

Keynote SpeechKEY 1

Don MacLean

Theatre engineering and architecture, the background to Cirque du Soleil, their approach to each new show and their venues, equipment reliability, creative design of a new cabaret-style adult show in Las Vegas, the concepts for the lobbies, auditorium and equipment.

Stage Elevator MechanismsET 1

Stuart Wilson, Robert Heimbach, Said Lounis

Conventional methods of raising and lowering stage platforms; screw-jacks, rack and pinion, wire-rope hauling, scissor lifts, ramps and wedge mechanisms; required depths, the operation and use of Spiralifts, typical applications, longevity, safety, new products; the development, operation and use of Serapid Rigid Chain equipment, how it works, reliability and noise levels.

Stage Wagon SystemsET 2

Clive Odom, Peter Lutz, Ingemar Carlsson, Eiji Nishimura

The development and functions of the stage wagon systems in the Gran Teatre del Liceu in Barcelona, in the Royal Opera House Covent Garden in London and in Goteburg Operans in Sweden; a description of the wagon drive systems used in a number of installations in Japanese theatres by Mitsubishi.

British Standards and Model ConditionsET 3

Paul Mathews, Ray Carter, David Adams, Peter Angier

Reasons for preparing BS 7905 on lifting equipment for performance and broadcasting, how it was undertaken, its content and use; the Model National Standard Conditions for Places of Entertainment and the Technical Regulations forming an Appendix to these; their construction and application to theatre planning and installations.

Safety in MotionET 4

Ted Fregon, Dave Ludlam

Stage automation, the background to regulations; electronic control systems; the European Machinery Directive, the DIN Standards and Classifications 4 & 5; the background to IEC 61508, its concept and applications; Safety Integrity Levels; derivative Standards; other European Standards; safety functions; the Safety Life-cycle of IEC 61508, its application in the theatre, suppliers and end-users responsibilities; human factors, independent assessors, low-complexity systems.

Physical Strain on StageET 5

Andy Hayles, Jonathan Johnson, Louis Janssen

Counterweight flying operations, the physical processes involved, weights that should be handled; Health & Safety Authority guidelines; application in life and in the theatre; rules, mathematics and conclusions; occupational biomechanics, posture, manual lifting and loading, back pain and its prevention, maximum loads; the restrictions on counterweights in the Netherlands, the effort required to move fly bars, the Norm 2 standard requiring power flying systems for real loads, progress of change to mechanisation.

Overhead Suspensions ET 6

Martin Honeywill, Mauryc Sowka, Fred Maeder

Chain hoists, their function and features; control and safety, applications; steel band hoists, their characteristics and applications; winches for upper stages, the many different types, their advantages and disadvantages; standard parameters; safety features; the selection of components; the development of a silent winch; testing and future products.

Stage Control Systems ET 7

Guy Voncken, Mark Ager, Ted Fregon, Günter Anderlohr

Wireless control systems, benefits, range, features, safety, operating systems; benefits of a product-based approach; expandability; system architectures; wired portable desks, facilities offered; 2 and 3 dimensional flying systems, applications in the West End; the stage engineering in the China National Grand Theatre, its control facilities, security and back-up; man-machine interfaces; the importance of control desk design, failsafe command entry; application of IEC 61508, multiple axes installations, new handheld and portable desks, need for multiple moves.

Changeable Auditorium Techniques ET 8

Julian Herrey, Stuart Wilson, Robert Heimbach, Jason Barnes

Viewing requirements, audience well-being, sightlines, telescopic seating systems, seating wagons, automated seating, tracked seating, questions during selection, financial aspects, rental revenue; air-bearings, their selection and use, air-pressures, use on different types of flooring, carpets; fully mechanised systems; the Cottesloe Theatre, its concept, development and formats for a range of shows; plans and sections; the introduction of Steeldeck, changeovers, the manual systems used.

Power and Harmonics ET 9

Mark White, Adam Bennette, Steve Barker, Dave Chapman

Electrical supplies, power factor, RMS and reactive power, real cost; background to harmonics, sine-waves, Fourier transforms, dimmer harmonics, problems in installations and for the supply authorities, low-impedance supplies, over-sized neutrals, harmonic cancellation; variable speed drives, principles, effects of harmonics, parallel tuned filters, twelve-pulse drives, clean power technology, active filtering, regulations; practical earthing systems, safety, noise suppression, communications systems, grounding rules.

Working at heights ET 10

Paul Edwards, Chris Blakeley, Chris Higgs

Hazards and risk management, eliminating hazards, risk assessments, risk factors, substitution, competence, NVQs, qualifications, Codes of Practice; personal protective equipment, helmets, body harnesses, lanyards, climbing, taking up a work position; taking a fall, rescuing a fallen person, the need for available trained people, the speed necessary, the process; understanding what working at height means; the use of Tallescopes, powered access equipment, safety of theatre grids, protection of openings, safety harnesses on lighting bridges, the vertical rope fall arrest system, attachment points, safety nets, horizontal safety lines, the resultant forces on the attachments, specially designed trussing for safe access, training.