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Project Information

Title	Line 21 Transmission Rebuild per Inspection - Phase 1
Project #	412C
Blanket Account	No
Work Order Number	
Work Order Link	
Project Manager	<input type="checkbox"/> RICHARDSON, SCOTT
Project Owner	SLOAN, STEPHEN
Project Category	Major Capital
Budget Status	Candidate
Region	SOR
County	Washington
Project Priority	1
Construction Class	Transmission
PTF	No
Project Owner AOR	Transmission Development
Business Driver	Prospective Project
Circuit ID	21
Project Type_	Line Rebuild; Targeted Upgrade; Improve Reliability
Project Description	<p>Targeted rebuild of approximately one-third of Line 21 wood poles due to end-of-life condition determined by recent visual inspection performed by an unmanned aerial system (UAS, a.k.a. drone) and ground line wood pole strength and condition assessment.</p>
Project Scope	<p>Rebuild approximately one-third of Line 21 (2.64 miles) by replacing 21 single wood pole K-frame structures and three two wood pole H-frame structures all in poor condition and at end-of-life. Replace four broken/chipped porcelain suspension insulators. The existing 266 ACSR conductor will be retained and transferred to new taller and heavier class single wood poles and held in space using horizontal polymer line post insulators.</p> <p>All transmission assets targeted by this project are located between US Route 1 and Buck's Harbor Substation.</p>
Asset Additions	-
Asset Replacements	Poles; Crossarms; Other
Project Justification	<p>Line 21 is an 8.2 mile long 34.5kV transmission line that provides power flow from the Company's Washington County Substation in Jonesboro to its Bucks Harbor Substation. This line is a radial transmission asset located 100% in a maintained 60+ foot wide ROW. Until recently this transmission line served only 350 distribution customers residing in Bucks Harbor and surrounding communities. However, the US Navy has rehabilitated its facility in Cutler and a tap line has been extended from Bucks Harbor and is now actively serving this load, greatly increasing the flow of transmission power over Line 21 and the importance of its reliability remaining high.</p> <p>Line 21 was originally constructed in 1961 and is comprised primarily 97 single wood pole K-frame structures, porcelain suspension insulators and 266 ACSR wire. According to the most recent complete ground line wood pole strength and condition assessment performed in 2007, 85% of all original wood poles set in 1962 remaining in-service have some level of internal decay and all (100%) had some level of detected shell strength reduction. In 2012 this group of Line 21 with decay had a retreat application of chemical preservatives per the Company's Ground Line Wood Pole Assessment Program Criteria at which time it was discovered that eight (or 11%) of these wood poles now exhibited internal heart rot, which is a more serious form of internal decay occurring prior to the stage of pole reject. A full ground line wood pole strength and condition assessment of this line was performed in 2017</p>

and at that time 97% of all wood poles had internal decay and 14% with advanced heart rot and reduced shell thickness/strength approaching the reject level of 66% of original levels.

In 2019 an unmanned aerial patrol of poles and crossarms comprising this transmission line was performed. This aerial inspection showed that many wood poles had significant pole top splitting and/or rot. Based upon this information and previous ground line wood pole assessments Asset Managers have rejected 51 or the 95 wood pole structures and recommended that these poor condition assets approaching end-of-life be replaced over the next three years. This project begins this effort by replacing 21 single wood pole K-frame structures and three two-pole H-frame structures. Phase 2 will rebuild the 2.7 mile length of Line 21 in ROW from Washington County Substation to US Route 1 and Phase 3 will complete this rehabilitation work by replacing another 17 wood pole K-frame structures from US Route 1 to Buck's Harbor Substation. maintenance end-of life erious splitting nd the results ts due to continued reduction of effective shell thickness/strength will be discovered.

Project Risk Assessment

Line 21 is a radial 34.5kV transmission line serving approximately 350 customers via Bucks Harbor Substation. However, because the US Navy also takes service from this low voltage transmission line it will be important to minimize the duration of planned outages needed to safely rebuild this segment of Line 21. Osprey activity in this geographic area is high. The company will need to develop and implement a process to deal with active Osprey nests during this project and should consider relocating active and nest to host poles along the edge of the ROW to encourage avian activity to move off EM transmission poles.

Screening Criteria for Consideration of NWA (Non-wires Alternative) Solution 5. This project addresses asset condition ONLY

Alternative Projects

None - Run this section of Line 21 to failure and accept lower reliability for customers served by Bucks Harbor Substation that also includes the US Naval installation at Cutler.

Estimated Total Project Cost	1,427,670
Estimate Grade	Planning Costs Only
Estimated Direct Cost	\$944,848
Estimated Overhead Cost	\$368,202
Estimated Labor Overhead	\$29,722
Estimated Non-Labor Overhead	\$378,276
Estimated AFUDC	\$24,620
Estimated Nonunion Cost (ST)	\$4,000
Estimated Union Cost (ST)	\$10,360
Estimated Union Cost (OT)	\$7,770
Estimated Outside Service Cost	\$831,383
Estimated Direct Purchases	\$49,113
Estimated Inventory Cost	\$40,679
Estimated Lobby Stock	\$1,543
Estimated Salvage	\$0
Estimated Credits	\$0
Estimated Reimbursement	\$0
Estimated OM	\$0
Estimated Contingency	\$90,000
Planning Hours	0
Engineering Hours	0
Line Resources	External Line
Estimated Line Hours	420
Estimated PST Hours	0
Other Hours	100

Project Status	Closed
Project Start Date	8/3/2020
Construction Start Date	8/3/2020
In Service Date	12/31/2020
Approval Log	; <p>Approval of Project Number (up to \$10K Spend) (version 7.0) by NORMAN, DAVID on 7/18/2018 4:39:55 PM Approval Limit per LOSA \$100K Total Project Cost \$321,082.34</p> <p>Request sent to SLOAN, STEPHEN for Approval of Project Estimate;</p> <p>Approval of Project Estimate(version 34.0) by i:0#w bhe-nt\sloan on 12/26/2019 8:29:14 AM Approval Limit per LOSA \$100K Total Project Cost 95132.55675;</p> <p>Approval of Project Estimate(version 35.0) by SLOAN, STEPHEN on 12/31/2019 6:11:07 AM Approval Limit per LOSA \$100K Total Project Cost 95132.55675;</p> <p>Approval of Project Estimate(version 27.0) by MILLER, PAUL on 7/21/2020 7:21:48 AM Approval Limit per LOSA \$500K Total Project Cost \$1,427,669.90;</p> <p>Approval of Project Estimate(version 29.0) by HERRIN, MICHAEL on 7/22/2020 1:17:26 PM Approval Limit per LOSA \$2M Total Project Cost \$1,427,669.90;</p> <p>Approval of Project Closure(version 36.0) by RICHARDSON, SCOTT on 12/30/2020 4:16:44 PM Approval Limit per LOSA Total Project Cost \$1,417,822.03</p>
Approval Status	Completed Approval of Approval of Project Closure
Required Resources	Line - Contractor; T&D Planning; Transmission Development
Team Members	PERKINS, DAVID ; MILLER, KENNETH ; PARADIS, MARK ; RICHARDSON, SCOTT
Planning	Completed
Planner	
Engineering	Completed
Line Engineer	
Trim	Required
ROW	Required
Procurement	Completed
Tel Pole Set	Not Required
Customer Rqmts	Completed
Environ Permits	Completed
Pole Permits	Not Required
Other Permits	Required
Dig Safe	Required
Final Inspection	Required
Released to Line	Energize
Line Status	Not Required
Notes	
Attachments	BOM IFC.PDF Copy of Emera Maine- Direct Cost- Capital Project Estimate Template.xlsx L21 TRBLD Phase I (WCS to RT1) STRAT Plan- Direct Summary Forecast Template (2).xlsx Line 21 Condition Assessment.xlsx LINE 21 DEVELOPMENT ESTIMATE.xlsx Line 21 Pole Locations.kmz Line 21 TRPI Phases.kmz