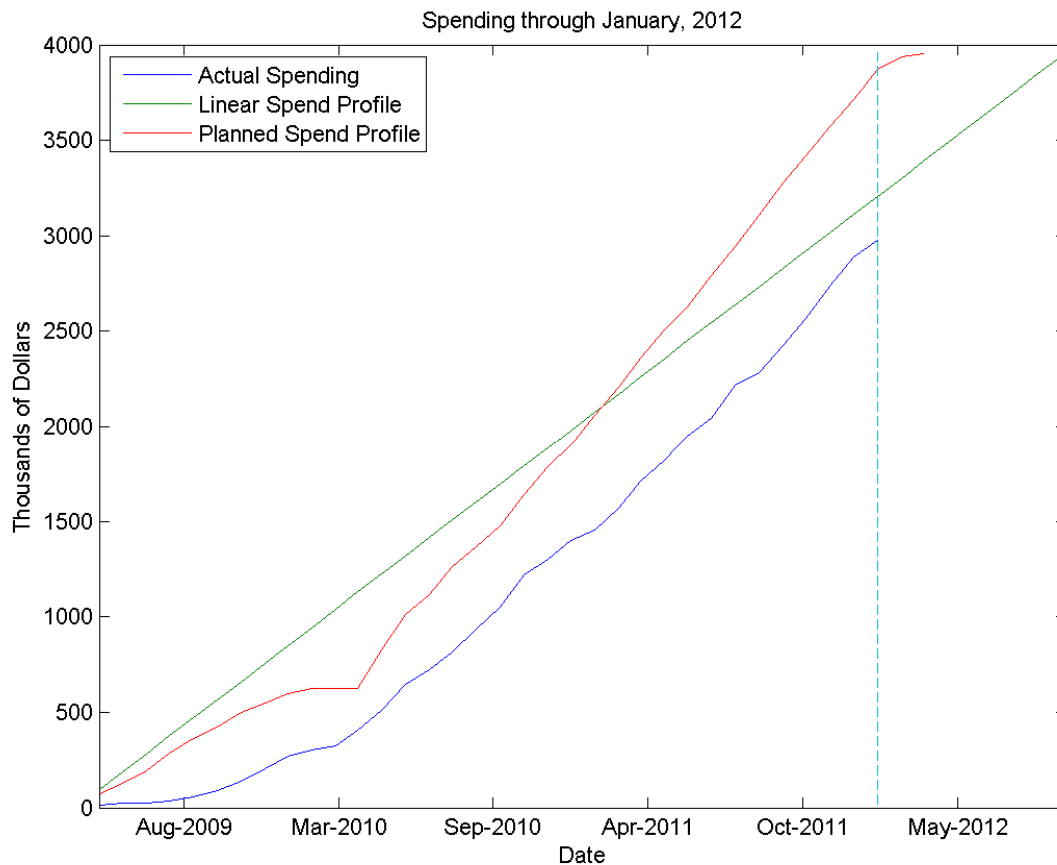
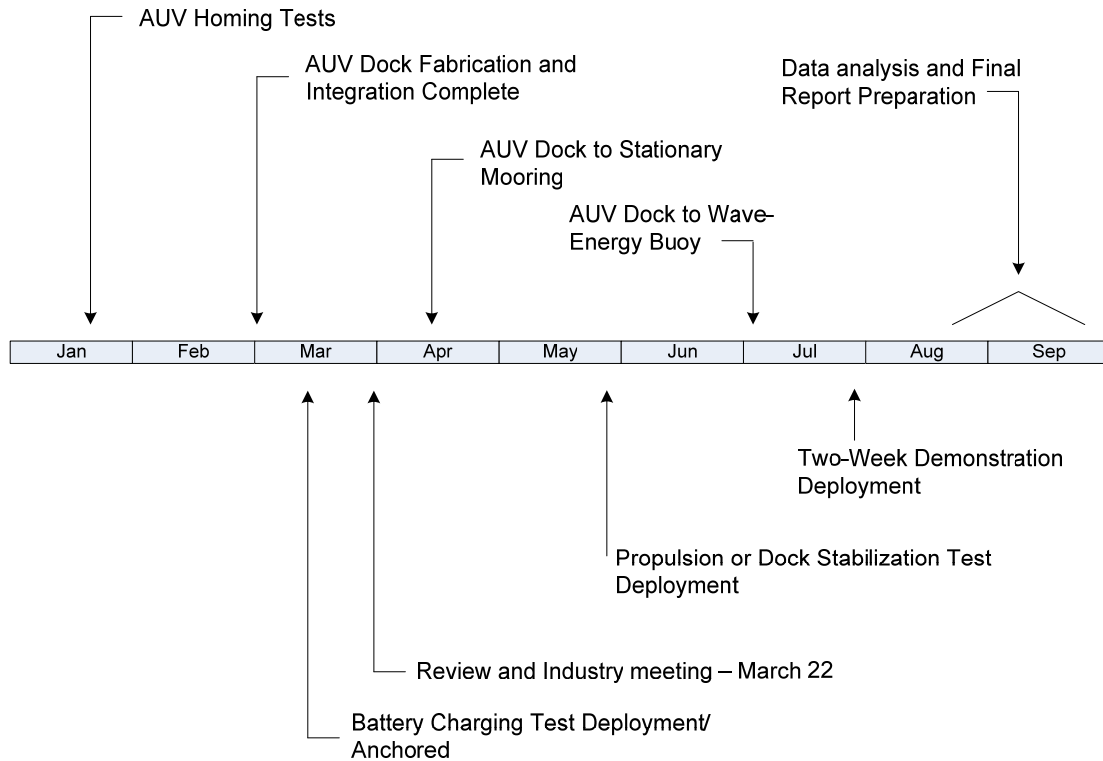


Financial Progress through January 2012

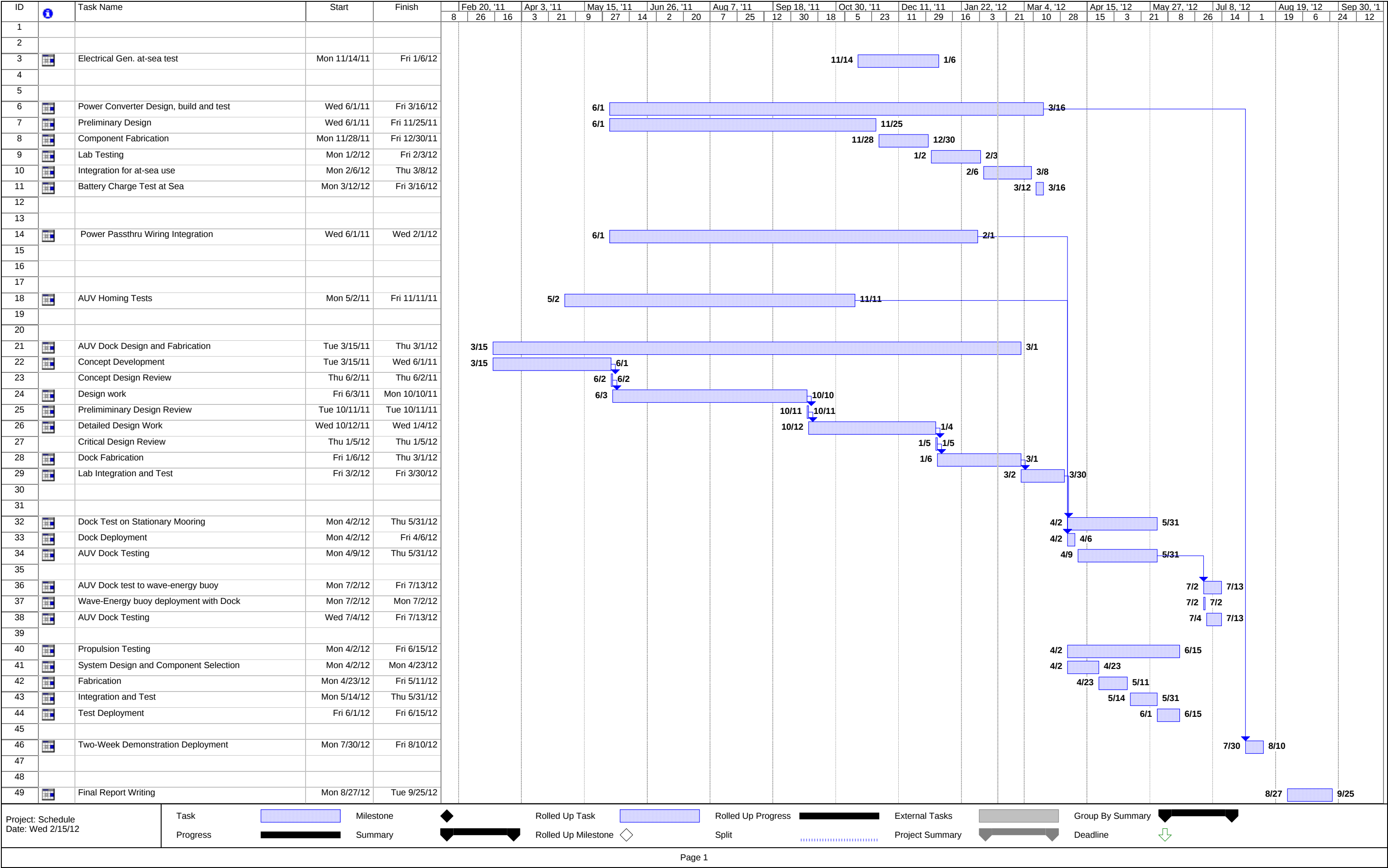
The graph below shows the projects actual spend profile through the end of January 2012. The red line shows the originally spending plan (from the original proposal), the green line shows the linear spend rate from the project inception to an end date that reflects a six month extension in the period of performance. The blue line shows the actual spend rate and shows the increased spending rate resulting from the build and test of equipment.



Time-Line



Activity	Completion Date	Notes
At-sea testing of electrical generation - 2nd test	January 2012	Complete: Data analysis underway
Power Converter Design, build, integration, and test	March 2012	Final configuration testing in lab underway, final PCB will be boards ordered next week.
Dock Stabilization and Power Pass-Through	June 2012	Power-Pass through design complete, PTO being dissassembled for modifications.
AUV Homing	8-Nov-11	Testing at sea on-going. Calibration issues with USBL causing problems.
AUV Dock Design and Fabrication	March 2012	Critical Design Review complete January 6th. Fabrication underway. Connectors are long leadtime items
AUV Dock Test to Stationary Mooring	April 2012	Pending Completion of Dock Fabrication
AUV Dock Test to Wave-Energy Buoy	July 2012	Pending successful docking to stationary mooring
Propulsion Testing	June 2012	Plans to-be determined
Two-week Demonstration Deployment	August 2012	
Numerical Model Packaging for General Use	TBD	Not yet scheduled.
Analysis and final report preparation	25-Sep-12	



Industry Open-House March 22, 2012

Invites sent on February 6, 2012. Text follows:

Dear friends. For several years now DARPA has supported engineering research at MBARI into the possibilities of wave-energy harvesting for buoy platforms (moored, drifting, and/or station keeping). The project has worked to evaluate and test a proof-of-concept prototype that generates electricity at levels greater than is currently available from solar and wind solutions. The aim of the program has been to develop a numerical model that enables the design of wave energy buoy systems that are independent and capable of generating average powers of 200-2000 Watts depending on the system size and deployment location. To validate that model a system has been built and demonstrated in the range of 400 Watts average power in Monterey Bay. As part of the program we are interested in exploring potential commercial applications and technology transfer paths.

To this end we are planning to hold an open house on March 22nd with the intent of exposing interested parties to the technology developed under this program. You are invited to attend or send a representative. This event will be held in conjunction with a DARPA program review on March 21st, therefore the DARPA program manager (Aaron Lazarus), DARPA support personnel and the MBARI project team will be in attendance.

The four technology elements that will be highlighted, and are potentially available for transition to a commercial entity are:

- 1) A specifically developed numerical model that is capable of modeling the behavior of a wide range of wave-energy devices. This model is a time-domain solution of the equations of motion, including linear wave-hydrodynamics, non-linear drag forces, and arbitrary power take-off forcing. This model has been validated by comparison to the at-sea tests that have been performed. In addition to providing design guidance for the device that has been built, the numerical model provides a tool for understanding the scaling of this type of small-scale wave-energy harvesting device.*
- 2) An electro-hydraulic based power take-off device that operates at efficiencies of greater than 70% (electrical power out divided by mechanical power in). This device was developed for the demonstration platform and has been tested in the ocean several times.*
- 3) An AUV dock that supports the MBARI tethys AUV, a 12" diameter vehicle. This dock is designed to provide battery re-charge and communications through the wave-energy buoy, or another source of power and communications.*
- 4) A freely floating wave-energy conversion buoy based upon the power take-off device described in item 2 and the dock described in item 3. Various at-sea tests of this system have been performed over the past year, and a demonstration deployment of the entire system is planned for July 2012.*

Please let me know of your interest in this event and your availability on the scheduled date (March 22nd). If you have any questions or are interested in further discussions, please feel free to contact me, Jim Bellingham, or Jim Fein. Contact details are provided below.

Best Regards,

Andy Hamilton

Responses to date:

Oceaneering: Two will attend:

Dave Weaver, Director of Program Development
Tom Tolman, Chief Engineer for Small Vehicles

Battelle: One will attend:

Bob Geoghegan, Manager – Ocean Engineering

Liquid Robotics: Three will attend, not exactly clear who yet.

Bill Vass, CEO
Robert Olson, VP Electrical and Software Engineering
Roger Hine
Tim Ong

BlueFin: Declined.

iRobot: CEO Joe Dyer responded, but did not appear to have read or understood the e-mail. We will follow up.

Harris: No response, but Kevin was just here...