Itron Fights Static With Humidity

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"Static electricity, and the potential for defects due to electrostatic discharge (ESD) is one of the biggest manufacturing headaches a board manufacturer can face," says Itron's [1] Paul Anderson.

In snowy Minnesota winters, the potential for ESD problems increases as icy outside air is heated to normal plant operating temperatures of around 70 degrees F. Without proper humidity control, relative humidity (RH) in the plant could plunge, creating ideal conditions for ESD problems.

Anderson is the facilities operations manager for Itron Inc.'s 540-employee, 110,000 sq. ft. manufacturing plant in Waseca, MN. The plant produces radio frequency (RF) devices and automated meter reading equipment used by utilities and large water and power users. With more than 25 years of facility management experience, Anderson has managed the facility's operations since 1999.

A constant topic of discussion for Itron has been process improvements aimed at further reducing ESD damage to components from the plant's already successful quality levels. Industry standards recommend minimum RH levels of at least 30 percent.

The physics is simple: static builds as RH levels drop; the colder the air, the greater the potential for dry air and static build-up. As cold winter air is heated, it dries out and loses its capacity for carrying moisture. For instance, when outside air with a temperature of 10 degrees F, and RH of 50 percent is heated to an internal temperature of 70 degrees F, RH will drop to about 10 percent. Keeping RH at an

acceptable level requires most plants to add large amounts of water to the air through humidification systems. For years, Itron ran a compressed air humidification system, but it came with some baggage:

- **Inefficiency:** "The moisture it produced didn't cover the area as uniformly as we wanted. That's a tough problem here, because we have ceiling heights as low as 11- and 12-feet in some parts of our manufacturing area."
- **Expensive energy:** "Compressed air is a very expensive commodity, and operating the humidification system had just about eaten up our compressor capacity, so manufacturing couldn't use it."
- **Noise:** The system annoyed workers with a high-pitched whine and spawned constant complaints.

Anderson looked at other humidification technologies, including ultrasonic and electric steam systems, but was unhappy with his options. Both the steam and ultrasonic systems were plumbed with stainless steel pipes, making them more expensive to install and virtually impossible to reconfigure, as Itron's plant layout changed several times a year.

Anderson's energy company, Xcel Energy [2], suggested that he investigate high-pressure humidification systems from ML System [3] as a way to cut his energy costs. After careful investigation and discussions with Husson Inc. [4], exclusive North American distributor for ML, Anderson decided that an engineered system from ML was the best solution for his problems.

The ML system included 8 ML Princess 2 humidification units configured in two zones: one for warehouse areas, the other for production. The system also includes reverse osmosis (RO) water to eliminate minerals in the water by 97 percent, and a UV filter to kill bacteria.

Humidity sensors in each zone monitor RH levels and report to a remote PLC which controls the system. If RH in a zone drops below Itron's 40 percent set point, the PLC activates the Princess 2 units in that zone until RH returns to the desired level.

The effect of the new ML system was immediate and dramatic. Anderson says, "We could feel the difference in the RH level almost immediately, and the system kept it at a uniform level. Our ESD numbers improved fast."

For more information, visit www.hussoninc.com [4].

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