ASL

zenitel

Case studies
PA/VA solutions

Road and Tunnels

Tunelový rozhlas

The requirement

Slovakian highway construction and maintenance company, Národná dialničná spoločnosť, a.s., recently deployed a sophisticated ASL Voice Alarm (VA) system for three motorway tunnels on the D1 and D3 motorways which bypass the city of Žilina in Northwest Slovakia, spanning over 6km of road. The brief was to provide an EN 54-compliant system for a series of motorway tunnels to allow for the safe and trouble-free evacuation of people in case of a fire event or traffic accident. The system had to cater for acoustic challenges of tunnels and to be centrally controlled and monitored.

Summary

Application: Voice Alarm & Control System
Product: VIPEDIA-12-NET, V2000 Amplifiers, iVENCS
Country: Slovakia

The solution

The system was designed and supplied by ASL's distributor and system design specialists, Avalon, with support from ASL. The three tunnels were treated as separate entities, with two or three racks installed in each. Each rack consisted of a VIPEDIA-12-NET audio controller with eight message players and ASL's V2000 range amplifiers, allowing complex scenarios to be programmed.

Built-in SFP modules allow the connection of the single mode fibre-optic cables required to cover the large distances involved. Delays to speaker outputs were calculated and configured via the VIPEDIA's powerful DSP to ensure optimum intelligibility.

An ASL iVENCS control system provides a central control and monitoring location that conveniently brings together the three remote tunnel systems. A 2D map shows the status of the PAVA system in the tunnel and allows pre-recorded and live announcements to be made as required.

The result

Thanks to the high availability ASL voice alarm system, announcements can be heard clearly throughout the tunnels.

The unified control solution from ASL allows the system to be monitored from a central point – streamlining the operations of the client. Using an open protocol, iVENCS can be customised to the specific needs of any client to integrate seamlessly with existing systems.

To ensure the efficacy of the integration, ASL provided constant technical support and assisted in the remote configuration of devices.

> Thanks to the high availability ASL voice alarm system, announcements can be heard clearly throughout the tunnels. Centralised control offers streamlined and efficient management.

ASL

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CASE STUDY

Photo: Anne Mette Storvik, Bane NOR

PAVA

HOLMESTRAND STATION

the requirement

Holmestrand train station is a new station engineered into the mountainside of the Holmestrand municipality along a tunnel 12km in length. The officially titled "Holm-Nykirke project" incorporating the construction of the double-track tunnel and the construction of the train station began in the Summer 2010. Blasting of the rock cavern, to thirty five metres wide and eighteen metres high, commenced in December 2011 and concluded in 2014.

The station hall, approximately eight hundred and seventy metres long, thirty metres wide and twelve metres high along with the double track train line opened to the public in December 2016 provides the Holmestrand community with valuable high-speed inter-city links.
ASL partnered with Innotronic of Scandinavia and SAC Sweden AB to deliver a comprehensive EN54 certified public address and voice alarm (PAVA) system at Holmestrand station. Engaged by Bane NOR the design, supply, installation and commissioning of the new EN54 compliant PAVA systems at Holmestrand station harnesses many of the disciplines ASL offers customers.

the solution

ASL had already supplied long-line PAVA systems to more than 300 stations for Bane NOR, however Holmestrand station was the first to utilise ASL's new VIPEDIA range of products. The VIPEDIA range which includes audio routers, amplifiers

> "ASL has been a key supplier to Bane NOR for around ten years, delivering over 300 stations using the Vipedia and IPAM ranges of PAVA equipment. Their customer focused approach to design, manufacture and maintenance ensures we continue to work together"
>
> **- Roy Strand, Bane NOR**

the client

BANE NOR

Bane NOR (formerly Jernbaneverket) is a state enterprise in charge of the national rail infrastructure. Bane NOR's purpose is to provide accessible rail infrastructure with efficient and user friendly services, including the development of hubs and freight terminals.

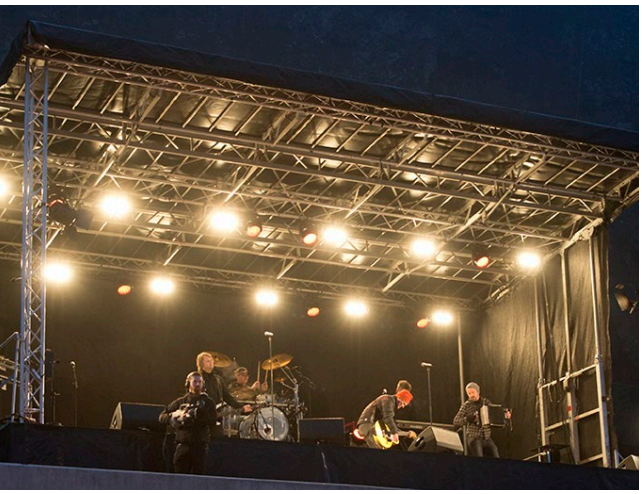
Bane NOR has 4,500+ employees with the main head office located in Oslo, Norway.

and microphones, are all certified to safety standard EN54-16 and internationally recognised by the Loss Prevention Certification Board (LPCB).

The solution at Holmestrand station provides audio routing between twelve analogue inputs and twelve analogue outputs. The VIPEDIA-12 also includes provision for sixty-four internally stored Digital Voice Announcement messages and hosts ASL's VIPA long-line public address software. Four VIPEDIA-12 audio routers were locally linked to provide routing from any or all of their inputs to a total of forty-eight zone outputs, all configured via an Ethernet network.

Two ASL EMS10 Emergency Microphone Stations provide live and pre-recorded message broadcast. Each feature graphic LCD displays together with 'Power', 'Voice Alarm', 'System Fault', 'Fault' and 'Speak Now' indicators. The EMS10's implement router hardware bypass to ensure continued all-call microphone operation in the event of matrix digital signal processor (DSP) or central processing unit (CPU) failure.

Two additional, ASL MPS10 paging microphones are able to broadcast live, store-forward and recorded messages into user selected zones in addition to providing EN54-compliant emergency functions and mandatory indicators / controls.



Live entertainment at the Holmestrand Station opening ceremony

Photo: Anne Mette Storvik, Bane NOR

ASL's V2000 amplifiers provide high-quality transformer-less audio output, configurable in software from 25W to 500W output per module. Seven were installed per V2000 chassis at Holmestrand station to provide a total of almost 19,000 Watts of 100V output.

Integrated EN54-4 certified battery chargers in the V2000's charger battery packs, each with enough capacity for a fully loaded V2000 amplifier as well as one VIPEDIA-12 and peripherals - avoids the need for external battery chargers. Installed ASL LSZDC amplifier cards provide amplifier health monitoring, standby switchover, loudspeaker line earth leakage monitoring and loudspeaker line 'End of Line' (EOL) monitoring.

Configured using a user-friendly graphical software interface, the V2000's standby modes and low quiescent power requirements provide improved environmental performance ensuring the PAVA system at Holmestrand station minimise its carbon footprint too.

Integral to the operation of the PAVA system at Holmestrand station and across

12km
length of the rail tunnel

7
D-series amplifiers per V2000

19,000
Watts of 100V output

300+
stations delivered to Bane NOR

CASE STUDY

Bane NOR's network of train stations is ASL's VIPA software suite. Running on ASL hardware at every train station with ASL IPAM installed, and now also VIPEDIA installed hardware, VIPA software provides audio-over-IP, routing control and fault reporting capability between Bane NOR's Control Centre and all of the remote train stations, including Holmestrand station.

VIPA, one of the first audio-over-IP systems, developed and designed specifically to meet the requirements of long-line public address systems, delivers live broadcasts using UDP multicast over IP. Multicast broadcasts offer the benefit over Unicast broadcasts of requiring just single audio streams to deliver audio to any number of stations Bane NOR's Control Centre chooses to, which reduces required bandwidth.

> **"In consultation with Bane NOR, ASL developed the standard IPAM range to meet all of the requirements for the Bane NOR project, which has successfully been implemented in more than 300 stations. ASL then introduced the VIPEDIA range of EN54 certified solutions in 2015 and this was chosen for the new-build project at Holmestrand station"**
>
> **- Henry Rawlins, ASL**

VIPA also delivers the ability to stream digital voices announcement (DVA) messages from the Control Centre or to trigger them at remote locations on the station network, subject to bandwidth availability. An additional advantage of ASL'S VIPA software is that live audio broadcasts can be transmitted in high or low bandwidth modes. This can be particularly useful where network bandwidth is more restricted, as in the examples of legacy / brownfield installations on Bane NOR's network.

Prime Minister of Norway Erna Solberg greets the press at the opening event

Photo: Anne Mette Storvik, Bane NOR

VIPA also provides detailed fault monitoring of remote trains stations via IP as well as providing a software API for interfacing with third party train timetabling/messaging systems.

VIPA has also been interfaced with a custom software module which allows Bane NOR to trigger messages at stations using legacy PA systems across other stations on Bane NOR's network using a module which uses DTMF tones to control remote stations. Developed by in-house software teams at ASL, VIPA's modular architecture and software development kit (SDK) allows VIPA to integrate with other third party PA systems, should it be required.

the outcome

The successful introduction of ASL's new VIPEDIA range of products at Holmestrand is already being replicated in other stations across Bane NOR's network with installations taking place at Oslo Airport's Gardemoen train station.

Roy Strand, Department Manager for Bane NOR comments "Application Solutions (Safety and Security) Ltd has been a key supplier to Bane NOR for around ten years, delivering over 300 stations using the Vipedia and iPAM ranges of PAVA equipment. Their customer focused approach to design, manufacture and maintenance ensures we continue to work together".

> "Everyone at ASL works incredibly hard to develop and deliver our EN54 certified voice alarm products, so we're genuinely proud to be chosen as a supplier to one of the most prestigious railway projects in Europe"
>
> **- Peter Stewart, ASL Technical Director**

Photo: Anne Mette Storvik, Bane NOR

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