



## Case Study

# Norway's national stadium improves fans' experiences with Motorola Solutions' safety and security ecosystem

## ULLEVAAL STADION

Ullevaal Stadion is an all-seater football stadium located in Oslo, Norway. It is the home ground of the Norway national football team and hosts the annual Norwegian Cup Final and international matches, as well as concerts and other events. With a capacity of approximately 28,000, it is the largest football stadium in Norway. The national stadium is fully owned by the Football Association of Norway (NFF). One of Norway's largest meeting and conference centres, Meet Ullevaal, is also located at the stadium.

## ULLEVAAL STADION

### Customer

Ullevaal Stadion

### Partner

NORAKOM® (Norsk Radiokommunikasjon AS)

### Distributor

Danimex Communication A/S

### Industry

Stadium, Sports & Leisure, Events, Conferences

**NORAKOM®**  
NORSK RADIOKOMMUNIKASJON AS

**Danimex™**  
WHEN YOU NEED TO TALK



**MOTOROLA SOLUTIONS**

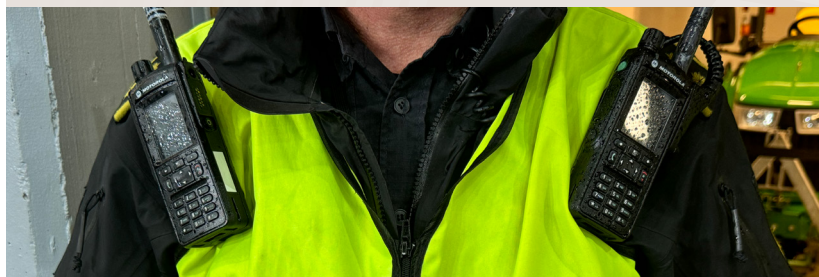
## Challenge

Ullevaal Stadion has always been concerned with delivering the highest possible standards of safety, security and match day or event experience to its fans. With this in mind, it first contacted its long-term ecosystems solutions partner NORAKOM to upgrade its previous analogue radio system to digital, for improved coverage and functionality. As a Motorola Solutions ecosystem solutions partner, and having seen the stadium's requirements, NORAKOM also discussed the benefits of connecting technologies such as the Motorola Solutions WAVE PTX Push-to-Talk over Cellular (PTToC) or broadband solution, for wider area multimedia communications, body cameras and Radio Alert, to integrate with the stadium's existing Avigilon video security solution. Indeed, this holistic approach to security solutions resulted in NORAKOM being appointed as the preferred overall solutions partner, responsible for all aspects of the ecosystem, from video to radio and everything in between. NORAKOM provides ongoing support, service, remote system management, basic training, and information and presentations on relevant new models and technologies.

## Solutions

A safety and security ecosystem comprising:

- MOTOTRBO™ Capacity Plus Multi-Site
- SLR 5500 two-way repeaters
- Full range of MOTOTRBO two-way radios including the Ion, SL4000e, DP3441e, DP4801e, DP4601e, DP2400e and R7 models (to suit each team's requirements)
- WAVE PTX™ including TLK 100 and TLK 25 radios and mobile application
- Evolve LTE handhelds
- VB400 body cameras
- CAPE drone video and flight control software
- Full range of Avigilon security cameras, from H3 to H5 ranges, including PTZ, fixed dome, bullets and Pro models
- Avigilon Network Video Recorders (NVRs)
- Avigilon Unity 8 Video Management Software (VMS)
- Avigilon Video Analytics: Unusual Motion Detection (UMD) and Unusual Activity Detection (UAD)
- Radio Alert
- SmartPTT PLUS control room solution
- Range of supporting accessories and chargers



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We are strong advocates of Motorola Solutions' technology because of its exceptional performance, reliability and continual development. However, we have a small amount of pre-existing technology from third-party suppliers here on-site; another major benefit of the Motorola Solutions safety and security ecosystem is that, in most cases, it enables backward compatibility with other technology, with the Avigilon video solutions being ONVIF compliant, for example. So, we've been able to integrate our previous assets. This flexibility is another key advantage of the ecosystem.

– Thomas Sletbakk, Chief Security Officer and Chief Technology Officer, Ullevaal Stadion





“ We deliver integrated safety and security systems, not just out-of-the-box radio packages. Being a Motorola Solutions Ecosystem Solutions Partner (with a huge range of high-performance products in the portfolio – from video security cameras, body cameras, sensors and analytics, to DMR, TETRA and WAVE PTX PTTcC radio systems and accessories, and all the workflow, control room, dispatch, safety and other software – coupled with the high level of possible integration) places us in a very strong position to provide the best possible solutions to meet our customers’ complete requirements. And, as with the stadium, where Pro Sec (the external security company) is still using a Motorola Solutions analogue system – and there is a history of H3 Avigilon models through to the present range – the longevity of the devices and systems and how those older systems can still integrate with the latest technologies is also a real plus.

– Tor Martin Karlsen, Partner and CEO, NORAKOM

## Solution

On match days, the core stadium team, the Norwegian Football Federation officials, the VIP area team, supervisors and stewards all use Motorola Solutions radios for communication and planning. The radios encompass a wide range of models to best suit individual users’ needs. Some use WAVE PTX devices or the mobile application for multimedia communications and for access to the radio network from beyond the stadium. And various talk groups have been established, such as operations, security, catering, medical and cleaning. The head stewards also use the VB400 body cameras for a first-hand perspective or coverage in an area where normal footage is obscured, for example, due to a flare being set off. The VB400 offers features such as pre- and post-record and high-quality audio. The body cameras can be paired with other VB400s or MOTOTRBO radios, for automatic recording triggers, if needed. Footage from the VB400s is live-streamed to the Avigilon VMS, so it can be viewed alongside the fixed camera videos.



The external security company, Pro Sec (Professional Security), brings its own Motorola Solutions analogue repeater and radios; however, it has various radios programmed to the stadium's network and vice versa, to enable smooth communications between security and operations, as a certain number of the MOTOTRBO radios can be used in both analogue and digital modes for added flexibility. At some point soon, Ullevaal Stadion hopes that Pro Sec will utilise its Capacity Plus system, expanding the capacity of its MOTOTRBO communication system even further.

The control room is the main operations hub and, on match days, a member of the Pro Sec team, the police and internal teams will closely monitor activity on the wide range of fixed cameras, which remain operational 24/7, as well as any body camera footage. The cameras provide full high-resolution visibility across the whole area and enable the stadium to monitor crowd flow, from the gates to being seated, and any antisocial behaviour. Radio Alert, meanwhile, has been activated on some radios and is configured with line-crossing algorithm rules set up in the Avigilon Unusual Motion Detection (UMD) or Unusual Activity Detection (UAD) video analytics, so users are immediately notified of any person or vehicular unauthorised access. These alarms are also a vital way to quickly alert the operational teams to any areas of potential concern, at matches, events or concerts.

The stadium is edged on two sides by the Alti Ullevaal shopping centre and the conference centre. The shopping centre has a legal agreement in place with Ullevaal Stadion, so the stadium can access its cameras and its Avigilon Alta access control solution on match days to monitor crowds

entering through its half of the gates. The stadium also uses the SmartPTT PLUS control room solution to record every event and all communications, in case any incident needs to be reviewed, and to monitor the system, by checking all devices are online, all time slots are active for optimal capacity and all components are fully operational.

## Benefits

Key to the success of this Motorola Solutions safety and security ecosystem deployment is the holistic approach and integration. Ullevaal Stadion is utilising multiple connected technologies and integration to become proactive, rather than reactive, in its approach to safety and security. The ecosystem also enables seamless cooperation between multiple teams, including external organisations, on match days and at events, as well as an easy overview for day-to-day operations.

The stadium will continue to innovate and is currently considering other technologies such as the Orchestrate cloud-based workflow automation tool, the Avigilon Alta unified video and access control solutions for prohibited zones within the stadium and the CAPE drone video and flight control software; the latter would be integrated with the stadium's authorised drones, as the area around the stadium is usually a no-fly zone and the drones will be used to monitor crowds outside the stadium, for example. Unauthorised drone access could be mitigated by Counter Unmanned Aircraft Systems (UAS) software from Silent Sentinel, a Motorola Solutions company, which was used successfully during the 2022 FIFA World Cup in Qatar. All these technologies can be seamlessly connected to the stadium's existing systems.



Our safety and security ecosystem of technologies gives us an extremely reliable, holistic overview of the stadium and the operational tools we need to ensure maximum security, safety and a smoother, optimal match day or event experience for the fans. We've worked on the solution together with our long-term partner NORAKOM, who is always there to support us and keep us up to date with any new Motorola Solutions products they think could be of interest, which means we can keep progressing; I'm always looking at new technology and integration opportunities and how to optimise the use of our older assets. Out of match days and events, we are quite a small operation, with just the conference centre operating daily – a conference centre which both NORAKOM and Motorola Solutions use, incidentally; and the ecosystem of technologies helps us to efficiently operate and control the whole stadium effectively with just our core team. Luckily, we have relatively few incidents for a venue of our size. However, if we do, we know we have the tools in place to deal with them effectively.

– Thomas Sletbakk, Chief Security Officer and Chief Technology Officer, Ullevaal Stadion



As Thomas Sletbakk summarises: “The exceptional reliability of the systems and design of the technology – with features such as AI-Trained noise-cancelling technology and the self-learning video analytics – enable us to focus on our job of ensuring fans have an optimal match day or event experience, rather than worrying about the technology. The systems are high performance, yet simple from a user perspective. And there seems to always be a device perfectly suited to each role: for example, our conference centre and VIP teams are very interested in the sleekly designed TLK 25 Wi-Fi, a wearable WAVE PTX device. Moreover, having a sole system integrator in NORAKOM is a key differentiator. The Motorola Solutions safety and security ecosystem really is a complete solution for our stadium and I look forward to seeing how it continues to evolve.”

### Real-life incidents where the Motorola Solutions safety and security ecosystem has helped to deliver a positive outcome:

- Flares are prohibited at matches and concerts. Teams can accurately pinpoint the offenders, track them and coordinate a suitable time and place to apprehend them (to avoid police arrests in the stands). They can also use the fixed camera video footage and the body camera video and audio for proof and to prosecute, if necessary; should the smoke conceal the offender on the fixed camera footage, a steward with a body camera can record from a different angle and live-stream this footage back to the Avigilon VMS.
- Medical assistance is sometimes needed. The medical supervisor is based in the control room and, via the cameras and radios, can advise the attending steward on the primary response and then offer valuable assistance and a second opinion to the medic, once they arrive on the scene.
- Effective crowd management is essential, especially on Cup Final days, when 6,000-fans-strong processions can arrive at the stadium; the technology helps the stadium to manage crowds efficiently, minimise queue waiting times and mitigate potential incidents.



**NORAKOM WAS AWARDED THE COMPLETE ULLEVAAL STADIUM CONTRACT. NORAKOM'S HOLISTIC APPROACH TO A TOTAL SECURITY SOLUTION IS ENABLING THEM TO GROW THEIR BUSINESS.**



### Benefits

- A high-performance and intelligent system that delivers a wide range of benefits, including:
  - Improved stadium security and safety
  - Better match day or event visitor experience
  - Greater situational awareness for faster response times to incidents
  - Enhanced collaboration between internal and external teams on match days
  - Simpler day-to-day management of stadium security
  - Ease of troublemaker tracking and apprehension when needed
  - Increased efficiency and productivity
  - Exceptional system reliability, stability and flexibility
  - Ease of integration of both the Motorola Solutions safety and security ecosystem and pre-existing assets
  - Cost and time savings as a result of remote maintenance and updating





To learn more, visit:  
[www.motorolasolutions.com](http://www.motorolasolutions.com)



Motorola Solutions Ltd., Nova South, 160 Victoria Street, London, SW1E 5LB, United Kingdom

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