

DIGITALISING TOWER OPERATIONS AT SCALE

Delivering the largest fully-capable
remote tower in the world

SHOWCASE IN BRIEF

PROFILE HungaroControl is a provider of specialist professional services and a certified provider of air navigation services; currently providing air navigation services within Hungary and in the upper-airspace of Kosovo.

CONTEXT Facing the constraints and operational service impacts of ageing tower infrastructure, HungaroControl needed to find a cost-effective solution to safely and efficiently serve the 14 million passengers that transit Budapest Liszt Ferenc International Airport.

SOLUTION In partnership with its integration and technology partners, HungaroControl coupled advanced technology with a coordinated and people-focussed implementation program to successfully digitise tower operations in Budapest.

RESULT HungaroControl's remote tower is a precedential use-case for this technology's application beyond the small airports and low complexity operating environments, demonstrating how this technology can be extended to serve medium-sized airports and some of the world's largest hubs.

THE CONTEXT

The physical air traffic control tower at **Budapest Liszt Ferenc International Airport** (LHBP) faced the end of its useful life after more than thirty years in service.

After flood damage and technical outages caused significant service disruptions, it **was crucial to find alternatives** to maintain business continuity and assure service resilience. However, to realise this would be no simple feat.

The two logical options were to **refurbish the existing tower** facility or to **build a new tower** to modern specifications. Both these options would **require a substantial capital outlay**.

Additionally, these options would also carry numerous **transition risks** that would undoubtedly lead to a protracted delivery timeframe. These weighted implications **called for a solution rethink**.



THE APPROACH

The starting point – to abandon tower refurbishment and construction options, and embark on a digital transformation of tower operations.

At the time, remote tower technology had already been demonstrated at industry-level validations and had been further proven at deployments in Sweden, however not necessarily to serve the scale and complexity of operational needs at Budapest.

Unique needs demanded a unique solution that was not offered by extant ‘out-of-the-box’ technology. Built solely on the idea of limited change to service quality and mode of operation, HungaroControl built an operating concept around replicating the current service architecture at a remote site and enhancing it with digital capabilities.

The foundation of this operating concept was a system design driven by end-user requirements and configuration flexibility to meet Budapest’s unique needs. Working collaboratively with integration and technology partners, an implementation program was launched to build this new digital capability.

However, this ambitious undertaking was not just about technology. Orchestrating change amongst end-users and transitioning to a new service environment safely called for a people-focused approach to harmonise delivery cadence with end-user acceptance. Other key components of the implementation include:

- Engagement with operational staff from concept-to-operation to build change consensus and technology acceptance
- A systematic application of safety principles to drive safety by design and enforce system resilience
- Emphasis on human performance to understand the impact of change on end-users, and identify the technology and process solutions to enhance performance
- Extensive validation to enable control of all transition risks and assess technology suitability for operations

Neither the technology nor the ‘soft’ components of the implementation were standalone precursors to success. In unison, they were all crucial to an overall integrated delivery approach built on synergies created between all delivery partners, delivery specialists, and end-users.



THE OUTCOME

The joint efforts of HungaroControl’s experts and industry partners resulted in delivering the largest fully-capable and certified deployment of remote tower technology in the world.

By digitising tower services, HungaroControl avoided inordinate capital expenditures of approximately €5 million and saved approximately twelve-months in implementation effort. All whilst building an enhanced capability to deliver resilient tower services.

Nevertheless, this was much more than a cost-efficiency exercise. HungaroControl’s remote tower was built around providing a resilient service capability to address the existing business continuity deficiencies. Moreover, to provide a platform that delivers enhanced visual capabilities not possible from a traditional brick-and-mortar tower. Building on an out-of-the-window view concept, additional camera sensors were installed to create auxiliary viewpoints that augment the visual range of end-users and unlock previous blind spots.

This leading-edge facility now serves as a dual contingency and operational environment from which HungaroControl delivers tower services for a medium-intensity runway operations airport. It is a precedential use-case for remote tower technology beyond the small airports and low complexity operating environments, demonstrating how this technology can be extended to serve medium-sized airports and some of the world’s largest hubs.