Update on Hydrokinetic Energy Projects in Alaska

J. Kasper¹, N. Hansen², M. Worthington³

¹UAF, ²Oceana Energy, Inc., ³ORPC, Inc.

April 2016
AHERC Activities
2015
- Oceana, Inc. Nenana deployment (AEA)
- Observations of sub-surface debris (DOE)
- Debris/infrastructure interaction modeling (DOE)
- Yakutat wave assessment (CBY & AEA)
- Debris Diversion and Characterization (AEA)

2016
- 5 kW turbine deployment: effect of debris diversion on hydrokinetic generator (State of AK)
- fish-turbine interactions & mid-river, full water column fish sampling (State of AK)
- Yakutat sonar seafloor debris & bathymetry survey (DOE)
- Kvichak River frazil ice assessment (DOE)
Yakutat Wave Resource Assessment

- Wave measurements complete (very good resource potential)
- Long term modeling nearly complete: waiting on DOE funded bathymetry study to finalize model study
Oceana Turbine Test at the Tanana River Test Site (2014 & 2015)

Turbine Test Platform and Research Debris Diversion Platform

Oceana Turbine Testing
Oceana In-Stream Evaluation 2015

- The second summer of testing at AHERC site on the Tanana River, near Nenana was successfully completed.
- The device performed well.
- Data was obtained on the device and river conditions.

© Oceana Energy 2016
To further characterize the electrical performance of the Oceana device, an initiative was begun to test in the UAF/PSI lab under controlled conditions.

- Device is spun by a motor in a tank.
- An electrical power inverter is to be added to the system.
ORPC Alaska Activities

ORPC RivGen Demonstration Project in Igiugig 2015

- Delivered power to shore in the remote, diesel-powered community of Igiugig, Alaska, supplying 1/3 of their power needs.
- Technology advancements improved performance by 1/3 over 2014 Project results.
- Proved self-deployment and retrieval system again.
- Collaborated with the Village of Igiugig and have signed letter of intent from them for commercial RivGen® Power System in 2018.
- KTVA-CBS produced segment about the project in Igiugig and the President and Secretary of State’s focus on clean energy during their August 2015 trip to Alaska.

https://youtu.be/mTvJ4t_1Ezk
Igiugig Village planning for a commercial RivGen® Project

- 2014: Successful permitting and testing of RivGen® Power System completed
- 2015: Demonstration phase completed
- 2015: DOE selected Igiugig to develop a “Next Generation MHK River Power System Optimized for Performance, Durability, and Survivability.”
- 2015: FERC draft license application submitted by ORPC on behalf of Igiugig Village Council.
- 2016: Final FERC pilot project license submission targeted
- 2018: Commercial deployment
False Pass Project

- Resource and site assessment completed with funding from U.S. Dept. of Energy - Office of Indian Energy Policy & Programs (DOE-IE). Robust tidal energy resource and viable locations for a tidal energy project were established with Alaska Energy Authority programmatic funding.

- False Pass Tribal Council recently selected for $1 million in funding from DOE-IE towards a tidal energy project in False Pass.
Acknowledgements

A special thanks to: the City of Nenana, the Nenana Tribal Council, Jason Mayrand, Victor Lord, Robin Campbell, Inland Barge Service, Charlie Hnilicka, Ruby Marine Inc., Matt Sweetsir, Crowley Marine Services, Endil Moore, Jon’s Machine Shop, Monty Worthington (ORPC), Bill Staby (RME), City and Borough of Yakutat (Bill Lucey, Skip Ryman, Ian Fiske), Ned Hansen (Oceana), Jonathan Colby (Verdant Power) and Tom Ravens (UAA)
National Recognition for ORPC’s 2015 RivGen® Project

- Delivered power to shore in the remote, diesel-powered community of Igiugig, Alaska, supplying 1/3 of their power needs
- Technology advancements improved performance by 1/3 over 2014 Project results.
- Proved self-deployment and retrieval system again
- Collaborated with the Village of Igiugig and have signed letter of intent from them for commercial RivGen® Power System in 2018
- Funded by Alaska Energy Authority REF and EETF, the Denali Commission, U.S. Department of Agriculture SBIR Program, and the U.S. Department of Energy
- KTVA-CBS produced segment about the project in Igiugig and the President and Secretary of State’s focus on clean energy during their August 2015 trip to Alaska [https://youtu.be/mtvl4t_1Ezk](https://youtu.be/mtvl4t_1Ezk)

First marine energy company ever to receive this honor