



Operating Engineers Local No. 77 Pension Plan

Actuarial Valuation
As of January 1, 2024

Bolton

Submitted by:

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Employee Benefits, Actuarial & Investment Consulting

November 22, 2024

Trustees
Operating Engineers Local No. 77 Pension Plan
c/o Associated Administrators, LLC
911 Ridgebrook Rd.
Sparks, MD 21152

Re: ***January 1, 2024 Actuarial Valuation***

Dear Trustees:

This report sets forth the actuarial valuation of the Operating Engineers Local No. 77 Pension Plan as of January 1, 2024 for the plan year beginning on that date. The report is based on census and contribution data submitted by Associated Administrators, LLC. Financial data for the plan year ended December 31, 2023 was submitted by Calibre CPA Group, PLLC. We have relied on the accuracy of this data.

Actuarial Methods and Assumptions

Mortality and retirement rates were updated based on a study of the Plan's recent experience.

All other methods and assumptions remain the same as those used in the prior valuation.

Plan Provisions

Accrual rate lowered from 1.75% to 1.50% of contributions for hours worked on or after January 1, 2024.

All other plan provisions remain the same as those used in the prior valuation.

Plan Assets and Investment Performance

The market value of assets (MVA) as of January 1, 2024 is \$193,916,218. The actuarial value of assets (AVA) as of the same date is \$207,953,864.

The net return for the year ended December 31, 2023 after investment expenses was 7.8% on a market value basis and 6.6% on an actuarial value basis.

PPA Zone Status

The Plan is in the "Green Zone" (Neither Critical Nor Endangered Status) for the 2024 plan year. Our current projections of the funded percentage and credit balance indicate that the plan will remain in the Green Zone for the 2025 plan year.

Minimum Funding

The minimum funding requirement is the normal cost including expenses for the year plus an amortization of unfunded liabilities under the plan's actuarial cost method, with interest to the end of the year.

Minimum Funding Requirement before the Credit Balance	
Total Normal Cost	\$5,968,431
Net Amortization Charges	11,206,566
Interest	1,202,250
Total Minimum Funding Requirement	\$18,377,247

For the plan to satisfy minimum funding requirements, employer contributions to the plan plus the credit balance for prior contributions in excess of minimums must exceed this total. Total contributions plus interest for 2024 are anticipated to be \$10,294,331. The credit balance with interest is \$50,433,796. These total \$60,728,127. Thus, assuming all assumptions are met, the minimum contribution requirements are met for the year.

Each year's actuarial gain or loss is amortized over a 15-year period. Most plan amendments and actuarial assumption changes are amortized over a 15-year period. One-time bonus checks, like 13th checks, are recognized immediately. A schedule later in this report sets forth each component of the amortization, the outstanding balance and the number of years remaining.

Deductible Contributions

Following IRS Announcement 96-25, Section 360, if the anticipated contributions for the year do not exceed the deductible limit, then the actual amounts contributed are deemed to be deductible. For this purpose, anticipated employer contributions are determined in a manner consistent with the manner in which actual contributions are determined. For 2024, the anticipated contributions are \$9,946,214 and the deductible limit is \$358,949,403. Therefore, anticipated contributions do not exceed the deductible limit.

Since the anticipated contributions for 2023 did not exceed the deductible limit of \$426,644,157, the actual contribution total of \$9,599,101 is deductible.

Risk Assessment

This valuation report includes information intended to assist plan sponsors and the readers of this report in understanding the most significant risks that affect the plan's future financial position. This report includes commentary about risks to be considered when developing the plan's investment and funding policies and why it is important that these two policies are connected. Preparing a full risk assessment for the plan is beyond the scope of this engagement.

We encourage plan sponsors and plan administrators to consider this information carefully, view the results of the annual valuation in the context of the risks to plan costs and member benefit security, and determine whether it is an appropriate time to consider a more in-depth, comprehensive risk assessment.

Actuarial Certification

This actuarial valuation sets forth our calculation of an estimate of the liabilities of the pension plan, together with a comparison of these liabilities with the value of the plan assets, as reported by the plan's auditor. This liability calculation and comparison with assets are applicable for the valuation date only. The future is uncertain, and the plan may become better funded or more poorly funded in the future. This valuation does not provide any guarantee that the plan will be able to provide the promised benefits in the future.

This is a deterministic valuation in that it is based on a single set of assumptions. This set of assumptions is one possible basis for our calculations. Other assumptions may be equally valid. We may consider that some factors are not material to the valuation of the plan and may not provide a specific assumption for those factors. We may have used other assumptions in the past. We will likely consider changes in assumptions at a future date.

A change in assumptions does not indicate that the prior assumptions were invalid. At the time the prior assumptions were chosen, they represented our best estimate of the future experience of the plan. If we change assumptions in the future, it would be to align the assumptions with our then-current best estimate.

The trustees could reasonably ask how the valuation would change if we used a different assumption set or if plan experience exhibited variations from our assumptions. This report does not contain such an analysis. This type of analysis would be a separate assignment.

In addition, decisions regarding benefit improvements, benefit changes, the trust's investment policy, and similar issues should not be based on this valuation. These are complex issues and other factors should be considered when making such decisions. These other factors might include the anticipated vitality of the local economy and the growth expectation for the industry within which the contributing employers work, as well as other economic and financial factors.

The cost of this plan is determined by the benefits promised by the plan, the plan's participant population, the investment experience of the plan and many other factors. An actuarial valuation is a budgeting tool for the trustees. It does not affect the cost of the plan. Different funding methods provide for different timing of contributions to the plan. As the experience of the plan evolves, it is normal for the level of contributions to the plan to change. If a contribution is not made for a particular year, either by deliberate choice or because of an error in a calculation, that contribution can be made in later years. We will not be responsible for contributions that are made at a future time rather than an earlier time. The contributing employers are responsible for funding the cost of the plan.

We make every effort to ensure that our calculations are accurately performed. These calculations are complex. We reserve the right to correct any potential errors by amending the results of this report or by including the corrections in a future valuation report.

The accuracy of the results presented in this report is dependent upon the accuracy and completeness of the underlying information. The plan sponsor is solely responsible for the validity and completeness of this information.

The information in this report was prepared for the internal use of the Board of Trustees and its auditors in connection with our actuarial valuations of the pension plan. It is neither intended nor necessarily suitable for other purposes. We are not responsible for the consequences of any other use.



This report provides certain financial calculations for use by the auditor. These values have been computed in accordance with our understanding of generally accepted actuarial principles and practices and fairly reflect the actuarial position of the Plan. The various actuarial assumptions and methods which have been used are, in our opinion, appropriate for the purposes of this report.

This report is conditioned on the assumption of an ongoing plan and is not meant to present the actuarial position of the Plan in the case of Plan termination. Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions, changes in economic or demographic assumptions, increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the plan's funded status), and changes in plan provisions or applicable law.

The valuation was completed using both proprietary and third-party models (including software and tools). We have tested these models to ensure they are used for their intended purposes, within their known limitations, and without any known material inconsistencies unless otherwise stated.

Bolton Partners, Inc. ("Bolton") does not practice law and, therefore, cannot and does not provide legal advice. Any statutory interpretation on which this report is based reflects Bolton's understanding as an actuarial firm. Bolton recommends that recipients of this report consult with legal counsel when making any decisions regarding compliance with ERISA, the Internal Revenue Code, or any other statute or regulation.

The undersigned credentialed actuaries meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein and are currently compliant with the continuing professional education requirements developed by the Joint Board for the Enrollment of Actuaries. We are not aware of any direct or material indirect financial interest or relationship, including investments or other services that could create a conflict of interest that would impair the objectivity of our work.

The remaining sections of this report set forth details of the valuation as well as the information required for the auditors in accordance with FASB Accounting Standards Codification No. 960.

Respectfully Submitted,

Jim Ritchie ASA, EA, FCA, MAAA
President of Bolton Retirement

Timothy D. Boles, ASA, EA, FCA
Consulting Actuary

Section I. Summary of Assets

Income Statement for the Plan Year Ended December 31, 2023

Beginning of the year	
Market Value of Assets for Valuation as of January 1, 2023	\$185,942,372
Plus: Auditor's Adjustments	0
Market Value of Assets Reflecting Auditor's Adjustments	\$185,942,372
Receipts	
Employer Contribution for the Plan Year	\$9,599,101
Interest and Dividends	1,663,705
Net Appreciation	13,396,602
Investment Expenses	(797,729)
Other Income	16,289
Total Receipts	\$23,877,968
Disbursements	
Distributions to Participants/Beneficiaries	\$15,460,430
Administrative Expenses	443,692
Total Disbursements	\$15,904,122
End of the year	
Net Increase/(Decrease) in Assets	\$7,973,846
Market Value of Assets as of January 1, 2024	\$193,916,218

Section I. Summary of Assets (cont.)

Determination of Investment Gain/(Loss) for Assets

Market Value of Assets			
As of January 1, 2023			\$185,942,372

Item (1)	Amount (2)	Weight for Timing (3)	Weighted Amount (2) x (3)
Contributions	\$9,599,101	50%	\$4,799,551
Benefits Paid	(15,460,430)	50%	(7,730,215)
Expenses	(443,692)	50%	(221,846)
Total			(3,152,510)
Market Value plus Total Weighted Amount			182,789,862
Assumed Rate of Return for the Year			7.00%
Expected Return			\$12,795,290

Actual Return	
1. Market Value as of January 1, 2023	\$185,942,372
2. Contributions	9,599,101
3. Benefits and Administrative Expenses Paid	(15,904,122)
4. Market Value as of January 1, 2024	193,916,218
Actual Return [(4) - (1) - (2) - (3)]	\$14,278,867
Calculation Base (1) + 50% x [(2) + (3)]	182,789,862
Market Value Return as a Percentage	7.8%

Investment Gain/(Loss)	
Actual Return minus Expected Return	\$1,483,577

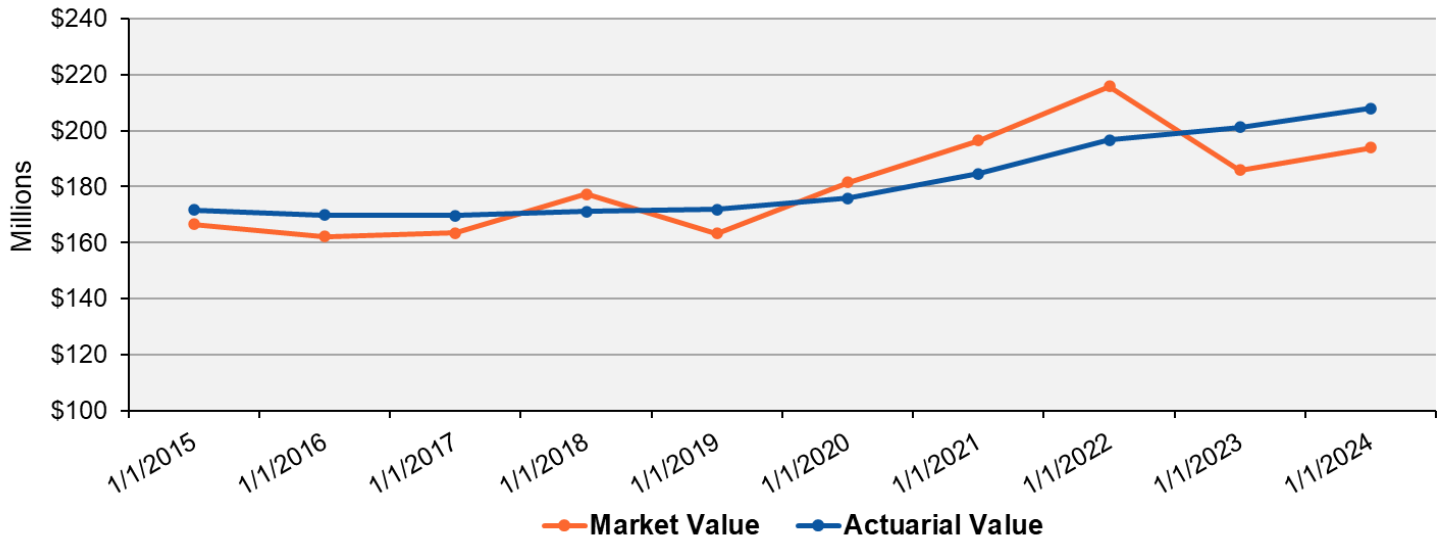
Section I. Summary of Assets (cont.)

Development of Actuarial Value of Assets

Market Value of Assets				
As of January 1, 2024				\$193,916,218
Plan Year End (1)	Investment Gain/(Loss) (2)	Percent Recognized (3)	Percent Deferred (4)	Deferred Gain/(Loss) (2) x (4)
12/31/2023	\$1,483,577	20%	80%	\$1,186,862
12/31/2022	(37,663,398)	40%	60%	(22,598,039)
12/31/2021	13,524,306	60%	40%	5,409,722
12/31/2020	9,819,046	80%	20%	1,963,809
Total				(\$14,037,646)
Preliminary Actuarial Value of Assets				
As of January 1, 2024 (Market Value of Assets less total Deferred Gain/(Loss))				\$207,953,864
Final Actuarial Value of Assets				
Minimum actuarial value of assets (80% of MVA)				155,132,975
Maximum actuarial value of assets (120% of MVA)				232,699,461
As a Percentage of Market Value				107.2%
Actuarial Value of Assets as of January 1, 2024				\$207,953,864
Calculation of Actuarial Return				
1. Actuarial Value as of January 1, 2023				\$201,135,383
2. Contributions				9,599,101
3. Benefits and Administrative Expenses Paid				(15,904,122)
4. Actuarial Value as of January 1, 2024				207,953,864
5. Actuarial Return [(4) - (1) - (2) - (3)]				13,123,502
6. Calculation Base (1) + 50% x [(2) + (3)]				197,982,873
Actuarial Return as a Percentage [(5) / (6)]				6.6%

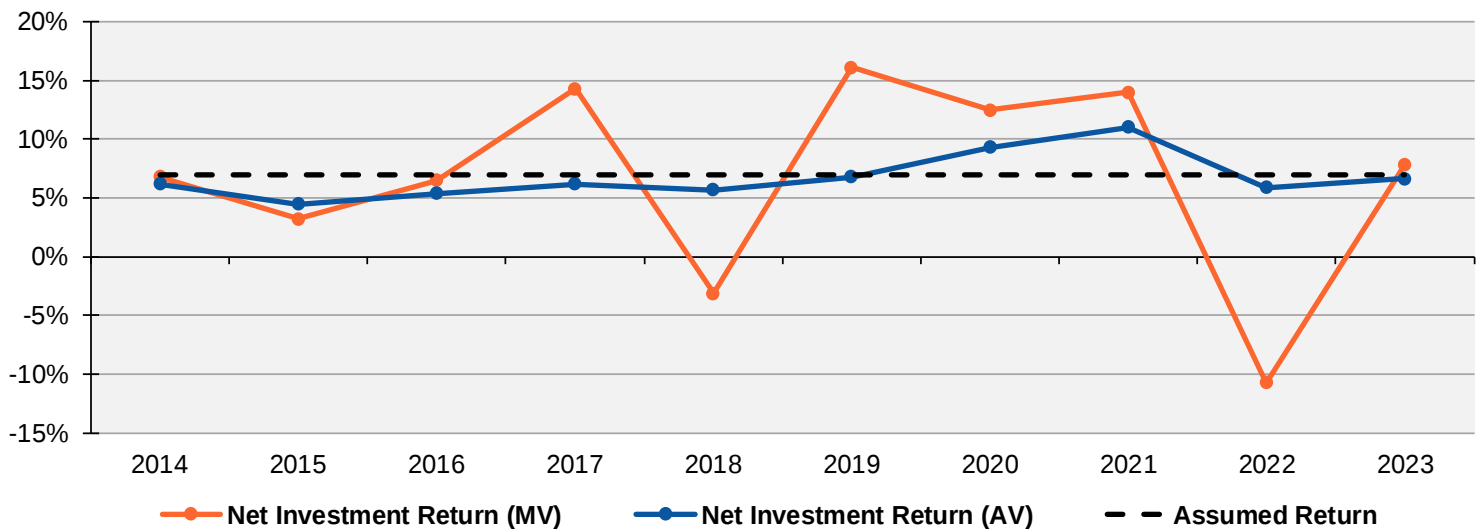
Section I. Summary of Assets (cont.)

10-Year: Market Value vs. Actuarial Value of Assets



10-Year: Market Value vs. Actuarial Value Rates of Return

The assumed long-term rate of return is 7.00%. This rate considers past experience, the Trustees' asset allocation policy, and future expectations.



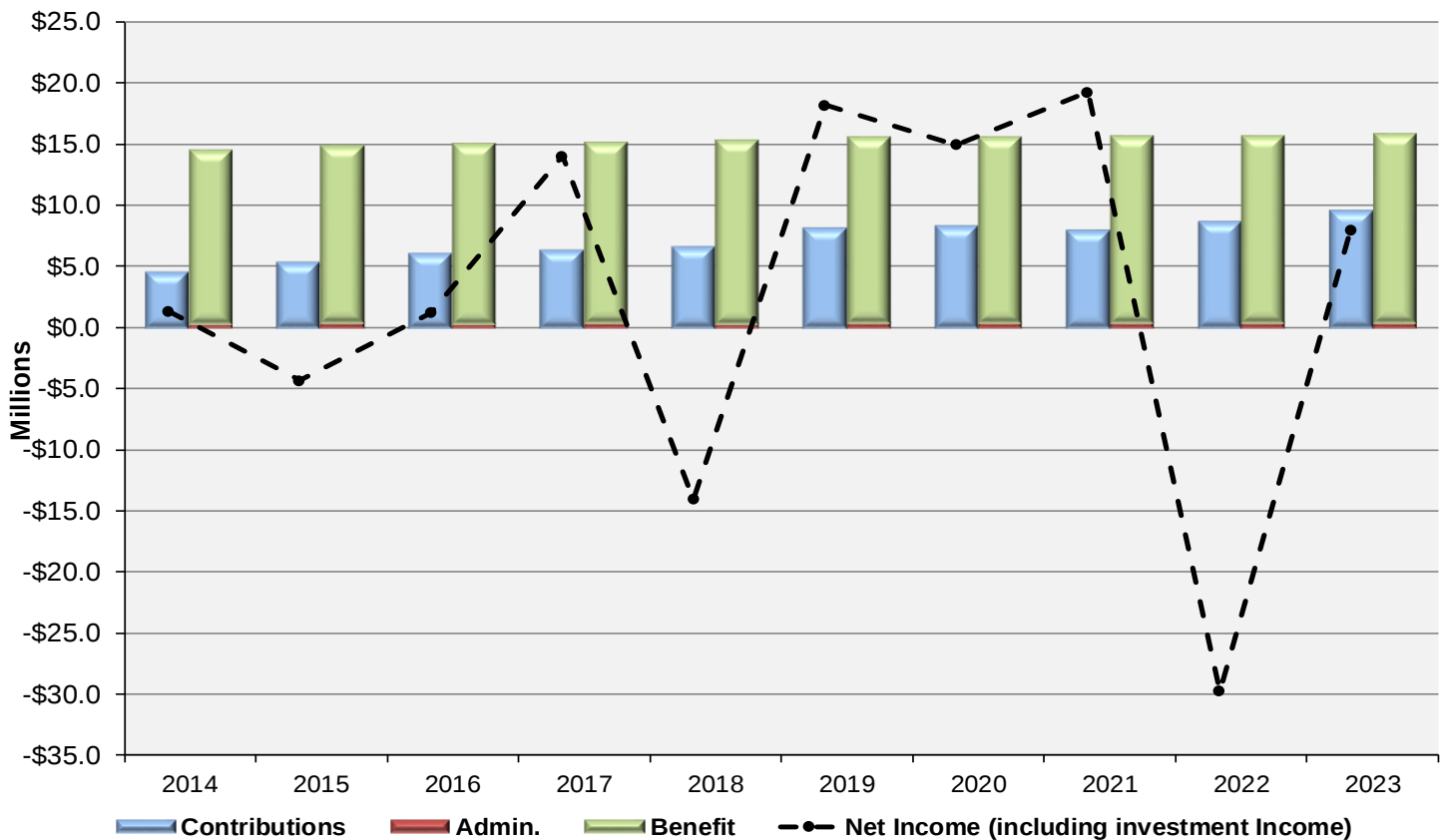
Average Rates of Return	Market Value	Actuarial Value
Most recent year return	7.8%	6.6%
Most recent five-year average return	7.5%	7.9%
Most recent ten-year average return	6.4%	6.7%

Section I. Summary of Assets (cont.)

Summary of Investment Returns & Historical Cash Flows

Plan Year Ending	Market Value	Net Investment Return	Total	Benefit	Admin.
	Amount	Percent	Contributions	Payments	Expenses
2014	\$11,322,507	6.8%	\$4,561,780	\$14,179,513	\$345,587
2015	5,125,198	3.2%	5,429,032	14,488,151	405,567
2016	10,204,231	6.5%	6,102,973	14,726,856	377,701
2017	22,796,936	14.3%	6,398,313	14,757,794	417,218
2018	(5,336,482)	-3.1%	6,623,512	14,986,927	376,867
2019	25,648,821	16.1%	8,130,240	15,208,434	394,051
2020	22,268,501	12.5%	8,328,546	15,237,053	398,116
2021	27,005,284	14.0%	7,952,202	15,280,210	430,272
2022	(22,807,257)	-10.7%	8,710,568	15,220,241	452,246
2023	14,278,867	7.8%	9,599,101	15,460,430	443,692
Total	\$110,506,606		\$71,836,267	\$149,545,609	\$4,041,317

Comparison of Net Income versus Historical Cash Flows



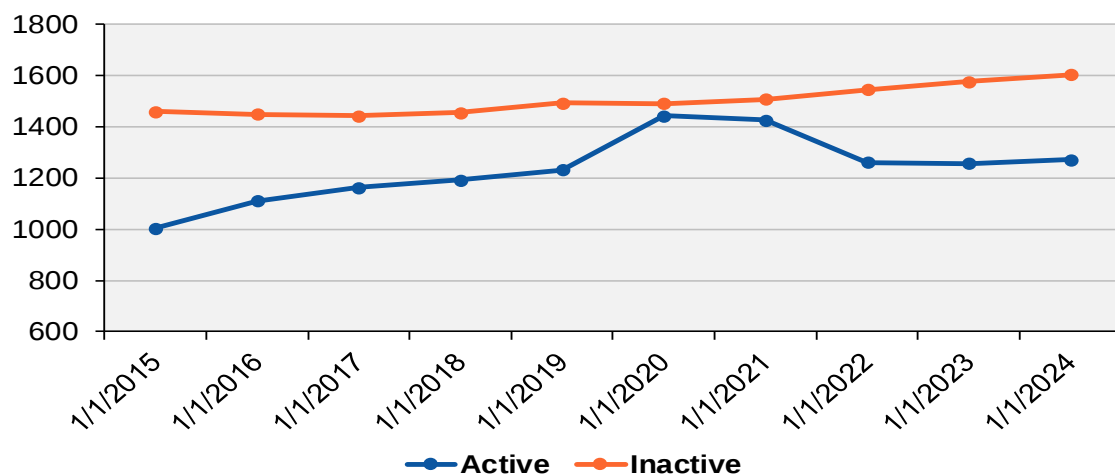
Section II. Summary of Data

Participant Reconciliation

The accuracy of an actuarial valuation depends on the accuracy of the participant data used to generate the liability and future income estimates. In an effort to ensure reliability and consistency between valuations, we have performed a reconciliation consisting of an accounting for all the exits from, and entries into, each of the three participant groups (actives, deferred vesteds, and retirees) as well as for the participant group as a whole.

	Actives	Deferred Vested Participants	Pensioners & Beneficiaries	Total
Participants as of January 1, 2023	1,257	563	1,013	2,833
Change During Year				
a. deaths with beneficiary		(2)	(16)	(18)
b. deaths without beneficiary		(1)	(34)	(35)
c. deaths with deferred beneficiary				0
d. retirements	(27)	(18)	45	0
e. disabled retirements	(1)		1	0
f. reciprocal pensions				0
g. vested terminations	(47)	47		0
h. non-vested terminations	(107)			(107)
i. new alternate payee				0
j. returns to active employment	11	(11)		0
k. new entrants	186		18	204
l. payments ceased			(2)	(2)
m. lump sum payout				0
n. deferred beneficiary commencement		(1)	1	0
o. data adjustments ¹			1	1
p. total increase (decrease)	15	14	14	43
Participants as of January 1, 2024	1,272	577	1,027	2,876

Plan Participation: Ten Years



¹ Participant removed from the data in the prior valuation since erroneously provided with a "deceased" code.

Section II. Summary of Data (cont.)

Schedule of Active Participant Data as of January 1, 2024 Years of Credited Service

Attained Age	Under 1	1 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 & Up	Total
Under 25	7	27	6	0	0	0	0	0	0	0	40
25 - 29	11	61	23	1	0	0	0	0	0	0	96
30 - 34	6	69	58	17	2	0	0	0	0	0	152
35 - 39	13	62	54	28	12	3	0	0	0	0	172
40 - 44	7	62	59	26	16	4	1	0	0	0	175
45 - 49	6	50	45	17	18	19	8	0	0	0	163
50 - 54	5	50	37	19	27	19	11	5	0	0	173
55 - 59	2	28	27	30	24	26	10	3	5	1	156
60 - 64	3	17	19	15	14	16	12	3	5	1	105
65 - 69	0	8	9	4	3	3	3	1	0	2	33
70 & Over	0	2	2	3	0	0	0	0	0	0	7
Total	60	436	339	160	116	90	45	12	10	4	1272

10-Year Historical Active Participant Data

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Average Age	45.5	45.0	45.0	45.2	45.1	44.6	44.9	45.5	45.4	45.2
Average Vesting Service	9.8	9.0	8.9	9.1	8.7	7.9	8.3	9.2	9.0	9.1

Section II. Summary of Data (cont.)

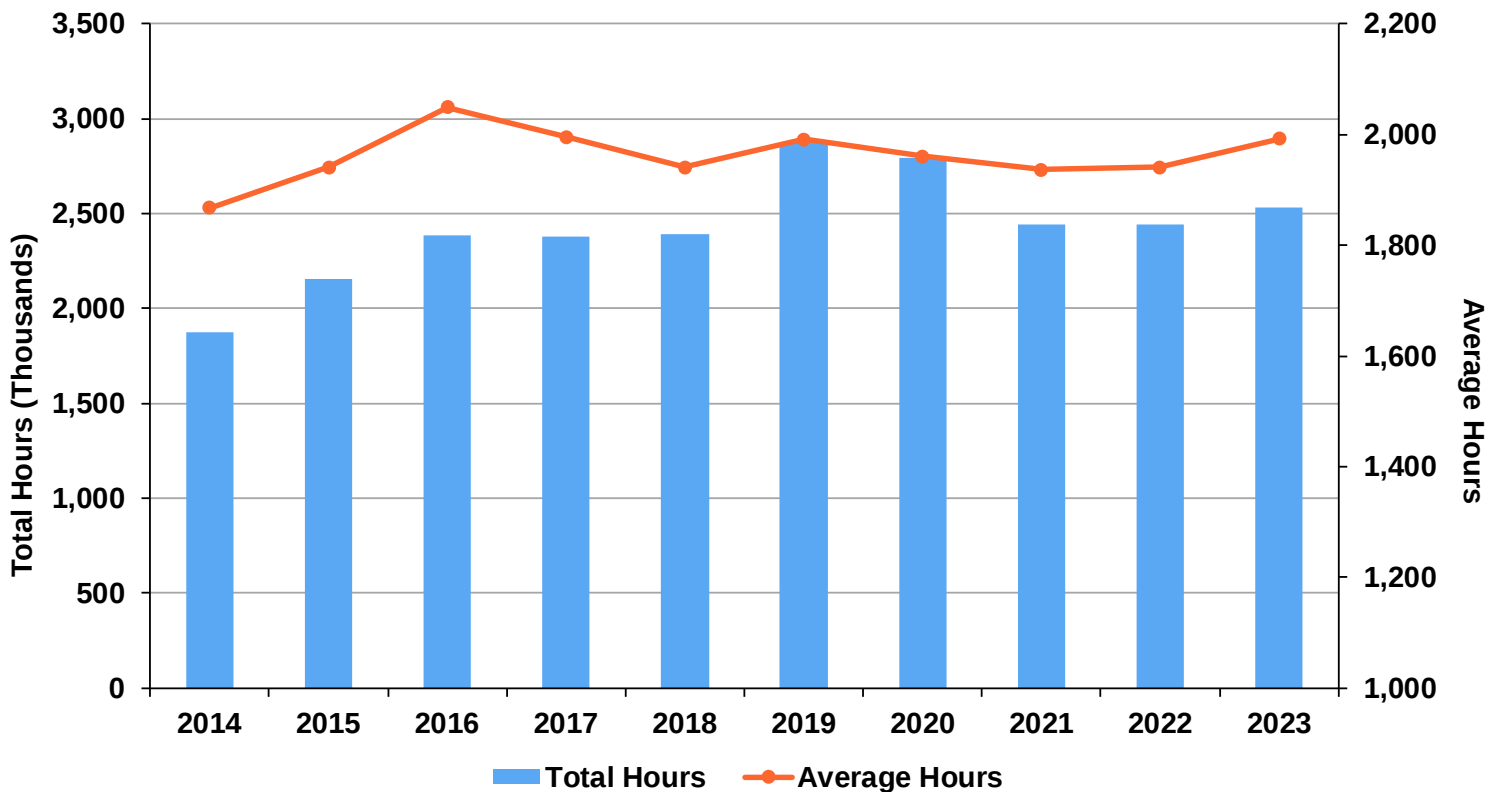
Employment History

Year Ended December 31	Total Pension Hours ² Number	% Change	Active Participants Number	% Change	Average Pension Hours Number	% Change
2014	1,875,048	6.4%	1,004	5.9%	1,868	0.5%
2015	2,156,969	15.0%	1,111	10.7%	1,941	4.0%
2016	2,383,072	10.5%	1,163	4.7%	2,049	5.5%
2017	2,378,242	-0.2%	1,192	2.5%	1,995	-2.6%
2018	2,389,665	0.5%	1,231	3.3%	1,941	-2.7%
2019	2,874,174	20.3%	1,443	17.2%	1,992	2.6%
2020	2,796,253	-2.7%	1,426	-1.2%	1,961	-1.6%
2021	2,441,531	-12.7%	1,261	-11.6%	1,936	-1.3%
2022	2,440,447	0.0%	1,257	-0.3%	1,941	0.3%
2023	2,534,674	3.9%	1,272	1.2%	1,993	2.6%

Five-year average hours: **1,965**

Ten-year average hours: **1,962**

Total Pension Hours versus Average Hours



² The total pension hours are based on the sum of the pension hours reported in the valuation data collection, which may differ from the hours reported to the Fund Office.

Section II. Summary of Data (cont.)

Pensioner Benefit Data as of January 1, 2024

	Retired		Disabled		Beneficiaries		Alternate Payee		Total	
		Average		Average		Average		Average		Average
Age	Count	Monthly Benefit	Count	Monthly Benefit	Count	Monthly Benefit	Count	Monthly Benefit	Count	Monthly Benefit
Under 55	1	\$664	2	\$1,637	12	\$728	0	\$0	15	\$845
55 - 59	3	594	2	3,061	12	422	1	813	18	765
60 - 64	46	1,174	13	1,967	14	647	1	310	74	1,202
65 - 69	129	1,409	8	2,434	41	791	0	0	178	1,313
70 - 74	155	1,446	9	2,420	46	702	1	681	211	1,321
75 - 79	149	1,560	15	2,153	63	682	1	1,005	228	1,354
80 - 84	103	1,524	4	1,970	63	658	0	0	170	1,213
85 - 89	43	1,515	1	1,532	38	629	0	0	82	1,104
90 & Over	22	1,385	0	0	29	640	0	0	51	961
Total	651	\$1,455	54	\$2,184	318	\$674	4	\$702	1,027	\$1,249
Average Age	75.0		70.7		76.5		68.7		75.2	

New Entrants as of January 1, 2024

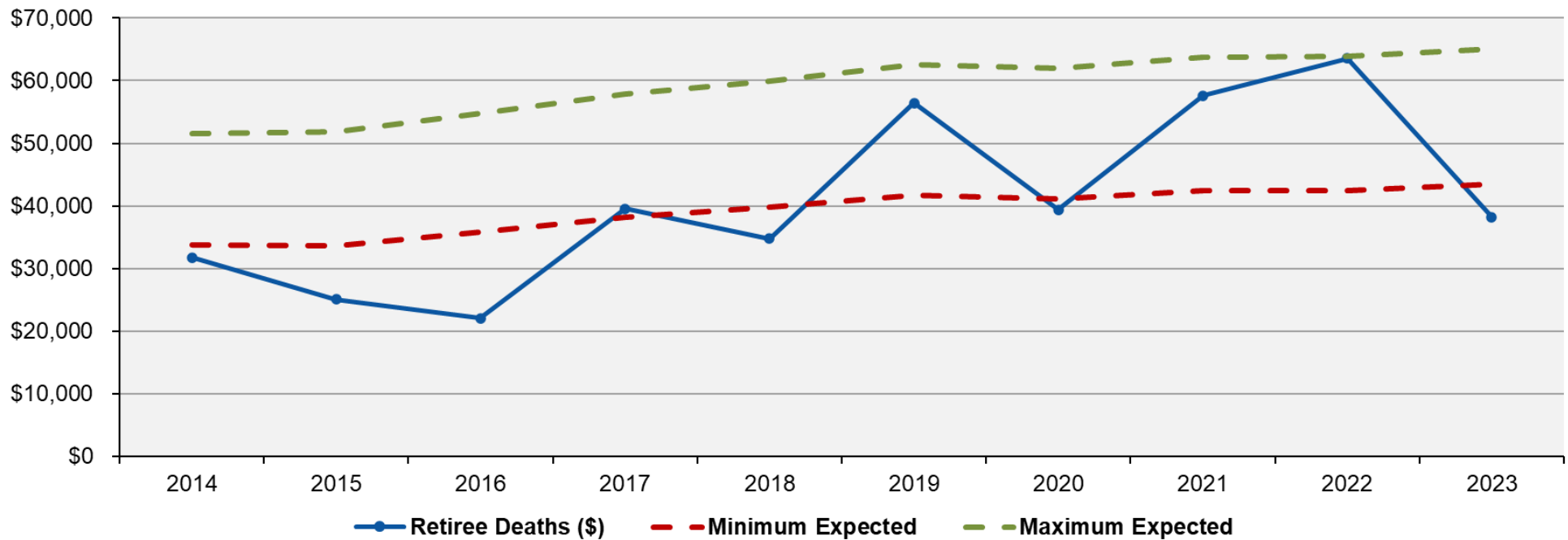
	Retired		Disabled		Beneficiaries		Alternate Payee		Total	
		Average		Average		Average		Average		Average
Age	Count	Monthly Benefit	Count	Monthly Benefit	Count	Monthly Benefit	Count	Monthly Benefit	Count	Monthly Benefit
Total	45	\$1,471	1	\$3,101	19	\$899	N/A	N/A	65	\$1,329
Average Age	65.4		61.4		66.6		N/A		65.7	

Section II. Summary of Data (cont.)



Expected Deaths³ vs. Actual Deaths

Year	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Retiree Deaths (\$) ⁴	\$31,750	\$25,087	\$22,040	\$39,521	\$34,766	\$56,442	\$39,391	\$57,594	\$63,567	\$38,243



³ Expected deaths based on mortality assumption in place for the 2023 valuation.

⁴ Monthly benefit amounts.

Section III. Valuation Results

Summary of Valuation Results

	1/1/2023	1/1/2024
Interest Rate	7.00%	7.00%
Unfunded Actuarial Accrued Liability		
Actuarial Accrued Liability		
Active	\$71,055,775	\$73,068,501
Retired	115,839,774	122,963,596
Terminated Vested	28,264,461	31,231,784
Total Actuarial Accrued Liability	215,160,010	227,263,881
Actuarial Value of Assets	201,135,383	207,953,864
Funded Percentage	93.5%	91.5%
Unfunded Actuarial Accrued Liability	\$14,024,627	\$19,310,017
Total Normal Cost		
Pension service & auxiliary benefits	\$5,693,081	\$5,530,669
Administration expense	446,202	437,762
Total Normal Cost	\$6,139,283	\$5,968,431
Components of Minimum Funding		
Total Normal Cost	\$6,139,283	\$5,968,431
Net Amortization Charges	9,551,398	11,206,566
Interest	1,098,348	1,202,250
Minimum Funding Before Credit Balance	16,789,029	18,377,247
Credit Balance	50,456,399	47,134,389
Minimum Funding After Credit Balance	0	0
Maximum Deductible Limit		
Maximum Deductible Limit	\$426,644,157	\$358,949,403
Unfunded Vested Benefits for EWL		
Vested Benefits for EWL	\$295,799,996	\$273,792,962
Market Value of Assets	185,942,372	193,916,218
Unfunded Vested Benefits for EWL	\$109,857,624	\$79,876,744

Section III. Valuation Results (cont.)

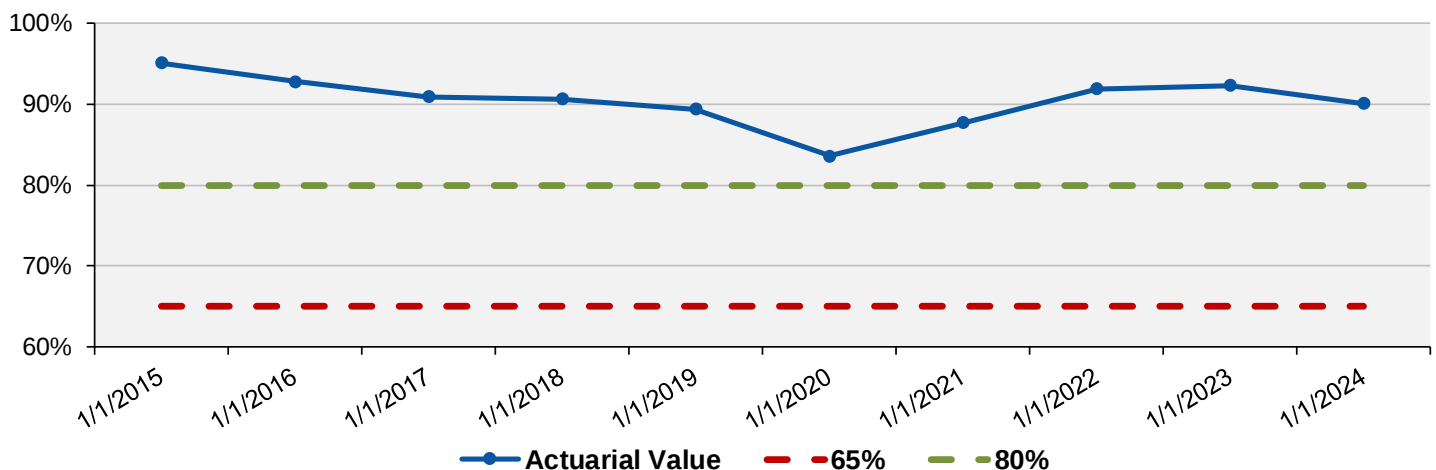
Pension Protection Act of 2006 (PPA)

For plan years beginning after December 31, 2007, a multiemployer defined benefit pension plan's actuary must certify the plan's funding status pursuant to the Pension Protection Act of 2006 (PPA). PPA originally established three categories (or "zones") of plans: (1) "Green Zone" for healthy; (2) "Yellow Zone" for endangered; and (3) "Red Zone" for critical. These zones were expanded upon under the Multiemployer Pension Reform Act of 2014 (MPRA). There are multiple tests that must be evaluated for the actuary to determine a plan's Zone Status. One criterion is to measure the funded percentage based on the Actuarial Value of Assets as of the beginning of the plan year. In general, Green Zone plans have a funding percentage greater than 80%, Yellow Zone plans have a funding ratio between 65% and 79%, and Red Zone plans are less than 65% funded. Healthy plans must also avoid a Funding Standard Account (FSA) accumulated funding deficiency. Each plan's actuary must certify the plan status within 90 days of the start of the plan year.

10-Year History of Funded Percentage and Zone Status

Valuation Date	Market Value	Actuarial Value	Projected FSA Deficiency	Zone Status
1/1/2015	91.5%	95.1%	No	Green
1/1/2016	87.9%	92.8%	No	Green
1/1/2017	86.6%	90.9%	No	Green
1/1/2018	93.9%	90.6%	No	Green
1/1/2019	84.9%	89.4%	No	Green
1/1/2020	86.3%	83.6%	No	Green
1/1/2021	92.9%	87.7%	No	Green
1/1/2022	100.8%	91.9%	No	Green
1/1/2023	85.7%	92.3%	No	Green
1/1/2024	83.8%	90.1%	No	Green

10-Year Funded Percentage versus PPA zone benchmarks



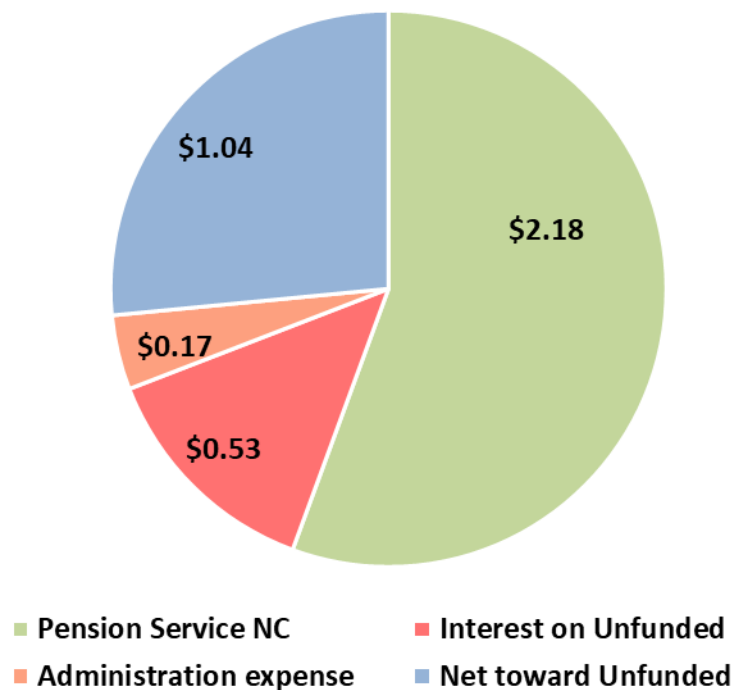
Section III. Valuation Results (cont.)

Projected Cost vs. Contribution

The following is an estimate of the annual fiscal activity for the plan year beginning January 1, 2024:

	Amount	Dollars Per-Hour ⁵
1. Employer contributions	\$9,946,214	\$3.92
2. Total Normal Cost		
a. Pension service & auxiliary benefits	5,530,669	2.18
b. Administration expense	<u>437,762</u>	<u>0.17</u>
c. Total (a) + (b)	5,968,431	2.35
3. Annual amount toward UAAL (1) - (2c)	\$3,977,783	\$1.57
4. Interest on unfunded	1,351,701	0.53
5. Net annual amount toward UAAL (3) - (4)	\$2,626,082	\$1.04

Breakdown of Projected Contributions



⁵ Based on 2,534,674 hours worked by active participants in the census data for this valuation.
Operating Engineers Local No. 77 Pension Plan

Section III. Valuation Results (cont.)

Funding Standard Account (FSA)

ERISA established a minimum funding standard for defined benefit pension plans, including multiemployer plans. The concept of a Funding Standard Account (FSA) is used to keep track of actual employer contributions as compared to minimum required contributions on a cumulative basis. To the extent that actual contributions exceed minimum required contributions on a cumulative basis, an FSA credit balance is developed. On the contrary, to the extent that actual contributions fall short of minimum required contributions on a cumulative basis, an FSA funding deficiency is developed. A plan satisfies the minimum funding standard if employers make contributions sufficient to ensure that the plan does not develop a funding deficiency as of the end of any plan year. The minimum funding standard does not apply to multiemployer plans in Critical Status after the Trustees have adopted a Rehabilitation Plan and that Rehabilitation Plan is reflected in bargaining agreements.

Each year the plan's normal cost and amortization charges for past increases in the unfunded actuarial accrued liability are charged against the FSA. Similarly, employer contributions and amortization credits for past decreases in the unfunded actuarial accrued liability are credited to the FSA. All charges and credits, including any credit balance or funding deficiency, are adjusted to the end of the applicable plan year by interest at the plan's assumed interest rate for funding purposes.

Below is a table showing the charges against and the credit to the FSA for the latest plan year.

FSA for the Plan Year Ended December 31, 2023

Charges	
Prior Year Funding Deficiency	\$0
Normal Cost plus Administration Expense	6,139,283
Amortization Charges	16,009,365
Interest	1,550,405
Total Charges	\$23,699,053
Credits	
Prior Year Credit Balance	\$50,456,399
Employer Contribution	9,599,101
Amortization Credits	6,457,967
Interest	4,319,975
Full Funding Credit	0
Total Credits	\$70,833,442
Credit Balance, End of Year	\$47,134,389

Section III. Valuation Results (cont.)

Development of Actuarial (Gain)/Loss for January 1, 2023 to December 31, 2023

	Liability	Asset	UAAL
Beginning of year total	\$215,160,010	\$201,135,383	\$14,024,627
Normal cost (net of admin exp)	5,693,081		5,693,081
Administration Expense		(446,202)	446,202
Benefit payments	(15,460,430)	(15,460,430)	
Contributions		9,599,101	(9,599,101)
Interest	14,918,602	13,843,097	1,075,505
Expected end of year total	220,311,263	208,670,949	11,640,314
Actual end of year (before changes)	220,965,610	207,953,864	13,011,746
(Gain) / Loss	\$654,347	\$717,085	\$1,371,432

Development of Actuarial Unfunded Accrued Liability as of December 31, 2023

Development of Actual Unfunded Actuarial Accrued Liability		
1. Expected UAAL as of December 31, 2023		\$11,640,314
2. Changes in UAAL due to:		
a. Actuarial (Gain)/Loss		1,371,432
b. Plan Change		0
c. Assumption Change		6,298,271
d. Method Change		0
e. Other		0
3. Total of all changes in UAAL		7,669,703
Actual UAAL as of December 31, 2023 [(1) + (3)]		\$19,310,017

Historical Actuarial (Gains) and Losses

Plan Year Ended	Actuarial (Gain)/Loss		Total
	Non-Asset	Asset	
12/31/2019	\$1,884,740	\$224,883	\$2,109,623
12/31/2020	(257,557)	(3,933,227)	(4,190,784)
12/31/2021	(1,367,488)	(7,215,546)	(8,583,034)
12/31/2022	(2,574,249)	2,141,247	(433,002)
12/31/2023	654,347	717,085	1,371,432

Section III. Valuation Results (cont.)

Schedule of Amortization Bases as of January 1, 2024

Charges	Date Established	Years Remaining	Outstanding Balance	Amortization Amount
(1) Combined Charges	01/01/09	2.371	\$18,318,075	\$8,085,876
(2) Recognized Investment Loss (2008)	01/01/09	14	13,347,690	1,426,392
(3) Recognized Investment Loss (2008)	01/01/10	14	5,739,323	613,331
(4) Recognized Investment Loss (2009)	01/01/10	15	888,899	91,212
(5) Recognized Investment Loss (2008)	01/01/11	14	10,260,897	1,096,526
(6) Recognized Investment Loss (2008)	01/01/12	14	10,324,796	1,103,352
(7) Change in Assumptions	01/01/12	3	46,619	16,601
(8) Actuarial Loss	01/01/13	4	171,503	47,319
(9) Actuarial Loss	01/01/14	5	1,062,401	242,157
(10) Change in Assumptions	01/01/14	5	1,253,149	285,635
(11) Actuarial Loss	01/01/15	6	1,031,804	202,307
(12) Actuarial Loss	01/01/16	7	3,246,093	562,918
(13) Actuarial Loss	01/01/17	8	1,922,095	300,831
(14) Actuarial Loss	01/01/18	9	1,318,495	189,131
(15) Actuarial Loss	01/01/19	10	2,837,485	377,565
(16) Assumption Change	01/01/19	10	8,655,587	1,151,740
(17) Actuarial Loss	01/01/20	11	1,736,884	216,472
(18) Actuarial Loss	01/01/24	15	1,371,432	140,725
(19) Assumption Change	01/01/24	15	6,298,271	646,277
Total Charges			89,831,498	16,796,367

Credits	Date Established	Years Remaining	Outstanding Balance	Amortization Amount
(1) Actuarial Gain (Net of Investment Loss)	01/01/10	1	\$1,053,602	\$1,053,602
(2) Actuarial Gain (Net of Investment Loss)	01/01/11	2	2,766,762	1,430,166
(3) Actuarial Gain (Net of Investment Loss)	01/01/12	3	3,460,679	1,232,430
(4) Assumption Change	01/01/20	11	4,159,639	518,427
(5) Actuarial Gain	01/01/21	12	3,654,632	430,024
(6) Actuarial Gain	01/01/22	13	7,876,007	880,721
(8) Actuarial Gain	01/01/23	14	415,771	44,431
Total Credits			23,387,092	5,589,801

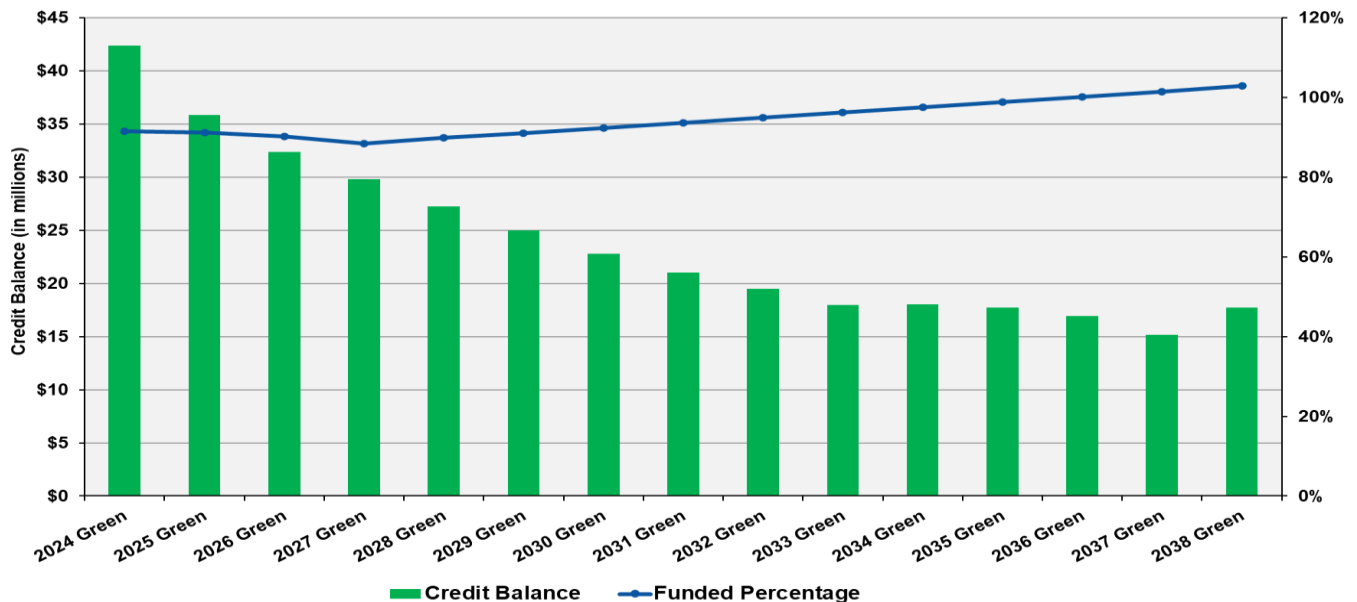
Section III. Valuation Results (cont.)

15-Year Projection of the Credit Balance and Funded Percentage

Plan Year	PPA Funded %	Beginning Credit Balance	Total Normal Cost	Net Amort. Charge	Anticipated Contribution ⁶	Interest	Ending Credit Balance
2024	91.5%	\$47,134,389	\$5,968,431	\$11,206,566	\$9,946,214	\$2,445,275	\$42,350,881
2025	91.2%	42,350,881	6,649,396	12,646,399	10,765,799	1,990,659	35,811,544
2026	90.2%	35,811,544	7,035,698	9,600,983	11,420,770	1,741,968	32,337,601
2027	88.4%	32,337,601	7,164,241	8,546,188	11,628,061	1,570,884	29,826,117
2028	89.8%	29,826,117	7,173,532	8,466,305	11,628,061	1,400,022	27,214,363
2029	91.1%	27,214,363	7,183,009	7,938,492	11,628,061	1,253,482	24,974,405
2030	92.4%	24,974,405	7,192,675	7,736,194	11,628,061	1,110,169	22,783,766
2031	93.6%	22,783,766	7,202,535	7,173,264	11,628,061	995,539	21,031,567
2032	94.9%	21,031,567	7,212,592	6,872,448	11,628,061	893,239	19,467,827
2033	96.2%	19,467,827	7,222,850	6,683,287	11,628,061	796,301	17,986,052
2034	97.5%	17,986,052	7,233,313	5,154,011	11,628,061	798,893	18,025,682
2035	98.8%	18,025,682	7,243,986	5,455,962	11,628,061	779,783	17,733,578
2036	100.1%	17,733,578	7,254,872	5,885,990	11,628,061	728,472	16,949,249
2037	101.5%	16,949,249	7,265,976	6,766,702	11,628,061	611,143	15,155,775
2038	102.8%	15,155,775	7,277,302	2,571,518	11,628,061	778,469	17,713,485

The Ending Credit Balance is equal to the Beginning Credit Balance, less Normal Cost and Net Amortization Charges (Credits), plus Anticipated Contribution and Interest.

Projection of the Credit Balance and Funding Percentage (Graph)



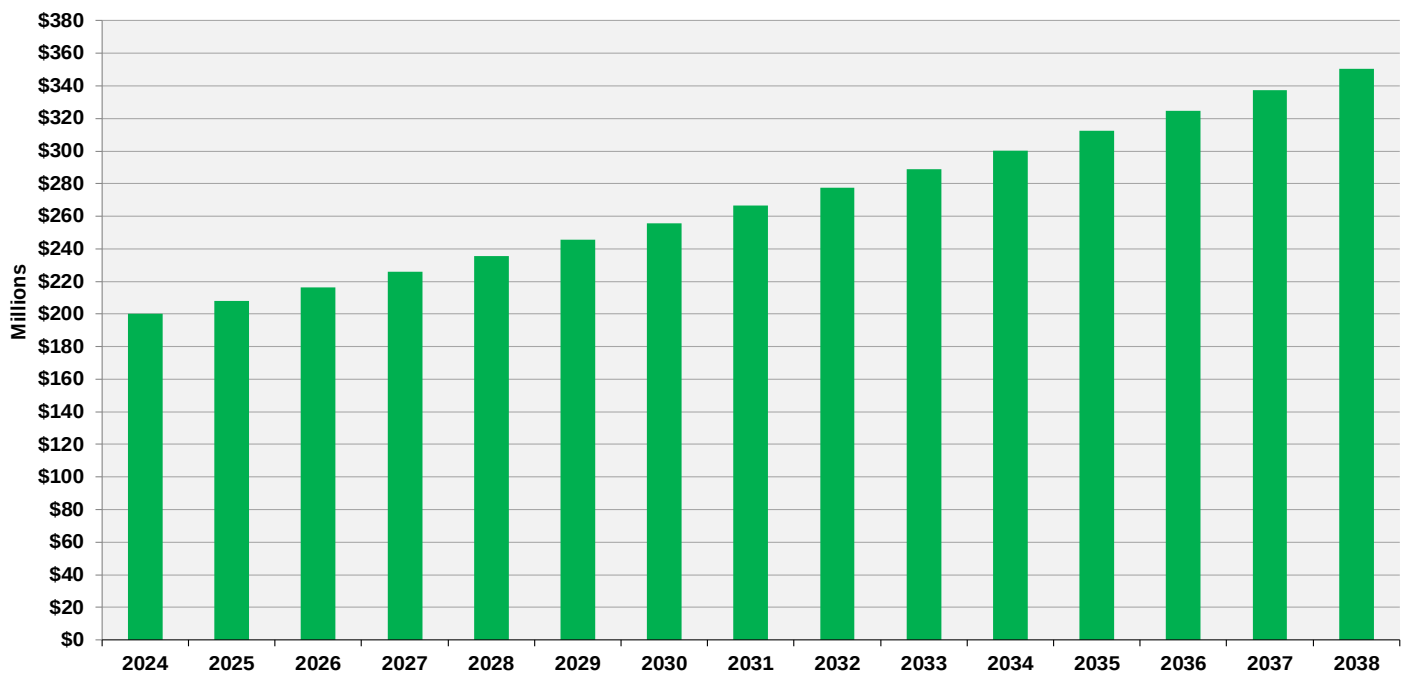
⁶ Projected contributions are based on 2023 hours and contribution rates provided by Josh VanDyke.
Operating Engineers Local No. 77 Pension Plan

Section III. Valuation Results (cont.)

15-Year Projection of the Market Value of Assets

Plan Year	Market Value BOY	Anticipated Contributions ⁷	Estimated Benefit Payments	Estimated Admin. Expenses	Estimated Invest. Return	Market Value EOY
2024	\$193,916,218	\$9,946,214	\$16,432,110	\$437,762	\$13,316,486	\$200,309,046
2025	200,309,046	10,765,799	16,544,992	446,517	13,788,106	207,871,442
2026	207,871,442	11,420,770	16,659,291	455,447	14,335,772	216,513,246
2027	216,513,246	11,628,061	16,794,067	464,556	14,942,598	225,825,282
2028	225,825,282	11,628,061	17,017,076	473,847	15,585,985	235,548,405
2029	235,548,405	11,628,061	17,464,497	483,324	16,250,281	245,478,926
2030	245,478,926	11,628,061	17,744,869	492,990	16,934,927	255,804,055
2031	255,804,055	11,628,061	18,049,731	502,850	17,646,325	266,525,860
2032	266,525,860	11,628,061	18,471,790	512,907	18,381,376	277,550,600
2033	277,550,600	11,628,061	18,985,010	523,165	19,134,427	288,804,913
2034	288,804,913	11,628,061	19,357,704	533,628	19,908,453	300,450,095
2035	300,450,095	11,628,061	19,904,425	544,301	20,703,733	312,333,163
2036	312,333,163	11,628,061	20,352,504	555,187	21,519,103	324,572,636
2037	324,572,636	11,628,061	20,821,411	566,291	22,358,676	337,171,671
2038	337,171,671	11,628,061	21,167,864	577,617	23,227,691	350,281,942

Projection of the Market Value of Assets as of December 31 (Graph)



⁷ Projected contributions are based on 2023 hours and contribution rates provided by Josh VanDyke.
Operating Engineers Local No. 77 Pension Plan

Section IV. Risk Assessment

The results presented in this valuation report are based on several assumptions about the future. The assumptions are a best estimate of expected future experience based on information that occurred in the past and/or reasonable predictions of the future. As with all assumptions, the actual events may differ significantly from what is assumed.

The purpose of this section is to provide the reader with a basic understanding of the fundamentals of pension financing and the associated risks, including implications of the plan's funding policy on future plan funding, how future experience may differ from the assumptions used, and the potential volatility of future measurements resulting from these differences.

Elements of Pension Plan Financing

The following equation lays out the fundamental elements of pension plan financing:

$$\text{Contributions} + \text{Investment Returns} = \text{Benefit Payments} + \text{Expenses}$$

Employers **contribute** to a plan based on negotiated contribution rates and agreements for paying withdrawal liability assessments. The plan invests these contributions and earns a **return** on that investment. Together, these contributions and investment returns are typically the sole sources of income to the plan. **Benefits** are paid to participants who have met the eligibility and vesting requirements defined by the plan. Plans also pay administrative, investment, auditing, legal, and other **expenses** for maintaining the plan. **Over time, contributions and investment earnings must equal benefits and expenses.**

From this equation, it is evident that funding, investment, and benefit policies must be developed together. In multiemployer plans, the plan sponsor does not have full control over the total annual contribution received because they do not control the hours worked by participants and must adhere to the negotiated contribution levels. Therefore, negotiated contributions must be determined based on the desired benefit level and anticipated investment returns and expenses, as well as the cumulative effect of past actuarial experience.

It is important to remember that the plan sponsor's investment and funding policies, along with the selected actuarial assumptions, determine the assumed balance between contributions and investment returns. **The actual cost of a plan is based on actual experience and may result in a different balance than is assumed.** Ultimately, the expected return does not impact the long-term relationship between the contributions required and the benefit level that can be supported by such contributions. Using a higher expected return assumption may give a false sense of benefit security if the plan does not realize that level of actual returns over time.

The development of integrated benefit, funding, and investment policies generally requires consideration of many factors such as:

- Balancing benefit security and intergenerational equity;
- Risk appetite and ability to absorb short-term volatility in plan contributions;
- Current plan funded status;
- Timing and expected duration of benefit payments; and
- Nature and frequency of past and anticipated future plan amendments.

Section IV. Risk Assessment (cont.)

Significant Risks Affecting Pension Plans

Some examples of risks common to multiemployer plans that could impact future measurements include:

- **Investment risk:** The potential that investment returns will be different than expected.
- **Interest rate/discount rate risk:** The potential that the discount rate used to value plan liabilities may change for future measurements.
- **Asset/liability mismatch risk:** The potential that changes in plan liabilities are not matched by changes in the value of the assets. This is sometimes called duration risk.
- **Contribution risk:** The potential that actual future contributions are lower due to a reduction in hours worked, withdrawals from the plan, or the bankruptcy or insolvency of a contributing employer.
- **Cash flow risk:** The potential that contributions and withdrawal liability payments coming into the plan will not cover benefit payments and expenses.
- **Longevity risk:** The potential that the life expectancy of participants will be different than projected based on the assumptions used in the valuation.
- **Demographic risk:** The potential that assumptions like termination of employment, retirement, and disability will differ from what is assumed in the valuation.
- **Regulatory/Legislative risk:** The potential that Congress, the PBGC, or another regulatory agency will change the laws and regulations governing multiemployer pension plans. Examples include increased per participant PBGC premiums or limitations on the net investment return assumption.

Investment risk is often the single most significant risk for defined benefit plans. Plans that seek a higher investment return are typically forced to accept a higher level of volatility that can change the plan's funded status drastically year-to-year. The Internal Revenue Code allows for asset smoothing up to five years, which can give the perception of less volatility in the funded status from year to year.

Interest rate or discount rate risk is common in corporate ERISA plans where funding is based on bond rates. Interest rates on bonds are still an important consideration when setting an expected return assumption and can change over time, along with long-term capital market expectations. Together these may lead to a change in the interest rate used to value plan liabilities which will increase or decrease the measurement of plan liabilities and the minimum required contribution.

Section IV. Risk Assessment (cont.)

Asset/liability mismatch risk is also another major risk for many pension plans. To the extent that the duration of plan assets is not matched to the duration of plan liabilities the change in discount rates could have a significant impact on the plan's funded status. For most multiemployer plans, changes in asset values and interest rates do not directly affect the measurement of the plan's liability. Liability-driven investment approaches (where the liability is immunized by investments in fixed income whose cash inflows are matched to the benefit payment outflows, or the asset and liability durations are brought into close alignment) will reduce this risk, however it is difficult to invest in a manner that hedges all risks.

Contribution risk most commonly results from large contribution increases that are difficult for the plan sponsor to meet with the negotiated contribution rates, the failure of a withdrawn employer to make their withdrawal liability payments as scheduled, or from a material decrease in the contribution base units.

As plans mature, they become more reliant on investment returns to pay benefits and expenses. When plans have negative cash flows, they must spend interest and dividends, or may be forced to sell assets at inopportune times, to meet those obligations. Any plan that pays benefits out in a lump sum or other form that can significantly increase cash outflows or is subject to significant volatility in contribution receipts are particularly exposed to this risk.

Assumptions regarding mortality (or life expectancy) and other demographic factors related to participant behavior bring the risk that future experience will diverge from the reasonable assumptions utilized within the actuarial valuation model. For example, participants living longer than expected will increase plan costs, while people terminating sooner than expected will generally decrease plan costs. Additionally, what is considered a reasonable assumption may change over time and lead to an increase or decrease in future contributions.

Since the start of the COVID-19 pandemic, there has been much discussion about how this event will affect longevity, both over the short-term and long-term, and how certain demographic groups may be impacted to a greater degree than others. Actual life expectancies may be longer or shorter than what is reflected in the valuation and benefit payment projections, and will increase or decrease the cost of the plan as actual experience emerges.

Finally, a change in laws or regulations can lead to required changes in plan benefits, the methods or assumptions for determining the minimum required contribution, or other administrative requirements affecting the plan. This can also increase the risk of a plan falling out of compliance with the new requirements.

Quantifying Investment and Funded Status Risk

Although cash and money market funds have the lowest absolute investment risk, they are typically not the lowest risk investment for a pension plan. With respect to interest rate risk, a pension plan liability behaves like the price of a bond because both equal the discounted value of a series of future cash flows. The present value will change in the opposite direction to a change in interest rates. Therefore, a bond portfolio with the timing of expected income cash flows matched to the expected benefit payment outflows is typically the lowest risk investment approach for a pension plan.

Section IV. Risk Assessment (cont.)

High quality corporate bonds, often considered a lower risk investment class, can still have a high level of interest rate risk in their present values. If the duration (timing and pattern of income payments) of the fixed income assets are misaligned with the duration of the plan's liability, there can be significant funded status volatility as interest rates change. The way to mitigate this volatility is minimizing the asset/liability (or duration) mismatch risk.

One means of quantifying the expected cost of assuming future investment and asset/liability mismatch risk in exchange for lower expected contributions is to compare the Plan's current assets to a liability calculated assuming very low default risk. One such measure is called a **Low Default-Risk Obligation Measure (LDROM)**. An example of an LDROM is the Plan's Actuarial Accrued Liability for funding purposes, modified to utilize the Current Liability interest rate assumption (which is calculated using the yield on 30-year Treasury bonds):

Liability Basis	Liability Measure	Assumed Return	Funded Percentage (using MVA)
Funding	\$227,263,881	7.00%	85.33%
LDROM	368,706,902	3.29%	52.59%
Current Liability	392,643,819	3.29%	49.39%

The difference between the LDROM and the Actuarial Accrued Liability used to determine minimum funding contributions can be viewed in several ways, and certain views of this measure may be more relevant for some plan sponsors:

- The expected long-term contribution savings to be achieved by investing in asset classes with higher expected risk and returns than bonds.
- The cost of investing in an all-bond portfolio and significantly lowering expected long-term investment returns in exchange for protecting the Plan's current funded status.
- A measure of the Plan's non-diversifiable investment risk.

Investors expect to be compensated for assuming risk when they make an investment. The risk premium of an investment is the return an asset is expected to generate in excess of the risk-free rate of return. The more risk assumed by the investor, the greater the return they expect to achieve in exchange for accepting that risk.

For plans whose assumed long-term rate of return on plan assets is greater than the 30-year Treasury rate used for the Current Liability calculation, the expected cost to fund the plan will be lower because of the greater level of investment risk accepted. This in turn leads to greater volatility in the plan's funded status because the actual return on plan investments is expected to vary considerably year-to-year. Conversely, if a Plan has taken steps to reduce asset/liability mismatch risk the expected cost of contributions to fund the plan will be greater (if the plan is not fully funded) and the volatility in the plan's funded status will be reduced.

Selecting the right level of investment risk (and associated asset/liability mismatch risk) for a plan requires complex analysis that goes beyond the scope of these basic disclosures. Included in any such analysis must be an evaluation of the plan sponsor's funding policy.

Section IV. Risk Assessment (cont.)

Risk Considerations in Assessing a Funding Policy

The plan is funded by contributions made by contributing employers on behalf of each employee who is a participant in the plan, pursuant to the terms of collective bargaining agreements with the unions that represent the plan's participants. When contributions received exceed the Minimum Required Contribution (MRC), a credit balance is maintained and used to satisfy any shortfall between amounts contributed and the MRC in future years.

For multiemployer plans, the MRC meets the requirements to be considered an Actuarially Determined Contribution. However, sponsors of plans in endangered, critical, or critical & declining status may find that the MRC is not sufficient for the plan to satisfy the statutory requirements for plans in these zones.

Under PPA, any changes in the plan's unfunded actuarial accrued liability are required to be amortized over 15 years, with new amortization bases established annually. Therefore, if the plan sponsor makes at least the MRC under the law and all actuarial assumptions are realized, any unfunded actuarial accrued liability will be fully amortized within 15 years. Some examples of changes from year to year that will shorten or lengthen the period until the funding shortfall is fully amortized include:

Factors that Shorten the Amortization Period	Factors that Lengthen the Amortization Period
Contributing more than the minimum required contribution	Failing to meet the minimum funding requirements
Investment and demographic gains	Investment and demographic losses
Increasing interest rates	Decreasing interest rates
Shorter life expectancies	Longer life expectancies
Reducing or eliminating future benefit accruals	Increasing benefit accruals (past and/or future)

An additional consideration for plan sponsors is the projected period until full funding. Depending on the contributions that are expected from contributing employers, the plan may be projected to reach \$0 in unfunded accrued liability in greater than or fewer than 15 years.

Based on the assumptions and methods identified in Section VIII, the plan is projected to have \$0 in Unfunded Actuarial Accrued Liability (UAAL) in the Plan Year beginning January 1, 2036.

Section IV. Risk Assessment (cont.)

Historical Plan Risk and Maturity Measures

While historical plan experience is not a guaranteed predictor of the future, it can be informative in assessing the degree of risk and variability in the annual valuation results year-to-year, and in understanding how certain factors influence future outcomes.

There are plan maturity measures that illustrate some of the risks associated with the plan. The following table shows some commonly used measures of the pension plan's demographics. These are not hard and fast rules. Assessing a pension plan's risk requires looking at the whole picture and considering each of these measures together with the plan's historical experience.

Risk Measures	12/31/2021	12/31/2022	12/31/2023
Inactive Vested Liability as a % of Total Liability	67%	67%	68%
Benefit Payments as a % of Market Value	7%	8%	8%
Benefit Payments as a % of Contributions	192%	175%	161%
Normal Cost as a % Contributions	72%	70%	64%

The greater the ratio of inactive vested liability to total liability, the more the plan is reliant upon contributions on behalf of current active participants to fund benefits for those no longer earning pensionable service. Thus, it can also be considered a measure of intergenerational equity.

Assessing benefit payments as a percentage of market value illustrates the annual return that is required to cover this portion of the annual cash outflows. The greater the percentage of the expected return that is necessary to cover the cost of benefits to current retirees, the less that is available to reduce any UAAL or build future surplus.

Comparing benefit payments to annual contributions illustrates whether the plan is in a negative cash flow situation (i.e., the ratio is greater than 100%) and the degree to which the plan is dependent upon stable investment returns to provide benefits. The higher the ratio, the more investment returns must contribute to financing benefits and expenses.

Similarly, comparing the normal cost to annual contributions assesses the portion of the annual contribution that is necessary to fund current benefit accruals. The smaller the ratio, the more money that is available to apply toward reducing any UAAL or building the plan's credit balance. If the ratio is greater than 100%, the plan's credit balance must be used to cover the remainder of the normal cost as well as the annual amortization payment.

Section IV. Risk Assessment (cont.)

When risks are identified and discussed early, Trustees have many levers available to them (such as changes in contribution rates or plan provisions) to address those risks. As plans mature, however, certain tools become less effective for addressing potential funding shortfalls.

To gain a better understanding of the risk associated with plan funding and investment policies, the Trustees may want to consider a more detailed risk assessment for this plan. Some examples of the analysis that could be conducted include, but are not limited to, the following:

- **Scenario Testing:** An analysis of the impact of one possible event, or several simultaneously or sequentially occurring possible events, on a plan's financial condition.
- **Sensitivity Testing:** An analysis of the impact of a change in an actuarial assumption on an actuarial measurement.
- **Stochastic Modeling:** A process for generating numerous potential outcomes by allowing for random variations in one or more assumptions over time for the purpose of assessing the distribution of future outcomes.
- **Stress Testing:** An analysis for assessing the impact of adverse changes in one or relatively few factors affecting a plan's financial condition.

Due to the limited scope of our engagement, we have not estimated future required contributions under differing investment return and interest rate scenarios.

Section V. History of Unfunded Vested Benefits for Withdrawal Liability Purposes

History of Unfunded Vested Benefits

For purposes of employer withdrawal liability under the Multiemployer Pension Plan Amendments Act of 1980 we have calculated the value of unfunded vested benefits as of the end of each plan year.

The following table shows the results of those calculations:

Plan Year Ending	Present Value of Vested Benefits ⁸	Market Value of Assets	Unfunded Vested Benefits
12/31/2004	\$131,505,152	\$160,900,939	(\$29,395,787)
12/31/2005	142,006,595	169,328,900	(27,322,305)
12/31/2006	150,284,973	183,682,940	(33,397,967)
12/31/2007	152,640,381	191,576,306	(38,935,925)
12/31/2008	157,236,644	140,337,036	16,899,608
12/31/2009	179,815,256	139,125,095	40,690,161
12/31/2010	187,684,509	148,710,282	38,974,227
12/31/2011	204,957,742	141,002,112	63,955,630
12/31/2012	226,288,865	146,624,322	79,664,543
12/31/2013	212,279,866	165,160,271	47,119,595
12/31/2014	233,067,039	166,519,458	66,547,581
12/31/2015	227,327,214	162,179,970	65,147,244
12/31/2016	232,750,580	163,382,617	69,367,963
12/31/2017	252,483,608	177,402,854	75,080,754
12/31/2018	253,765,243	163,326,090	90,439,153
12/31/2019	300,097,283	181,502,666	118,594,617
12/31/2020	339,121,460	196,464,544	142,656,916
12/31/2021	334,951,071	215,711,548	119,239,523
12/31/2022	295,799,996	185,942,372	109,857,624
12/31/2023	273,792,962	193,916,218	79,876,744

⁸ Effective for the Plan Year Ending December 31, 2022, the interest rate assumption for withdrawals is PBGC interest rates as of January each year. For this valuation, 5.06% in the first 20 years, then 4.37% thereafter.

Section VI. Statement of Accounting Standards Codification No. 960

Statement of Accumulated Plan Benefits as of January 1, 2024

Present Value of Accumulated Plan Benefits (PVAB)	1/1/2023	1/1/2024
Vested Benefits		
Participants Currently Receiving Payments	\$115,839,774	\$122,963,596
Deferred Vested Participants	28,264,461	31,231,784
Active Participants	58,875,730	60,919,209
Total Vested Benefits	202,979,965	215,114,589
Non-Vested Benefits	12,180,045	12,149,292
Total (PVAB)	\$215,160,010	\$227,263,881

The interest rate used in determining the present value of accumulated plan benefits was 7.00% for 2023 and 7.00% for 2024.

Statement of Changes in Accumulated Plan Benefits		
Actuarial Present Value of Accumulated Plan Benefits as of January 1, 2023		\$215,160,010
Increase (Decrease) during the year attributable to:		
Interest	\$14,520,086	
Plan Experience	6,745,944	
Benefits Paid	(15,460,430)	
Assumption Changes ⁹	6,298,271	
Plan Amendment	0	
Net Increase		12,103,871
Actuarial Present Value of Accumulated Plan Benefits as of January 1, 2024		\$227,263,881

⁹ Mortality and retirement rate assumptions updated.
Operating Engineers Local No. 77 Pension Plan

Section VII. Summary of Plan Provisions

Effective Date	November 30, 1961										
Plan Year	January 1 through December 31										
Hour of Service	A participant is credited with one hour of service for each hour for which he is paid for the performance of duties in covered employment. A participant is also credited with one hour of service for each hour for which he is paid for non-work, such as vacation, holiday, etc.										
Pension Service	Past Service: A participant who is not an employee of a paving contractor receives one Past Benefit Unit for each calendar year prior to 1960, any part of which he worked under a collective bargaining agreement with the Union. Future Service: A participant receives Future Benefit Units based upon service after December 31, 1959 (December 31, 1969 for employees of paving contractors) equal to the lesser of: i) Years and completed quarters of a year measured from the beginning of the first year with any hours to the end of the last year with at least 400 hours, or to the end of the last month with any hours, if later, or ii) Years and completed quarters of a year determined by dividing the participant's number of hours by 1,600.										
Vesting Service	5 years required for vesting. A participant receives Years of Vesting Service based on his hours during the plan year, in accordance with the following table: <table data-bbox="630 1066 1419 1289"> <thead> <tr> <th>Hours</th><th>Years of Vesting Service</th></tr> </thead> <tbody> <tr> <td>0 – 499</td><td>0.00</td></tr> <tr> <td>500 – 749</td><td>0.50</td></tr> <tr> <td>750 – 999</td><td>0.75</td></tr> <tr> <td>1,000 or more</td><td>1.00</td></tr> </tbody> </table>	Hours	Years of Vesting Service	0 – 499	0.00	500 – 749	0.50	750 – 999	0.75	1,000 or more	1.00
Hours	Years of Vesting Service										
0 – 499	0.00										
500 – 749	0.50										
750 – 999	0.75										
1,000 or more	1.00										
Participation	• Age Requirement: none • Service Requirement: Any employee covered by a collective bargaining agreement with the International Union of Operating Engineers, Local No. 77, is a participant in this plan.										

Section VII. Summary of Plan Provisions (cont.)

Normal Pension

- **Age Requirement:** 65
- **Service Requirement:** Fifth anniversary of participation.

Amount: The monthly normal retirement benefit paid to a participant is the sum of:

- i) Benefit earned for service before 1/1/2008
 - a. All Past and Future Benefit Units for Participants with one or more breaks in service prior to 2008, and who have been credited with 25 years of Vesting Service, will be valued using the benefit unit rates in effect at the time their application for benefit is approved.
- ii) Plus, for years from 2008 to 2010, 3.0% of employer contributions on behalf of that participant for the year
- iii) Plus, for years from 2011 to 2014, 2.5% of employer contributions on behalf of that participant for the year
- iv) Plus, for years from 2015 to 2019, 2.1% of employer contributions on behalf of that participant for the year.
- v) Plus, for years from 2020 to 2023, 1.75% of employer contributions on behalf of that participant for the year.
- vi) Plus, for years after 12/31/2023, 1.50% of employer contributions on behalf of that participant for the year

Deferred Vested Pension

- **Age Requirement:** 65
- **Service Requirement:** 5 years of vesting service
- **Amount:** same as normal

Early Pension

- **Age Requirement:** 55
- **Service Requirement:** 5 years of vesting service
- **Amount (less than 35 years of Vesting Service):** same as normal but reduced $\frac{1}{2}$ of 1% for each month prior to normal retirement eligibility
- **Amount (more than 35 years of Vesting Service):** same as normal but reduced $\frac{1}{4}$ of 1% for each month prior to age 60

Section VII. Summary of Plan Provisions (cont.)

Disability Benefit	• Age Requirement: none • Service Requirement: 15 years of vesting service upon total and permanent disability • Amount: same as normal with no reduction for early commencement
Pre-Retirement Death Benefit	• Age Requirement: none • Service Requirement: vested • Amount: \$5,000
Post-Retirement Death Benefit	• In addition to any survivor benefit payable under the annuity option elected by the participant, the beneficiary of a deceased retiree will receive a lump sum benefit of \$5,000.
Pre-Pension Surviving Spouse Pension	• Age Requirement: none • Service Requirement: vested • Amount: 50% of the normal or early retirement benefit the participant would have received had he retired on the first day of the month in which he died but elected an actuarially reduced joint & 50% spouse annuity. The actuarial reduction cannot exceed 10%. • Duration: life of spouse
Vesting	• Age Requirement: none • Service Requirement: 5 years of vesting service
Normal Form of Benefit	• Unmarried Participant: Three-year certain and continuous annuity. • Married Participant: Actuarially reduced 50% Joint & Survivor Pop-up Annuity.
Optional Forms of Benefit	• Three-year certain and continuous annuity • 75% Joint & Survivor Pop-up Annuity

Changes to Prior Year's Plan Provisions

Accrual rate lowered from 1.75% to 1.50% of contributions for hours worked on or after January 1, 2024.

Section VIII. Actuarial Methods and Assumptions

Actuarial Funding Method

The Traditional Unit Credit (accrued benefit) cost method has been used to develop the funding requirements presented in this report. Under this method, the normal cost is equal to the actuarial present value of benefits accrued during the plan year. The actuarial liability represents the actuarial present value of benefits which have been accrued in all prior plan years. Actuarial gains or losses resulting from plan experience which differs from the actuarial assumptions, plan amendments or changes in the actuarial assumptions are considered new pieces of actuarial liability and must be funded over no more than fifteen years.

Asset Valuation Method

The actuarial value of assets is a calculated value determined by adjusting the market value of assets to reflect the investment gains and losses (the difference between the actual investment return and the expected investment return based on the prior year market value) during each of the last five years at the rate of 20% per year. The actuarial value is subject to a restriction that it cannot be less than 80% nor more than 120% of market value.

Mortality

Funding

Healthy: 110% of Pri-2012 Amount-Weighted Employee Table with Blue Collar Adjustment for pre-commencement and Pri-2012 Amount-Weighted Retiree Table with Blue Collar Adjustment for post-commencement, projected generationally using scale MP-2021. For the prior valuation, 130% of the RP-2014 Blue Collar Mortality, projected generationally using scale MP-2018.

Disabled: 110% of Pri-2012 Amount-Weighted Disabled Table, projected generationally using scale MP-2021. For the prior valuation, 140% of the RP-2014 Disabled Retiree Mortality, projected generationally using scale MP-2018.

The mortality assumption was selected based on a mortality experience study conducted in 2023.

Current Liability:

2024 IRS Static Mortality Table.

Interest Rate

Valuation:

7.00% annual compound interest in the future, based on expected earnings from portfolio analysis.

Section VIII. Actuarial Methods and Assumptions (cont.)

Interest Rate (cont.)

Withdrawal Liability:

Starting with this valuation, PBGC interest rates as of January each year for withdrawals after December 31, 2022. For this valuation, 4.86% for the first 20 years, then 4.70% thereafter. For prior valuations, the PPA corporate bond spot-rate yield curve for December prior to the valuation date.

Current Liability:

3.29% per year compounded annually. The current liability interest rate is chosen from a specified range that is set by law.

Termination & Disability

Termination

We have assumed that terminations of employment, other than death, disability, or pension will occur in the future at a moderate rate.

Age	Rate
25	4.93%
30	3.41%
35	2.37%
40	1.31%
45	0.67%

Disability

Based on 1965 to 1982 Social Security experience with adjustment for occupational class.

Age	Rate
25	0.20%
30	0.30%
35	0.42%
40	0.59%
45	0.82%
50	1.22%
55	2.09%

Section VIII. Actuarial Methods and Assumptions (cont.)

Age at Pension

Active participants are assumed to retire at the following rates:

Age	Rate
<58	0.0%
58 – 61	2.5%
62 – 64	10.0%
65	25.0%
66	60.0%
67 - 69	20.0%
70	100.0%

For the prior valuation:

Age	Service	
	5-34	35+
<55	0.0%	0.0%
55	2.5%	2.5%
60	2.5%	20.0%
64	10.0%	100.0%
65	40.0%	100.0%
70	100.0%	100.0%

Terminated vested participants are assumed to retire at age 65.

The weighted average retirement age as of the valuation date is 64.9. The overall weighted retirement age is the average of the individual retirement ages based on all the active participants included in the January 1, 2024 actuarial valuation.

The retirement age assumption used was reviewed and determined to be reasonable taking into account the following factors:

- The Plan's early retirement provisions,
- A review of the Plan's retirement experience during the 2020 – 2023 plan years,
- The actuary's experience with other plans of a similar size, demographic composition, and plan design.

Administration Expenses

The prior year's administrative expenses increased 2% are assumed as a mid-year number for the current year. That mid-year number is then discounted to the beginning of the year and included in the normal cost. For projections, administrative expenses are assumed to increase 2% annually.

The annual administrative expenses were based on historical and current data, adjusted to reflect estimated future experience and professional judgment..

Section VIII. Actuarial Methods and Assumptions (cont.)

Assumed Hours Worked

Each active participant will work the same hours in each year in the future that were worked in the Plan Year ended immediately prior to the valuation date.

The future hours assumption is based on historical and current demographic data, adjusted to reflect estimated future experience and professional judgment. As part of the analysis, a comparison was made between the assumed and the actual hours over the past several years.

Active Participants

For the purpose of projecting future contributions only, we have assumed that the number of active participants will remain constant with replacements being made immediately upon pension, death, or disability. Participants who worked zero hours in the prior plan year are assumed to be separated participants.

Marital Status

85% of all participants are assumed to be married. Wives are assumed to be 3 years younger than husbands.

Forms of Benefit

Single participants are assumed to elect a three-year certain and continuous annuity at retirement. Married participants are assumed to elect a 50% Joint and Survivor pop-up annuity at retirement. Because all optional forms of benefit are actuarially equivalent, the net impact on the valuation results is immaterial.

Assumptions reflected in the determination of plan assets and liabilities that are not specifically discussed are not considered significant relative to the measurement.

Changes to Prior Year's Valuation

Mortality and retirement rates were updated based on a study of the Plan's recent experience.

Section IX. Contribution Rate History

The following table shows the Fund's historical contribution rates, including those rates as set by the current Collective Bargaining Agreement.

Plan Year	Contribution History ¹⁰
2005	\$1.50
2006	1.61
2007	1.66
2008	1.76
2009	1.80
2010	1.93
2011	2.01
2012	2.13
2013	2.20
2014	2.36
2015	2.40
2016	2.50
2017	2.69
2018	2.78
2019	2.83
2020	2.90
2021	3.26
2022	3.57
2023	3.79

¹⁰ Contribution rate varies by contract. Rates listed are the average for the plan year preceding the valuation date.

Section X. Full Funding Limitation

Determination of Current Liability as of January 1, 2024

	Number of Participants	RPA '94 Current Liability
Retired Participants and Beneficiaries	1,027	\$170,655,601
Terminated Vested Participants	577	63,290,392
Active Participants		
Non-Vested		24,270,048
Vested		134,427,778
Total Active Participants	1,272	158,697,826
Total	2,876	\$392,643,819

RPA '94 Information		
Value of Benefits Accruing During the Year		\$13,542,921
Expected Benefit Payments During the Year		16,438,846
Interest Rate		3.29%
Mortality Table	2024 IRS Static Mortality	

Full Funding Limitation for Minimum Funding As of December 31, 2024

The Full Funding Limitation for Minimum Funding establishes the maximum net charge to the Funding Standard Account calculated without regard for contributions or credit balance. If the net charge exceeds this limit, then a special credit is taken on the Schedule MB of Form 5500. The net charge for the Fund does not exceed this limitation.

Full Funding Limitation for Minimum Funding	ERISA	RPA
Expected Liability	\$249,304,162	\$402,841,019
Liability Percentage	100%	90%
Funding Limit Liability	249,304,162	362,556,917
Expected Assets for Minimum Funding	(156,588,152)	(205,028,024)
Preliminary Full Funding Limitation (not less than 0)	92,716,010	157,528,893
Full Funding Limitation (greater of ERISA and RPA)	\$157,528,893	

Section X. Full Funding Limitation (cont.)

Full Funding Limitation for Maximum Deductible as of December 31, 2024

The Full Funding Limitation for Maximum Funding provides one of several components in the calculation of the limit for deductible contributions for the plan.

The maximum Deductible Limitation is the greater of:

- (1) 140% of current Liability Deductible Limit on RPA basis less actuarial value of assets, and
- (2) The lesser of:
 - (a) Normal Cost plus Ten Year Amortization of the UAAL, or
 - (b) Full Funding Limitation for Maximum Funding.

Full Funding Limitation for Maximum Funding	ERISA	RPA
Expected Liability	\$249,304,162	\$402,841,019
Liability Percentage	100%	90%
Funding Limit Liability	249,304,162	362,556,917
Expected Assets for Maximum Funding	(207,021,948)	(205,028,024)
Preliminary Full Funding Limitation (not less than 0)	42,282,214	157,528,893
Full Funding Limitation (greater of ERISA and RPA)	\$157,528,893	

Current Liability Deductible Limit
140% of RPA Expected Liability – RPA Expected Assets
\$358,949,403

For the current year, the 140% Current Liability deductible Limit is \$358,949,403, the Normal Cost plus Ten Year Amortization is \$9,349,527 and the Full Funding Limitation is \$157,528,893. Therefore, the Maximum Deductible Limit is \$358,949,403.

Section XI. Glossary

Actuarial Accrued Liability:

In general, this term means the present value, expressed in a single sum, of the benefits yet to be paid. It is computed differently under different Actuarial Funding Methods.

Actuarial Assumptions:

Estimates or projections of future plan experience such as investment return, expected lifetimes and the likelihood of receiving a pension from the pension plan. Demographic, or “people” assumptions include rates of mortality, retirement and separation. Economic, or “money” assumptions, include expected investment return, inflation and salary increases. Assumptions of a long-term nature are representative of average expectations (i.e., they will not be exactly realized in every year, however over an extended period are a reasonable projection of future outcomes).

Actuarially Determined Contribution (ADC):

An amount of annual plan funding contribution determined using the following:

- Actuarial assumptions that are reasonable both individually and in aggregate,
- An Actuarial Cost Method that reasonably allocates pension costs over each participant’s working lifetime,
- An amortization method that specifies the period over which any unfunded accrued liability is paid off,
- A method for measuring plan assets, either at market value or with reasonable smoothing of market volatility, and
- In some cases, an output smoothing method that mitigates significant changes in the calculated contribution from year-to-year.

Actuarial Funding Methods:

An actuarial method that defines the allocation of pension costs over a member’s working career. All standard actuarial cost methods are comprised of two components: Normal Cost and the Actuarial Accrued Liability. An Actuarial Funding Method determines the timing of pension costs, not the ultimate cost of a pension plan; that cost is determined by the actual benefits paid less the actual investment income.

Actuarial Gain or Loss:

A pension plan incurs actuarial gains or losses when the actual experience of the pension plan does not exactly match assumptions.

Actuarial or Experience Gain or Loss:

A measure of the difference between actual experience and experience anticipated by a set of Actuarial Assumptions during the period between two actuarial valuation dates, in accordance with the actuarial cost method being used. Such gains or losses are not actual economic gains or losses immediately incurred by a plan, as experience in future years could offset the effect of experience in a single year due to the typically long-term average nature of actuarial assumptions

Section XI. Glossary (cont.)

Actuarial Value of Assets (AVA):

The value of the pension plan's investments and other property used by the actuary for the purpose of an actuarial valuation (sometimes referred to as valuation assets). This may be the market or fair value of plan assets or a smoothed value to reduce the year-to-year volatility.

Funded Percentage:

The ratio of a plan's assets compared to the liabilities. There are several acceptable methods of measuring a plan's assets and liabilities for this purpose.

Low Default-Risk Obligation Measure (LDRM):

The present value of benefits accrued at the valuation date using actuarial assumptions that are generally the same as those used in determining the plan's funding liability, with the discount rate changed to reflect the expected return on a low-default-risk investment portfolio.

Market Value of Assets (MVA):

The value of the pension plan's assets based on the value they would trade at on an open market, including accrued income and expenses (sometimes referred to as fair value). This is typically provided by the plan's auditor.

Normal Cost:

Computed differently under different funding methods. The Normal Cost generally represents the value of benefits being earned that are allocated to the current plan year.

Unfunded Actuarial Accrued Liability (UAAL):

The excess, if any, of the Actuarial Accrued Liability over the Actuarial Value of Assets.