

Case Study

Energy Efficient Lighting- King Kong The Musical

Greener Live Performances
through energy efficiency



Background

King Kong the musical premiered on 15th June 2013 at the Regent Theatre in Melbourne, for its exclusive Australian season. It was produced by Global Creatures, the makers of Walking with Dinosaurs – the Arena Spectacular and How to Train Your Dragon Arena Spectacular, in association with DreamWorks Theatricals.

Featuring a cast of more than 50, this musical takes the audience on a journey from the streets of 1930's New York to the uncharted wilderness of Skull Island. The production includes the latest innovations in choreography, puppetry, circus and animatronics.

King Kong's historical roots reach as far as the 1930's recession in New York. During this time original film director Merian C. Cooper was instrumental in the success of the movie's special effects and animation work. Cooper also played a role in the development of Technicolour and the widescreen format, Cinerama. It is then, without surprise, that the theatrical production embodies the same penchant for innovative inspiration.



Image: King Kong, Air War (Jeff Busby)

Opportunities

Space limitations in the automation heavy production of King Kong meant the lighting designer Peter Mumford had to be creative and economical in his selection of fixtures and hanging positions. Lights could not be placed on any overhead lighting bars; therefore all lights had to be put around the keyway. It was important they were out of the way so Kong wouldn't hit them.

Peter Mumford has been quoted as saying "It's not so much a question about working around the gantry, but working with it." With conventional overhead space taken up by the Kong machinery, the lighting rig was designed into the gantry.

Recognised by industry for his work on King Kong, Peter Mumford won a Helpmann Award in 2013 for Best Lighting Design.

Measures implemented

With space for lighting limited, a significant amount of LED light source was used, with the largest being a 12mm pixel LED screen that is 27m wide by 8m high. This results in nearly 1,500,000 LED pixels emitting amazing light but requiring minimal power input to bring alive.

Continuing on the efficient lighting journey, a new product - LED Source Four (S4) lamps from ETC were utilised. These save a tremendous amount of power. The show would have otherwise required 750 watt standard stage lamps but the LED S4's need a maximum of 126 watts of energy input. This resulted in a massive 83% reduction in energy consumption, per lamp.



Image: Source Four LED Lustr+ from ETC

Pivotal to the lighting design are 86 ETC Source Four LED Lustr+ profiles, 50 positioned out front at the Regent Theatre with another eight on the side balcony trusses and the rest in the gantry.



*Image: Lighting for King Kong
Image Source: Jands Australia*

Eight ETC Selador Desire D60 Vivid Luminaires are located within the Empire State Building, used solely for effect when Kong falls off the building. The show also utilises 69 Vari-lite VL3500 with the first three bars on stage, packed to give a steep front of house look. Banks of Sharpys were used left and right.

Along with the VL3500s, the design includes Clay Paky 700s, Sharpys and over eighty ETC Source Four LED Lustr+ profiles. The rig did not include any inefficient tungsten sources as these would have interfered with infrared projection work.

Outcomes

One of the major benefits in using LED light sources for King Kong is that the potential power usage is dramatically reduced. Utilising Source Four LED Lustr+ instead of standard stage lamps reduced stage lighting power consumption by approximately 533.3 kW per show. With nearly 200 shows performed in the season the consumption savings could represent as much as \$30,000 in cost reductions.

The large number of energy efficient stage lighting choices that were integrated into the performance rig, suggest the overall electricity savings would be far greater.

Along with a reduction in power consumption, an additional benefit has been a reduced number of light globes changed-out during the season. On a standard stage lamp, globes would be changed every 500 hours of use, which could be close to 500 globes for the season. LED systems provide thousands of hours in operation reducing not only lamp replacement costs but also related labour expenses.



*Image: Source Four LED Lustr+
Image source: Jands Australia*

Source Four LED's are totally silent and don't have scroller noise issues. Using Source Four LEDs also halved the dimmers and halved the cables required. Seven lights can be daisy chained together and run off the one cable, so instead of having a dimmer for each of the seven lights, there is one circuit breaker.

Acknowledgements:

Global Creatures Australia

Marriner Group

Director Daniel Kramer; technical director Richard Martin; production/scenic designer Peter England; costume designer Roger Kirk; lighting designer Peter Mumford; sound designer Peter Hylenski and projection designer Frieder Weiss.

Production Resource Group (PRG) Melbourne

Jands Audio Lighting Staging

