HITACHI ABB

Oslo Airport

CASE STUDY

Monitoring and coordinating diverse airport operational systems with Network Manager

HITACHI ABB POWER GRIDS

The client

Avinor AS is a state-owned, limited company that owns and operates 46 airports in Norway. That includes the Oslo Airport, the second-busiest airport in the Nordic countries, with 24 million passengers and 245,000 aircraft movements every year.

The challenge

Avinor has long relied on a facility-wide supervisory system to control and coordinate the many airport functions. Avinor needed to enhance system security while ensuring that the system continues to provide highly reliable control of these functions. They also needed to ensure that the system is able to accommodate a significant airport expansion in the near future.

The solution

Airports represent a complex operating environment with many separate areas and functions that must be controlled and coordinated. At Oslo Airport, each of those functions – including baggage, departures, doors, HVAC, fire/security, and others – are controlled locally via a technical management system (TMS). Those subsystems, 23 in all, roll up to a superior SCADA system, the airport's central technical maintenance system (CTMS).

At the Oslo airport, the CTMS is Network Manager.

"Network Manager primarily serves as the process data center for the entire airport." says Arne Saugstad, a senior sales executive for Hitachi ABB Power Grids' Enterprise Software product group. "It also provides central control of the subsystems and, through Network Manager's advanced alarm processing, enables a single, centralized alarm system. It also serves as the conduit for sharing information across those subsystems. The CTMS comprises approximately 55,000 indications (e.g., on/off, open/closed), measurements (e.g., temperature, pressure, RPM), and set points for process controls."

Graphics simplify operation

The visual system supports airport operators with approximately 1,500 data graphics. These graphics serve mainly as real-time analytics or illustrations of a subsystem, such as the aircraft gates, with dynamic data overlays.

"Hitachi ABB Power Grids developed a 'Summary Indication' function in Network Manager for our system," says Bjørn Erik Borlaug, Avinor's Operations Manager – Technical Delivery Management. "It is a graphic that combines several indications of a device's status in a single object. For example, we can see all status data and alarm indications for a device, such as a fan, in a single object. This was a custom feature we requested when the original system was installed and it continues to be very valuable today."

Open communication enables painless integration

Most of the TMS subsystems were provided by other suppliers, using mostly standardized sensors and data-collection devices. Still, they represent a wide variety of data sources. The fact that these subsystems are able to be interfaced with Network Manager with no special equipment or interfaces is a testament to its flexibility.

Communication is currently accomplished via the ELCOM-90 protocol over TCP/IP, although Avinor is exploring Unified Architecture (UA), the next-generation Open Platform Communications interface now supported by Network Manager. "The UA interface will provide us with faster communications regardless of the amount of data," says Borlaug.

Security
"System security is something on the minds of managers in every industry," says Saugstad. "Reports of airport-related system failures, and the resulting chaos, are common. The reliability of Network Manager ensures near-constant uptime. Data security for both real-time and historical data is provided by complete system redundancy. Cyber security is ensured by state-of-the-art protection and mitigation techniques incorporated in Network Manager."

Ready for growth
As the airport has grown and the capabilities of Network Manager have increased, the airport has continually upgraded the application. The most-recent upgrade and operating system will provide increased redundancy with enhanced protection from cyber threats. Further, it ensures the system will be able to accommodate the additional five or more new subsystems (approximately 10,000 indications) that will be added as part of a planned airport expansion.

"As the number and complexity of our systems continues to expand, the value of Network Manager grows," says Borlaug. "By providing a data bridge across all subsystems and consolidating all the signals and alarms, it has enabled us to reduce the staff size needed to monitor and manage the various plants throughout the airport."

Other airports that have successfully deployed Network Manager include Kuwait International Airport and Dubai International Airport.

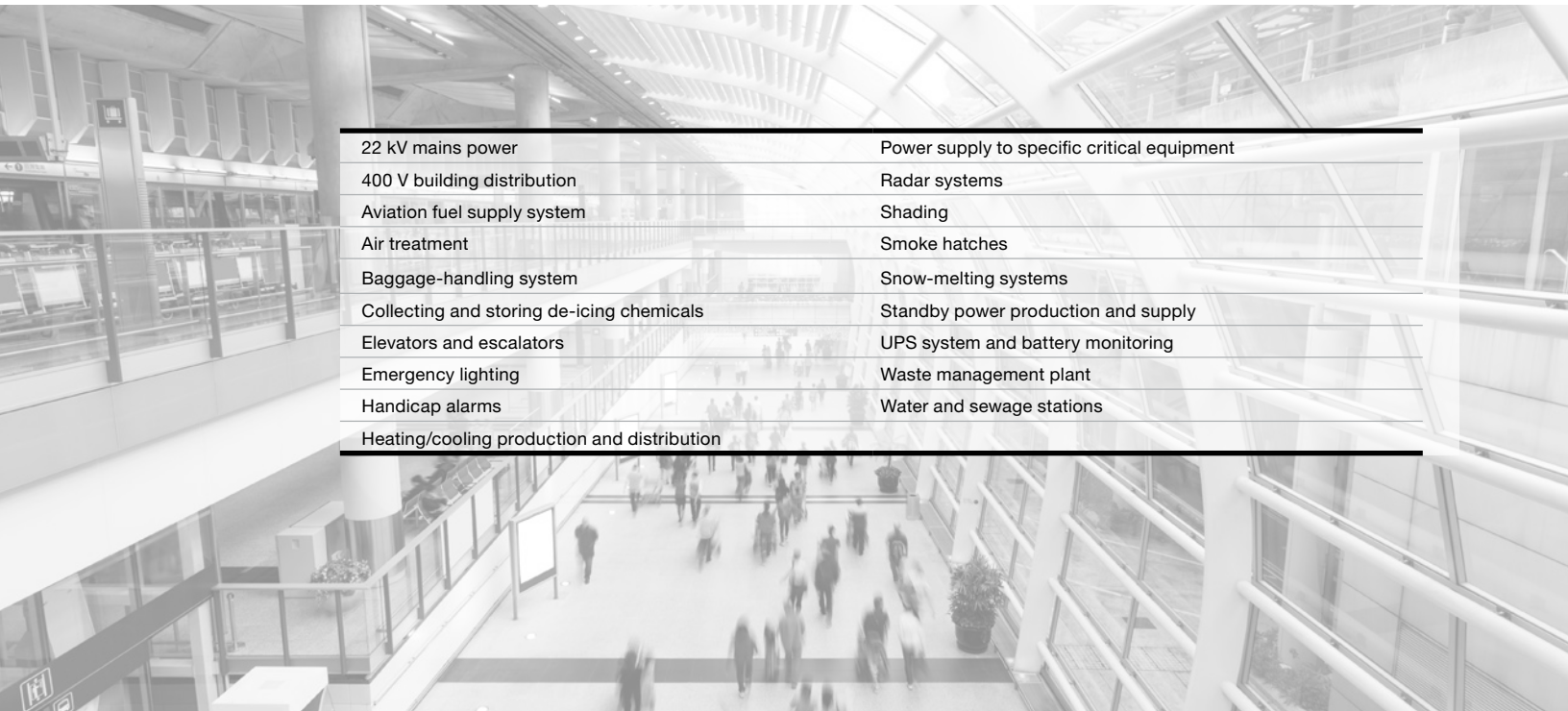
Results

After working with Avinor for nearly 20 years, the Hitachi ABB Power Grids experts involved with the Oslo Airport installation characterize them as continuously looking to utilize the many capabilities of Network Manager to improve their day-to-day operations.

"They are very technically competent," says Iversen. "They know what they expect from Network Manager, and challenge us to fulfill those expectations. Fortunately, we have a powerful tool in Network Manager that is able to satisfy Avinor's expectations and create a highly-capable, secure, facility-wide control system."

The scale of the Oslo installation and the success of Network Manager in this application has attracted the attention of other airports, including representatives from one of the world's largest airports who came for a first-hand look. They came away with the understanding of how Network Manager can provide enhanced operational control and improved effectiveness when dealing with the complexities of a major airport.

Oslo Airport systems under Network Manager control



22 kV mains power	Power supply to specific critical equipment
400 V building distribution	Radar systems
Aviation fuel supply system	Shading
Air treatment	Smoke hatches
Baggage-handling system	Snow-melting systems
Collecting and storing de-icing chemicals	Standby power production and supply
Elevators and escalators	UPS system and battery monitoring
Emergency lighting	Waste management plant
Handicap alarms	Water and sewage stations
Heating/cooling production and distribution	

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