

2019 ACEC of Maine Engineering Excellence Awards

CES, Inc., a Maine-headquartered firm of engineers, environmental scientists and land surveyors, has received an Honor Award for their role in the Brookfield Renewable Penstock No. 1 Replacement project in Millinocket, Maine. "CES is proud to receive the **Honor Award for Engineering/Contractor Collaboration**," said CES President and CEO Denis St. Peter, PE. "Our team demonstrated how advantageous the design-build project delivery approach can be when the design professionals and construction experts collaborate on solutions."

HONOR AWARD:
**ENGINEERING/
CONTRACTOR
COLLABORATION**

CES, INC.

*Brookfield Renewable Penstock
Replacement Project*



L-R: Peter Parizo, Sargent Corporation; Dana Averill, CES;
Peter Tuell, CES; Tim Boyce, ACEC-ME

This prestigious award recognizes entries that provide an innovative application of techniques and successfully address complex criteria as well as engage with the client in the overall project development. Sargent Corporation, the general contractor, and CES took a team approach in solving the issues associated with this project. Brookfield Renewable Energy operates the hydroelectric system that formerly powered the Great Northern Paper Mill in Millinocket, Maine. Penstocks, 10 feet in diameter, drive hydroelectric turbines downstream in a Powerhouse. They run below Fergusson Lake and the last 125 feet is directly beneath the Powerhouse. The team faced unique challenges because the integrity of the building and its foundations needed to be maintained and Penstock No. 1 required smaller replacement units than those previously identified for Penstock No. 3. CES used the original Penstock drawings from the 1900s and Brookfield design and fabrication drawings to design an alignment that reused all of the pre-fabricated sections with only minor adjustments and minimal fabrication of new units. The Penstock was slip-lined under the building, followed by an open excavation/remove/replace approach for sections outside the

Powerhouse. Slip-lining an elbow section where it connected to the turbine under the Powerhouse was not possible due to its shape so the contractor placed this piece on air bags downstream from the system discharge in Millinocket Stream, floating it into the tailrace of the Powerhouse, and then hoisting it into place with a rigging system. Installation of this piece required personnel to work on a barge below the Powerhouse.

"Notably, the project was completed three days ahead of schedule, allowing Brookfield to put that turbine back online for power generation," said Vice President and Senior Project Manager Pete Tuell, PE. CES, working with Sargent Corporation in a design-build team effort, presented the owner options that capitalized on century-old documented history of the site as well as ingenuity born of experience in the field today. Brookfield Renewable Energy is an important member of the Millinocket region, and CES was pleased to take part in maintaining this important energy project.

A 2015-2018 Best Places to Work in Maine, CES, Inc. provides civil and environmental consulting and land surveying services to clients. In business since 1978, CES employs approximately 100 professionals across eight offices in Maine and Florida.

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