The OMNI Transmitter

INSTRUMENTATION
ELECTRICAL
CONTROLS

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Instrumentation | calibration | loop check | startup | commissioning | electrical installation | control panel design & fabrication | project management

Understanding Data Center Infrastructure: Tiers and Redundancy Systems

Data center redundancy is critical for protecting IT equipment from power disruptions and equipment failures. The Uptime Institute has established four data center tiers that serve as the international standard for performance evaluation, with higher tiers requiring increased levels of redundancy.

Understanding Data Center Tiers

These four tiers align with specific business requirements and define criteria for maintenance, power, cooling, and fault capabilities. Each tier builds upon the requirements of the previous tiers, creating a comprehensive hierarchy of reliability.

Tier Classifications

- **Tier I**: The most basic level requiring a UPS, dedicated IT systems area, cooling equipment, and a generator. No redundancy is required.
- **Tier II**: Utilizes a single path for power and cooling while incorporating redundant and backup components.
- **Tier III**: Features multiple paths for power and cooling with redundant components serving the critical environment. Allows for maintenance and equipment replacement without system downtime.
- **Tier IV**: Provides complete fault tolerance with redundancy for every component, utilizing multiple independent, physically isolated systems.

Redundancy Levels

Data centers implement various levels of power redundancy based on their tier classification and specific user requirements. Common redundancy configurations include:

N-Level Systems

- **N**: Basic configuration with zero built-in redundancy
- **N+1**: Adds one additional component to support single failure or maintenance needs (typically one extra unit for every four required)
- **N+2**: Provides two additional backup units beyond base requirements

Advanced Redundancy

- **2N**: Offers full redundancy through a completely independent, mirrored system, allowing an entire system segment to go offline without service interruption
- **2N+1**: Provides maximum reliability by combining a fully redundant, mirrored system with an additional backup unit

For example, in an N+1 configuration requiring eight UPS units, the facility would install ten units. Similarly, an N+2 system would require twelve UPS units for the same capacity. This progressive approach to redundancy ensures increasingly robust protection against system failures.

Bioluminescence: Harnessing Nature's Light

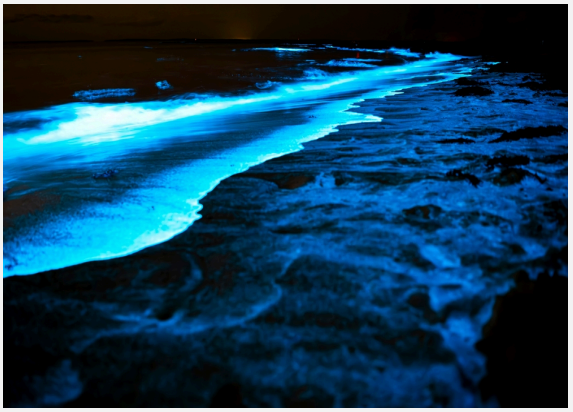
Ocean bioluminescence, the natural glow produced by certain marine organisms, is making significant advances in various fields, particularly medicine and biotechnology. Here are some key areas of impact:

Medical Imaging: Bioluminescent proteins, like luciferase, are used as markers in imaging techniques. They can help visualize biological processes in real-time, enabling researchers to track the progression of diseases and the effectiveness of treatments.

Drug Discovery: Bioluminescent assays are utilized in drug screening, allowing scientists to monitor cellular responses to potential drugs. This method can speed up the identification of effective therapies.

Gene Expression Studies: Scientists use bioluminescent genes to study gene expression in living organisms. This helps in understanding how genes are regulated and can lead to advancements in genetic research and therapies.

Environmental Monitoring: Bioluminescent organisms can serve as indicators of environmental changes. Researchers are exploring their use to detect pollution or changes in ecosystem health.



Sustainable Lighting: Inspired by bioluminescence, researchers are investigating ways to create sustainable lighting solutions, which could lead to energy-efficient technologies.

Agricultural Applications: Bioluminescence can be used in agriculture to monitor plant health and growth, providing farmers with real-time data to optimize crop production.

These advances highlight the potential of marine bioluminescence to innovate across multiple disciplines, offering new tools and insights in science and technology.

Safety as a Core Value at Omni

At Omni safety is not just a priority; it is a core value that drives every aspect of our operations. We are dedicated to creating a work environment where the health and well-being of our employees, partners, and customers are paramount. Our commitment extends beyond compliance with regulations; we strive for a culture of proactive safety measures that empower our team to take ownership of their safety and that of others. That is why Omni is proud to have participated in numerous VPP projects.

Workplace Safety from the Ground Up: The Impact of Comfortable Work Shoes

Proper footwear is crucial for workplace safety, especially in environments where employees spend long hours standing. Whether in restaurants, hospitals, or construction sites, well-fitted work shoes protect workers and prevent injuries.

Comfortable shoes with adequate support and non-slip soles help prevent falls and foot injuries while promoting better posture. Different jobs require specific features - from steel-toed boots in construction to cushioned shoes in healthcare. When footwear is both appropriate and comfortable, employees are more likely to wear them consistently. Wearing well-fitted, ergonomic shoes can help prevent common issues such as foot pain, plantar fasciitis, and other musculoskeletal disorders, which are particularly concerning for mature workers.

Beyond safety, comfortable shoes enhance workplace efficiency by allowing workers to focus on tasks rather than discomfort. They also prevent long-term health issues like arthritis and bunions. By prioritizing proper footwear, organizations demonstrate their commitment to employee well-being while fostering a culture of safety.

Celebrating 15 Years of The Omni Transmitter

Looking back 15 years to our very first issue published in January 2010 celebrating the launch of our new newsletter The Omni Transmitter.

There have been other big changes in the 15 years since the first Omni transmitter was published. In 2016, we opened our Maryland branch office to better serve our clients in the mid Atlantic region, and in 2019, we added the word “electrical” to our company name and are now officially known as Omni Instrumentation and Electrical Services Inc.

Next year we mark 40 years since our company was established in 1986, Omni has evolved from a small instrumentation control specialist to a world class multi discipline electrical contractor. This provides our customers a one source solution for all of their electrical, controls, and low voltage needs. Our new name better reflects who we are what we do and our vision for the future.

The OMNI Transmitter

INSTRUMENT INSTALLATION
TECHNICIAN SERVICES
UL PANEL FABRICATION

JANUARY 2010 NEWSLETTER

INSTRUMENTATION ENGINEERS AND CONTRACTORS

Inside This Issue:
- Power Up
- ISPE Facility of the Year
- Waste Neutralization
- From The Panel Shop
- Top 10 Things

OMNI Powers Up “The Transmitter”

OMNI Instrumentation Service is proud to introduce our company newsletter “The Transmitter”. We look forward to periodically sharing with you updates about our company and interesting information about the world of process instrumentation. Please feel free to pass “The Transmitter” along to any friends or colleagues that may be interested or entertained by it. We hope you enjoy it and we welcome your feedback.

OMNI and the ISPE 2010 Facility of the Year:
Listening to what customers need.

Omni recently completed work on a project that was selected by ISPE, INTERPHEX and Pharmaceutical Processing Magazine as winner of the “2010 Facility of the Year” in two separate categories, *Equipment Innovation and Process Innovation*. The facility was the best of a select group of 21 state-of-the-art projects that were constructed in 12 different countries. This is the second time in the past few years that Omni has played an integral part in the construction of an ISPE Facility of the Year.

As we do on each and every project, Omni took on this challenge with an intensive, hands-on approach. We listened to our client’s needs, asked questions, and thoroughly familiarized ourselves with day to day operations. Exhaustive consideration was given to every detail, such as where and how to place indicating transmitters, where to locate HMIs, VFDs, HOAs, point of use, valves, and e-stops, ultimately ease the use for operators. Weekly meetings and frequent system walkthroughs with owners, process staff and construction managers kept open lines of effective communication. Omni was also given the opportunity to be a big part of the commissioning team. Specialized teams worked closely together, meeting in the process areas on a daily basis to ensure the success of the facility and its systems. Omni is proud to have participated in this ground-breaking project.

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