

Water Treatment Challenge

In Las Vegas, Aquatic Life Goes With the Flow

There are only 12 golden saltwater crocodiles known to remain in the world, and five of them are in Las Vegas. Maintaining their watery home is the responsibility of the life support team at the Mandalay Bay Resort Hotel, where the Shark Reef aquarium contains more than 1,200 aquatic species, including sharks and sea turtles as well as a variety of freshwater and saltwater fish. More than 1.6 million gallons of water are recycled hourly through the vast array of pipes and water treatment equipment. Approximately 0.3 million gallons are used for the freshwater exhibits while the rest, 1.3 million gallons, is for the saltwater exhibits.

Approximately 4,000 gallons of fresh water are delivered to the aquarium daily. Salt water is made on site by mixing salt imported from the Red Sea. It's important for the recycled and incoming water to be treated consistently, and reliable analytical equipment is needed to maintain salinity, pH, ORP, flow and temperature. That job falls to Signet instruments from George Fischer Inc. in Tustin, CA. Throughout the water treatment systems, flow measurements are made with paddlewheel sensors to ensure that the correct amount of water flows in and out of the displays. Salinity levels of the saltwater are monitored using a conductivity sensor with a salinity meter, and pH sensors and instruments help maintain a pH level of about 8.2. For the freshwater exhibits, pH must be kept at about 7. It's important to monitor the pH value of the make-up water sent to freshwater and saltwater generation units before it enters the units in order to control the amount of treatment chemicals that are added. When water is recycled from the freshwater and saltwater exhibits, ozone is injected for disinfection. An ORP sensor and instrument are used to measure the ORP of the water to ensure enough ozone has been injected. Later down the line, ORP is measured again to make sure the ozone and its by-products have dissipated. Ozone left in the line would irritate the sensitive gills of the fish, which need a stable environment in order to flourish. This Signet 515 paddlewheel sensor is used for flow measurements while the Signet 5900 ProPoint monitor measures salinity.

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