

History of Eversource X-178 structures.

In 1985 the X-178 1 & 2 were replaced by PSNH:

The 1948 336 ASCR 26/7 conductor was replaced with 795 ASCR 26/7 conductor, increasing the max. amperage of the conductors from 529 to 908 and their weight from 482 to 1094 lbs per 1,000'. The structure heights increased by only 5' on average according to [PSNH](#) which stated "Structure height increases were kept to a minimum by designing the new line with a higher tension than PSNH normally utilizes for this type construction, 7500 pound tension per phase at NESC heavy loading."

The average circumference of the 1985 poles is larger than that of the 1969 poles on the X-178 (3).

Eversource recently sent a [memo](#) to the ISO-NE PAC which included a summary of structure replacements on the three sections of the X-178:

Table 1 – X-178 Structure In-Service Years

Year	X-178	Segment 1	Segment 2	Segment 3
1953 ³	28	28	0	0
1958	2	0	0	2
1969	175	0	0	175
1971	22	21	1	0
1983	83	1	79	3
1985	266	112	151	3
2002	2	0	0	2
2012	2	0	1	1
2015	1	1	0	0
2020	11	11	0	0
2023	2	1	0	1
Total	594	175	232	187

Since the X-178 was rebuilt in 1969 and 1985, only 18 structures have been replaced.

On October 17, 2018 Eversource [presented](#) 41 “asset condition” structure replacement projects to the PAC. Eight were in New Hampshire:

Line	Proposed Replace (2018-2019)	Est. Replace Cost (\$M)
A126	49	\$8.3
H123	29	\$6.0
H141	44	\$7.7
K174	43	\$8.7
L163	64	\$14.0
A152	29	\$6.1
X178	56	\$11.2
NH Total	314	\$62.0

Eversource recently stated to the PUC that PAC “...attendees are provided opportunities to participate with questions, comments, and concerns.” PAC members asked three [questions](#) about these 41 projects in three states. None were about a particular project

Eversource eventually canceled the \$11.2 m. X-178 project. Perhaps it realized that an attempt to build a project on this former Northern Pass route would subject its rapidly increasing number of “asset condition” projects to scrutiny.

Eversource did not provide structure ratings for these projects, but we can assume that it would have labeled the 56 structures it wanted to replace as Category C, the category of the 41 structures it claimed needed replacement in its February 28, 2024 X-178 [presentation](#) to the PAC:

Reason For Replacement	Total	Priority C	Priority B	Priority A
OPGW Loading / Clearance Failure	244	0	242	2
Asset Condition + Laminate	43	41	2	0
Access Opportunity	231	0	229	2
Additional Opportunity	62	0	62	0
Total Replacement Structures	580	41	535	4

Eversource provided no proof of the needs it “identified” in this presentation. It recommended a full line rebuild at a cost of \$384.61M (-50/ +200%) No members of the PAC asked for structure inspection reports.

Clearance failure (above) would be caused by the larger, heavier, high-sag conductor for which no need has been determined either by ISO-NE (reliability) or Eversource, which has said nothing about the condition of the existing conductors.

E\$ has not provided documents showing clearance failures.

Loading failure would also be caused by the 50% heavier proposed conductor and the extra weight of the OPGW, which also has not been determined to be necessary and which is not permitted in the easement terms. Eversource has not negotiated with easement-encumbered landowners for the right to transmit intelligence on the easements for obvious reasons.

E\$ has not produced proof of loading failure with OPGW.

Eversource did not provide the recommended actions for A, B, C and C rated structures but we can assume they are the same as those in its 5/18/2023 [presentation](#) for the U-199, Q-195 and B-112 complete line rebuilds:

- A: Nominal Defect – No Action Required
- B: Minimal Defect – Monitor Degradation
- C: Moderate Defect – Repair or Replace under next maintenance
- D: Severe Defect – Repair, Reinforce, or Replace immediately

Eversource would not say how long its maintenance cycle is, but its inspection/treatment cycle for transmission lines is eight to ten years.

The [minutes](#) for the February 28, 2024 presentation to the PAC state:

“Eversource Energy issued the following statements in response to stakeholder questions:...

- Priority D structures possess a “severe defect” that requires immediate action. Priority C structures have a “moderate defect” and should be addressed in the near future during the next maintenance cycle. An asset condition’s maintenance cycle does not fall into a firm 10-year period, but rather, initiates as needed...

- The chart indicates that 43 structures are in jeopardy of failure...

- Eversource is unsure how the line’s rating will be impacted after replacing all the conductors. It could lead to a 40-50% increase in the line’s capacity...

The following comments were issued:

- Structure replacements driven by “access opportunity” do not seem like an appropriate PTF [pooled transmission facility] asset condition need.

- It is difficult to decipher which elements of this proposal are true asset condition needs

and which are merely add-ons for desired buildout...

- Eversource's proposal to install OPGW [Optical Ground Wire] on X-178 does not seem like a true asset condition need and its inclusion in this preferred solution feels like a strategic maneuver to regionalize this cost."

In its June 20, 2024 [presentation](#) to the PAC Eversource redefined Category/Priority C structures as "Immediate replacement structures". It introduced 127 uplift structures that would need to be replaced even if only the 41 category C structures were replaced. It described uplift as "Structures that become overstressed due to conductor and/or shield wire tensions created by replacement of one or more nearby structures." It failed to mention that the uplift would be caused by its replacement of the 41 structures with taller structures able to carry the larger conductor and OPGW.

It warned that "2024 drone inspections are ongoing and additional priority C structures may be identified."

[Minutes](#) for this meeting state:

"In response to stakeholder questions, Eversource issued the following statements:

- Eversource is in the process of conducting its 2024 inspections. After completion, Eversource will require time to assess the identified structural defects, which could take anywhere from several weeks to many months, depending on inspection results...

- Eversource, while unsure on the exact location of each of the 41 "Priority C" structures, confirmed they are scattered across the X-178 line, rather than confined to one section of the line...

Stakeholders issued the following comments:

- Many stakeholders felt Eversource should provide additional detail on X-178's proposed pole replacements.

- A stakeholder noted concern that the replacement of the 41 "Priority C" structures would further contribute to the uplift issue."

[The actual exchange was this:

Kris: So if you replace those [41] poles with poles of the same height, would you then have an uplift problem?

Chris Soderman: If we maintained our proper shielding angles that we're looking for in our standards, no, we wouldn't have an uplift problem but now we would have a clearance to ground problem." [Because of the heavier conductor, though the profiles provided by

Eversource have not shown the minimum structure heights required to maintain the clearance required by Code, with the heavier conductor].

“- A stakeholder felt asset condition projects of substantial cost and/or controversy require more than 30 minutes of allocated time on the PAC agenda to facilitate meaningful discussion...

- NESCOE [New England States Committee on Electricity] requested more insight into the needs driving OPGW installation on the line.

- NESCOE noted its frustration and reiterated its request for Eversource to provide a targeted solution cost analysis.”

In response to this unprecedented questioning (Eversource’s 70 New Hampshire “Asset Condition” projects have elicited few questions from the PAC) Eversource created an October 23, 2024 [presentation](#) to the PAC, in which it claimed that the drone inspection had identified 115 new Category C structures (and thus more uplift structures.)

Eversource stated that “Deterioration is non-linear and accelerates once structures are compromised by cracks, woodpecker holes, or moss/lichen growth” but failed to provide a graph of this deterioration, pole replacement summaries for other lines, or results of any structural testing it might have done on the thousands of wood poles it has cut down in its complete and partial line rebuilds.

Eversource provided no history of outages on the three sections of the X-178.

Eversource has replaced only 13 of the 56 structures it claimed, in 2018, needed replacement.

None of these replacements were on Section 2 where the line reaches its highest elevation.

Year	X-178	Segment 1	Segment 2	Segment 3
2020	11	11	0	0
2023	2	1	0	1
Total	594	175	232	187



Elevation profile along route

Year	X-178	Segment 1	Segment 2	Segment 3	
1953 ³	28	28	0	0	
1958	2	0	0	2	
1969	175	0	0	175	Rebuild
1971	22	21	1	0	
1983	83	1	79	3	
1985	266	112	151	3	Rebuild
2002	2	0	0	2	
2012	2	0	1	1	
2015	1	1	0	0	
2020	11	11	0	0	
2023	2	1	0	1	

2/28/2024 43 (claimed Category C based on 2022 inspections)
10/23/2024 158 (claimed Category C based on 2024 inspections)

Eversource claimed that the replacement of 590 structures was still the most cost-effective response to dealing with 41 Category C structures (while installing taller steel structures, 1272 ACSS conductor, OPGW, and roads.)

It failed to mention that the “Piecemeal” approach it rejected would subject it to regulations that would provide more oversight of its plans and costs and require it to assess alternatives, including ACCC type conductor.

Eversource needs to provide the structure replacement histories of the O-154, D-142 and W-179, which were constructed in 1947-48 and completely replaced in 2023 and 2024.

If an upgrade of the X-178 line capacity was identified by ISO-NE as necessary for system reliability, ISO would exercise oversight on its costs and alternatives, which is not the case now, with the proposed rebuild claimed by Eversource as due to “asset condition.”