



Environmental Quality Monitoring at a Nuclear Power Facility

Description

Nuclear power is the use of sustained nuclear fission to generate heat and electricity. Nuclear power plants provide about 5.7% of the world's energy and 13% of the world's electricity. The benefits of nuclear energy include unparalleled energy density of the fuel used. Just one uranium fuel pellet - approximately the size of a marble - contains as much energy as 17,000 cubic feet of natural gas, 1,780 pounds of coal or 149 gallons of oil. Other advantages of nuclear energy include lower emissions of carbon dioxide, nitrogen oxides and sulfur dioxide than any fossil fuel alternatives. Still, nuclear energy comes with concerns as well, and several environmental monitoring sampling requirements must be met in order to maintain a permit to have a functioning nuclear power plant (in the United States).

Among these sampling requirements are surveys to monitor ecology. These tests are mandatory in order to monitor long-term changes or environmental impacts that result from cooling water use and, specifically, entrainment (when plankton get drawn into the cooling system and are consequently discharged back into the environment), impingement (when juvenile and adult fishes are screened out before the water enters the cooling system) and changes in the thermal environment.

Application

A customer that monitors the aquatic environment at a nuclear power station was interested in measuring temperature, salinity, turbidity, and

dissolved oxygen both at depth and at the surface of a local river and nearby bay. These four parameters, when taken in conjunction with the data obtained from ground trawling for the aquatic life in these bodies of water, are useful indicators of the riverine and marine environmental conditions. Currents in these waters cause issues when trying to measure these parameters at depth by pulling the probe away from the desired location within the water column. The customer was also performing measurements at multiple locations along the river and wanted an easy way to associate the various sampling sites with the data obtained. In addition, the instrument needs to be rugged, durable and able to withstand salty, wet conditions. For these reasons, the **HI9829** Multiparameter pH/ORP/EC/DO/Turbidity Meter was the best option for this customer.

The weighted protective shield ensures that measurements are taken at the desired depth. The waterproof protection of both the meter (IP67) and the probe (IP68) ensures that the internal elements of the meter are protected, despite the harsh seawater conditions. In addition, the user-friendly and quick calibration of the probe sensors with one solution allows the customer to calibrate with the least interruption to the sampling procedure. Occasionally, the customer conducts sampling at night. This is made simpler through the use of the backlit LCD of the HI9829. Other features that make this meter one of the best portable multiparameter water quality meters include data logging, GLP data, and easy data transport via USB port.

The optional integrated GPS receiver allows GPS coordinates to be stored with logged data. Customizable sampling location names can be associated with GPS coordinates for easy identification of sampling sites. The HI9829 Multiparameter Meter provided a comprehensive measurement and data management solution to the customer's environmental monitoring needs.

