Rise above: The New World Rigging Symposium in review

BY JOE ALLEN

THE FLORIDIAN SUN GLINTED off rows of yachts docked outside as more than 160 riggers crowded into the hotel ballroom. The heaviest elements hanging above the crowd were two crystal chandeliers and the solemn responsibility to know what's hanging overhead. As a tour rigger who's come a long way, but still has a way to go, I was drawn to the event by that sense of responsibility. You never know what you don't know—until the need to know catches you with your pants down. Aside from experience, the best preparation is a solid education. Without question, the experts assembled in Ft. Lauderdale, both onstage and off, provided a wealth of knowledge and a broad orientation to further resources.

The keynote address was delivered by Scott Fisher. The legendary innovator and founder of Fisher Technical Services is perhaps best known for developing the widely used Navigator Automation System software. Fisher's life story is an inspiration for anyone ambitious enough to attempt to hang the moon and the stars. But for all his tales of fortune and glory, the seasoned veteran repeatedly issued words of warning to up-and-coming riggers.

One of the keys to Fisher's remarkable success was to take note of mistakes. He kept a detailed notebook, from his early years in Vegas to touring with Paula Abdul to his projects at Japanese theme parks. He diligently recorded technical glitches and structural failures, and presumably, a brilliant idea or two. This allowed him to systematically review what had gone wrong and consider what could be done better.

The foul-ups included a mechanical dragon head that fell off during a Siegfried and Roy performance. It dangled by flimsy electric cables as the bemused crowd looked on. Then there was the afternoon when Fisher haphazardly invited his shop employees to take an exhilarating ride on a high-speed winch being prepped for *Spiderman 2*.

> . . . professional riggers should be committed to keep up with the latest standards and proven best practices, and to learn from past mistakes.

Presenters for the panel covering "Automation and Touring. Because we can" included Bob Powers, Joe McGeough, and Jim Shumway.

"Structural Engineering. For when guessing just won't do" featured panelists Michael Nishball, Mariam Paschetto, and Bill Gorlin.

Scott Fisher, ESTA's Lifetime Technical Achievement Award recipient, gave the opening keynote address, emphasizing risk assessment and risk management.

The winch was suspended by a crane out in the shop's parking lot. One-by-one, shrieking men and women were shot into the sky at 45'/sec, just for the hell of it. Things went smoothly, no one was hurt, but later on Fisher ran a few numbers. His guts twisted. A sudden mechanical failure on the way up would have meant 19' of air, followed by gravity's swift revenge. What would the resulting shock load do to a human body strapped into a sit harness? Imagine a rag doll tied to the tip of a cracking whip. Fisher readily admitted he should have worked out all the safety issues before the test run, not after—and he should have used a tag line. Another entry went into his notebook.

The organizers delivered everything they promised: Technical knowledge, up-to-date codes and standards, and a chance to discuss the craft that we love.

With this anecdote, Fisher emphasized the concepts of risk assessment and risk management. Production rigs are rapidly becoming heavier and more complex. Artists fly through the air like endangered eagles. Massive, fast-moving props are regularly suspended over crowds the world over. With each technical advance, the potential for disaster also increases. Meticulous calculations and clearly articulated contingency plans are absolute necessities. As these systems evolve, professional riggers should be committed to keep up with the latest standards and proven best practices, and to learn from past mistakes. The consequences of negligence are too severe to let yourself relax.

During the "Ground Support Concert Rigs" presentation, we watched sobering footage of a wicked thunderhead tearing into a six-post aluminum stage at Ohio's TattooFest. The 75-mph winds whipped the audio arrays and video walls around like hapless marionettes being abused by a drunken puppeteer. How do you prepare for an incoming storm like this? Numerous facets were discussed, but among the most important: Establish direct contact with the local weather service, rather than relying on media reports. And watch your anemometer like a hawk. Jeff Reder, Co-Founder of Clark-Reder Engineering, offered a useful rule of thumb: If sustained winds get up to 20 mph, put all personnel on standby. At 30 mph, bring in the PA and video. If it hits 40 mph, evacuate the area. And before any of this happens, have an effective evacuation plan in place. Lost profits are a petty concern when faced with the possibility of lost lives. As one of the panel's engineers stated, "Our job is to make sure people walk home at night."

How to hang motors that hang motors (that hang people)

The most interesting sessions, from my perspective, were "Automation and Touring: Because We Can" followed by "Structural Engineering: For When Guessing Just Won't Do." As tour riggers, our primary task is to place the proper hoists in exact locations. It's crucial to know precisely how much force is applied by the rigging below the motor, which changes with motion, and how much strain can be safely distributed across the structure above, which changes in every city.

In an uncanny cosmic alignment, Bob Powers' tour bus passed through town just in time for him to drop in and discuss the tour rigger's role in hanging dynamic automated systems. Powers is presently traveling with equipment provided by both TAIT Towers and Flying by Foy, so he was in good company beside fellow panelists Jim Shumway, a Project Manager for the former, and Joe McGeough, Director of Operations for the latter.

All three speakers emphasized the scale and complexity of cutting-edge automation, such as the dazzling "thousand-winch" geometric hallucination that TAIT created for the Red Hot Chili Peppers in 2016. "[There are] more and more complicated systems," Shumway groaned, "and less and less competent people." This is an even graver concern when the job is to fly people.

Anyone dealing with aerial artists, McGeough stated, has to establish a clear rescue plan—and then rehearse it. "It starts with the harness," he said. "[Performers should] say something if something doesn't feel right." Once the show is underway, always be ready to spring into action. McGeough also recommended writing up a formal risk/method statement that includes safety signals, max lift height, max speed, max load, harness certification, and inspection sheets.

Bob Powers and I both cut our teeth on Fred "Fritz" Breitfelder's

New World Rigging Symposium

Held in conjunction with the USITT Conference and Stage Expo, in Ft. Lauderdale, FL

Tuesday, March 13, 2018

Keynote Address

Scott Fisher

Show Rigging on Cruise Ships. Big ideas. Tiny venues.

Presenters: Paul Riley, Royal Caribbean; Loren Schreiber, San Diego State University

Ground Support Concert Rigs

Presenters: Mike Garl, Mike Garl Consulting; Jeff Reder, Clark Reder Engineering; Jose Roche, Roc-Off Productions; Will Todd, TOMCAT USA

ANSI Standards and ICOPER. Paperwork that's actually useful.

Presenters: Tiny Good, Showtech Australia; Karl Ruling, ESTA; Bill Sapsis, Sapsis Rigging

Damn it, Jim. I'm a chain hoist, not a winch.

Presenters: Rick Montgomery, Motion Labs; Eric Rouse, Chicago Flyhouse, Inc.; Ken Tilson, Columbus McKinnon

Training, Certification, and Liability. It's a good start.

Presenters: Pete Donovan, IATSE Local One; Eddie Raymond, IATSE Local 16; and Drew Wending, PSAV

Wednesday, March 14, 2018

Automation and Touring. Because we can.

Presenters: Joe McGeough, Foy Inventerprises, Inc.; Bob Powers, PRG; Jim Shumway, TAIT Towers

Structural Engineering. For when guessing just won't do.

Presenters: Bill Gorlin, McLaren Engineering Group; Michael Nishball, Theatre Projects; Miriam Paschetto, Geiger Engineers

OSHA, Risk Assessments, and Rigging Emergency Action Plans

Presenters: Steve Adelman, Adelman Law Group; Tony Galuppi, VER; Eddie Raymond, IATSE Local 16

Hot Button Issues

The Way Forward

ground-breaking 1998 manual *Bridle Dynamics*, which emphasizes practical math skills and a sound philosophical orientation. "Every rigger out there," Powers told the audience, "has the moral responsibility to look at every aspect." He compared the rigger's function to that of a fire marshal, who holds the "red card" to say what can and can't happen on a production.

When hanging automated systems from city to city, Powers explained, there are a few key points to keep in mind. First, you have to consider the Z-axis carefully because automation tends to need max trim height. At the least, have a pre-programmed A-trim (for high ceilings) and B-trim (for low). Second, know what forces are being generated. Even with delay brakes and other dampening systems, you should expect 150% of the load. With a sudden E-stop, it could reach 300%. Load cells are critical to know exactly how much stress is being put on each hoist when elements are in motion. Third, look ahead and come to each building with your best plan.

A working knowledge of structural engineering allows a tour rigger to identify the points governing strength in a given venue, and to safely inch toward a structure's load limit. But as we approach the allowable capacity, it is advisable—and sometimes legally required—to get a professional engineer's approval. As Miriam Paschetto, an Associate at Geiger Engineers, wryly put it, "Engineers have a reputation for being killjoys [but] we provide a standard of care that can withstand the scrutiny of lawyers."

Bill Gorlin, Vice President of McLaren Engineering Group's Entertainment Division, gave a few tips to evaluate a structure: Look carefully at your show's concentrated loads; isolate the challenge to a "minimum number of elements," following load paths from span to column; inspect the building for common signs of structural vulnerability, such as rusted members, deflection, compromised welds, cracks in concrete or masonry, water stains, deformation of ceiling tiles, etc. For a great introduction to engineering concepts, I recommend Gorlin's chapter on "Structural Behavior" in *Entertainment Rigging for the 21st Century*, edited by Bill Sapsis. And when in doubt, involve a professional engineer.

A courtroom scene in the crystal ball

The "OSHA, Risk Assessment, and Rigging Emergency Plans" panel offered good reasons to document proof of due diligence. Tony Galuppi, VER's Executive Director of Rigging, keeps meticulous records for every project. His assessment policy is to rank the degree of risk according to the nature of potential hazard (e.g., falling, collision, being eaten by alligators—no joke), the persons at risk (cast, crew, public), the severity of possible injury (fatal, major, minimal), and the probability of an accident occurring. His central concern, at all times, is "life safety." In a voice darkened by raw experience, Galuppi considered the seriousness of having to explain to someone's parent, spouse, or child that their loved one has died in a rigging accident.

Special thanks to our NWRS sponsors:

Platinum:
Stage Rigging, Inc.

Gold:
J.R. Clancy and ETC

Silver:
Kish Rigging, Inc.

Bronze:
H&H Specialties
The Light Source
Motion Labs
Sapsis Rigging

AV sponsor:
PSAV

The threat of liability loomed heavy over the room. Steven Adelman, head of Adelman Law Group and Vice President of the Event Safety Alliance, painted a grim picture of the enemy. If something goes wrong, he warned, three questions will be asked: Did you have a good reason to make that decision? Did you take precautions against every conceivable danger? Did you receive proper training and seek out expert advice? But these questions won't be asked by friendly lawyers, like Adelman. No, you'll be facing "badass lawyers from a major metropolitan area." Gravity is a rigger's nemesis, but when the dust settles, it's the attorneys who'll pick the bones clean.

A powerful defense against litigation, argued Eddie Raymond of IATSE Local 16, is knowing OSHA legislation and ANSI standards up and down—and abiding by them. (See: tsp.esta.org/freestandards) One can also prove competency by way of ETCP Certification. I would add that SPRAT certification is another reliable indicator, as it requires both a verbal exam and a hands-on evaluation. As Raymond pointed out, certification actually increases skill levels by raising the bar for "high-end individuals who want to prove they know what they're doing." Having received my ETCP Arena Certification five years ago, I appreciate that the exam forces riggers to confront gaps in knowledge and to grasp the mathematics that describe a structure's reaction to heavy loads. Some mules need a stick-and-carrot to get moving. I certainly did.

The enthusiastic conversations at the New World Rigging Symposium left me with hope for the future. The organizers delivered everything they promised: Technical knowledge, up-to-date codes and standards, and a chance to discuss the craft that we love. They also evoked a deep sense of duty. That alone is worth its weight in steel. ■

Joe Allen is a rigger and fellow primate who wonders why we ever came down from the trees. He's been hanging points for a decade and a half now, and looks forward to hanging a few more.