably, if much of the reserve deficiency for Steam
14 Production Assets is reduced, then as noted earlier, the remainder of the accounts are
15 driven largely by Distribution Assets, which contain a significant reserve surplus.

16 I also would not be opposed to the Board ordering this information to be filed as part of a
17 compliance filing following the finalization of the securitization, or as part of a future
18 separate application. Indeed, this alternative may eliminate the need for the filing of a full
19 depreciation study in the next GRA, which I admit would be a short period of time between
20 the filing of the current depreciation study, notwithstanding that it was prepared based on
21 December 31, 2023 data.

22 **3.1.8 Discussion of intergenerational impacts of changing to the ALG** 23 **procedure in the context of the proposed securitization**

24 **Q: Does NS Power's proposal to securitize certain general plant investment impact**
25 **intergenerational equity for customers?**

26 A: Yes. Depreciation theory suggests that these costs should be recovered over their
27 remaining useful life (i.e., through to approximately 2030) from the customers that benefit
28 most from those costs. Securitization shifts this burden to future customers. Put differently,
29 depreciation expense would otherwise need to be orders of magnitude higher than the

\$26.6 million⁷ per year that has been removed from the GRA to recover the remaining investment over the useful lives of the assets.

Q: Does this mean that future customers will pay for depreciation that they should not have paid for?

A: Yes. Mathematically, the consequence of securitization is that future customers must pay for costs which they did not benefit from. The rationale for this shift in burden is largely of a societal and policy nature.

Q: Doesn't your proposal to move to the ALG procedure increase depreciation expense for future customers?

A: Yes. Once again, mathematically the use of the ALG procedure will eventually lead to future customers paying more for depreciation expense than they currently do.

Q: If this is the case, then shouldn't the ELG procedure be maintained to ensure future customers pay less depreciation?

A: No. The shift in the burden of higher depreciation under the ALG procedure will not occur for many years, likely decades, if it ever occurs. It is certainly not imminent. This is because under the ELG procedure, which is currently in place, the amount of depreciation that is recovered in rates will always be higher if the overall investment in an account is growing. This pattern can also be viewed in the context of the overall aggregate investment of all accounts, particularly those with longer service lives.

To illustrate this dynamic, I refer parties to my earlier evidence. Specifically, this trend is perhaps best viewed in the context of Figure 9 and Figure 11 provided above. As noted previously, these figures show a trend where the amount of depreciation recovered under the ELG procedure accelerates at the front end before tapering off in the later years. If NS Power consistently grows the size of its investment, which is a reasonable expectation in the context of heightened demand for electrification, then the result shown in these figures would layer upon itself. The result is a continued higher amount of depreciation expense

⁷ NS Power GRA, page 41, lines 9 to 13.

1 collected from customers in earlier years, with future customers many decades or centuries
2 later paying for the difference.

3 **Q: Are you concerned that your recommendation may result in future generations of NS**
4 **Power customers paying both higher depreciation under the ALG procedure and the**
5 **costs to recover securitized assets?**

6 A: No. On the contrary, I fully expect the opposite result to occur. This is because it is
7 reasonable to expect in the absence of evidence to the contrary, of which I am aware of
8 none, that NS Power will continue to grow, or at minimum sustain its investment.
9 Accordingly, it is highly likely that any future “cross-over” point, where the depreciation
10 recovered under ALG exceeds the amount recovered under ELG, will occur decades if not
11 centuries into the future. It is certainly highly unlikely that it will occur over the period of
12 recovery of the remaining securitized value of the assets. I admit such a scenario is at least
13 notionally possible, but it would take place at a time that investment in NS Power is
14 declining and thus its overall rate base will be in decline leading to lower overall rates for
15 customers as depreciation expense increases. Thus, notionally the increase in depreciation
16 as a result of this cross over would be at least in part offset by lower return on investment,
17 all else being equal.

18 As a final point, I acknowledge that it may be viewed that the ALG procedure shifts
19 depreciation to a future generation. This is false. The result of my proposal is that
20 customers of all generations pay for their fair share of depreciation expense. The ALG
21 procedure achieves intergenerational equity, whereas the securitization proposal causes
22 inequity.

23 **Q: What are the implications then of your proposal to move to the ALG procedure at the**
24 **same time as securitization of NS Power’s assets is occurring?**

25 A: First off, it is imperative that the best depreciation procedure and lives be selected. Other
26 factors in that selection are only relevant after determining the most reasonable level of
27 depreciation expense for a utility. With this caveat, the implications are two-fold.

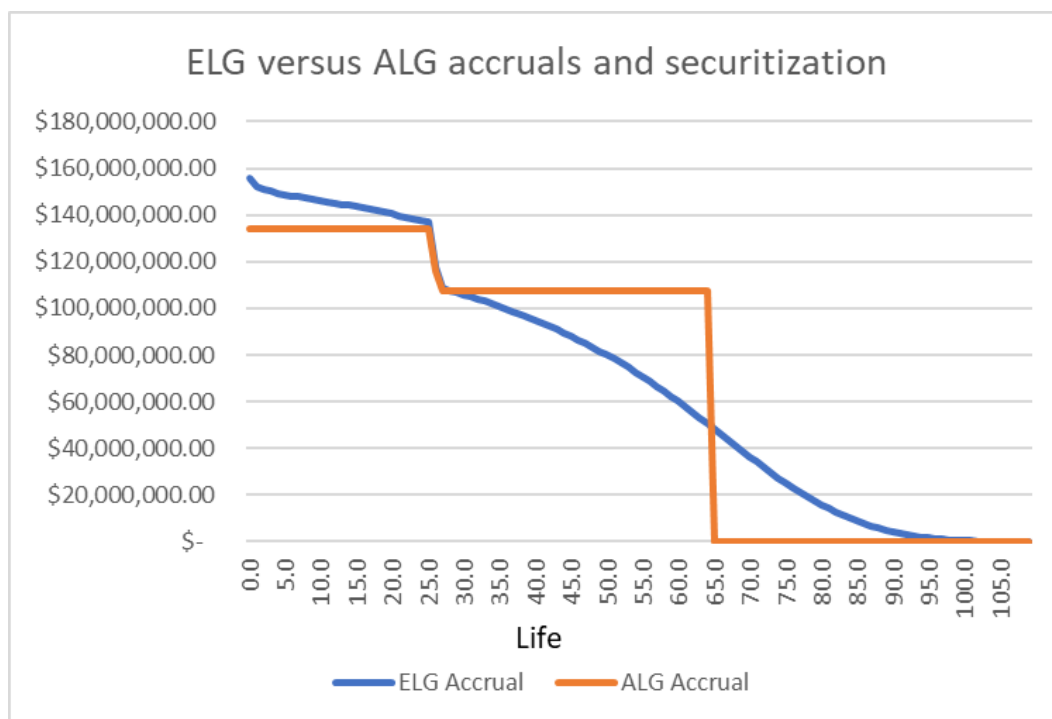
28 First, my proposals will allow for a reduction in depreciation expense collected in rates
29 from customers in the near to medium term, most likely covering the period of recovery of

1 securitized costs. This should provide some mitigation to future customers that will also be
2 required to bear the cost of the securitized assets.

3 Second, my proposal to move to the ALG procedure will reduce near term depreciation,
4 which may allow the Board to choose to accelerate the recovery of the securitized costs at
5 a rate that is faster than it would be able to affordably achieve if the ELG procedure were
6 continued. For example, assuming rates decrease by the amounts I forecast in this
7 evidence, the Board could approve an acceleration in the recovery of costs related to the
8 securitization of \$30 million per year and still not materially alter the revenues from the
9 applied for amounts. This would allow for the resolution of the securitized balance in a
10 timely manner from current customers who are more likely to be the same customers that
11 benefited from the assets that are being retired and securitized. While not ideal, a quicker
12 recovery could, all else being equal, mitigate some of the intergenerational impacts from
13 securitization. For clarity, I am not recommending this as the preferred approach in this
14 case. Before I could make such a recommendation, I would need to fully understand the
15 level of securitized costs, the interest rate on those costs, the level of future anticipated
16 costs and rates for NS Power, and the various options available for recovery.

17 To illustrate the above points, the following figure shows the recovery of a theoretical \$7
18 billion of investment over 65 years under the ELG and ALG procedure, in addition to
19 recovery of the \$700 million of securitized assets at a rate that is consistent with a straight-
20 line approach of \$26.6 million per year. This example, for simplicity, assumes that the
21 assets were all installed in year 1 and no further assets are installed beyond year 1:

Figure 17 – Illustrative recovery of depreciation and securitized costs over 65 years under the ELG and ALG procedure



A few points are important from this figure. First, under both procedures the same amount of depreciation is recovered over the years. Second, if new assets were added under this scenario, then the ELG procedure curve would continue to be perpetually above the ALG curve assuming that the new assets increase the investment in the utility and the average life of the new assets is approximately equal to the current average expected life of 65 years. Finally, the cross over point in this highly simplified example is 29 years. What this means is that the date at which the ALG procedure accruals are higher than the ELG procedure accruals is 29 years out. The securitized costs would be fully recovered from customers by year 26 if the \$26.6 million of annual depreciation was maintained assuming a total unrecovered cost of \$700 million; 26.3 years (\$700 million/\$26.6 million).

In conclusion, while the ALG procedure would shift out recovery of some depreciation to later years than would occur under the ELG procedure that shift is highly likely to occur after the full recovery of the securitized costs which reduces the burden on future customers that must repay those costs. The shift also aligns the remaining depreciation of the installed assets with their reasonable useful lives for all the reasons stated above.

1 Additionally, the shift allows for some moderation in rates for customers that will be
2 required to repay the securitized costs. Finally, the ALG procedure may allow for quicker
3 recovery of the securitized costs than would be possible under the ELG procedure.

4 For all the above reasons, I conclude that adoption of the ALG procedure in the context of
5 the need to securitize certain assets provides for a better result for future customers than
6 would occur under the ELG procedure.

7 **3.2 Recommended changes to applied for lives**

8 **3.2.1 Approach applied in the review of service lives.**

9 **Q: Please summarize the process employed by depreciation experts to select a service life**
10 **and survivor curve for an asset.**

11 **A:** Both the ALG and ELG procedures rely on the selection of an Iowa curve based on several
12 factors, including but not limited to:

- 13 • Visual and mathematical fit of the observed retirement data to the selected
14 survivor curves.
- 15 • Peer data on the average service lives and survivor curves used in other
16 jurisdictions.
- 17 • Discussions with management and operational personnel to understand the life
18 characteristics of the assets and other relevant operating, technical and
19 maintenance details that may impact the lives of the assets.

20 To determine a visual fit to a specific Iowa curve, the expert will review the retirement data
21 for the account against the curve to assess how that data fits against the curve relative to
22 alternatives. Visual fitting is important and can assist in narrowing down the curve type.
23 However, visual fitting also needs to contemplate the underlying retirement data to
24 understand if there is a significant change in exposures, or if the data being fit to the curve
25 is relatively small and thus not representative of the broader retirement data. For this
26 reason, mathematical curve fitting is also important.

1 Mathematical curve fitting is generally performed by taking the difference between each
2 point of the observed data points from the retirement data and the selected Iowa curve.
3 Gannett Fleming defines this process as follows:

4 The curve-fitting portion of Gannett Fleming's depreciation software
5 program matches the stub survivor curves (i.e., from the original life
6 tables) with each member of the Iowa curve family. The curve-fitting
7 results are based on a least squares solution of the differences between the
8 stub curve and the Iowa curve. Survivor data developed by the actuarial
9 analysis and set forth on the original life table are graphed and compared
10 visually and statistically with the Iowa curves. There are two distinct steps
11 in the estimation of service lives and retirement dispersions which must be
12 recognized in the interpretation of the service life analysis results. The first
13 step, life analysis, refers to the application of statistical procedures to
14 determine life and dispersion indications based solely on past experience.
15 The second step, life estimation, refers to the exercise of informed
16 judgment in making sound estimates of service lives and retirement
17 dispersions. Life estimation incorporates known historical experience,
18 estimated historical trends and estimated future trends or events in order
19 to define complete patterns of estimated service life characteristics. The
20 results of the life analyses, performed as the first step, are only one of the
21 relevant factors to be considered during the decision making process of life
22 estimation.⁸

23 Another important exercise is to identify a group of peer utilities that operate assets that are
24 similar in nature to the assets operated by the utility being studied. Once identified, these
25 peers can be used to assess the observed retirement data results. For example, if the
26 retirement data for the account suggests that the best mathematical fit is a 45-S2.0 Iowa
27 curve, but the peers generally have a range of average service lives of between 50 and 80

⁸ 2026-2027 GRA Direct Evidence Appendix 8A, pages III-3 and III-4.

1 years and rely on the R family of Iowa curves, then this may suggest additional discussions
2 with management could be warranted to understand whether the retirement data may be
3 misleading.

4 In my opinion, peer analysis is critical in the case of NS Power, because of its reliance on
5 simulated plant data. This is because the peer data would be largely, based on my
6 experience, based on actual aged data for the same assets. Thus, the peer data for NS
7 Power provides an opportunity to expand the level of data being reviewed to a much larger
8 data set effectively encompassing the data of multiple utilities.

9 The mathematical curve fitting process for NS Power should be assigned significantly less
10 weight for the same reasons. Specifically, the retirement data presented by Gannett
11 Fleming in its report for many accounts is likely not indicative of the actual pattern of
12 historical retirements. This is particularly the case, as noted earlier, where there are
13 inexplicably large differences between the lives proposed by NS Power and those proposed
14 by many peer utilities.

15 Returning to the peer data, I have elected to rely, at least in part, on the peer data provided
16 by Gannett Fleming to inform my analysis. This information was provided in response to
17 2026-2027 GRA EMRYDIA IR-013 Att 01 - Industry Statistics Database. Using Exhibit
18 DMM-4, I have sorted the data into the relevant accounts for NS Power then compared the
19 range of results to those proposed for NS Power for each of the accounts. I will discuss the
20 results of my peer review in further detail below. As Gannett Fleming did not identify who
21 each peer was or explain why each peer was selected, I have also supplemented the peer
22 review with my own peer data, most notably from NB Power. In this regard, I note that NB
23 Power is not one of the utilities listed by Gannett Fleming in its peer review. I assume that
24 is because NB Power uses Concentric for its depreciation studies.

25 The final piece of information relied upon by a depreciation expert is discussions with
26 management and operational personnel to understand the underlying life characteristics of
27 the account. This is also an important exercise as in some cases the historical assets and
28 retirement patterns may not be indicative of future retirement patterns due to a variety of
29 reasons, including but not limited to:

- 30 • Changes in maintenance practices.

- Unusual events in prior years.
- Changes in technology or the resilience of certain assets.
- Changes in other relevant causes of retirement.

I requested copies of the management notes and discussions as part of Emrydia IR-12, and those notes were provided in response to my request. I address those notes as necessary in my life analysis below.

3.2.2 Production plant service life review

Q: Is NS Power proposing a significant alteration to its production plant in service as a result of the securitization proposal in this case?

A: Yes. As explained earlier, at page 52 of NS Power's GRA it states that it is proposing to securitize the net book value of the Point Aconi, Trenton, Point Tupper Marine Terminal, Sydney International Coal Pier, and steam general assets as of December 2025. The original cost of all Steam Production Plant per page VI-4 of the Gannett Fleming depreciation study (Appendix 8A) is \$2,616,967,386. Based on the same reference, the combined original cost of the assets to be moved to securitization (not the net book value) appears to be \$1,143,319,931. Thus, a significant amount of the plant investment is proposed to be securitized in the test years and thus will no longer need to be studied.

Rather than propose changes to the lives of the plant that is proposed to be retired, I am instead recommending that the final proposed recovery of the investment through depreciation be studied as a distinct issue after the costs have been securitized. This approach appears to align with NS Power's response to Emrydia IR-39, reproduced below, which is logical considering that the Board ordered the recovery to be determined only after the transfer:

The unrecovered asset costs transferred to the decarbonization deferral account (DDA) were proposed to continue depreciating at existing rates. The amortization period and annual amortization amounts would be established by the Board in a future GRA proceeding or in another matter as directed by the Board. In effect, the Board decision approved the transfer of costs to the DDA but the recovery of those costs remained to be

1 determined, and therefore, in the interim there would have been no change
2 to the revenue required from customers upon transferring costs to the
3 DDA.

4 **Q: After accounting for the removal of assets related to securitization, which steam**
5 **production assets remain in-service?**

6 A: The following steam production assets will continue to provide service beyond 2030:

- 7 i. Lingan.
- 8 ii. Point Tupper.
- 9 iii. Tufts Cove.
- 10 iv. Port Hawkesbury Biomass.

11 **Q: Please explain the proposals from Gannett Fleming regarding production plant in**
12 **this case.**

13 A: Gannett Fleming explained its approach to determining depreciation for production plant at
14 pages III-7 and III-8 of its depreciation study (Appendix 8A):

15 For Production Plant accounts, the life span technique was employed in
16 conjunction with the use of interim survivor curves. Interim survivor
17 curves reflect retirements that occur prior to the ultimate retirement of the
18 major electricity generating unit or facility. An interim survivor curve was
19 estimated for each functional plant category, inasmuch as the rate of
20 interim retirements differs among functional plant categories. The interim
21 survivor curves estimated for production plant were based on the
22 retirement rate method of life analysis which incorporated experienced
23 aged retirements for the period beginning with the unit's in-service date
24 through 2023. The statistical support for the interim rates of retirement for
25 production plant accounts are set forth in Part VII of the report.

26 The life span estimates for power generating stations were the result of
27 considering experienced life spans of similar generating units, the age of
28 surviving units, general operating characteristics of the units, major

1 refurbishing, and discussions with management personnel, concerning the
2 outlook for the units. The estimated probable retirement dates for each
3 power generating unit were provided to Gannett Fleming by NSPI's
4 management.

5 **Q: Please explain what a life span estimate is.**

6 A: As noted by Gannett Fleming, a life span reflects the period of time that the broader plant
7 will be in service and provide benefits to customers. Throughout this life span the plant
8 may experience interim retirements of certain plant which must be contemplated in the
9 depreciation expense analysis.

10 **Q: Does the Company rely on an Integrated Resource Plan to support its decisions**
11 **around depreciation?**

12 A: Yes. At the following link ([IRP | Nova Scotia Power](#)) NS Power has provided copies of its
13 2020 IRP, its Evergreen IRP Documents, and its 2025 Action Plan and Roadmap, which I
14 have reviewed in detail.

15 **Q: Please confirm the process you applied to the review of production plant.**

16 A: As part of my review, I reviewed the detailed assumptions and Iowa curves proposed by
17 Gannett Fleming, reviewed the IRP and related materials to confirm the life span dates
18 align with the most recent planning information, and reviewed the information obtained by
19 Gannett Fleming from management to support its decisions.

20 **Q: Please summarize your recommendations in respect of production plant.**

21 A: At this time, I do not propose any changes to the proposed lives of the production plant in
22 service. In considering this position, I reviewed the detailed evidence and
23 recommendations of Mr. Jack Pous filed on behalf of Board Counsel, February 9, 2011
24 (NSUARB File-NSPI-P-891). In that case, Mr. Pous expressed significant concerns
25 regarding the proposed lives for certain production plant in place and proposed adjustments
26 to those lives. As one example, at page 17 of his report, Mr. Pous expressed concern with
27 the retirement data for Langan 1 through 4 with a retirement date of 2033 and a life span of
28 48 to 53 years. Mr. Pous noted the potential for 60+ year lives for similar assets but

adopted a conservative approach by recommending a retirement date of between 2033 and 2035 for these assets (page 18 of his report) and a life span of between 50 and 53 years.

In this case, Gannett Fleming is proposing a 65-L1.0 survivor curve for all steam production plant,⁹ and in particular for Lingan a probable retirement date of 2049 for all units except Lingan Unit 2. This reflects a life span of 65 to 69 years, with a life span of 48 years for Lingan Unit 2.

Upon review of the proposed lives, I did have some significant concerns regarding the proposed retirement dates for most plant, excluding hydro production as being 2049, shown below:¹⁰

Figure 18 – Gannett Fleming proposed probable retirement dates and life span for non-Hydro Production Assets

<u>Depreciable Group</u>	<u>Nameplate Capacity Rating, MW</u>	<u>Year in Service</u>	<u>Probable Retirement Year</u>	<u>Life Span</u>
<u>Steam Production Plant</u>				
Lingan Units 1	150.5	1980	2049	69
Lingan Units 2	150.5	1981	2029	48
Lingan Units 3-4	150.5	1984	2049	65
Point Aconi	165.0	1994	2029	35
Point Tupper	150.0	1973	2048	75
Trenton 5	150.0	1970	2029	59
Trenton 6	160.0	1992	2029	37
Tufts Cove 1	100.0	1966	2049	83
Tufts Cove 2	100.0	1973	2049	76
Tufts Cove 3	150.0	1977	2049	72
Tufts Cove 6	50.0	2011	2049	38
Pt. Tupper Marine Terminal		2005	2029	24
Port Hawkesbury Biomass	43.0	2013	2045	32
International Coal Pier		1998	2029	31

⁹ See page VI-4 of the Gannett Fleming Report (Appendix 8A).

¹⁰ See pages III-8 and III-9 of the Gannett Fleming Report (Appendix 8A).

Other Production Plant

Solar Smartgrid	2.0	2019	2051	32
Burnside	96.0	1977	2049	72
Tusket	23.0	1972	2049	77
Victoria Junction	60.0	1976	2049	73

<u>Depreciable Group</u>	<u>Nameplate Capacity Rating, MW</u>	<u>Year in Service</u>	<u>Probable Retirement Year</u>	<u>Life Span</u>
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Other Production Plant

Tufts Cove CT Unit 4	47.3	2003	2049	46
Tufts Cove CT Unit 5	47.3	2005	2049	44
Digby	30.0	2010	2036	26
Nuttby	50.6	2010	2035	25
Canso/Sable	1.5	2022	2039	17
South Canoe	102.0	2015	2040	25
Tupper/Bearhead	22	2023	2035	12

Notwithstanding some improvements in the lives of certain assets from the previous depreciation study, I would be remiss if I did not acknowledge that the retirement of other production plant, like coal, was consistent with the past expectations of Gannett Fleming despite opposition from Mr. Pous. Nevertheless, absent the factors outlined in further detail below, I would ordinarily have recommended longer lives for certain of the Steam Production, Other Production, and Hydro Production Plant in service beyond those recommended by Gannett Fleming.

Of particular concern is that NS Power and Gannett Fleming have provided limited information to support the proposed life spans. Beyond the management estimates and notes it is unclear why certain life spans are recommended. As an example, the following were the notes provided in response to Emrydia IR-12 related to Lingan:

Figure 19 – Gannett Fleming management notes for Lingan

Lingan:

- Lingan – 4 ~150MW Units. Currently burns coal. In-service dates – Unit 1: 11/79; Unit 2: 6/80; Unit 3: 12/83; Unit 4: 6/84.
- Three units at Lingan will have been converted to oil from coal.
- Coal handling equipment retired.
- International Coal Pier – Retire 2029/30. Life tied to Lingan.
- Lingan Units 1, 3, 4 being converted to oil (~2029)
 - Units 1, 3, 4 will be seasonal peaking units (summer / winter)
 - Lingan 2 retired in 2029. Other units are being converted to oil.
 - Conversion work would be one boiler at a time
 - Will take weeks not months to convert.
 - Units 1, 3 and 4 will operate until 2049/50.

The above notes provide no context for why certain assets are planned to retire by certain dates. Instead, the suggestion is that the units will operate as seasonal peaking units using oil as fuel, with limited further rationale for the planned retirement. Nevertheless, I remain optimistic that the lives for many of these assets have improved since the last depreciation study, which is why I do not recommend a further change at this time.

Similarly, many of the hydro plant assets may be able to continue beyond the current life span date of 2066. The following is a snapshot of some of the management notes regarding the hydro assets from Emrydia IR-12 Attachment 1:

Figure 20 – Gannett Fleming management notes for Hydro Assets

- Hydro Investment Plan (HIP)
 - Shows spending at hydro facilities
- Most small hydro units 70 to 100+ years old.
- Will life span all hydro units, except Wreck Cove, Mersey and Tusket over a 40-45 year remaining life period, out to mid 2060's, e.g., 2066, as none of the remaining small hydro plants are planned for permanent shutdown.
- Will recover all remaining undepreciated investment over 40-45 years as most of the cost associated with the initial cost of the hydro plants has already been recovered.

Similar to the notes for Lingan, there is no context provided for why 2066 is a reasonable date particularly considering the Hydro Investment Plan. Notably, NS Power characterized

1 this as “major re-investment and life extension in the Company’s hydro facilities” at page
2 52 of the GRA.

3 Nevertheless, I am mindful of the fact that given the limited evidence provided by NS
4 Power and the many other changes I am proposing, that a wait and see approach through to
5 the next depreciation study and the next IRP would likely be a more pragmatic approach to
6 addressing production plant issues.

7 Finally, there remains significant risks with NS Power’s forward-looking generation
8 forecast, including SMRs, significant reliance on wind and batteries, and other
9 considerations. All of these factors warrant an update as part of a complete IRP prior to
10 recommending major changes in the currently proposed lives. Accordingly, I do not
11 recommend any changes to the currently proposed production plant lives relative to those
12 proposed by Gannett Fleming.

13 **Q: Notwithstanding that you do not recommend an adjustment to production asset lives**
14 **at this time, do you have any other recommendations for the Board to consider?**

15 A: Yes. It is always easier to do the work I do when I have all the relevant information upfront
16 in the original application. This is particularly important for depreciation studies. For this
17 reason, I recommend that the Board direct NS Power to provide at minimum the following
18 information in support of both production plant and mass property as part of its next
19 depreciation study, rather than wait for that information to be inevitably requested through
20 the interrogatory process:

- 21 a. Detailed management notes for each account.
- 22 b. All analysis and studies performed by management for each production asset to
23 confirm the expected life.
- 24 c. All updated IRP documents.
- 25 d. A reconciliation of the lives proposed in the depreciation study to the lives
26 proposed in the IRP.
- 27 e. The peer analysis relied upon by the Company in an Excel file.

3.2.3 Peer data review

Q: Please elaborate on the peer review analysis you completed.

A: As discussed above, the peer analysis I completed was only conducted for transmission, distribution and general property accounts. The peer analysis results are all included in Exhibit DMM-4. The following two tables demonstrate the results of that peer analysis. The first table compares the accounts listed to the peers reported by Gannett Fleming. As I was unable to verify the data provided to approved results (because no names were linked to reported parameters) I also had to conduct my own further analysis. Therefore, the second table includes the results of recent depreciation studies for NB Power, Maritime Electric, and Newfoundland Power. Each of the depreciation studies are filed as Exhibit DMM-5 through 8, respectively, with NB Power having separate transmission and distribution studies.

1 **Table 6 – Analysis of peer results from Gannett Fleming Study**

Account Number	Account Name	Investment at Dec 31, 2023	Percent Investment at Dec 31, 2023	NS Power Life Estimates	NS Power Curve Type	Life Peer Result Average	Life Peer Result Range	NS Power Net Salvage Estimate	Net Salvage Peer Result Average
TRANSMISSION ASSETS									
350.1	LAND RIGHTS - EASEMENTS	100,622,597	2%	80	R5	73	30-85	0	0
353	STATION EQUIPMENT	586,908,962	14%	45	R2.5	51	18-65	-20	-14
354	TOWERS AND FIXTURES	111,028,870	3%	60	S2.5	67	10-85	-40	-30
355	POLES AND FIXTURES	268,176,042	6%	45	R1.5	55	18-75	-60	-48
356	OVERHEAD CONDUCTORS AND DEVICES	178,454,463	4%	45	R3	58	18-72	-20	-42
DISTRIBUTION ASSETS									
360.1	LAND RIGHTS - EASEMENTS, SURVEYS AND CLEARING	118,136,716	3%	65	R5	71	50-90	0	0
362	STATION EQUIPMENT	74,535,144	2%	55	R1.5	52	10-70	-5	-17
364	POLES, TOWERS AND FIXTURES	646,990,061	16%	43	R2	53	20-80	-35	-69
365	OVERHEAD CONDUCTORS AND DEVICES	329,509,672	8%	42	R2	52	10-70	-30	-50
367	UNDERGROUND CONDUCTORS AND DEVICES	75,012,364	2%	42	R3	50	29-70	-25	-31
368	LINE TRANSFORMERS	555,455,934	13%	35	R1	42	10-65	-25	-15
369	SERVICES	149,613,065	4%	48	S2.5	50	10-70	-65	-51
370.1	METERS - AMI	96,761,787	2%	18	S2	16	7-45	-10	-4
373.1	STREET LIGHTING AND SIGNAL SYSTEMS - LED	38,107,176	1%	20	S2	34	7-50	-15	-38
GENERAL PLANT ASSETS									
390.1	STRUCTURES AND IMPROVEMENTS	184,609,960	4%	42	R2.5	67	40-100	-10	-6
397	COMMUNICATION EQUIPMENT	91,516,693	2%	22	R2.5	16	5-45	-5	0
397.1	COMMUNICATION EQUIPMENT - SCADA EQUIPMENT	28,577,987	1%	19	R2	13	8-24	-5	0

2
3

1 **Table 7 – Analysis of peer results from other Canadian geographically similar utilities**

Account Number	Account Name	NB Power Life Estimate	NB Power Curve Type	Maritime Electric Life Estimate	Maritime Electric Curve Type	Maritime Electric Net Salvage	NFLD Power Life Estimate	NFLD Power Curve Type	NFLD Power Net Salvage
TRANSMISSION ASSETS									
350.1	LAND RIGHTS - EASEMENTS	70	R4	70	R5	0	70	R4	0
353	STATION EQUIPMENT	55	R4	58	R3	-15	48	R1	-20
354	TOWERS AND FIXTURES	65	R4	65	R4	-40	52	S0.5	-40
355	POLES AND FIXTURES	60	R3	54	R2.5	-90	52	S0.5	-40
356	OVERHEAD CONDUCTORS AND DEVICES	65	R4	62	R3	-90	60	R3	-40
DISTRIBUTION ASSETS									
360.1	LAND RIGHTS - EASEMENTS, SURVEYS AND CLEARING	35	L1	70	R5	0	NA	NA	NA
362	STATION EQUIPMENT	NA	NA	45	R3	-15	NA	NA	NA
364	POLES, TOWERS AND FIXTURES	47-52	R1	45	R1.5	-65	56	R1.5	-40
365	OVERHEAD CONDUCTORS AND DEVICES	60	R3	50	R2.5	-65	60	R2.5	-40
367	UNDERGROUND CONDUCTORS AND DEVICES	40	R3	50	R3	-15	48	R4	-5
368	LINE TRANSFORMERS	33	R0.5	36	R2.5	-22	42	S1	-10
369	SERVICES	35	R1	48	R3	-65	53	R2	-60
370.1	METERS - AMI	15	R3	22	S2	-2	18	S1	-10
373.1	STREET LIGHTING AND SIGNAL SYSTEMS - LED	37	R1	27	R2	-25	18	O1	-10
GENERAL PLANT ASSETS									
390.1	STRUCTURES AND IMPROVEMENTS	50	R4	40	R1	-10	80	L0	-5
397	COMMUNICATION EQUIPMENT	NA	NA	20	S4	-5	NA	NA	NA
397.1	COMMUNICATION EQUIPMENT - SCADA EQUIPMENT	NA	NA	15	S2	-5	NA	NA	NA

2
3

1 While I analyzed the data for all accounts, the peer analysis completed above analyzes only
2 those accounts with investment that is greater than 1% of the combined transmission,
3 distribution and general plant assets. I focused only on those assets with a large dollar
4 investment as recommending changes in smaller accounts would likely have an immaterial
5 impact on the applied for depreciation expense. Thus, the effort to complete a detailed
6 review outweighed the likely benefits of completing that analysis.

7 The analysis compares the NS Power proposed lives to the peer average and range. It also
8 compares the NS Power net salvage estimate to the peer average. Finally, I have included
9 details from NB Power, Maritime Electric, and Newfoundland Power's recent depreciation
10 studies where available.

11 As shown above, except for Account 350.1, 362, 370.1, 397 and 397.1, NS Power has
12 applied for service lives lower than the Gannett Fleming peer average. When lower lives
13 are considered alongside the ELG procedure, the combined result is much more aggressive
14 depreciation estimates and lives than are utilized for NS Power's peers. I note from a
15 review of the peer companies included by Gannett Fleming in its peer study, that a
16 significant majority use the ALG procedure considering the concentration of peers in the
17 United States. I consider this to be relevant for the Board, as Gannett Fleming assessed the
18 entities as peers to NS Power, and those peers utilize both longer average services and a
19 less aggressive depreciation procedure than NS Power.

20 **3.2.4 Mass property service life review**

21 **Q: Do you agree with the service life and survivor curve estimates recommended by**
22 **Gannett Fleming?**

23 A: No, not in all cases. I have identified the following accounts based on the peer review
24 discussed above that require further review below. Specifically, I have identified those
25 accounts, based on my judgment that are materially and inexplicably different from the
26 peers, as a starting threshold test to assess whether further changes are required to the
27 applied for lives. The following table summarizes my recommended service lives for each
28 account I study below, including where I propose no change:

Table 8 – Emrydia recommended service lives for mass property accounts

Account Number	Account Name	Investment at Dec 31, 2023	Emrydia Recommended Life Estimate	Emrydia Recommended Curve Estimate
TRANSMISSION ASSETS				
353	STATION EQUIPMENT	586,908,962	50	R2.5
354	TOWERS AND FIXTURES	111,028,870	No Change	No Change
355	POLES AND FIXTURES	268,176,042	50	R2.5
356	OVERHEAD CONDUCTORS AND DEVICES	178,454,463	52	R3
DISTRIBUTION ASSETS				
364	POLES, TOWERS AND FIXTURES	646,990,061	45	R1.5
365	OVERHEAD CONDUCTORS AND DEVICES	329,509,672	45	R2
367	UNDERGROUND CONDUCTORS AND DEVICES	75,012,364	No Change	No Change
368	LINE TRANSFORMERS	555,455,934	36	R1
GENERAL PLANT ASSETS				
390.1	STRUCTURES AND IMPROVEMENTS	184,609,960	No Change	No Change

3.2.4.1 Account 353.00 Station Equipment

Q: Please provide a description of the assets in this account.

A: The Federal Energy Regulatory Commission (FERC) defines this account as follows:

This account shall include the cost installed of transforming, conversion, and switching equipment used for the purpose of changing the characteristics of electricity in connection with its transmission or for controlling transmission circuits.

Q: Please describe the account characteristics from the perspective of NS Power.

A: As of December 31, 2023, NS Power has invested \$586,908,962 into this account. NS Power is recommending a 45-R2.5 curve for this account with a -20 percent net salvage

1 rate. Gannett Fleming also used a placement band¹¹ of 1925-2023 and an experience
2 band¹² of 1942-2023.

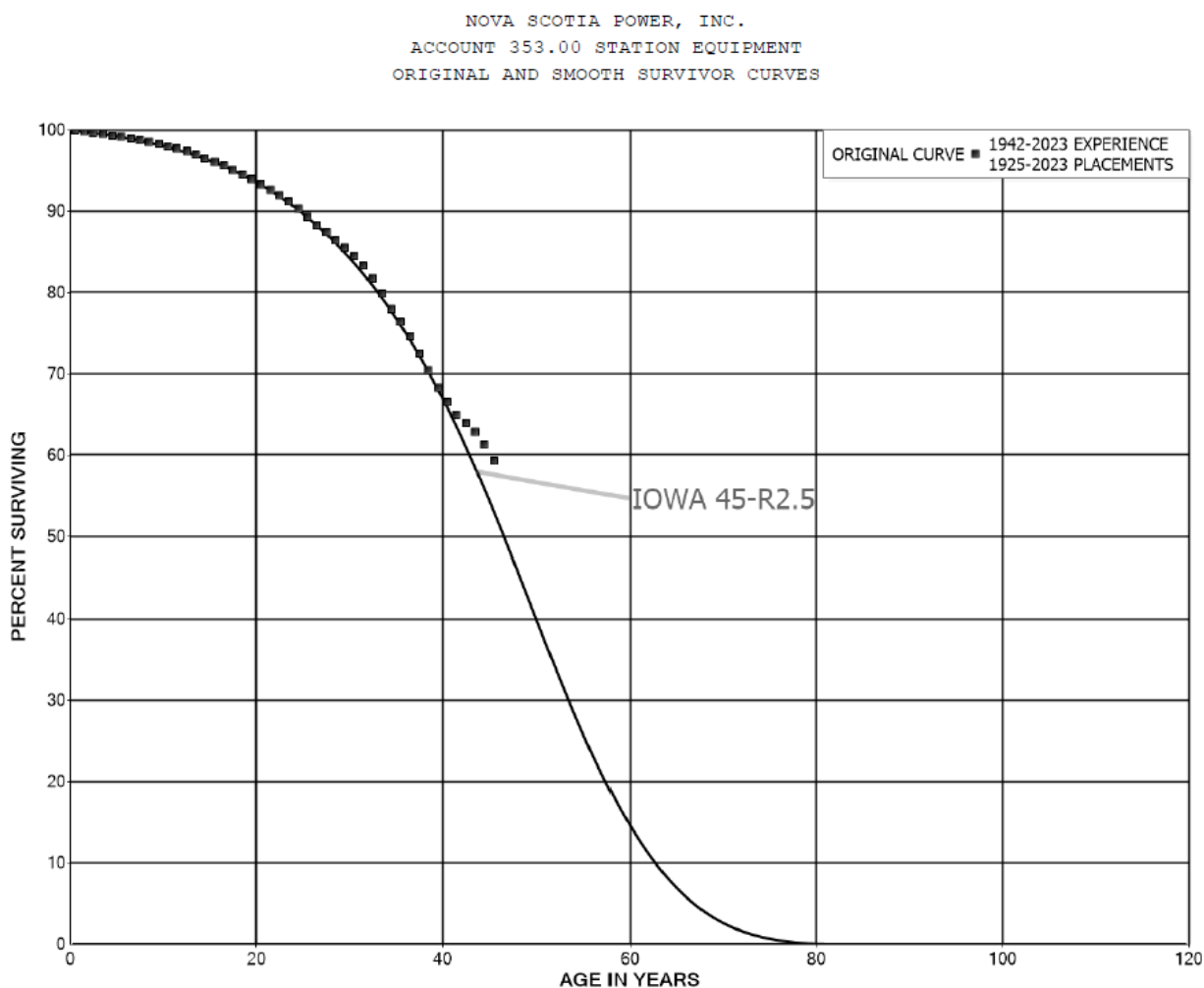
3 **Q: Please provide a copy of the NS Power's proposed Iowa curve for this account.**

4 A: The following figure represents the Iowa curve plotted against the retirement data for this
5 account:

¹¹ The NARUC Depreciation Manual defines placement band as follows: Placement bands show, for a group of vintages, the composite retirement history from the property's placement in service to the present. Placement bands allow the analyst to isolate the effects of changes in technology and materials that occur in successive generations of plant.

¹² The NARUC Depreciation Manual defines experience band as follows: Experience bands show the composite retirement history for all vintages during a select set of activity years. These bands allow the analyst to isolate the effects of the operating environment over time.

Figure 21 – Gannett Fleming survivor curve for Account 353.00



Q: What are your observations based on the proposed Iowa curve?

A: First, which is an observation for all accounts, is that retirements are based on a best guess of the aged data. Thus, the plotting against the curve must be weighed accordingly.

Second, the experience band places undue attention on the lengthy period of time where NS Power relied upon simulated retirement data (i.e., pre-2009), which is again an observation for all accounts I assess below. Third, the tail of the plotted retirement data implies some sort of a life lengthening may be occurring and the proposed 45-R2.5 Iowa curve does not provide a strong visual fit to that data. Finally, based on the observed retirement data an R2.5 curve appears to be a reasonable selection to fit the majority of the data available.

Q: Did Gannett Fleming consider any other placement bands, experience bands, or life curves for this account per its response to Emrydia IR-2 Attachment 1?

A: Yes. In addition to the previously noted placement and experience bands, Gannett Fleming also reviewed the following placement and experience bands for this account:

a. Placement band – 1938-2023; Experience band – 1990-2023.

b. Placement band – 1966-2023; Experience band – 2004-2023.

c. Placement band – 1966-2023; Experience band – 2014-2023.

d. Placement band – 1967-2023; Experience band – 2020-2023.

As explained earlier, NS Power began tracking actual retirements for this account in 2009.¹³ Therefore, I have focused my analysis on the original placement and experience band, as well as the placement band – 1966-2023 and experience band – 2014-2023.

The following figures present a summary of the various survivor curves considered by Gannett Fleming for this account, with each figure representing each placement and experience band:

¹³ Response to Emrydia IR-10.

Figure 22 – Account 353.00 Gannett Fleming Recommended Placement and Experience Band

NOVA SCOTIA POWER, INC.

ACCOUNT 353.00 STATION EQUIPMENT

SUMMARY OF CURVE FITTING RESULTS - PCT SURV BALANCED AREAS

PLACEMENT BAND 1925-2023			001	EXPERIENCE BAND 1942-2023		
SURVIVOR CURVE	RESID MEAS	RANGE OF FIT		SURVIVOR CURVE	RESID MEAS	RANGE OF FIT*
60.2-S0	2.97	0 - 46			NOT FITTED	
54.7-S0.5	1.79	0 - 46			NOT FITTED	
50.6-S1	0.82	0 - 46			NOT FITTED	
47.7-S1.5	1.53	0 - 46		48.9-S1.5	0.96	30 - 46
45.5-S2	3.14	0 - 46		47.4-S2	2.09	30 - 46
73.1-R0.5	5.42	0 - 46			NOT FITTED	
61.4-R1	4.50	0 - 46			NOT FITTED	
54.2-R1.5	3.23	0 - 46			NOT FITTED	
49.1-R2	1.47	0 - 46		47.8-R2	1.15	30 - 46
45.9-R2.5	0.94	0 - 46		46.0-R2.5	1.52	30 - 46
43.5-R3	3.02	0 - 46		44.7-R3	3.07	30 - 46
41.3-R4	7.19	0 - 46		43.1-R4	6.95	30 - 46
80.2-L0	4.37	0 - 46			NOT FITTED	
69.7-L0.5	3.33	0 - 46			NOT FITTED	
61.8-L1	1.95	0 - 46			NOT FITTED	
56.0-L1.5	0.82	0 - 46			NOT FITTED	
51.7-L2	1.60	0 - 46			NOT FITTED	
48.5-L2.5	2.89	0 - 46		50.4-L2.5	2.14	30 - 46
87.8-O1	5.87	0 - 46			NOT FITTED	
98.8-O2	5.88	0 - 46			NOT FITTED	
142.7-O3	6.01	0 - 46			NOT FITTED	
192.3-O4	6.08	0 - 46			NOT FITTED	

* SEGMENT BETWEEN 85.0 AND 15.0 PERCENT SURVIVING

Figure 23 – Account 353.00 Emrydia Recommended Placement and Experience Band

NOVA SCOTIA POWER, INC.

ACCOUNT 353.00 STATION EQUIPMENT

SUMMARY OF CURVE FITTING RESULTS - PCT SURV BALANCED AREAS

PLACEMENT BAND 1966-2023			003	EXPERIENCE BAND 2004-2023		
SURVIVOR CURVE	RESID MEAS	RANGE OF FIT		SURVIVOR CURVE	RESID MEAS	RANGE OF FIT*
61.7-S0	2.89	0 - 47				NOT FITTED
56.1-S0.5	1.72	0 - 47				NOT FITTED
51.8-S1	0.73	0 - 47				NOT FITTED
48.9-S1.5	1.54	0 - 47		50.0-S1.5	1.29	31 - 47
46.6-S2	3.18	0 - 47		48.5-S2	2.46	31 - 47
75.1-R0.5	5.37	0 - 47				NOT FITTED
63.0-R1	4.46	0 - 47				NOT FITTED
55.5-R1.5	3.19	0 - 47				NOT FITTED
50.3-R2	1.50	0 - 47				NOT FITTED
47.0-R2.5	1.12	0 - 47		47.0-R2.5	1.89	31 - 47
44.6-R3	3.07	0 - 47		45.7-R3	3.46	31 - 47
42.2-R4	7.37	0 - 47		44.1-R4	7.28	31 - 47
82.3-L0	4.29	0 - 47				NOT FITTED
71.4-L0.5	3.24	0 - 47				NOT FITTED
63.3-L1	1.83	0 - 47				NOT FITTED
57.4-L1.5	0.71	0 - 47				NOT FITTED
52.9-L2	1.64	0 - 47				NOT FITTED
49.7-L2.5	2.93	0 - 47				NOT FITTED
90.2-O1	5.81	0 - 47				NOT FITTED
101.5-O2	5.81	0 - 47				NOT FITTED
146.6-O3	5.94	0 - 47				NOT FITTED
197.6-O4	6.01	0 - 47				NOT FITTED

* SEGMENT BETWEEN 85.0 AND 15.0 PERCENT SURVIVING

Based on the second figure above, the Iowa curves with the best mathematical fit (residual measure) were a 50.0-S1.5 and 47.0-R2.5.

Q: Please summarize the management notes for this account per NS Power's response to Emrydia IR-12 Attachment 1.

A: Gannett Fleming provided its notes for this account at pages 22 to 26 of Emrydia IR-12 Attachment 1, noting the following from its discussions with management:

- When does NSPI need to be planning to replace transformers?
 - Around 50- 60 years of age.

- 60 years is their standard useful life, however events and circumstances can result in retirements earlier than 60.

- During the winter time, there's an increase in electricity use due to home heating with electricity, i.e., heat pumps
- 55 to 65 years for the older transformers. These units were overdesign with more safety margin and used more material, copper, steel, etc.

Q: Please summarize the results of the peer review for this account.

A: The following are observations from my peer review for this account:

- a. The average life for this account is 51 years per the Gannett Fleming peer data.
- b. The peer life range per Gannett Fleming appears to be between 18 and 65 years. I was unable to understand the reason for the lower limit of this range due to a lack of disclosure of the names for each result.
- c. NB Power uses a 55-R4 curve for this account.¹⁴
- d. Maritime Electric uses a 58-R3 curve for this account.
- e. Newfoundland Power uses a 48-R1 curve for this account.

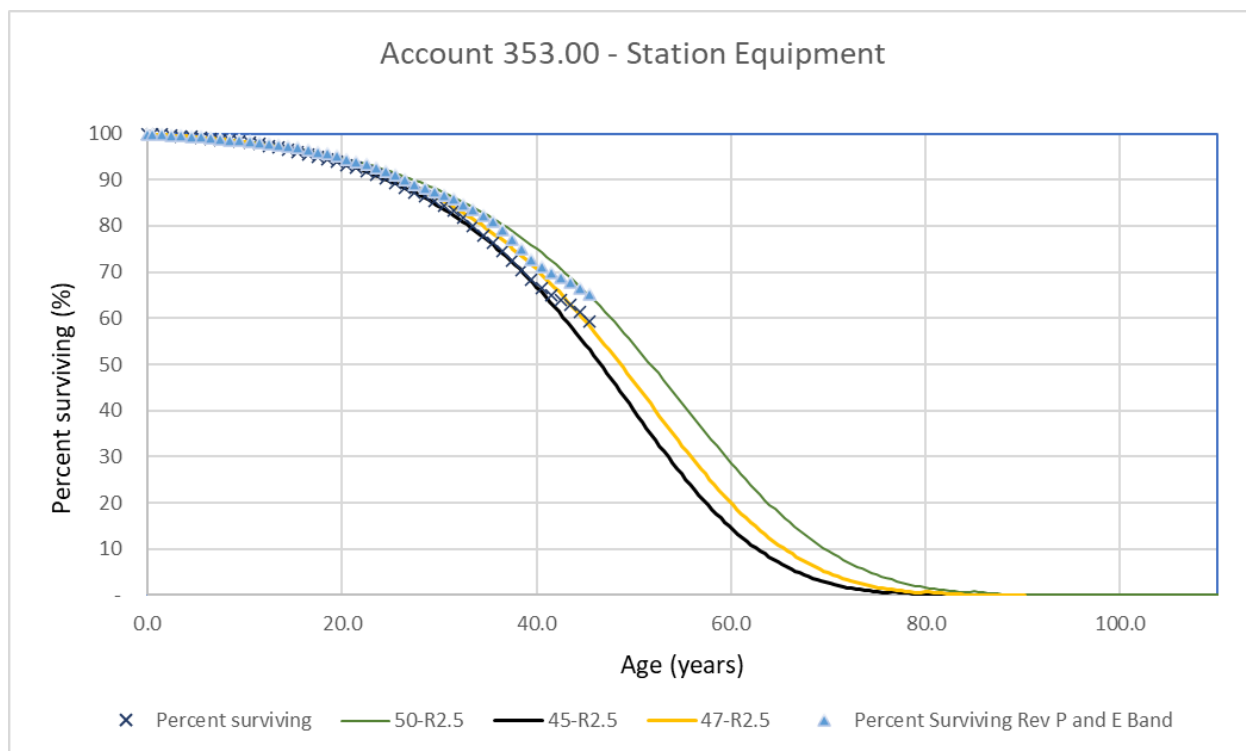
Q: Please provide your recommended average service life and survivor curve for this account.

A: Having regard to all the above data, I recommend a 50-R2.5 curve combined with the ALG procedure. First, as shown in the figure below, I have plotted both the original observed life for the Gannett Fleming placement and experience band used in its study. Second, I

¹⁴ Based on the transformer investment, which comprises a large portion of the costs. However, the average lives vary for the different components.

also plotted the more recent experience band of 2014-2023 to reflect the more recent experience for NS Power.

Figure 24 – Emrydia Survivor Curve Analysis for Account 353.00 – Station Equipment



The “X”s in the above table reflects Gannett Fleming’s original percent surviving based on its depreciation study. The blue triangles reflect the revised experience band of 2014-2023. Both of these curves have been truncated to reflect exposures of 1% or greater than the beginning exposures. Finally, I graphed both a 50-R2.5 and 47-R2.5 curve as alternatives to Gannett Fleming’s proposed 44-R2.5 curve.

As shown above, both the 50-R2.5 and 47-R2.5 curves have a superior visual fit to the more recent retirement data. Additionally, an R2.5 curve continues to be reasonable based on the simulated retirement data available to me. I also note that while a change to a 47-R2.5 curve would be reasonable and provide for a gradual shift, a 50-R2.5 curve provides better alignment to the peer data available as discussed above.

Q: Please quantify the impact of this recommendation on NS Power’s depreciation expense.

A: Despite being requested, NS Power did not provide detailed calculations in support of its individual accounts for depreciation purposes in response to Emrydia IR-27 Attachment 1. For this account, I understand that the parties settled on a rate of 48-R2.5 per Appendix 8G. The details of this calculated impact on the depreciation forecast in 2026 and 2027 also was not provided.

Therefore, I am unable to provide a precise calculation of the impact of this change. However, by comparing the ALG remaining life calculation from Gannett Fleming for a 48-R2.5 to a revised ALG remaining life calculation for a 50-R2.5 curve as I recommend (both with a -20 net salvage rate), the impact would be a reduction in depreciation expense for this account of approximately \$1 million in each of 2026 and 2027. I recommend the Board direct NS Power to provide these detailed calculations as part of a compliance filing to this application after approval of this change in life.

3.2.4.2 Account 354.00 Towers and Fixtures

Q: Please provide a description of the assets in this account.

A: The FERC defines this account as follows:

This account shall include the cost installed of towers and appurtenant fixtures used for supporting overhead transmission conductors.

Q: Please describe the account characteristics from the perspective of NS Power.

A: As of December 31, 2023, NS Power has invested \$111,028,870 into this account. NS Power is recommending a 60-S2.5 curve for this account with a -40 percent net salvage rate. Gannett Fleming also used a placement band of 1978-2023 and an experience band of 1997-2023.

Q: Please summarize your concerns and recommendations with this account.

A: I considered recommending a longer life for the assets in this account but determined that I have insufficient information regarding the composition of this account as between newer and older towers to recommend a reasonable life estimate. Accordingly, I do not recommend a change to the currently proposed Iowa curve for this account of 60 S2.5 at this time. However, I do consider that this account should undergo further study as part of the next depreciation study. Specifically, I note the following statement regarding the lives

of towers in the management notes at page 33 of Emrydia IR-12 Attachment 1 “50-60 years for towers. Larger towers (e.g., Canso Crossing) – 60 to 80 years”.

I understand from NS Power’s application, as well as my involvement with NB Power in New Brunswick, that NS Power plans to invest heavily in transmission infrastructure in the coming years. As this new, likely significant, investment is added the Board should monitor whether the majority of the investment is made up of newer towers and tower designs with longer service lives. If so, it may be appropriate to assign the aggregate assets a different average service life or separate out the assets into two categories. I note this practice of tracking and depreciating newly designed transmission towers with different lives has been used in other jurisdictions, including Alberta by the Alberta Utilities Commission.

Therefore, while I recommend no change in the life for this account, I recommend the Board direct NS Power to track the nature of additions to this account going forward, and to the extent practicable, break out the historical cost of new towers within the account. I recommend this information be provided as part of the next depreciation study.

3.2.4.3 Account 355.00 Poles and Fixtures

Q: Please provide a description of the assets in this account.

A: The FERC defines this account as follows:

This account shall include the cost installed of transmission line poles, wood, steel, concrete, or other material, together with appurtenant fixtures used for supporting overhead transmission conductors.

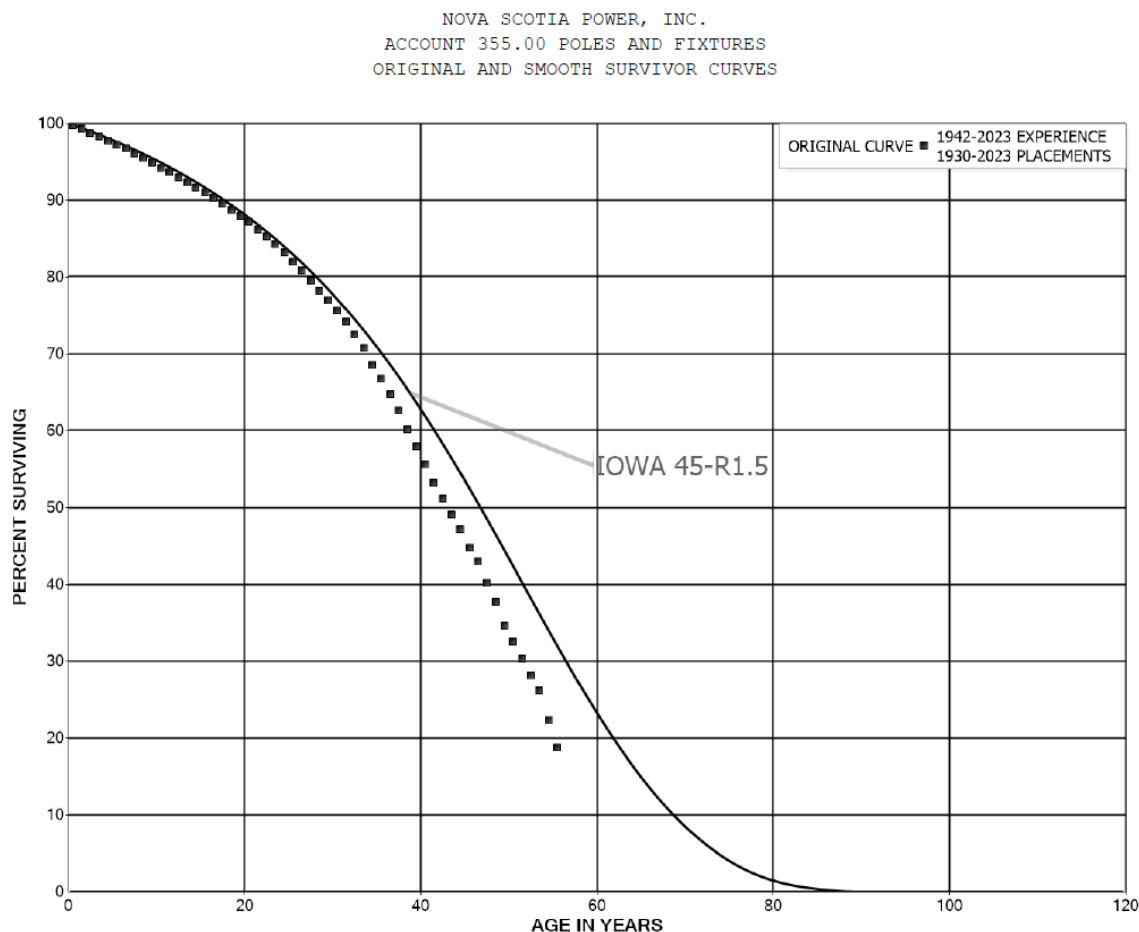
Q: Please describe the account characteristics from the perspective of NS Power.

A: As of December 31, 2023, NS Power has invested \$268,176,042 into this account. NS Power is recommending a 45-R1.5 curve for this account with a -60 percent net salvage rate. Gannett Fleming also used a placement band of 1930-2023 and an experience band of 1942-2023.

Q: Please provide a copy of the NS Power’s proposed Iowa curve for this account.

A: The following figure represents the Iowa curve plotted against the retirement data for this account:

Figure 25 – Gannett Fleming survivor curve for Account 355.00



Q: What are your observations based on the proposed Iowa curve?

A: First, the recommended curve does not provide for a good fit to retirement data beyond year 30.5. Additionally, based on the observed retirement data an R1.5 curve may not provide for a reasonable fit to the observed retirement data. However, as noted below, I am unable to place significant weight on the survivor curve type selected based on the data used.

Q: Did Gannett Fleming consider any other placement bands, experience bands, or life curves for this account per its response to Emrydia IR-2 Attachment 1?

1 A: Yes. In addition to the previously noted placement and experience bands, Gannett Fleming
2 also reviewed the following placement and experience bands for this account:

3 a. Placement band – 1937-2019; Experience band – 2004-2019.

4 b. Placement band – 1937-2019; Experience band – 2014-2019.

5 c. Placement band – 1964-2023; Experience band – 2020-2023.

6 I have reviewed the various placement and experience bands and could not determine why
7 the placement band was shortened by Gannett Fleming to 2019. Additionally, for the
8 earlier reasons, I have placed no significant weight on the original placement and
9 experience band used by Gannett Fleming, and I note that its own recommendation appears
10 to vary significantly from the plotted retirement data.

11 **Q: Please summarize the management notes for this account per NS Power's response to**
12 **Emrydia IR-12 Attachment 1.**

13 A: Gannett Fleming provided its notes for this account at pages 30 to 32 of Emrydia IR-12
14 Attachment 1, noting the following from its discussions with management:

- 15 • How many transmission poles NSPI owns and if they have it by
16 material type what is that?

- 17 ○ Wood and Steel

- 18 ■ 28,840 wood

- 19 ■ 1,992 steel

- 20 • What would cause retirements in wood poles?

- 21 ○ Almost entirely deterioration

- 22 ■ When they do the analysis on a pole that's getting
23 replaced, other adjacent structures may also get
24 replaced

- 25 ○ Some relocation but not nearly as much as distribution
26 because their poles are on easements on the transmission

side so if asked to move these poles, it'll have to be paid for
by a customer in on company ROW.

- Storm damage

- There's a higher percentage of storm damage on
their 69 KV system.

- Not near the volume they'd see on distribution

- NSPI recently widened the right-of-ways,
i.e., aggressive vegetation management, so
there is less damage from storms.

No clear determination on life for wood transmission poles was provided in the notes, and
untreated wood distribution poles appeared to be discussed in the notes at page 32.

Q: Please summarize the results of the peer review for this account.

A: The following are observations from my peer review for this account:

- a. The average life for this account is 55 years per the Gannett Fleming peer data.
- b. The peer life range per Gannett Fleming appears to be between 18 and 75 years. I
was unable to understand the reason for the lower limit of this range due to a lack
of disclosure of the names for each result.
- c. NB Power uses a 60-R3 curve for this account.
- d. Maritime Electric uses a 54-R2.5 curve for this account.
- e. Newfoundland Power uses a 52-S0.5 curve for this account.

**Q: Please provide your recommended average service life and survivor curve for this
account.**

A: Having regard to all the above data, I recommend a 50-R2.5 curve combined with the ALG
procedure for this account. A 50-R2.5 curve aligns with the peers of NS Power
geographically near it. It is also quite conservative relative to those peers and the peers

1 cited by Gannett Fleming. Finally, 122 of the peers noted by Gannett Fleming use either a
2 R2.0, R2.5 or R3.0 curve for this account, out of 213 peers.

3 In my opinion, the Board should also consider further life lengthening for this account
4 considering the lack of clear evidence presented by NS Power for its recommendation and
5 the overwhelming evidence of NS Power's peers for a significantly longer life. I have not
6 recommended a longer life at this time in the interest of recommending gradual changes in
7 depreciation.

8 **Q: Please quantify the impact of this recommendation on NS Power's depreciation**
9 **expense.**

10 A: Despite being requested, NS Power did not provide detailed calculations in support of its
11 individual accounts for depreciation purposes in response to Emrydia IR-27 Attachment 1.
12 For this account, I understand that the parties did not propose any changes to the lives for
13 this account per Appendix 8G, but did propose a -20% net salvage rate.

14 Due to the lack of information from NS Power, I am unable to provide a precise calculation
15 of the impact of this change. However, by comparing the ALG remaining life calculation
16 from Gannett Fleming for a 45-R1.5 to a revised ALG remaining life calculation for a 50-
17 R2.5 curve as I recommend (both with a -20 net salvage rate), the impact would be a
18 reduction in depreciation expense for this account of approximately \$1 million in each of
19 2026 and 2027. I recommend the Board direct NS Power to provide these detailed
20 calculations as part of a compliance filing to this application after approval of this change
21 in life.

22 **3.2.4.4 Account 356.00 Overhead Conductors and Devices**

23 **Q: Please provide a description of the assets in this account.**

24 A: The FERC defines this account as follows:

25 This account shall include the cost installed of overhead conductors and
26 devices used for transmission purposes.

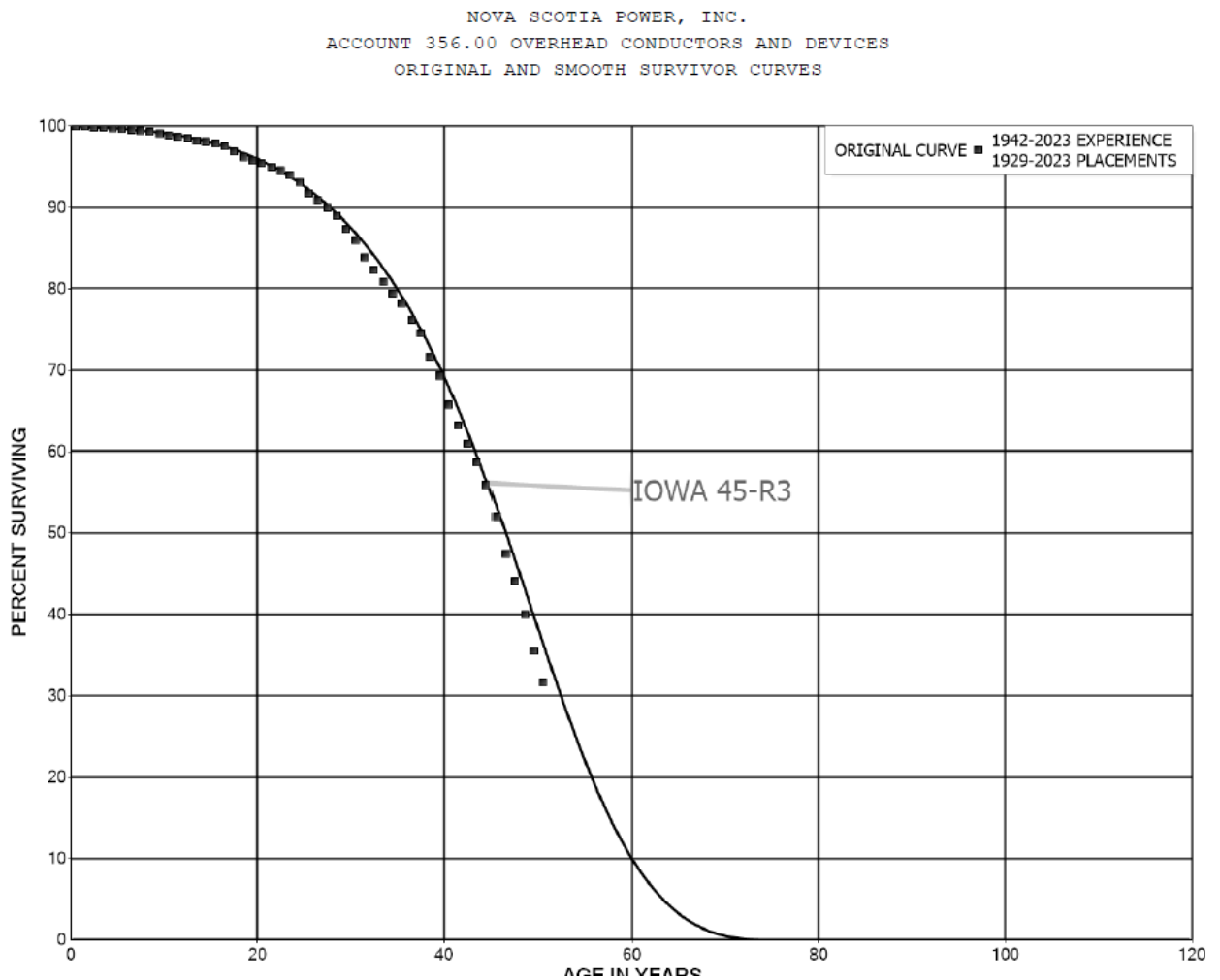
Q: Please describe the account characteristics from the perspective of NS Power.

A: As of December 31, 2023, NS Power has invested \$178,454,463 into this account. NS Power is recommending a 45-R3.0 curve for this account with a -20 percent net salvage rate. Gannett Fleming also used a placement band of 1929-2023 and an experience band of 1942-2023.

Q: Please provide a copy of the NS Power's proposed Iowa curve for this account.

A: The following figure represents the Iowa curve plotted against the retirement data for this account:

Figure 26 – Gannett Fleming survivor curve for Account 356.00



Q: What are your observations based on the proposed Iowa curve?

A: First, the proposed curve appears to have a good visual fit to the observed retirement data, likely too good for the reasons noted earlier. Additionally, based on the observed retirement data an R3.0 curve appears to be a reasonable selection to fit the majority of the data available.

Q: Did Gannett Fleming consider any other placement bands, experience bands, or life curves for this account per its response to Emrydia IR-2 Attachment 1?

A: Yes. In addition to the previously noted placement and experience bands, Gannett Fleming also reviewed the following placement and experience bands for this account:

a. Placement band – 1939-2023; Experience band – 1990-2023.

b. Placement band – 1954-2023; Experience band – 2004-2023.

c. Placement band – 1965-2023; Experience band – 2020-2023.

As explained earlier, NS Power began tracking actual retirements for this account in 2009.¹⁵ Therefore, I have focused my analysis on the original placement and experience band, as well as the placement band – 1965-2023 and experience band – 2020-2023. While this is a narrow experience band, I consider it important to emphasize the results from the band relative to the historically simulated data for the Board.

The following figures present a summary of the various survivor curves considered by Gannett Fleming for this account, with each figure representing each placement and experience band:

¹⁵ Response to Emrydia IR-10.

Figure 27 – Account 356.00 Gannett Fleming Recommended Placement and Experience Band

NOVA SCOTIA POWER, INC.

ACCOUNT 356.00 OVERHEAD CONDUCTORS AND DEVICES

SUMMARY OF CURVE FITTING RESULTS - PCT SURV BALANCED AREAS

PLACEMENT BAND 1929-2023			001	EXPERIENCE BAND 1942-2023		
SURVIVOR CURVE	RESID MEAS	RANGE OF FIT		SURVIVOR CURVE	RESID MEAS	RANGE OF FIT*
57.5-S0	7.23	0 - 50		51.1-S0	7.69	31 - 50
53.2-S0.5	5.79	0 - 50		49.5-S0.5	6.51	31 - 50
50.0-S1	4.17	0 - 50		48.3-S1	5.28	31 - 50
47.8-S1.5	2.69	0 - 50		47.3-S1.5	3.84	31 - 50
46.0-S2	1.65	0 - 50		46.4-S2	2.43	31 - 50
44.9-S2.5	1.94	0 - 50		45.7-S2.5	1.52	31 - 50
43.9-S3	3.56	0 - 50		45.1-S3	2.57	31 - 50
66.2-R0.5	9.86	0 - 50		NOT FITTED		
57.3-R1	8.55	0 - 50		48.6-R1	7.51	31 - 50
52.1-R1.5	6.90	0 - 50		47.0-R1.5	6.00	31 - 50
48.3-R2	4.71	0 - 50		45.8-R2	4.34	31 - 50
46.0-R2.5	2.55	0 - 50		44.9-R2.5	2.29	31 - 50
44.3-R3	0.53	0 - 50		44.3-R3	0.82	31 - 50
42.7-R4	4.85	0 - 50		43.6-R4	5.11	31 - 50
42.1-R5	10.64	0 - 50		43.4-R5	12.65	31 - 50
74.2-L0	8.96	0 - 50		NOT FITTED		
65.9-L0.5	7.73	0 - 50		NOT FITTED		
59.7-L1	6.29	0 - 50		NOT FITTED		
55.1-L1.5	4.73	0 - 50		52.6-L1.5	6.07	31 - 50
51.6-L2	3.02	0 - 50		51.1-L2	4.59	31 - 50
49.0-L2.5	1.82	0 - 50		49.2-L2.5	2.87	31 - 50
46.9-L3	2.33	0 - 50		47.9-L3	2.09	31 - 50
43.8-L4	5.73	0 - 50		45.2-L4	5.77	31 - 50
77.9-O1	10.57	0 - 50		NOT FITTED		
87.6-O2	10.56	0 - 50		NOT FITTED		
125.6-O3	10.80	0 - 50		NOT FITTED		
168.5-O4	10.92	0 - 50		NOT FITTED		

* SEGMENT BETWEEN 85.0 AND 15.0 PERCENT SURVIVING

Figure 28 – Account 356.00 Emrydia Recommended Placement and Experience Band

NOVA SCOTIA POWER, INC.

ACCOUNT 356.00 OVERHEAD CONDUCTORS AND DEVICES

SUMMARY OF CURVE FITTING RESULTS - PCT SURV BALANCED AREAS

PLACEMENT BAND 1965-2023			005	EXPERIENCE BAND 2020-2023		
SURVIVOR CURVE	RESID MEAS	RANGE OF FIT		SURVIVOR CURVE	RESID MEAS	RANGE OF FIT*
60.0-S0	4.95	0 - 53		55.7-S0	5.41	32 - 53
55.7-S0.5	3.50	0 - 53		53.7-S0.5	4.19	32 - 53
52.4-S1	2.02	0 - 53		52.2-S1	2.92	32 - 53
50.1-S1.5	1.29	0 - 53		50.8-S1.5	1.43	32 - 53
48.3-S2	2.54	0 - 53		49.8-S2	0.90	32 - 53
47.2-S2.5	3.93	0 - 53		48.9-S2.5	2.47	32 - 53
68.6-R0.5	7.62	0 - 53		NOT FITTED		
59.7-R1	6.27	0 - 53		53.0-R1	5.38	32 - 53
54.4-R1.5	4.54	0 - 53		50.9-R1.5	3.85	32 - 53
50.6-R2	2.31	0 - 53		49.4-R2	2.17	32 - 53
48.3-R2.5	0.22	0 - 53		48.2-R2.5	0.33	32 - 53
46.6-R3	2.52	0 - 53		47.4-R3	2.27	32 - 53
45.0-R4	7.29	0 - 53		46.5-R4	7.24	32 - 53
77.1-L0	6.72	0 - 53		NOT FITTED		
68.7-L0.5	5.47	0 - 53		NOT FITTED		
62.4-L1	4.05	0 - 53		59.6-L1	5.19	32 - 53
57.6-L1.5	2.52	0 - 53		56.9-L1.5	3.61	32 - 53
54.1-L2	1.66	0 - 53		55.0-L2	2.09	32 - 53
51.4-L2.5	2.23	0 - 53		52.8-L2.5	1.12	32 - 53
49.3-L3	4.14	0 - 53		51.2-L3	2.86	32 - 53
80.5-O1	8.37	0 - 53		NOT FITTED		
90.5-O2	8.37	0 - 53		NOT FITTED		
129.7-O3	8.63	0 - 53		NOT FITTED		
173.9-O4	8.76	0 - 53		NOT FITTED		

* SEGMENT BETWEEN 85.0 AND 15.0 PERCENT SURVIVING

Based on the second figure above, the Iowa curves with the best mathematical fit (residual measure) were 49.8-S2 and 48.2-R2.5.

Q: Please summarize the management notes for this account per NS Power's response to Emrydia IR-12 Attachment 1.

A: Gannett Fleming provided its notes for this account at pages 32 and 33 of Emrydia IR-12 Attachment 1, noting the following from its discussions with management:

- Retirement causes for overhead transmission conductors
 - Age / condition.

- Deterioration
- Inadequacy / Capacity – Increased retirements in future caused by changes in usage, electrification throughout province, i.e., home heating, EVs, ability to handle new wind generation, solar, etc.
- Even split between deterioration and their engineering design packages calling for it.
- Lives – 40 to 55 years years [sic]

Q: Please summarize the results of the peer review for this account.

A: The following are observations from my peer review for this account:

- a. The average life for this account is 58 years per the Gannett Fleming peer data.
- b. The peer life range per Gannett Fleming appears to be between 18 and 72 years. I was unable to understand the reason for the lower limit of this range due to a lack of disclosure of the names for each result.
- c. NB Power uses a 65-R4 curve for this account.
- d. Maritime Electric uses a 62-R3 curve for this account.
- e. Newfoundland Power uses a 60-R3 curve for this account.

Q: Should overhead conductor generally have a longer life than the poles or towers supporting it?

A: Yes. Overhead conductor is typically only replaced when it is damaged, when the load on the transmission line is expected to exceed the capacity of the conductor, or when the entire line is planned to be replaced, which is uncommon. Poles on the other hand can be replaced while the conductor remains in place. Thus, it is common in the industry to see lives for overhead conductor that exceed the lives of the poles or towers that support the conductor. For example, as shown above, the life of overhead conductor for Gannett Fleming's peer group is 4 years longer on average than the life of poles and fixtures. Similarly, Maritime Electric and Newfoundland Power's lives for conductor are 8 years longer than poles and fixtures, while NB Power has a conductor life that is 5 years longer.

1 For this reason, it is highly unusual that NS Power is recommending the same 45 year life
2 for these two accounts.

3 **Q: Please provide your recommended average service life and survivor curve for this**
4 **account.**

5 A: I recommend a 52-R3 curve for this account combined with the ALG procedure. I would
6 ordinarily recommend a much higher average service life for this account considering the
7 peer data and lack of any clear reason for why NS Power should have a significantly
8 shorter life for these assets. For example, I considered recommending a life curve
9 combination of 55-R3 and consider such a result to be reasonable and likely conservative
10 on a standalone basis. This life would also align with NS Power's upper limit and also
11 better address the fact that certain of NS Power's larger towers are expected to last much
12 more than 60 years. Thus, I would expect the conductor for those assets to also have a
13 longer average service life. However, I am mindful of the need to provide a gradual change
14 in depreciation overtime.

15 Accordingly, I recommend the Board direct further study of this account as part of the next
16 depreciation study. As part of that study, I recommend that NS Power be directed to better
17 study the physical lives of the assets in this account and describe in detail the types of
18 assets installed by type, quantity, and estimated age. I also recommend that NS Power be
19 directed to segregate its overhead conductor in account 356 into the conductor that is
20 strung on higher dollar value steel towers with longer lives and provide NS Power's
21 estimate of the services lives of that conductor with explanations.

22 **Q: Please quantify the impact of this recommendation on NS Power's depreciation**
23 **expense.**

24 A: Despite being requested, NS Power did not provide detailed calculations in support of its
25 individual accounts for depreciation purposes in response to Emrydia IR-27 Attachment 1.
26 For this account, I understand that the parties did not propose any changes to the lives for
27 this account per Appendix 8G.

28 Due to the lack of information from NS Power, I am unable to provide a precise calculation
29 of the impact of this change. However, by comparing the ALG remaining life calculation

1 from Gannett Fleming for a 45-R3 to a revised ALG remaining life calculation for a 52-R3
2 curve as I recommend (both with a -20 net salvage rate), the impact would be a reduction
3 in depreciation expense for this account of approximately \$750,000 in each of 2026 and
4 2027. I recommend the Board direct NS Power to provide these detailed calculations as
5 part of a compliance filing to this application after approval of this change in life.

6 **3.2.4.5 Account 364.00 Poles, Towers and Fixtures**

7 **Q: Please provide a description of the assets in this account.**

8 A: The FERC defines this account as follows:

9 This account shall include the cost installed of poles, towers, and
10 appurtenant fixtures used for supporting overhead distribution conductors
11 and service wires.

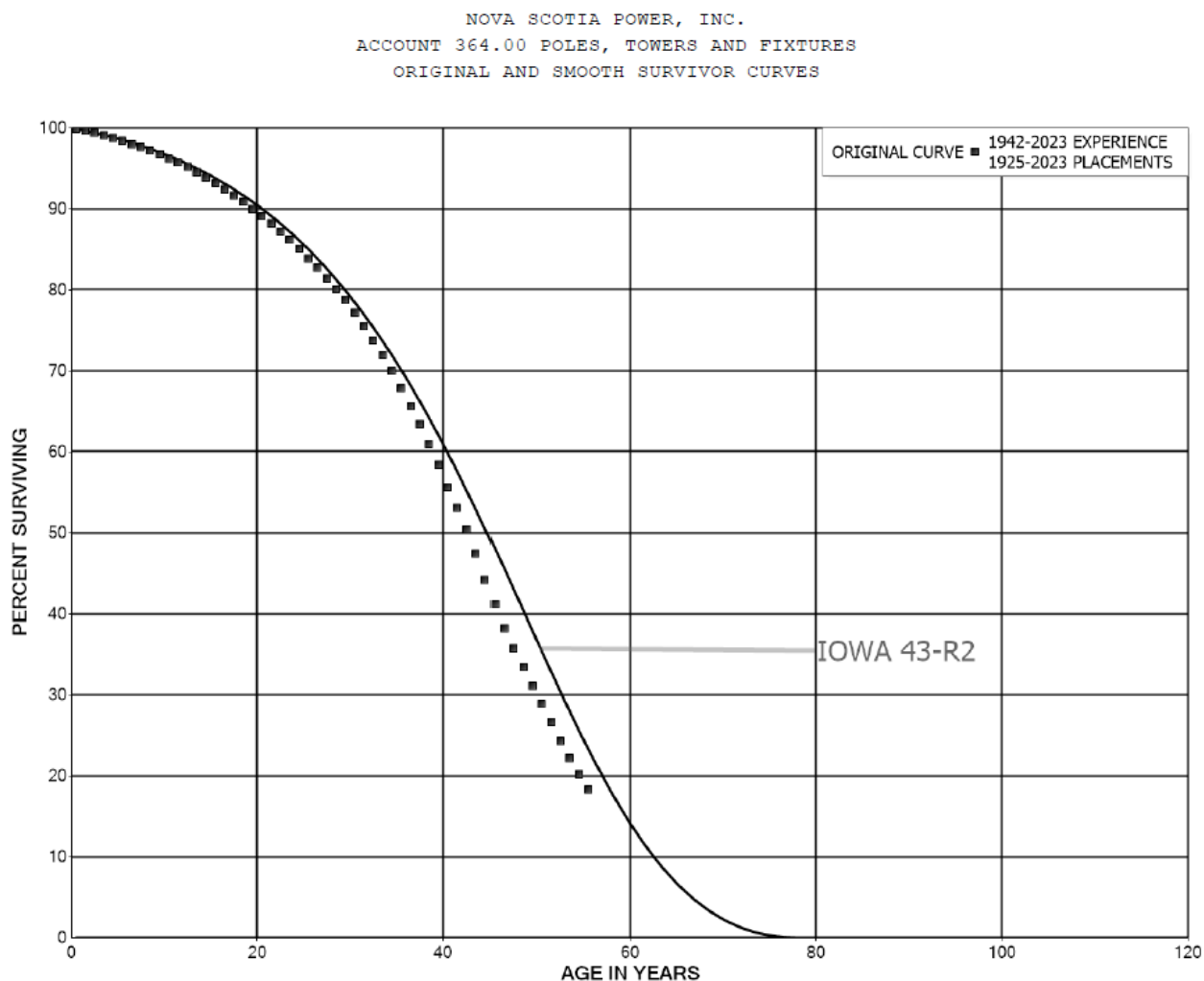
12 **Q: Please describe the account characteristics from the perspective of NS Power.**

13 A: As of December 31, 2023, NS Power has invested \$646,990,061 into this account. NS
14 Power is recommending a 43-R2.0 curve for this account with a -35 percent net salvage
15 rate. Gannett Fleming also used a placement band of 1925-2023 and an experience band of
16 1942-2023.

17 **Q: Please provide a copy of the NS Power's proposed Iowa curve for this account.**

18 A: The following figure represents the Iowa curve plotted against the retirement data for this
19 account:

1 **Figure 29 – Gannett Fleming survivor curve for Account 364.00**



2
3
4 **Q: What are your observations based on the proposed Iowa curve?**

5 A: First, the recommended curve does not provide for a good fit to retirement data beyond
6 year 38.5. Additionally, based on the observed retirement data an R2 curve may not
7 provide for a reasonable fit to the observed retirement data. However, as noted below, I am
8 unable to place significant weight on the survivor curve type selected based on the data
9 used.

10 **Q: Did Gannett Fleming consider any other placement bands, experience bands, or life**
11 **curves for this account per its response to Emrydia IR-2 Attachment 1?**

12 A: Yes. In addition to the previously noted placement and experience bands, Gannett Fleming
13 also reviewed the following placement and experience bands for this account:

a. Placement band – 1946-2023; Experience band – 2004-2023.

b. Placement band – 1947-2023; Experience band – 2014-2023.

c. Placement band – 1949-2023; Experience band – 2020-2023.

I have reviewed the results of the various placement and experience bands and have determined that it is inappropriate to assign significant weight to those results, for the reasons already stated. Particularly, the proposed life for this account is quite unusual compared to the peers and none of the placement or experience bands provide for a result that aligns with what I would expect for this account.

Q: Please summarize the management notes for this account per NS Power's response to Emrydia IR-12 Attachment 1.

A: Gannett Fleming provided its notes for this account at page 9 of Emrydia IR-12 Attachment 1, noting the following from its discussions with management:

- Poles

- Typical range for a wood distribution pole is 35-55 years industrywide.

- At what age would they project the useful life to be:

- Expected ASL – 40 to 45 years. Previous ASL was 38 years.

- If not taken out by a storm, 3rd party, clearance issues, etc., ...they would estimate the physical life is closer to 45-50 years.

Q: Please summarize the results of the peer review for this account.

A: The following are observations from my peer review for this account:

a. The average life for this account is 53 years per the Gannett Fleming peer data.

- b. The peer life range per Gannett Fleming appears to be between 20 to 80 years. I was unable to understand the reason for the lower limit of this range due to a lack of disclosure of the names for each result.
- c. NB Power uses a 47 to 52R1 curve for this account, depending on the asset type.
- d. Maritime Electric uses a 45-R1.5 curve for this account.
- e. Newfoundland Power uses a 56-R1.5 curve for this account.

Q: Please provide your recommended average service life and survivor curve for this account.

A: Having regard to all the above data, I recommend a 45-R1.5 curve combined with the ALG procedure. First, as noted above, the R2 curve proposed by Gannett Fleming does not provide for a close fit to the observed retirement data in later years. An R1.5 curve would better fit this data. Second, the life expectancy for NS Power for this account is broadly inconsistent with its peers, which all have much longer service lives. While a 45-year life is conservative, I consider that it is a directionally positive change at this time. Finally, I note that a life of 45 years is squarely in the middle of the 35-to-55-year life noted for the industry in discussions with management, and also consistent with upper range of 40 to 45 years as stated by management.

Importantly, while I would be supportive of further life extensions in the future for this account, if aligned with the evidence, I do not recommend further extension at this time considering the magnitude of the investment in this account.

Q: Please quantify the impact of this recommendation on NS Power's depreciation expense.

A: Despite being requested, NS Power did not provide detailed calculations in support of its individual accounts for depreciation purposes in response to Emrydia IR-27 Attachment 1. For this account, I understand that the parties did not propose any changes to the lives for this account per Appendix 8G.

Due to the lack of information from NS Power, I am unable to provide a precise calculation of the impact of this change. However, by comparing the ALG remaining life calculation from Gannett Fleming for a 43-R2 to a revised ALG remaining life calculation for a 45-

1 R1.5 curve as I recommend (both with a -35 net salvage rate), the impact would be a
2 reduction in depreciation expense for this account of approximately \$500,000 in each of
3 2026 and 2027. I recommend the Board direct NS Power to provide these detailed
4 calculations as part of a compliance filing to this application after approval of this change
5 in life.

6 **3.2.4.6 Account 365.00 Overhead Conductors and Devices**

7 **Q: Please provide a description of the assets in this account.**

8 A: The FERC defines this account as follows:

9 This account shall include the cost installed of overhead conductors and
10 devices used for distribution purposes.

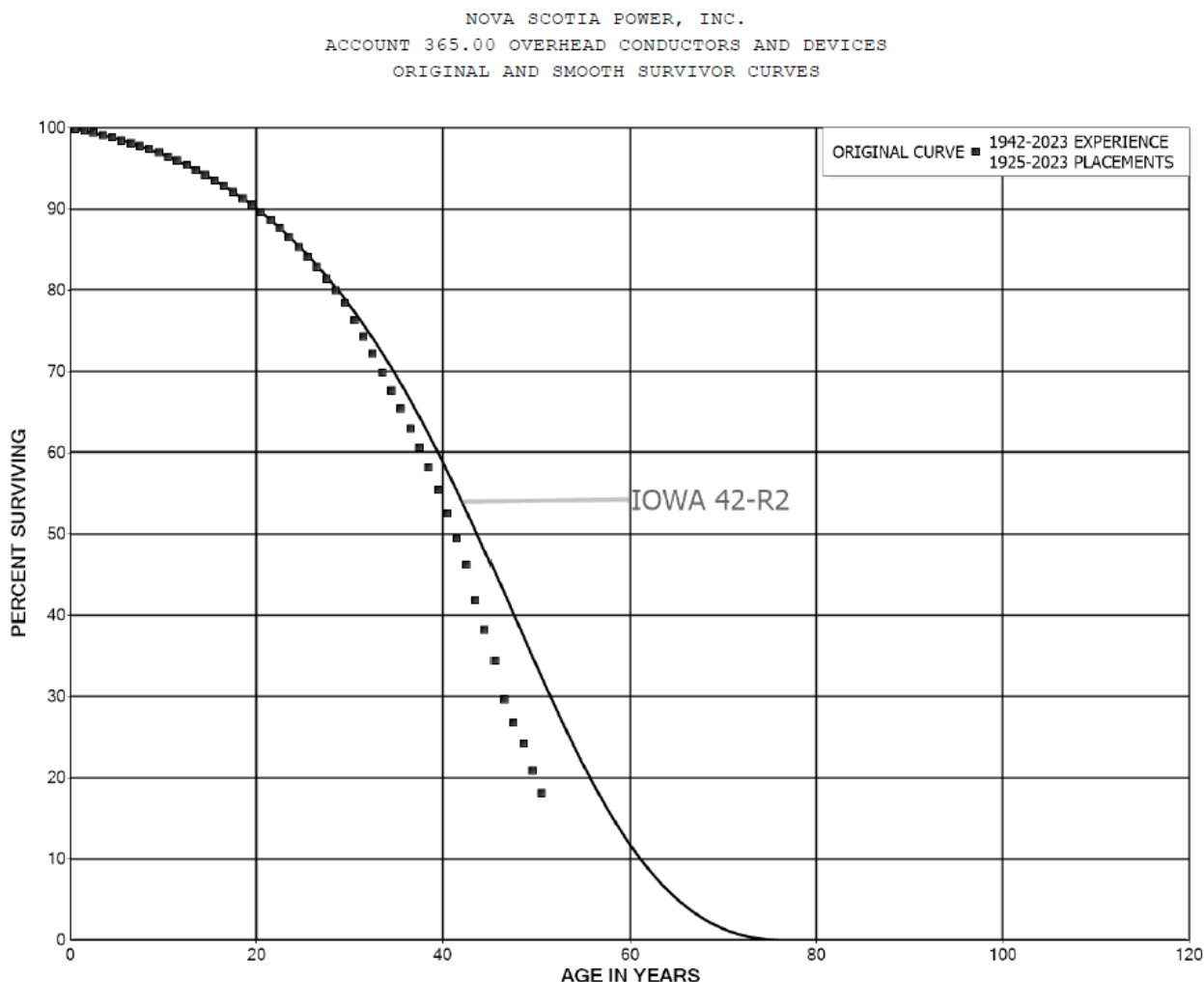
11 **Q: Please describe the account characteristics from the perspective of NS Power.**

12 A: As of December 31, 2023, NS Power has invested \$329,509,672 into this account. NS
13 Power is recommending a 42-R2 curve for this account with a -30 percent net salvage rate.
14 Gannett Fleming also used a placement band of 1925-2023 and an experience band of
15 1942-2023.

16 **Q: Please provide a copy of the NS Power's proposed Iowa curve for this account.**

17 A: The following figure represents the Iowa curve plotted against the retirement data for this
18 account:

1 **Figure 30 – Gannett Fleming survivor curve for Account 365.00**



2
3
4 **Q: What are your observations based on the proposed Iowa curve?**

5 A: First, the recommended curve does not provide for a good fit to retirement data beyond
6 year 39.5. Additionally, based on the observed retirement data an R2 curve may not
7 provide for a reasonable fit to the observed retirement data. However, as noted below, I am
8 unable to place significant weight on the survivor curve type selected based on the data
9 used.

10 **Q: Did Gannett Fleming consider any other placement bands, experience bands, or life**
11 **curves for this account per its response to Emrydia IR-2 Attachment 1?**

12 A: Yes. In addition to the previously noted placement and experience bands, Gannett Fleming
13 also reviewed the following placement and experience bands for this account:

- a. Placement band – 1929-2023; Experience band – 1990-2023.
- b. Placement band – 1946-2023; Experience band – 2004-2023.
- c. Placement band – 1950-2023; Experience band – 2014-2023.
- d. Placement band – 1955-2023; Experience band – 2020-2023.

Similar to my findings for Account 364.00, I have reviewed the results of the various placement and experience bands and have determined that it is inappropriate to assign significant weight to those results, for the reasons already stated. Particularly, the proposed life for this account is quite unusual compared to the peers and none of the placement or experience bands provide for a result that aligns with what I would expect for this account.

Q: Please summarize the management notes for this account per NS Power's response to Emrydia IR-12 Attachment 1.

A: Gannett Fleming provided its notes for this account at pages 9 of Emrydia IR-12 Attachment 1, noting the following from its discussions with management:

- Overhead conductors
 - Typical range for a overhead conductor
 - At what age would they project the useful life to be:
 - Conductors tend to last longer than poles
 - Average at 45-60 years (industry)
 - Conductor itself is not normally bad, it's just overloaded if it's being replaced.
 - Replaced due to inadequacy, deterioration, storm damage, relocations, 3rd party damage, voltage conversions, etc.
 - ASL – Approved at 38 years in the previous SL study

1 **Q: Please summarize the results of the peer review for this account.**

2 A: The following are observations from my peer review for this account:

- 3 a. The average life for this account is 52 years per the Gannett Fleming peer data.
- 4 b. The peer life range per Gannett Fleming appears to be between 10 and 70 years. I
- 5 was unable to understand the reason for the lower limit of this range due to a lack
- 6 of disclosure of the names for each result.
- 7 c. NB Power uses a 60-R3 curve for this account.
- 8 d. Maritime Electric uses a 50-R2.5 curve for this account.
- 9 e. Newfoundland Power uses a 60-R2.5 curve for this account.

10 **Q: Please provide your recommended average service life and survivor curve for this**

11 **account.**

12 A: I recommend a 45-R2 curve for this account combined with the ALG procedure. NS Power

13 has proposed an increase from the historical life of 38 years, which is appropriate but

14 insufficient. Similar to my recommendations for Account 364, I consider a further increase

15 to be appropriate at this time. In making this proposal, I am mindful that a much longer life

16 would likely be appropriate for this account, considering the management information and

17 peer data. I cannot conceive of any obvious force of retirement for NS Power that would

18 lead it to have a materially shorter life for these assets than its peers. I also note that a very

19 short life for this account may risk incenting NS Power to seek to replace these assets

20 earlier than may otherwise be necessary.

21 For this reason, I analyzed several alternative life curves, including but not limited to

22 curves at 46R1 to 60R1, and the same range for R1.5, R2.0, R2.5 and R3.0. That said, as

23 the retirement data for this account appears unreliable, it is difficult to draw informed

24 conclusions from that curve fitting process. Therefore, while I would support a longer life

25 for this account if the Board considered it appropriate at this time, I recommend that the

26 Board take a wait and see approach and consider further life extensions in future

27 depreciation studies.

Q: Please quantify the impact of this recommendation on NS Power's depreciation expense.

A: Despite being requested, NS Power did not provide detailed calculations in support of its individual accounts for depreciation purposes in response to Emrydia IR-27 Attachment 1. For this account, I understand that the parties did not propose any changes to the lives for this account per Appendix 8G but did propose a reduction in the net salvage rate to -26%. Due to the lack of information from NS Power, I am unable to provide a precise calculation of the impact of this change. However, by comparing the ALG remaining life calculation from Gannett Fleming for a 42-R2 to a revised ALG remaining life calculation for a 45-R2 curve as I recommend (both with a -26 net salvage rate), the impact would be a reduction in depreciation expense for this account of approximately \$300,000 in each of 2026 and 2027. I recommend the Board direct NS Power to provide these detailed calculations as part of a compliance filing to this application after approval of this change in life.

3.2.4.7 Account 367.00 Underground Conductors and Devices

Q: Please provide a description of the assets in this account.

A: The FERC defines this account as follows:

This account shall include the cost installed of underground conductors and devices used for distribution purposes.

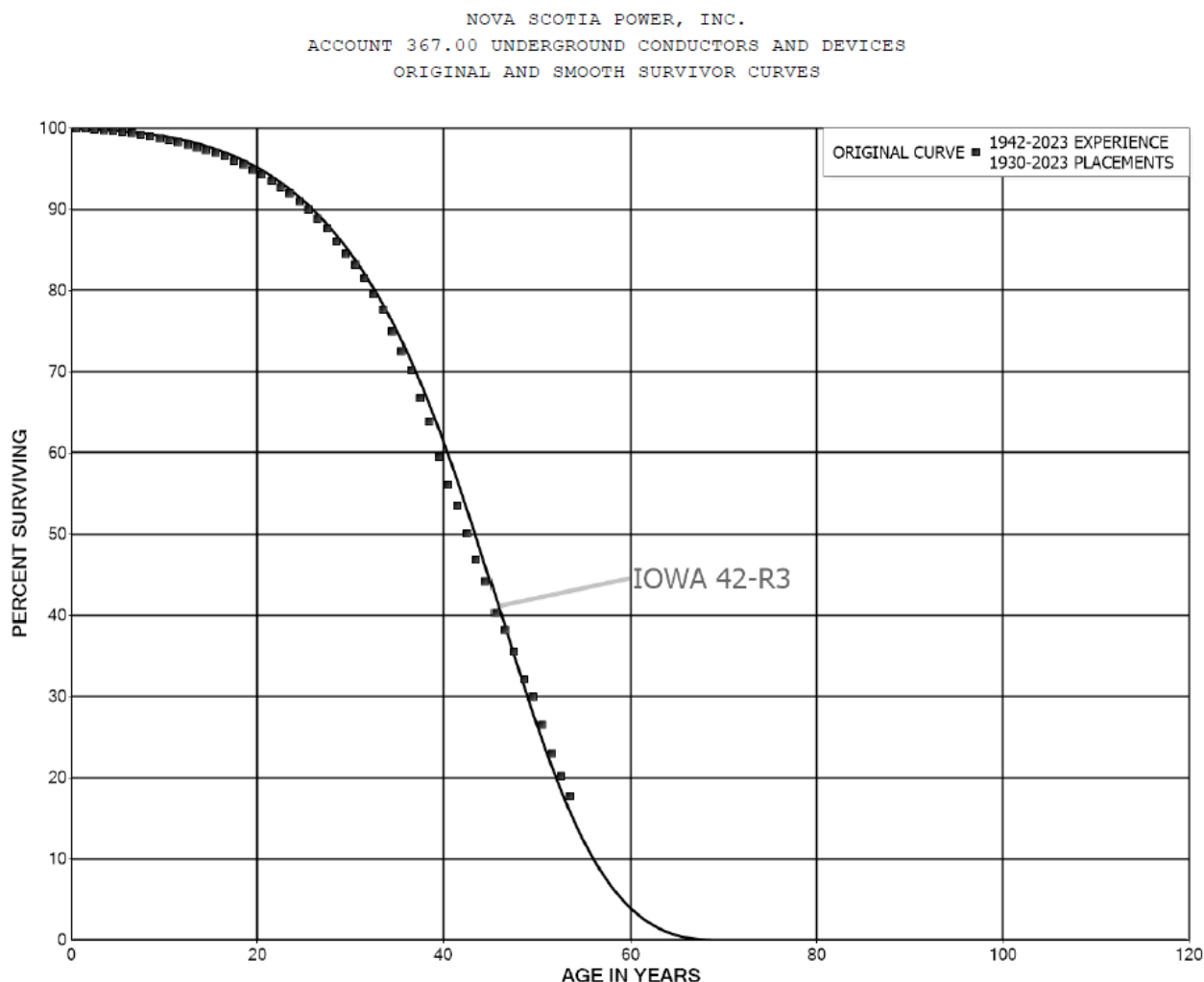
Q: Please describe the account characteristics from the perspective of NS Power.

A: As of December 31, 2023, NS Power has invested \$75,012.364 into this account. NS Power is recommending a 42-R3 curve for this account with a -25 percent net salvage rate. Gannett Fleming also used a placement band of 1930-2023 and an experience band of 1942-2023.

Q: Please provide a copy of the NS Power's proposed Iowa curve for this account.

A: The following figure represents the Iowa curve plotted against the retirement data for this account:

Figure 31 – Gannett Fleming survivor curve for Account 367.00



Q: Please summarize the management notes for this account per NS Power’s response to Emrydia IR-12 Attachment 1.

A: Gannett Fleming does not appear to have provided clearly distinguishable notes for this account in response to Emrydia IR-12 Attachment 1.

Q: Please summarize the results of the peer review for this account.

A: The following are observations from my peer review for this account:

- a. The average life for this account is 59 years per the Gannett Fleming peer data.
- b. The peer life range per Gannett Fleming appears to be between 29 and 70 years. I was unable to understand the reason for the lower limit of this range due to a lack of disclosure of the names for each result.

c. NB Power uses a 40-R3 curve for this account.

d. Maritime Electric uses a 50-R2.5 curve for this account.

e. Newfoundland uses a 60-R2.5 curve for this account.

Q: Please describe the nature of the assets in this account.

A: Underground conductor is less common than overhead conductor and are generally used in urban settings or when a customer elects to have it installed at their additional cost. For example, some rural customers may elect for the conductor to be placed underground due to the movement of large equipment. As the conductor resides underground it is generally subject to fewer forces of retirement than overhead conductor. For example, storms and general failure would be unlikely be a significant cause of retirement, though not impossible. More often the conductor is retired because it needs to be relocated. For these reasons, it is often the case, though not always the case, that underground conductor on the distribution system has a longer average service life than overhead conductor.

Q: Please provide your recommended average service life and survivor curve for this account.

A: At this time, I recommend no change to this account as NS Power's life does approximate some of its peers. Additionally, I lack detail from NS Power to support the life it proposals or a change to that life at this time. Therefore, considering the account has a lower investment than other accounts, I propose a wait and see approach for this account. I also recommend the Board direct NS Power to provide further information in its next depreciation study to explain the proposed life and why that life is appropriate considering NS Power's facts and circumstances.

3.2.4.8 Account 368.00 Line Transformers

Q: Please provide a description of the assets in this account.

A: The FERC defines this account as follows:

This account shall include the cost installed of overhead and underground distribution line transformers and poletype and underground voltage regulators owned by the utility, for use in transforming electricity to the

1 voltage at which it is to be used by the customer, whether actually in
2 service or held in reserve.

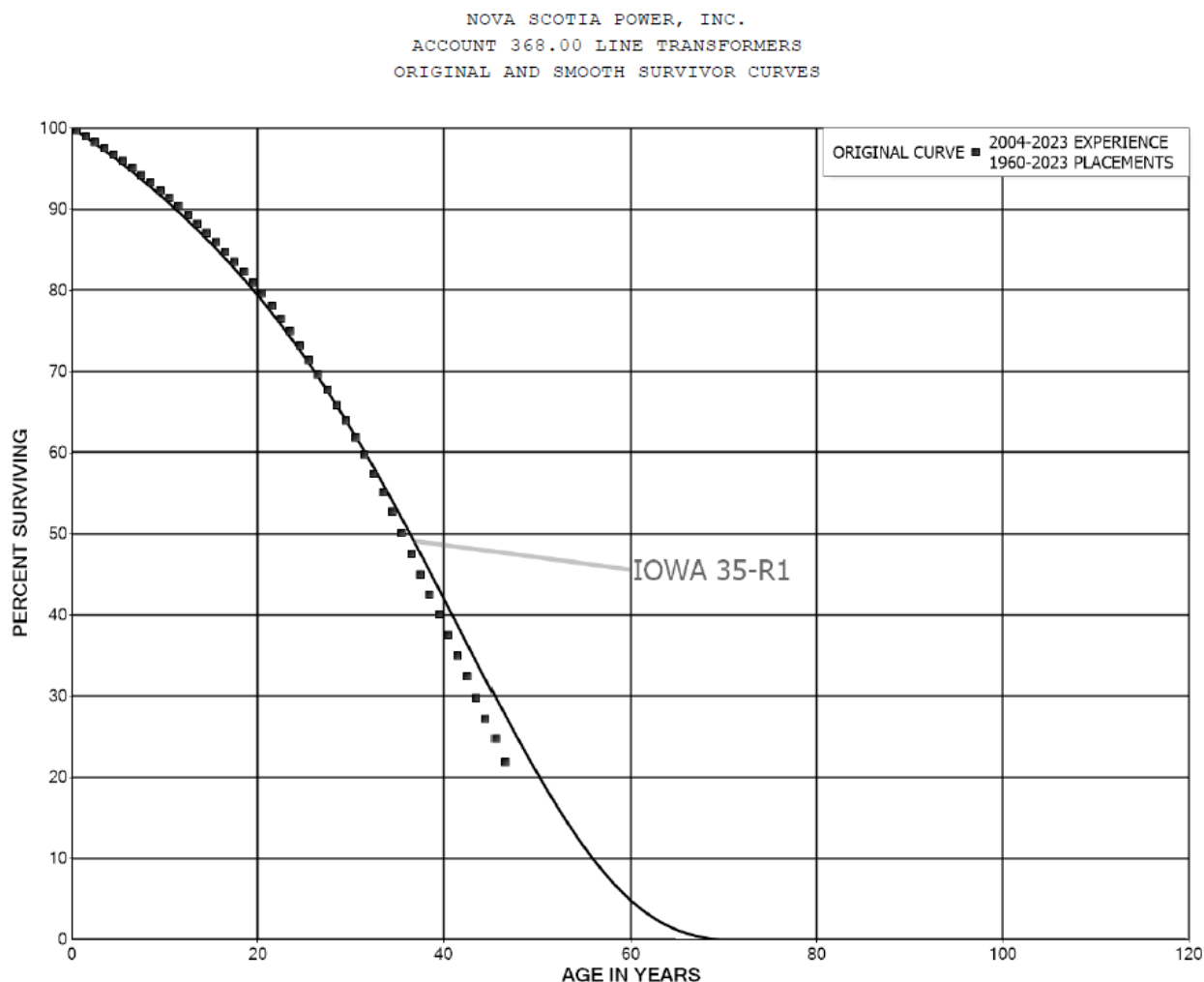
3 **Q: Please describe the account characteristics from the perspective of NS Power.**

4 A: As of December 31, 2023, NS Power has invested \$555,455,934 into this account. NS
5 Power is recommending a 35-R1 curve for this account with a -25 percent net salvage rate.
6 Gannett Fleming also used a placement band of 1960-2023 and an experience band of
7 2004-2023.

8 **Q: Please provide a copy of the NS Power's proposed Iowa curve for this account.**

9 A: The following figure represents the Iowa curve plotted against the retirement data for this
10 account:

1 **Figure 32 – Gannett Fleming survivor curve for Account 368.00**



2
3 **Q: What are your observations based on the proposed Iowa curve?**

4 A: First, the recommended curve does not provide for a good fit to retirement data beyond
5 year 39.5. Additionally, based on the observed retirement data an R1 curve may not
6 provide for a reasonable fit to the observed retirement data. However, as noted below, I am
7 unable to place significant weight on the survivor curve type selected based on the data
8 used.

9 **Q: Did Gannett Fleming consider any other placement bands, experience bands, or life**
10 **curves for this account per its response to Emrydia IR-2 Attachment 1?**

11 A: Yes. In addition to the previously noted placement and experience bands, Gannett Fleming
12 also reviewed the following placement and experience bands for this account:

a. Placement band – 1925-2023; Experience band – 1942-2023.

b. Placement band – 1942-2023; Experience band – 2014-2023.

c. Placement band – 1964-2023; Experience band – 2020-2023.

Similar to my findings for Account 364.00 and 365.00, I have reviewed the results of the various placement and experience bands and have determined that it is inappropriate to assign significant weight to those results, for the reasons already stated. Particularly, the proposed life for this account is quite unusual compared to the peers and none of the placement or experience bands provide for a result that aligns with what I would expect for this account

Q: Please summarize the management notes for this account per NS Power's response to Emrydia IR-12 Attachment 1.

A: Gannett Fleming provided its notes for this account at pages 9 and 10 of Emrydia IR-12 Attachment 1, noting the following from its discussions with management:

- Other retirement causes of line transformers include: new load growth, storm damage, 3rd party damage, animals, customer's leave system, rust, deterioration.
 - We had been seeing service lives trend longer due to the change to stainless steel
 - NSPI expects it will trend higher towards 40 years.
 - NSPI – Used a 30 year average service life in the previous SL study.

Q: Please summarize the results of the peer review for this account.

A: The following are observations from my peer review for this account:

- a. The average life for this account is 42 years per the Gannett Fleming peer data.
- b. The peer life range per Gannett Fleming appears to be between 10 and 65 years. I was unable to understand the reason for the lower limit of this range due to a lack of disclosure of the names for each result.

c. NB Power uses a 33-R0.5 curve for this account.

d. Maritime Electric uses a 36-R2.5 curve for this account.

e. Newfoundland Power uses a 42-S1 curve for this account.

Q: Please provide your recommended average service life and survivor curve for this account.

A: I recommend the Board approve a 36-R1 life curve combination for this account combined with the ALG procedure. This result balances the management data supporting a movement towards a 40-year life, as well as the peer data, which for this account is less consistent. A further change of 1 additional year will better facilitate the move towards a 40-year life in the future, if the operational data supports it.

Q: Please quantify the impact of this recommendation on NS Power's depreciation expense.

A: Despite being requested, NS Power did not provide detailed calculations in support of its individual accounts for depreciation purposes in response to Emrydia IR-27 Attachment 1. For this account, I understand that the parties did not propose any changes to the lives for this account per Appendix 8G.

Due to the lack of information from NS Power, I am unable to provide a precise calculation of the impact of this change. However, by comparing the ALG remaining life calculation from Gannett Fleming for a 35-R1 to a revised ALG remaining life calculation for a 36-R1 curve as I recommend (both with a -25 net salvage rate), the impact would be a reduction in depreciation expense for this account of approximately \$350,000 in each of 2026 and 2027. I recommend the Board direct NS Power to provide these detailed calculations as part of a compliance filing to this application after approval of this change in life.

3.2.4.9 Account 390.10 Structures and Improvements

Q: Please provide a description of the assets in this account.

A: The FERC defines this account as follows:

1 This account shall include the cost in place of structures and improvements
2 used for utility purposes, the cost of which is not properly includible in
3 other structures and improvements accounts.

4 **Q: Please describe the account characteristics from the perspective of NS Power.**

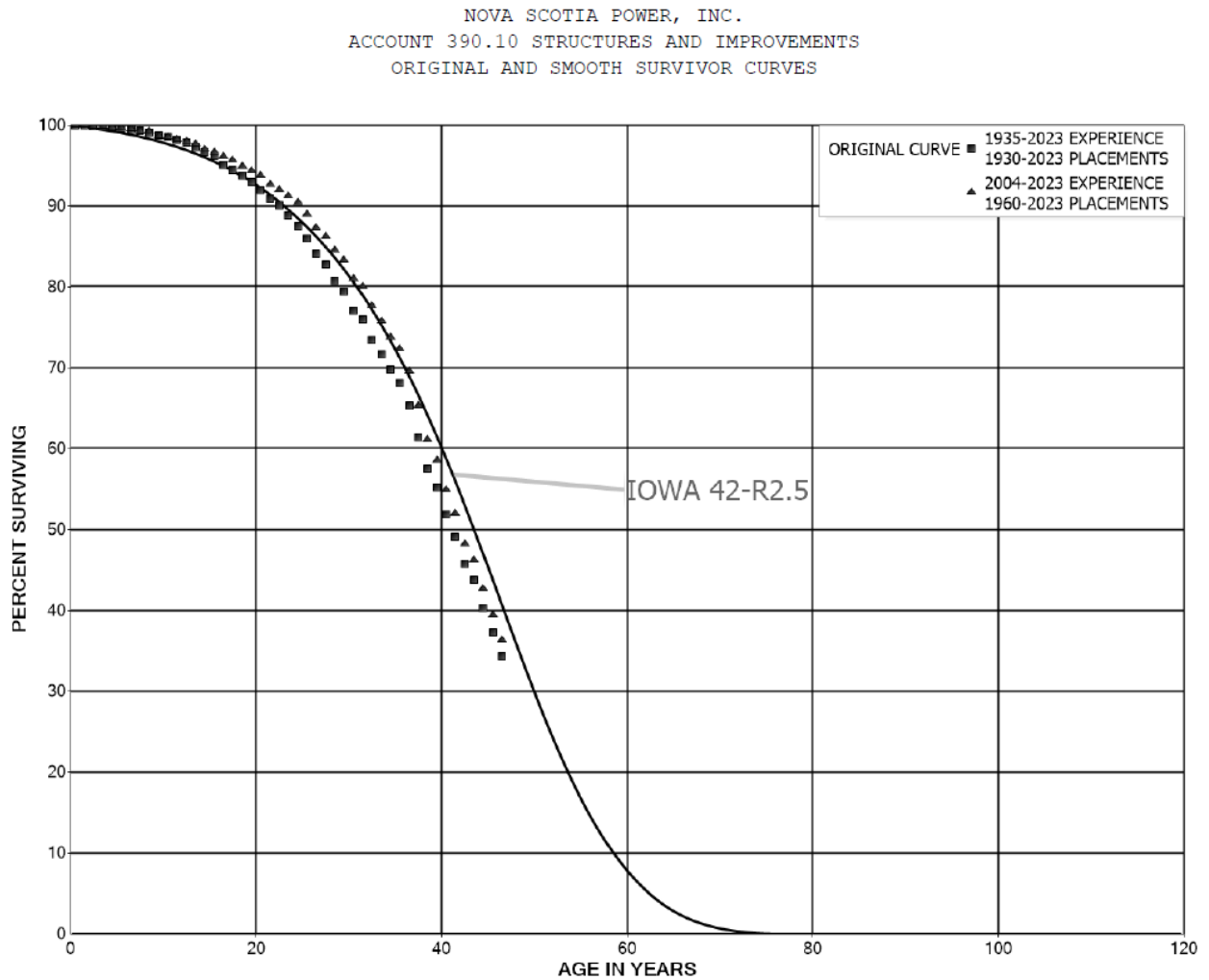
5 A: As of December 31, 2023, NS Power has invested \$184,609,960 into this account. NS
6 Power is recommending a 42-R2.5 curve for this account with a -10 percent net salvage
7 rate. Gannett Fleming also used two placement band and experience bands as follows:

- 8 • Placement 1930-2023; Experience 1935-2023.
- 9 • Placement 1960-2023 and an experience band of 2004-2023.

10 **Q: Please provide a copy of the NS Power's proposed Iowa curve for this account.**

11 A: The following figure represents the Iowa curve plotted against the retirement data for this
12 account:

Figure 33 – Gannett Fleming survivor curve for Account 390.10



Q: Please summarize the management notes for this account per NS Power’s response to Emrydia IR-12 Attachment 1.

A: The management notes for this account were limited to a discussion of buildings, which I understand to be in this account. Limited operational data was provided as support for the proposed life.

Q: Please summarize the results of the peer review for this account.

A: The following are observations from my peer review for this account:

- a. The average life for this account is 67 years per the Gannett Fleming peer data.
- b. The peer life range per Gannett Fleming appears to be between 40 and 100 years.

c. NB Power uses a 50-R4 curve for this account.

d. Maritime Electric uses a 40-R1 curve for this account.

e. Newfoundland Power uses a 80-L0 curve for this account.

Q: Please provide your recommended average service life and survivor curve for this account.

A: I recommend no change to the life for this account currently. While peer data supports a life extension of some degree, the lack of operational data from the Company makes it difficult to provide for an informed decision on the life of these assets. Additionally, I note that NS Power does not have any current plans to add new assets to this account. Nevertheless, I recommend that further study of this account be carried out in the next depreciation study.

Specifically, for each major structure included in the account, I recommend that the Board direct NS Power to disclose the expected useful life of the asset, the date the asset was acquired or constructed, and identify when NS Power expects to retire each asset. This data will provide further information to better understand the likely average service life of these assets.

3.3 Net salvage costs

3.3.1 Net salvage for certain hydro assets

Q: Please summarize the changes made by NS Power to its proposed net salvage rates for certain assets and why those changes were made.

A: NS Power summarized its proposal in relation to hydro asset net salvage as follows at page 44 of its GRA:

As stated in **Section 8.2.2**, NS Power has excluded the costs of decommissioning the Wreck Cove, Mersey, and Tusket hydroelectric assets from the calculation of the proposed depreciation rates. The estimated future cost to partially decommission these hydro systems is estimated at approximately \$550 million, totalling \$293 million for Tusket, \$228 million for Mersey and \$27 million for Wreck Cove. Given the

1 magnitude of these costs and the broad policy, societal, and environmental
2 considerations and factors that would need to be taken into account to
3 decommission such sites, NS Power believes removing these costs from
4 customer rates, at this time, is a reasonable approach to balancing cost
5 recovery and rate pressure for customers; however, NS Power is only
6 proposing to do so to the extent that it does not prejudice its ability to
7 recover such costs in the future should they be prudently incurred.

8 [Footnote removed]
9

10 **Q: What is the implication of this proposal?**

11 A: The Traditional Method of recovering net salvage costs is the most technically correct and
12 reasonable method of recovering net salvage costs from customers. By linking the recovery
13 of the cost to the depreciation of the assets, it ensures that the costs to salvage those assets
14 are recovered over the lives of the same assets. Thus, it similarly ensures that the customers
15 who benefit from the currently installed assets pay to remove those assets.

16 NS Power's proposal alters this dynamic by ceasing the collection of final salvage costs for
17 these assets. The implication is thus that future customers may be required to either pay a
18 disproportionate amount of the costs to salvage the assets while they are still in use, or
19 customers that no longer benefit from those assets will be required to pay for those assets.

20 **Q: Does NS Power acknowledge this as an implication?**

21 A: Yes.

22 **Q: Do you support these changes?**

23 A: Yes. Notwithstanding the potential implications of the change in collection, it is important
24 to remember that the collection of net salvage in rates is based on a forward-looking
25 estimate of the cost to salvage the installed assets. That estimate is often based on historical
26 costs to salvage assets, inflated forward to the future years the costs will be incurred. The
27 issue in this case as noted by NS Power in its Application, is that there is significant
28 uncertainty whether the costs will actually be incurred.

1 Indeed, having reviewed the detailed salvage studies and the policy, societal, and
2 environmental reasons for why full salvage of the installed assets would not be in the
3 public interest, I agree that the likelihood that the assets will be fully salvaged is low.
4 Furthermore, NS Power has stated its intention to significantly invest in currently installed
5 hydro assets, which may further extend the useful life of those assets and render the
6 question of whether the assets will be retired based on the current life span date a moot
7 point.

8 For these reasons, the best estimate of the net salvage rate at this time is 0 for the final
9 retirement of the assets. I acknowledge that a portion of the salvage costs continue to be
10 recovered for the retirement of certain assets. Accordingly, NS Power's decision to exclude
11 those net salvage costs is appropriate and compliant with the Traditional Method of
12 recovering net salvage costs.

13 **Q: If the costs are required to be incurred in the future are there alternatives for NS**
14 **Power to consider?**

15 A: Yes. Perhaps the most appropriate alternative in this case would be to securitize the costs
16 to salvage the assets and recover the costs over a reasonable period following retirement of
17 the assets. This approach could be used in combination with the recovery in rates for as
18 long a period of time as possible any reasonable amount of salvage costs from customers at
19 the time. The use of securitization in this case, like the case of the Deferred
20 Decarbonization Asset (DDA) costs I discuss below, would likely be driven by a policy
21 decision from the Government of Nova Scotia to remove the assets, not based on a
22 financial, societal or environmental basis. Thus, shifting the costs in this limited case
23 through securitization to future customers would be appropriate.

24 **Q: Does NS Power support similar tools to address these costs in the future?**

25 A: Yes. In response to Emrydia IR-31 which asked NS Power whether it would oppose future
26 securitization of the costs if they were required to be incurred, NS Power stated:

27 No. In the event that decommissioning costs were required to be incurred
28 for Wreck Cove, Mersey, and/or Tusket hydro systems, NS Power would

1 consider all relevant factors to determine the best approach for cost
2 recovery of these decommissioning activities.

3 **Q: Do you have any other items regarding this proposal that you want to bring to the**
4 **Board's attention?**

5 A: Yes. I note that the change in approach to recovering net salvage costs for certain activities
6 warrants NS Power undertaking an effort to fully reconcile all year-to-date net salvage and
7 actual salvage costs that have been recovered and paid for by customers to date. This
8 information is important as NS Power will continue to seek to recover certain salvage costs
9 for these assets and it is critical for parties to understand how much has been collected to
10 date for the final (or terminal) salvage of the assets. As a simple example, if NS Power has
11 prefunded \$10,000,000 for interim salvage and incurred \$9,000,000 of actual interim
12 salvage costs, but has also prefunded an additional \$10,000,000 for the final salvage of the
13 assets, then this latter amount would be relevant to the Board. In particular, the Board
14 should decide whether the amount should be refunded to customers if it is not required to
15 be spent or used to offset the future interim salvage requirements for NS Power.

16 In summary, I recommend the Board direct NS Power provide a reconciliation as part of its
17 next depreciation study showing the annual collection of interim and final net salvage in
18 rates since the date the assets were installed. I also recommend this same information be
19 presented for actual interim salvage costs that have been incurred each year for each of the
20 hydro assets where NS Power has proposed to cease collection of the final net salvage
21 costs for the assets.

22 **3.3.2 Changes to specific net salvage parameters**

23 **Q: Have you reviewed NS Power's applied for net salvage parameters?**

24 A: Yes. I conducted a detailed review of the proposed net salvage parameters, conducted
25 benchmarking against NS Power's industry peers, and assessed the underlying data relied
26 upon by Gannett Fleming, and NS Power, to support the applied for net salvage rates.

Q: What approach has Gannett Fleming used to estimate its net salvage parameters in this case?

A: The approach employed by Gannett Fleming was described at page IV-2 and IV-3 of the depreciation study (Appendix 8A). Key elements of the proposed net salvage estimation process are reproduced below:

NET SALVAGE ANALYSIS

The estimates of net salvage by account were based in part on historical data compiled for the years 1993 through 2023. Cost of removal and salvage were expressed as percents of the original cost of plant retired, both on annual and three-year moving average bases. The most recent five-year average also was calculated for consideration. The net salvage estimates by account are expressed as a percent of the original cost of plant retired.

The experienced net salvage data were available by account for Transmission, Distribution, and General Plant accounts. The historical net salvage data for the years 1976 through 1992 were available only in total for the function and though not considered as the statistical basis for the net salvage estimates, the data were of some probative value.

Net Salvage Considerations

The net salvage estimates for transmission and distribution plant accounts were based primarily on judgment which considered a number of factors. The primary factors were the analyses of historical data; the net salvage characteristics of other electric utility properties; a knowledge of management's plans and operating policies; and net salvage estimates from previous studies of this Company and other electric companies. The statistical support for the net salvage estimates are set forth in Part VIII of the report.

1 Gannett Fleming also further elaborated on its reliance on a Stantec report for Steam and
2 Other Production Plant, as well as Hatch and Boreas Heritage Consulting reports for Hydro
3 Production Plant.

4 **Q: Did NS Power in its settlement agree to any changes in net salvage rates?**

5 A: Yes. Those changes are set out in Appendix 8G.

6 **Q: Do you recommend any changes to the applied for net salvage parameters in the test**
7 **period based on the settlement agreement?**

8 A: No, not at this time. This is primarily for two reasons. First, while certain of the net salvage
9 rates may be over or understated there does not appear to be a clear directional bias in the
10 proposed rates, as there are for life parameters. For example, while the proposed net
11 salvage rate for Account 368.00 Line Transformers appears too high, it remains within the
12 range of reasonable results. At the same time, the proposed net salvage rates for Account
13 364 and 365 may be somewhat lower than I would recommend, but again the amounts are
14 still within a reasonable range of results. Therefore, proposing changes to each parameter
15 would likely have an overall minor impact on the total proposed net salvage inclusion.

16 Second, as set out above, I recommend that NS Power adopt the ALG procedure and make
17 adjustments to several of its lives for several assets. These changes will have the impact of
18 reducing total depreciation expense for NS Power, which includes depreciation and net
19 salvage. Thus, as I am already proposing adjustments that while gradual and moderate, are
20 not inconsequential, I recommend that the Board allow the “dust to settle” and potentially
21 reassess the proposed net salvage rates as part of NS Power’s next depreciation study.

22 **3.4 Other reporting considerations for depreciation**

23 **Q: Do you recommend any improvements in the timing of filing future depreciation**
24 **studies?**

25 A: Yes. I recommend that going forward NS Power be required to file a full depreciation
26 study no less than once every five years, or alternatively, no less than every second full rate
27 application. This latter recommendation would only apply to the next depreciation study
28 where I have recommended significant additional information be provided as set out above.

It is important that depreciation rates be revisited frequently. This is the case for every utility, and the industry standard is a new depreciation study about every 5 to 7 years. Sometimes it is sooner, other times it can be more delayed. Still, for NS Power a more frequent review is warranted considering the changing make-up of its generation assets, as well as plans to construct significant new transmission assets in the near future. All these factors warrant a detailed review as part of a full depreciation study, and I do not recommend that NS Power wait another 10 or more years before filing its next depreciation study. Doing so greatly risks intergenerational equity for customers.

4 Deferral account amortization

Q: Please summarize NS Power's request pertaining to deferral account amortization.

A: NS Power's requested deferral account amortization is outlined in Figure 8-3 of its GRA, which is reproduced below:¹⁶

Figure 34 – NS Power figure illustrating the proposed amortization of deferrals

Amortizations	2026	2027
Non-Standard Meters	2.4	-
Hurricane Fiona Cost Recovery	3.4	3.4
Roseway Hydro Decommissioning Costs	1.0	1.0
Annapolis Tidal Net Book Value	-	2.6
Smart Grid NS Net Book Value	0.3	0.3
GRA and COSS Deferral	1.0	1.0
Total	8.1	8.3

Q: Did NS Power provide an expanded schedule to support the change in deferral balances?

A: Yes. In response Emrydia IR-32 Attachment 1, NS Power provided the following expanded table:

¹⁶ NS Power GRA, page 46, Figure 8-3.

**Table 9 – Expanded reconciliation of deferral account balances and amortization
received in response to IR-32 Attachment 1**

(\$ million)	2026 Opening Balance	2026 Additions	2026 Amortization	2026 Ending/2027 Opening Balance	2027 Additions	2027 Amortization	2027 Ending Opening Balance
Non-standard Meters	2.4	-	2.4	-	-	-	-
SmartGrid NS	1.7	-	0.3	1.3	-	0.3	1.0
Annapolis Tidal Retired Assets	-	-	-	-	25.8	2.6	23.2
Hurricane Fiona	28.8	-	3.4	25.4	-	3.4	22.1
GRA Deferral	2.0	-	1.0	1.0	-	1.0	-
Deferred Decarbonization Asset	-	-	-	-	-	-	-
Roseway Decommissioning	4.8	-	1.0	3.8	-	1.0	2.9
Total	39.7	-	8.1	31.5	25.8	8.3	49.2

Q: Based on your review of the evidence provided by NS Power are the proposed amortization amounts and periods reasonable, and to the extent relevant, consistent with the approved amortization set by the Board?

A: Yes. Accordingly, I have no recommendations pertaining to the proposed amortization of deferral balances at this time.

5 Securitization proposals

Q: What is securitization in the context of utility rate setting?

A: Securitization is the process of setting up either a special purpose entity or other financing vehicle that is used to hold and allow for lower cost recovery of costs incurred by a utility that if included in base rates would cause rate shock or negatively impact the financial integrity of the utility.

The main benefit of securitization is that it provides for recovery of the costs based on low-cost debt financing, which is generally available as the cost recovery is either guaranteed or highly certain, and over a finite period of time. Absent denying recovery of the costs in rates, which has its own implications, securitization poses the lowest general cost to customers. The issue with securitization is that it shifts the burden of costs to future customers who may not receive any direct or indirect benefits from the assets or costs that were deferred.

Q: Is securitization a common tool used in other jurisdictions?

A: Yes. Securitization is commonly used in the United States for various costs, including extraordinary storm costs and costs related to the early retirement of generation assets. I am

1 unaware of securitization having been previously used in Canada, but I have recommended
2 its use in other jurisdictions for different reasons.

3 **Q: What is NS Power's current proposal in this case?**

4 A: NS Power outlined its proposal regarding securitization at pages 52 and 53 of its GRA, as
5 follows:

6 The increase in NS Power's average capital assets due to capital
7 investment is partially offset by the forecast securitization of the December
8 2025 net book value of the DDA assets referenced in Section 8.2 (Point
9 Aconi, Trenton, Point Tupper Marine Terminal, Sydney International Coal
10 Pier, and steam general assets). As described in **Appendix 8F** it is
11 anticipated that the Province will issue regulations that will facilitate NS
12 Power's ability to apply to the NSEB for approval to securitize this balance
13 within the year. To maintain the financial health of NS Power, it is key that
14 securitization-related debt is not included in the calculation of NS Power's
15 credit metrics. This will require formal confirmation from NS Power's
16 credit rating agencies. No Canadian investor-owned utility has undertaken
17 a securitization similar to those undertaken by United States investor-
18 owned utilities. As such, it is anticipated that a NS Power securitization
19 will require identifying a finance structure to resolve a variety of issues
20 including, but not limited to, credit rating, trust indenture and tax
21 considerations. Subject to successful credit rating agency processes and
22 the issuance of enabling regulations, NS Power intends to apply to the
23 NSEB for approval for the securitization of approximately \$700 million of
24 DDA assets over the GRA period. If such a securitization is delayed such
25 that it cannot be completed in whole or in part by January 1, 2026, NS
26 Power is requesting that depreciation expense and financing costs of these
27 assets be deferred at WACC on an interim basis. Conversely, if it is
28 determined that such a securitization will not be possible, NS Power will
29 amend this filing to include the approximately \$700 million of DDA assets
30 in its rate base over the GRA period and inclusion of the associated

1 depreciation expense and financing costs in its applied-for revenue
2 requirement. This would be required to ensure NS Power is provided with
3 the opportunity to recover its prudently incurred costs. Please note that the
4 potential securitization is intended to apply only to the net book value of
5 these assets as of December 2025. Any subsequent sustaining capital
6 investments and operating expenses required while these assets remain
7 used and useful will continue to be included in rate base and/or revenue
8 requirement in the normal course of business.

9 Additionally included as 2026-2027 GRA Direct Evidence Appendix 8F is a letter from the
10 Government of Nova Scotia confirming its intent to support NS Power and other parties to
11 develop an approach that would allow the Board to issue a financing order.

12 **Q: Is NS Power requesting any specific relief in regards to its securitization proposal at**
13 **this time?**

14 A: No, except for its request to be permitted to recover its weighted average cost of capital
15 (WACC) on any depreciation and financing costs if the securitization is delayed beyond
16 December 31, 2025, NS Power does not appear to be seeking any specific relief.

17 **Q: What is the current status of the securitization?**

18 A: NS Power provided the following update in response to Emrydia IR-39:

19 NS Power continues to have discussions with third-party advisors and
20 credit rating agencies. The form of the securitization is still anticipated to
21 be consistent with the description in the Application, subject to any
22 modifications required as a result of credit rating agency and capital
23 markets feedback. NS Power was targeting the securitization being in
24 place prior to January 1, 2026. However, it now appears more likely that
25 securitization bonds will be issued in Q1 2026. This is subject to the
26 Province prescribing the enabling regulations and constructive credit
27 rating agency processes.

Q: Do you recommend approval of NS Power's proposed securitization?

A: Yes, in principle I have no issues with the proposal to securitize the costs in question for the reasons stated earlier. However, I am unable to review the results of the specific transaction as part of this evidence, and thus my opinion may change based on the final financing characteristics and facts/circumstances of the securitization. I recommend the Board conduct a full review of the final securitization, including the recovery period of all costs as part of a future process. Ultimately though, it is likely fair to conclude that out of all the options available, securitization would be the "least-bad" option.

While I do not oppose the securitization proposal, I do oppose NS Power's proposal to defer depreciation and financing costs on the assets at its WACC if the securitization is delayed. NS Power has not adequately demonstrated why the delay occurred. Additionally, it is in the interest of all parties, including customers and NS Power, that the details of the securitization are finalized quickly to ensure rate certainty for customers. Allowing for recovery of WACC on unrecovered costs provides a weak incentive for NS Power to ensure the process is completed in a timely manner.

Additionally, I note that the period of delay appears to be a matter of months. It is customary for return on such amounts to be approved by a regulator where there is a substantial delay that is outside the control of the utility. The context of this delay is one that is not substantial. The delay is also not clearly outside the control of the utility.

Accordingly, I support simple deferral of any amounts related to depreciation and financing costs to the extent the securitization is delayed. Simple deferral of only the specific dollar amounts, after review of all supporting calculations for those amounts is appropriate for the above reasons. Separately, I recommend the Board assess the reasons for the delays as a condition of approval of recovery of the amounts as part of a separate process. Forecast risk is an ordinary element of the rate setting process, and to the extent that delays extend beyond Q1 2026, it may not be appropriate for customers to bear the costs of that risk on behalf of NS Power, particularly when customers have no control over the timing of the securitization finalization.

1 **Q: Does this conclude your evidence?**

2 A: Yes.