

In the demanding conditions on the bottom of the Atlantic Ocean, the automation has to be extremely reliable.



minimized service requirements.”

The control room in Portugal is unmanned, and AW-Energy is using a remote round-the-clock connection from Finland to Portugal. Valmet has been heavily involved in the planning of the system's operation. The performance of Valmet DNA control system has enabled the fine-tuning of the control program to its utmost. Furthermore, Valmet's information system constantly follows and analyzes the prevailing wave conditions. According to Rantala, Valmet's experience with hydraulics, coupled with control expertise, was essential to the success of the project.

First automation solution of its kind

Since the project is implemented on the bottom of the ocean, compliance with precise safety requirements is needed to protect the equipment from salt fog, air moisture and other

factors. There are cables connecting the control room on the coast and to the WaveRoller unit in the sea. The process stations and I/Os are located at the bottom of the sea. The operational redundancy guarantees that the whole system will operate, even in critical circumstances. All necessary data on the display is sent via Ethernet route to AW-Energy office in Finland.

The graphical user interface in the control room includes all necessary process displays with values and alarms. Valmet's trend and event archive allows access to the collected process history. For instance, information about the amount of electricity produced can be followed. With help of this technology, process disturbances can be revealed immediately.

The factory acceptance testing (FAT) was done partly by Valmet in Tampere, Finland, and partly by the customer in Kotka, Finland. **Jussi**

Åkerberg, Development Manager, Power-Take-Off, AW-Energy, is very pleased with the cooperation with Valmet and emphasized the importance of the thorough testing phases. Although the project was very challenging, both parties continued to be very innovative to solve all the problems faced. According to Åkerberg, all technical issues and their solutions need to be considered in advance.

Clean energy without CO₂ emissions

Based on the knowledge of AW-Energy, electricity can now be produced with the help of ocean waves. Wave energy has a huge potential. And both AW-Energy and Valmet have been pioneering a now established project under the waves.

No mistakes are allowed in projects on such a level. **John Liljelund**, Managing Director from AW-Energy, explains: "A wave energy plant has to operate with the highest possible reliability, since it is difficult to access it for maintenance. We chose not to accept any basic industrial automation solution, but rather wanted a reliable, duplicated process automation system. It's great that Valmet has joined us in entering this new and challenging area, and helped us develop a novel concept for renewable energy." ■

↑ **WAVE ROLLER**
Wave energy device under water.

CONTACT PERSON
Jouko Rantala
Product Manager,
Automation
jouko.rantala@valmet.com
Tel. +358 400 831 093

↓ **JUSSI ÅKERBERG**
Development Manager,
Power-Take-Off,
AW-Energy



ENERGY FROM WAVES
Wave energy converter deployment day.



Successful operator training with simulators

Simulator training speeds up learning curve at CMPC Guaiba pulp mill. **TEXT** Rikard Henriksson

In June 2013, Valmet (at that time Metso) and CMPC Celulose Riograndense S.A. signed a contract for supplying the key technology for CMPC's new pulp production line in Guaiba, Brazil. As part of the complete automation system Valmet delivered operator training simulators which have proven to be a great success.

The simulators are designed for all mill process areas including the fiber line and pulp drying units, the complete recovery line, the chemical plant, as well as two water treatment plants.

"Using Valmet's operator training simulators not only helps us with training our operators, but also enables us to test

new control loops before starting practical operation," says **David Nascimento**, who is responsible for training coordination at CMPC in the Guaiba mill.

The simulator, which is connected to a copy of the real control system that is used at the mill, has been used as an important tool in verifying the distributed control system programming prior to start-up and for on-site training.

Improved operator reaction time and safety

On-site training has been conducted on a daily basis since September 2014. Approx-

VALMET'S TRAINING CONCEPT INCLUDES:

- WebAcademy – Online training portal**
 - Self-paced online training
 - Individual user accounts
 - Tracking and reporting
 - Customized pages and assessments
- Classroom training**
 - Experienced process or commissioning engineers
 - Commissioning & Start-up
 - Follow-up and refresher Training
- Virtual site – Training simulators**
 - Fully dynamic process simulations
 - DCS-based or standalone
 - Generic or customized

imately 50-60 operators have participated in the training, which continued up until the end of February 2015. So far, CMPC has spent a total of approximately 2,000 man hours with the simulator and the feedback has been very encouraging.

David Nascimento continues: "The training simulator has contributed to reducing operator reaction time, especially when compared to what is possible with normal classroom training. In addition, the simulator has also helped us to reduce hazards in terms of both personal injury and equipment. All of this taken together makes it possible for us to speed up our learning curve."

The training provided by Valmet also includes maintenance training for CMPC in order to create confidence in the continued use of the training simulator. ■

CONTACT PERSON
Tuula Ruokonen
Director, Power
Performance and
Components
tuula.ruokonen@valmet.com
Tel. +358 50 453 2731