

Wind-Diesel Hybrid Test Bed Emerging Technology Fund Quarterly Report II (2011)

April 1st 2011-June 30th 2011

Project Status

The focus of Q2, 2011, has been on getting all the crucial equipment to Marsh Creek in readiness for commissioning and start of trials. All the hardware components that were ordered from Sustainable Automation Inc. have been delivered at the Marsh Creek facility in Anchorage, including the Wind Turbine Simulator, Grid Forming Inverter, Transformer, and Battery Bank. Delivery of the simulation models was made in June 2011. The Wind Turbine Simulator has been commissioned by Sustainable Automation.

Not yet delivered but already ordered from Powercorp is the Controller needed to commission the Hybrid Test Bed. The Controller needs to manage and automate the operation of the hardware components. It is also responsible for the grid integration of renewable and conventional generation. In line with securing a multi-vendor test bed, the controller was sole-sourced to Powercorp as they are the only developer of this distributed control technology. Powercorp's Distributed Control System (DCS) utilizes ethernet for communication and does not have a master automation controller, as is typically seen in Alaskan communities, which has the potential to fail and force manual operation. The unique and secure software architecture has been developed at Powercorp and allows for remote access. The Hybrid Test Bed is well suited to testing and demonstrating technology new to Alaska in order to increase comfort and reduce risk for our smaller developers. Powercorp's controller is a distributed control system, which has yet to be utilized in Alaska, but one which provides success in numerous other installations worldwide. In order to secure a

A Service Contract between UAF and Marsh Creek is expected to be in place in July 2011; this spells out the scope of work, warranty, and terms of payment, among other pertinent issues.

Equipment & Budget

The Distributed Control System (DCS) ordered from Powecorp is expected to be delivered in July, with subsequent commissioning thereafter. The quoted price of this unit is 119,243.27 \$AUD.

Marsh Creek has indicated that they shall loan us some resistive load banks as we try to source for our own.

Plans are underway for AVEC to allow us use of two diesel generators for initial trials, and indications are that one needs to be returned in early 2012 while the other may provisionally be used for the duration of the project.

Timeline and Schedules

All commissioning work should be done by early August, after which performance trials will begin. A MS graduate student who is undertaking research on control for distributed generation in high penetration systems will be stationed in Anchorage for the next three months for the equipment trials at Marsh Creek. Preliminary test procedures are in place for the student to perform the research in accordance with the funding objectives, namely, diesel-off operation in high penetration systems.