Ocean Waves Workshop

Feb 28th, 1:30 PM - 2:00 PM

Session 3 Notes

Elena van Roggen
Marine Information Resources Corporation

Robert G. Williams
Marine Information Resources Corporation

Session III Notes

These notes are intended as a supplement to the Session III presentation. The following discussion points were captured by workshop rapporteurs:

- The use of the right type of alternative energy capability and support for its implementation is based on physical characterization surveys and baseline environmental surveys to support site assessment activities.

- Local sensors and high-resolution models are needed to site renewable energy systems and to evaluate environmental effects. Such systems could be incorporated into Integrated Ocean Observing Systems.

- The audience was reminded that during the 2011 Ocean Waves Workshop, the general consensus was that efficient wave energy conversion benefits from information on wave climatologies and extreme conditions as well as real-time wave observations and forecasts. The current workshop attendees noted that some wave energy conversion systems use the Bretschneider spectrum because the peak is broader than the JONSWAP spectrum, and is therefore more conservative for predicting power extraction. On the other hand, if the wave spectrum is narrow band it is easier to exploit. Developing seas tend to have a broader spectral peak. Decaying seas have a narrower peak. While the JONSWAP Spectrum is used by many, the Bretschneider spectrum is sometimes used when the need for fully developed seas is too restrictive.

- Wave energy conversion may offer significantly more potential energy than solar.

- Solar power was reported to be adequate to keep marine batteries aboard the buoy charged until scheduled maintenance. The solar panels can provide enough power to operate some of the buoy's sensors and transmission systems even at the end of battery life.

- Small wave energy conversion technologies need to be developed further to extend the service cycle for buoys. Such technologies may be essential for mini-buoys and sonobuoys, which have short lives.

- Some existing and prototype wave energy conversion systems would seem to alter the ability of a particular wave buoy to follow the waves.

- For the presentation on the prototype Sonobuoy Wave Energy Module, the wind waves produced more energy than swell. Energy produced by the swell decreased with increasing swell period.

- Wave energy harvesting technologies could be used to directly power transmitters that relay meteorological, oceanographic, and current GPS location for Emergency Position Indicating Radio Beacons (EPIRBs) or mini-drifting data buoys. Excess power could be stored in an onboard rechargeable battery to assure uninterrupted operations even in the lowest sea state.

This technology would extend the life of the EPIRBS and could result in greater savings of lives.

- Oregon State University in partnership with the Northwest National Marine Renewable Energy Center (NNMREC) was chosen as the future site of the first utility-scale, grid-connected wave energy test site in the United States. It will be used by engineers and scientists to measure wave resources and assist in the study of wave energy output and other wave characteristics. The testing began with Industrial Research Ltd. and Power Projects Ltd., both of New Zealand (see Sea Technology October, 2012, page 55).

These rapporteur notes do not necessarily reflect the view of all participants and speakers during this discussion session.