

Adelaide Convention Centre invests in industry leading seating hoist system

New seating system combines innovation and flexibility for a world-class convention centre

Challenge

To design, build and install an industry leading seating hoist system for Adelaide Convention Centre.

Solutions

Risk Assessment

- A risk assessment was conducted to address safety requirements

Control and Safety

- Allen-Bradley® Compact GuardLogix® provides decentralised control and safety requirements
- FactoryTalk® View ME provides comprehensive and accurate insight to the system
- Studio 5000® simplified programming and reduced engineering time
- PowerFlex® 755 drives powered the hoists and provided safety over Ethernet

Results

Safety First

- A high level of safety was achieved with heavily interlocked proximity sensors, pulse wheel sensors and encoders
- Reduced manual handling requirements

Fast changeovers

- Seating can be safely lifted or lowered in less than 20 minutes



Each year, the ACC plays host to around 700 individual events, welcoming approximately 200,000 delegates and guests.

Background

A pioneer from the very beginning, the Adelaide Convention Centre (ACC) opened its doors as Australia's first purpose-built convention centre in 1987, setting a benchmark for conference facilities and services. Each year, the ACC plays host to around 700 individual events, welcoming approximately 200,000 delegates and guests.

With a commitment to innovation, the Adelaide Convention Centre recently completed a \$397M redevelopment, which transformed the Centre into one of the world's most modern, flexible and technologically advanced meetings and events venues.

Today, the ACC comprises three independent, yet seamlessly integrated buildings (East, Central and West), offering more than 20,000sqm of multi-purpose event space. Each building takes advantage of the venue's prime positioning at the heart of the Adelaide Riverbank Precinct, providing extensive natural light and panoramic views to deliver visitors a heightened sense of destination.

A continual challenge for convention centres around the world is to ensure that their facilities can be adapted, often quickly, for different functions and events; from seminars and keynote presentations requiring tiered seating to trade exhibitions and banquets requiring flat floor space.

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The ACC's new East Building (launched August, 2017) is the centrepiece of innovation and flexibility. Home to the venue's main Plenary Hall, it combines striking architecture with state-of-the-art interior design, offering tiered seating for more than 3,000 people or 3,000sqm flat floor space. The Plenary's unique combination of hinged seating, operable walls and rotating seating drums enable it to be arranged into more than 15 different configurations to create an ideal fit for any event. The hinged seating utilises six of the world's largest seating drum hoists featuring industry-leading technologies, designed built and installed by HME Services.

Designing an innovative and flexible seating system

Upon winning the tender to refurbish the ACC's seating automation system, HME Services conducted a risk assessment to consider the safety requirements involved with the multifunction use of the venue - so it could be utilised as either an open space venue or tiered seating venue as required.

John Geddes, control systems officer at HME Services, explained that the engineering involved with the project needed to be able to lift the seats above the main auditorium area in a specific sequence and stored while the area was being used as an open space venue.

"The seating system design was based on the seats being lifted, housed and locked into the roofing infrastructure when not required. The seating bays are mechanically hinged and are connected to the hoists via quick connect lifting pins. These quick connect lifting pins can be detached from the seating bays and then raised out of site," said Geddes.



Operators Pendant PanelView Plus 7 for operation and system diagnostics.



Main Control Cabinet contains Compact GuardLogix PLC, PanelView Plus 7 for extensive system diagnostics and Stratix Switch.

"The risk assessment helped us to identify the hardware that was required to provide a safe environment, which was based on the Allen-Bradley® Compact GuardLogix® series of PLCs from Rockwell Automation, with integrated safety," he explained.

The Compact GuardLogix controllers include integrated safety and motion via Ethernet in a single controller. Studio 5000® was used to program the controllers, combining engineering and design elements into one standard framework that enables optimised productivity and reducing engineering time. The same software was used to program safety and motion aspects of the system. PowerFlex® 755 drives were used to power the hoists, with safety over Ethernet.

Safety was a key priority for the seating system and by integrating heavily interlocked feedback devices, a high level of safety was achieved.

"The control system comprises a Main Control Cabinet and a Hoist Control Cabinet at each hoist. Utilizing POINT I/O™ modules and Stratix® switches, we were able to integrate control and safety field cabling into a single Ethernet cable run."

Simple control and safety

At the commencement of the project, the ACC specified the importance of having a system that was simple to control and operate. As the seating segments are arranged in a curve along the back wall, they overlap themselves as they are moved up or down. To address this challenge, the control system was programmed to automatically stagger and monitor the movements of the

hoists, avoiding any mechanical collisions. This occurs all while the operator is holding a safety enable pushbutton and activating a programmed pushbutton on the PanelView™ Plus touchscreen pendant.

The system uses FactoryTalk® software via PanelView™ Plus screens on the Main Control Cabinet and touchscreen pendants. Extensive diagnostics and commissioning control are accessed via the Main Control Cabinet 10" PanelView™ Plus touchscreen.

The control system manages all six hoists of the seating system. Together with a multi reeve pulley system, the total lifting capacity is 240 tonnes. Each hoist has two steel wire rope drums and two zero fleet steel wire rope tracking pulleys. These tracking pulleys move up and down with the drum whilst the rope is being applied or removed. Each drum and tracking pulley have a position feedback device installed. Each of the feedback devices are being monitored by the PLC and if any discrepancies are registered the hoist and system will stop automatically to avoid any safety incidents.

"Safety was a key priority for the seating system and by integrating heavily interlocked feedback devices, a high level of safety was achieved," said Geddes.

Fast changeover and reduced manual handling

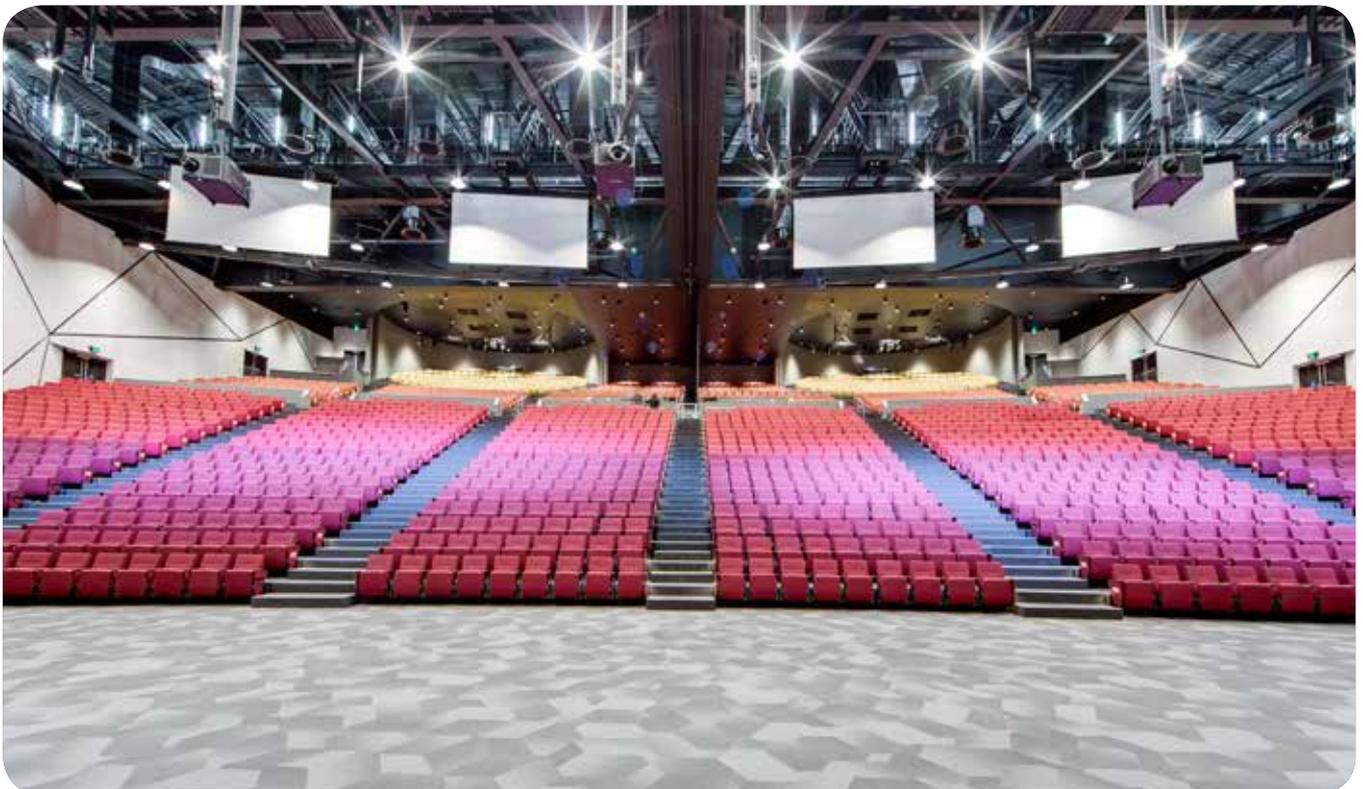
HME Services has delivered a solution that ticks all the boxes for the ACC. The new automated seating system has successfully reduced the requirement for manual handling



EDDH-ZF-40T Electric Dual Drum Hoist-Zero Fleet-40 tonne. The hoist contains 14 safety and monitoring devices, managed by Compact GuardLogix PLC via POINT I/O systems.

and also provides the capability for faster changeover times. It is now possible to safely lift or lower the seating in less than 20 minutes – a significant time saver for the Centre.

"We worked with HME to find engineering solutions that would minimize or eliminate the risk associated with hoisting seating panels. It was imperative to have a system that staff could use safely without having to have specialist rigging qualifications. The solution they have delivered is simple to operate and has multiple fail safe systems built in. It has proven to be reliable and quick to configure which is very important to our business" – Mike Smith, general manager – Property and Buildings, Adelaide Venue Management.



The Plenary offers tiered seating for more than 3,000 people or 3,000sqm flat floor space.

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