

# ProAudioMEAs

LIVE SOUND | RECORDING | INSTALLATION | A/V | BROADCAST | POSTPRODUCTION | July–August 2016

## SETTING THE STANDARD Inside Karbala International Stadium

**SUPPORTING SAUDI'S  
FILM FESTIVAL**

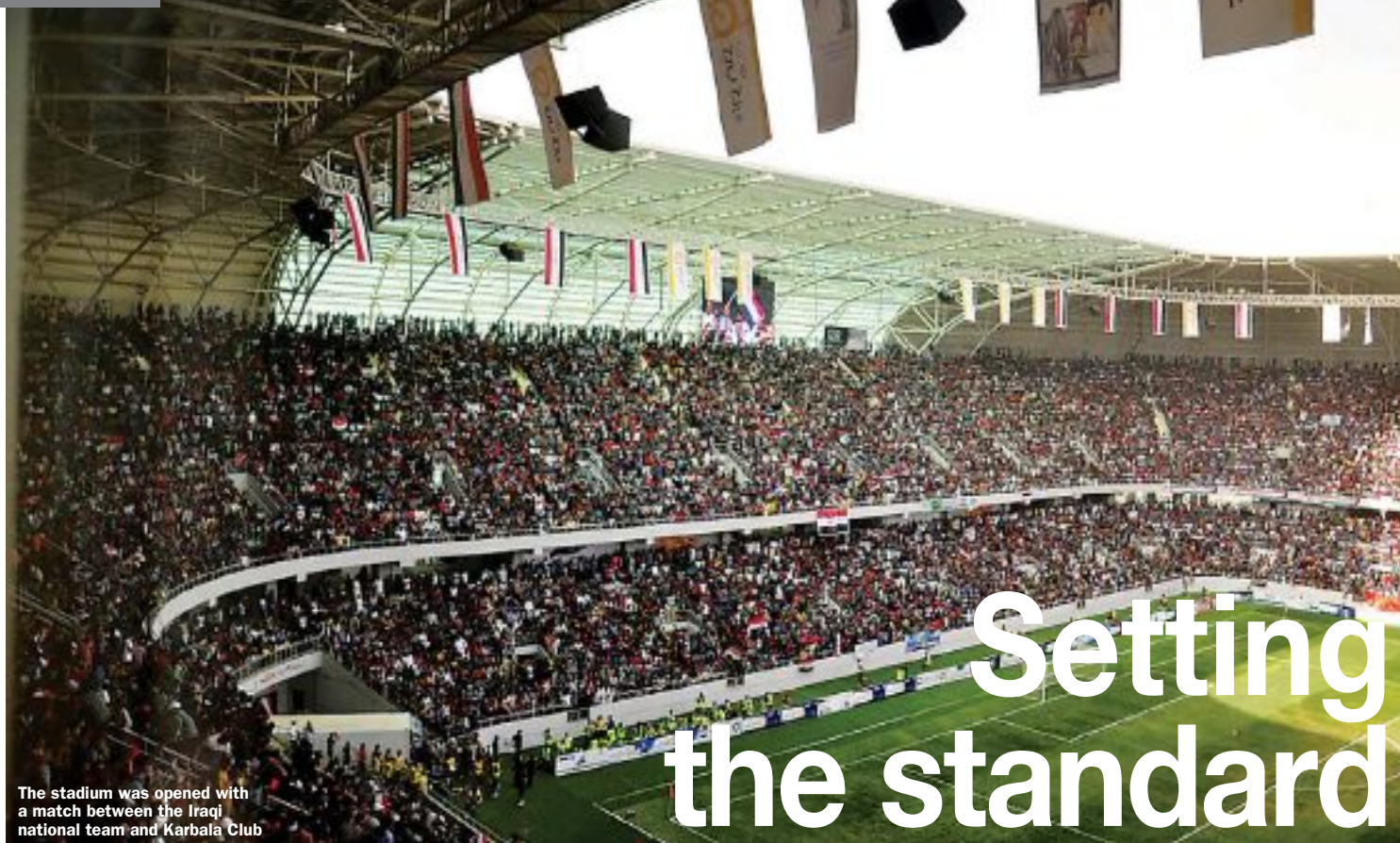
**SHIDCO IN PROFILE**

**DEVELOPING VERO**

The R&D behind Funktion  
One's new system

**MPEG-H AUDIO  
EXPLAINED**





The stadium was opened with a match between the Iraqi national team and Karbala Club

# Setting the standard

Iraq is now home to a variety of high-end sporting facilities. The latest of these to open its doors is the 30,000-seat Karbala International Stadium writes **James Ling**

## OPENED IN MAY 2016 WITH A MATCH

between the Iraqi national team and Karbala Club, the 30,000-seat Karbala International Stadium is the latest arena in Iraq to be built to FIFA standards. Meeting these standards was a key criteria for the venue and has led much of the design and installation process.

'One of the main aspects the contracting company and the consultants wanted to meet was the FIFA pro sound standard, so we only considered providing items which meet the FIFA standards and have EN54-24 type B certification,' explains Ali Saad Shakir, coordination and logistics for APCO Electronics, the company tasked with the design and installation of the project. 'The consultant team from Open Project - Italy, required a FIFA standard professional sound solution that could offer 92 per cent direct SPL coverage and an STI of 0.5. We provided them a real result of 95 per cent direct SPL coverage and an STI of 0.8.'

As Bosch partners in Iraq, APCO turned to an Electro-Voice solution modelled in EASE to achieve the result. 'Electro-Voice is a standard brand in stadium projects and their solutions are flexible and upgradeable, thanks to Iris-Net driven products, which allow the system to be extended to serve any purpose,' reasons Mr Shakir.

'The contracting company, Bahadirkul Co., had a pre-made pro sound design of more than 78 speakers,' continues Mr Shakir. 'We did our first design with only 42 speakers, but the consultants requested that we add more to provide extra coverage in the stadium corners. We increased the number of speakers to 50 and with an EASE simulation, we showed the results and did an audio



The 30,000-seat Karbala International Stadium has recently opened in Iraq

demonstration for the team. Following this, some slight modifications took place on the speaker angles and locations to optimise the coverage and the STI index.'

While it was a relatively straightforward design process, it was hampered by the shape of the venue. 'The stadium structure itself is a mix of steel and concrete and forms an acoustic reflector,' explains Mr Shakir. 'We wanted to carefully position the speakers in the design to give the best sound projection while at the same time ensuring a logical installation of them. That was a major challenge because the software drawings

may not be exactly realised in a real world installation. But we could achieve it with a careful speaker positioning process.'

The installation itself was a multi-phase process. The initial cabling of the stadium took place in the second quarter of 2015 and was followed by speaker placement at the start of 2016. 'There are 27 speaker locations around the stadium in two groups,' says Mr Shakir. 'The stadium projection group has 25 hangs of two EVH1152 per cluster, while the field projection group has two locations of single EVH1152 90/90. Our technical team followed our design for the hanging points of

each cluster. Then each hang was combined on the ground, hard wired and then lifted up using a winch to the catwalk where the final positioning and aiming took place using a Bosch laser measurement tool.'

With the speakers flown, the next stage saw the installation of the 14 CPS 4.10 amplifiers, five N8000 matrices and the Yamaha MG166CX mixing console. The amps and matrices were placed in four different zones around the stadium. 'Each zone has three amps and an N8000, with the exception of the east side of the stadium zones which have four amps and an N8000 per zone,' explains Mr Shakir. 'The extra amps are feeding the field speakers.'

**'We wanted to carefully position the speakers in the design to give the best sound projection while at the same time ensuring a logical installation of them'**

The system was then connected over a redundant fibre loop with Dante used to transport the audio. This was terminated in the control room with a fifth N8000 which serves as the master unit. 'We programmed the DSP core so it could handle the analogue





(L-R): The main bowl has 25 hangs of two EVH1152; APCO was responsible for the stadium-wide Bosch CCTV system; Control of the bowl PA is via a Yamaha MG166CX mixing console

audio inputs from microphones, mixing console, PC and score board audio unit and deliver the audio to the Dante interface of each N8000 in the four zones,' states Mr Shakir. 'We also provided the ability to stream audio from a PC digitally via Ethernet to the Dante interface, thanks to Audinate's DVS software.'

This was the first time that APCO had installed a large scale Dante network and as such, it called in extra support to assist in the process. 'Thanks to the support from the Bosch technical team and Audinate we were able to overcome the technical problems we faced setting up the switches,' observes Mr Shakir.

Due to electricity problems, the final test of the system came on



Each hang was winched into place; APCO also took on the PA/VA solution for the stadium

the same day that the stadium was due to open. The APCO team was under a great deal of pressure to deliver as a sudden power failure had caused a system malfunction. 'The Dante network was mirrored and we sent sound to the individual zones separately,' recalls Mr Shakir. 'We focused our efforts and did a detailed system check. When we saw the whole system was working fine, we cheered and hugged each other. A few minutes after that we played the national anthem. The stadium was already full, it was an unforgettable moment.'

With the project complete, Mr Shakir reflects on a challenging but satisfying installation. 'We think that we did our best in that project,' he offers. 'A few minutes after the opening events, we got a call from the Minister of Youth and Sport, Mr Abtan, telling us that he and his staff are very satisfied with the audio quality. The main broadcasting company, Ishtar Media, thanked us as well.'

'We want to thank each person in our team for the unlimited efforts they dedicated to this project, day and night,' continues Mr Shakir. 'We are so proud to have each and every one of them as part of the APCO Electronics team.'