Blue Lagoon Iceland
Grindavik, Iceland

iCONICS

BLUE LAGOON ICELAND

IÐNAÐAR**TÆKNI**
sérfræðingar í sjálfvirkni

Aerial View of Blue Lagoon

About Blue Lagoon Iceland

Located in Grindavk, Iceland, Blue Lagoon Iceland was founded in 1992 to unlock the benefits of geothermal sea-water, and in their own words "has evolved into a company encompassing transformative spa experiences, research and development, sustainability, culinary enjoyment, a renowned line of skin care products, and the convergence of hospitality and wellness." Blue Lagoon was unintentionally formed as a waste product from energy production in a geothermal powerplant near Grindavik, Iceland. The power plant produces both electricity and hot water with high temperature geothermal water. When energy from the water has been harnessed, the wastewater is returned to the surrounding lava field where it is supposed to seep back into the porous ground. However, soon after energy production started, the lava field was becoming clogged with dissolved minerals in the water thereby forming a lagoon.

Due to the high concentrations of silica, the water is not transparent but rather a light blue, hence the name. With a water temperature of around 40°C, the lagoon quickly attracted curious locals that started bathing there. In fact, some of the bathers observed improved skin health. Subsequent research confirmed that the chemical composition of the water is beneficial for the skin, and even more so for skin conditions such as psoriasis. These findings together with safety concerns led the power plant owners to start controlling access to the lagoon, which was initially a fence with an informal reception area and shower facilities. The facilities were gradually improved as the number of visitors increased, ultimately evolving into a large building with a reception, offices, proper changing facilities, a restaurant, a hotel, and a medical treatment center.

Today, Blue Lagoon is a world-renowned tourist attraction and was named one of the 25 wonders of the world
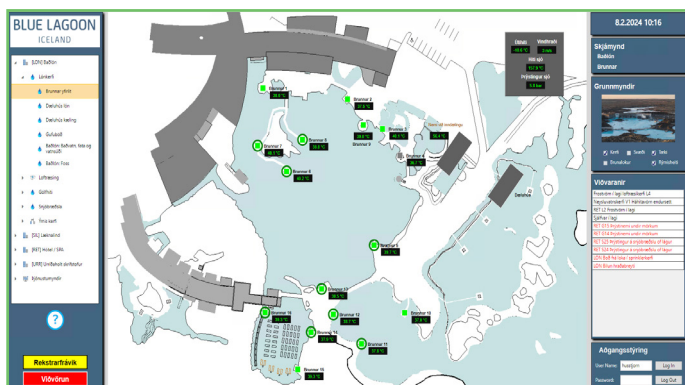
Blue Lagoon Overview
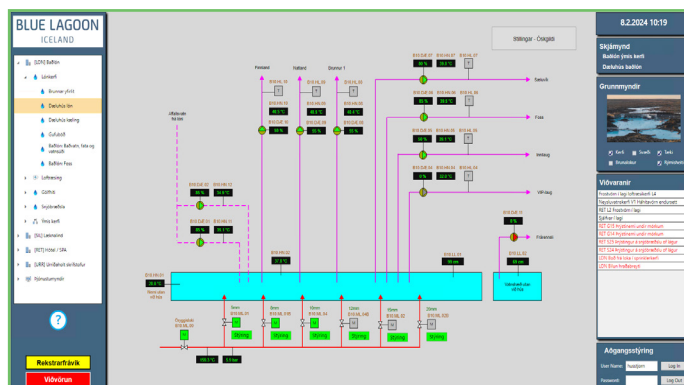
Pumping Station Dashboard

by National Geographic in 2012 and included in Time Magazine's list of the World's 100 Greatest Places in 2018.

Project Summary

Idnadartaekni has been the system integrator for Blue Lagoon for 30 years, delivering PLC automation with visualization on the ICONICS GENESIS platform. Idnadartaekni is an important player in the Icelandic automation field and has implemented some of the most ambitious automation projects and participated in the development of new automation methods since its start in 1991. With extensive experience and expertise, the company designs, programs, installs, and maintains automation systems for a variety of project types including building control, manufacturing facilities, power plants, remote monitoring, as well as swimming pool control.

In 1996, Idnadartaekni implemented the first SCADA system with the original ICONICS SCADA (GENESIS for Windows (GFW) and Dynamic Data Exchange (DDE)) which was used to control Blue Lagoon's building heating and ventilation as well as the lagoon water temperature and quality along with several support systems. Nonetheless, it soon became clear that the next generation ICONICS GENESIS32 SCADA and OPC system would provide a much better technical solution in terms of IT-compatibility, scalability, and productivity.

For the next 20 years, the GENESIS32-based system was an indispensable tool for the operators at Blue Lagoon, allowing them to manage the constantly growing site with ever increasing complexity. The SCADA system aggregated the different technical systems into a single platform

and gave the operators the necessary details for daily operations and maintenance.

However, as Blue Lagoon expanded, the GENESIS32 system and the underlying OPC servers were gradually diverging and becoming outdated. Having known about this challenge for a few years and partly motivated by the GENESIS32 product lifecycle announcement from ICONICS, Blue Lagoon managers decided it was time to have a serious facelift. They therefore naturally selected GENESIS64 as the next platform to upgrade their SCADA system.

ICONICS Software Deployed

- GENESIS64™
- GraphWorX™64
- AlarmWorX™64
- Hyper Historian™

Realized Benefits of the System

The Idnadartaekni experts were able to migrate from GENESIS32 to GENESIS64 in a couple of weeks. In addition, the standard GENESIS64 functionality allowed them to design and build a solid SCADA system with design principles that facilitate effortless maintenance on the back end. For example:

- AssetWorX is used to create site hierarchy for display navigation.
- The main display essentially contains a Navigation Tree and a GraphWorX Viewer. Clicking on the Navigation Tree loads the requested display in the GraphWorX Viewer.
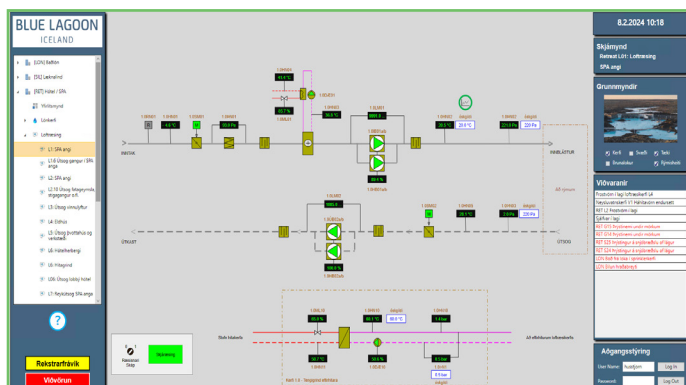
Blue Lagoon's Air Handling System

Building Layout Overview

- Global Aliasing is extensively used to dynamically change key information in displays and popups.

- AlarmWorX points are organized by area for aggregation, and all alarm information shown in displays is directly from the Alarm Server with no visible alarms coming directly from the PLCs. This setup ensures a single point for alarm configuration.

- Hyper Historian points are set up with Description and Units, and this information automatically follows the historical points when these are added to a Trend Viewer, providing key information for each pen in a chart.

Blue Lagoon technical operators are now using the GENESIS64 SCADA system in a standard web browser, retrieving data from a virtual server. No software needs to be installed on user computers. Moreover, it is a significant advantage that multiple users can simultaneously work on their respective part of the system, be it data connectivity, alarm server, trend server, or displays. Additionally, the new ICONICS navigation tree principle dramatically improves the oversight and shortens the route to requested information.

Thanks to this web-based thin client architecture, maintenance work on displays and databases can be completed in the background without the users noticing any downtime. System configuration and changes are all completed on the server side and immediately propagated to users. User management is now implicit for the IT-department since the security server is synchronized with their active directory. Furthermore, it is straightforward to assign privileges to users and groups in ICONICS' Workbench configuration environment, making it easy to control each user's visibility and allowed actions.

Another important benefit of using ICONICS GENESIS64 is that expert support from ICONICS is readily available, and issues are promptly resolved, giving Idnadartaekni confidence, new insights, and improved productivity.

Conclusion

Since the old system was kept running in parallel to the new system for a few weeks to give the operators the opportunity to compare the two systems and provide comments and corrections, the migration from GENESIS32 to GENESIS64 was incredibly smooth. Likewise, Blue Lagoon management and operators are extremely pleased with the new system as they see a stable and a future-proof solution that can accommodate future expansion.

> " Our new ICONICS SCADA system is an immense facelift. We have great visibility into all our sites. Plus, since it is much easier to navigate, our operators have gained new confidence running our technical systems. This upgrade proves to us that having Idnadartaekni implementing GENESIS64 gives the best possible outcome, and we are ready to expand the system further in years to come. "
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> **Amundinus Orn Ofjord**
> Blue Lagoon Director of Facilities