

1 Q. **Reference: Volume II, Exhibit 7; and Volume III, Exhibit 8**

2 Exhibit 7 relied on information available as of December 31, 2022. Exhibit 8 incorporates
3 operating experience, retirements, additions, and accounting data through December 31, 2024.

4 a) Did any asset classes experience retirement patterns inconsistent with the conclusions
5 reached in the 2023 study?

6 b) What new empirical evidence became available after completion of the 2023 study?
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9 A. *This response was provided by Concentric Advisors, Inc. ("Concentric").*

10 a) It is confirmed that there were a number of units of property accounts that had retirement
11 dispersion patterns that did not align with the recommended depreciation parameters.
12 These dispersions were caused by a variety of factors, including a lack of historical
13 retirement experience, the desire to make gradual changes to approved average service
14 lives, changes in the assets or forces of retirement related to a particular unit of property
15 account, or increased weighting placed on other sources of information. Concentric notes
16 that it is considered best practice to place less weighting on stub curves where minimal
17 retirements have been recorded. The cornerstone textbook, Depreciation Systems, states:

18 Analysis of the results of the experiment will reveal how short the stub curve
19 can be before the results of fitting the stub curves differ from the fit to the
20 entire curve. This experience was performed by Cowles (1957), who concluded
21 that reasonably good fits were obtained for stub curves that ended at a point as
22 high as 70% surviving.¹

23 Many of the units of property accounts with poor fits to historical data do not extend
24 beyond 70% surviving, and as such, it is inappropriate to place high amounts of weight on
25 the actuarial analysis.

¹ Frank K. Wolf and W. Chester Fitch, "Depreciation Systems," Iowa State University Press, 1994, p. 49.

1 While there are no universally accepted criteria for a “good fit” to historical data when
2 utilizing the actuarial analysis method, the following units of property could be considered
3 as having retirement patterns inconsistent with the recommended depreciation parameters:

- 4 • A04 – Auxiliary Power Systems: Discussions with management indicate that the
5 auxiliary systems are subject to retirement between the ages of 20 and 25 years due
6 to the failure of the PLC systems. Additionally, it is noted that the investment in this
7 account has increased substantially in recent years. Approximately \$10.0 million of
8 the total \$13.8 million exposures have been added within the 11.5 years prior to the
9 date of the study. These assets have not yet been in service for long enough to
10 expect a substantial number of retirements.
- 11 • B01 – Battery and Power Systems: Concentric placed more weighting on the
12 comments from management and subject matter experts, who indicated that the
13 longest-lived batteries survive for approximately 25 years, with most reaching the
14 end of life by age 20. Additionally, changes in technology and vendor availability
15 result in average service lives that are shorter than those which have been
16 experienced historically.
- 17 • B07 – Bus Duct Generator: This account has not yet experienced any retirements. As
18 such, minimal weighting was placed on the actuarial analysis in the selection of the
19 average service life and Iowa dispersion curve.
- 20 • B08 – Bus Work and Hardware: This account has only experienced \$139,900 in
21 historical retirements. As such, minimal weighting was placed on the actuarial
22 analysis in the selection of the average service life and Iowa dispersion curve.
- 23 • C01 – Cables Telecontrol: This account has only experienced \$105,530 in historical
24 retirements. As such, minimal weighting was placed on the actuarial analysis in the
25 selection of the average service life and Iowa dispersion curve.
- 26 • C03 – Cables Underground: This account has only experienced \$14,040 in historical
27 retirements. As such, minimal weighting was placed on the actuarial analysis in the
28 selection of the average service life and Iowa dispersion curve.

- 1 • C07 – Chemical Feed Systems: This account has not yet experienced any
2 retirements. As such, minimal weighting was placed on the actuarial analysis in the
3 selection of the average service life and Iowa dispersion curve.
- 4 • C12 – Condensers: The historical retirement experience for this account is
5 influenced by three large retirements, occurring at ages 2.5, 5.5, and 9.5. It is the
6 view of Concentric that these retirements are unlikely to recur in the future. As
7 such, Concentric has placed minimal weighting on the historical retirement
8 experience.
- 9 • D02 – Diesel Systems and Engines: The historical retirement information indicates
10 that a life shortening is necessary. Concentric recommends a step change in the
11 interest of gradualism and moderation.
- 12 • E01 – Elevators: This account has not yet experienced any retirements. As such,
13 minimal weighting was placed on the actuarial analysis in the selection of the
14 average service life and Iowa dispersion curve.
- 15 • E02 – EMS Equipment: The historical retirement experience for this account is
16 influenced by two large retirements, occurring at ages 8.5 and 9.5. As such, while
17 Concentric has recommended a life shortening to place some weighting on the
18 historical retirement experience, Concentric recommends not overreacting to the
19 early retirement experience. The recommended life shortening of 5 years follows
20 the practice of gradualism and moderation while not overreacting to the two
21 retirement data points.
- 22 • E03 – Environmental Equipment: The historical retirement information indicates
23 that a life lengthening is necessary. However, this account has only recorded
24 \$146,785 in historical retirements. As such, while Concentric agrees that a life
25 lengthening is necessary at this time, Concentric has proposed a smaller step change
26 than would be indicated by the historical data.
- 27 • F01 – Fall Arrest Equipment: This account has only experienced \$114,587 in
28 historical retirements. As such, minimal weighting was placed on the actuarial
29 analysis in the selection of the average service life and Iowa dispersion curve.

- 1 • G01 – Gas Turbine Systems: Conversations with subject matter experts indicate that
2 gas turbine lives should be approximately 40 years based on their experience. The
3 total life is based on the number of starts of the system, with overhauls expected to
4 live approximately 10–15 years. It is noted that the recommended 40-R3 is a
5 superior fit to the historical data through approximately age 30, after which point
6 there are only three years with retirement transactions recorded.

- 7 • G03 – Generators, Windings, and Powerhouse: This account combined Account G04
8 Generator - Windings with an Iowa 50-S3 and Account P10 Powerhouse with an
9 Iowa 75-R3 with Account G03 Generators with an Iowa 65-S3. The combination of
10 the three accounts, in addition to the trends in the life cycles of each account since
11 the last study, has led to the need to slightly decrease the life at this time.
12 Additionally, while there have been more than \$11 million in historical retirements,
13 the exposures never fall below 92% surviving. As noted above, Concentric placed
14 less weighting on Iowa curves where the exposures stay above 70% surviving.

- 15 • M03 – Metal Clad Switchgear: This account has only experienced \$88,117 in
16 historical retirements. As such, minimal weighting was placed on the actuarial
17 analysis in the selection of the average service life and Iowa dispersion curve.

- 18 • M06 – Meters Digital: The assets within this account relate to digital metering
19 assets. The historical data include additions from 1965 through 2024 with
20 retirements from 1991 through 2024. These assets have undergone a significant
21 change in the expected life cycle due to the impact of technology in the time since
22 the oldest additions were recorded. Additionally, Measurement Canada Standard
23 S.S.06 mandates testing batches of electric meters at 10 years and again at 18 years,
24 with significant fines for utilities who do not pass testing. An 18-year life aligns with
25 the end of the second testing period, which allows for meters to be replaced instead
26 of undergoing a third test period.

- 27 • P12 – Protective Control and Relay Panels: This account has only experienced
28 \$492,533 in historical retirements. As such, minimal weighting was placed on the
29 actuarial analysis in the selection of the average service life and Iowa dispersion
30 curve.

- R02 – Radio Fixed Microwave Equipment: This account combined Account R03 Radios - Fixed UHF Equipment with an Iowa 15-L0.5 with Account R02 with an Iowa 19-R5. Additionally, Subject Matter Experts indicated that a 15-year life is appropriate, as these accounts are subject to changing technology, which drives a shorter life cycle.
- R04 – Radios Fixed VHF Equipment: This account combined Account R05 Radios - Mobile VHF Base Station with an Iowa 15-R4 with Account R04 with an Iowa 19-R3. Additionally, Subject Matter Experts indicated that a 15-year life is appropriate, as these accounts are subject to changing technology, which drives a shorter life cycle.
- R06 – Ramps Yard Storage: This account has only experienced \$233,772 in historical retirements. As such, minimal weighting was placed on the actuarial analysis in the selection of the average service life and Iowa dispersion curve.
- R07 – Reactors and Resistors: This account has not yet experienced any retirements. As such, minimal weighting was placed on the actuarial analysis in the selection of the average service life and Iowa dispersion curve.
- S10 – Station Service: This account has only experienced \$131,186 in historical retirements. As such, minimal weighting was placed on the actuarial analysis in the selection of the average service life and Iowa dispersion curve.
- S13 – Storm and Yard Drainage: This account has only experienced \$2,307 in historical retirements. As such, minimal weighting was placed on the actuarial analysis in the selection of the average service life and Iowa dispersion curve.
- S18 – Surge Systems: This account has only experienced \$393,192 in historical retirements. As such, minimal weighting was placed on the actuarial analysis in the selection of the average service life and Iowa dispersion curve.

b) Concentric reviewed the updated addition, retirement, and net salvage data for fiscal years 2023 and 2024 as part of the 2024 Technical Update.