

Midwest Power Plant Boiler Repair

Out-of-the-box thinking ensures safety while saving time

Systems™ Scaffold installed on top of a QuikDeck® suspended platform provided easy access for water wall work in the upper half of the boiler. By keeping the base clear, BrandSafway's customer was also able to safely and simultaneously repair a damaged V bottom, reducing shutdown time.

› Babcock & Wilcox (B&W), a global leader in energy and environmental technologies and services for the power and industrial markets, prides itself on the ability to provide innovative solutions for its customers. Even though no one knows the inside of power plants better — the company designed the first inherently safe water-tube boiler in 1867 — new challenges are always arising. This was definitely the case when a school-bus-size clinker damaged the V bottom of a Midwest-area power plant. However, with some out-of-the box thinking and ideas from BrandSafway, a unique solution was developed that ensured a safe operation while also saving both time and money.

The site has two coal-fired plants, each with a nameplate capacity of 697.5 MWe. Located northeast of a major city, the boiler is the third largest producer of electricity for its international owner. Following successful maintenance work at a nearby facility, Babcock & Wilcox Construction Co., LLC (BWCC), a B&W affiliate, was awarded the contract for a planned maintenance shutdown.

Primary work involved cutting out and replacing a total 3,200 square feet of boiler tubing (“water wall”) starting about 75 feet from the V bottom and extending past the bullnose. The smallest section measured approximately 6 feet by 20 feet.

Working in two places at once

“Normally, we would erect boiler scaffolding using Systems Scaffold starting in the V bottom and building up to the desired height,” said the BrandSafway manager in charge of the project. “However, BWCC also needed to replace one entire slope of the V bottom, which sustained damage when a bus-size clinker fell on it.”

Clinkers form when the noncombustible elements and minerals found in coal melt and fuse together.

“Because we wanted to work in two places at once, none of the traditional access options appealed to us,” said Larry Taylor, regional project manager, BWCC. “Installing standard boiler scaffold would have delayed tearing out the damaged half of the slope until after completing the water wall work. Because of the loads and labor required for handling the large boiler tube sections, suspending a swing stage would have been challenging and unsafe. Fortunately, the QuikDeck solution recommended by BrandSafway worked great.” ›

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BRAND SAFWAY™

At Work For You™

› The patented QuikDeck Suspended Access System uses four- and/or eight-foot joists to support plywood decking. To form a rectangle or square, joists connect to a node at each corner. Chain slots on each node provide locations to secure 3/8-inch-diameter, Grade 100 suspension chain. With chain placed every eight feet, QuikDeck has a rating of 50 psf, which was more than enough to support the load envisioned for the project.

“During an initial planning meeting, we suggested using QuikDeck to allow simultaneous work in both areas of the boiler,” said the BrandSafway manager. The plan would be to penetrate the floor of the penthouse, suspend QuikDeck from the structural elements of the penthouse and then erect six to eight levels of Systems Scaffold on top of the QuikDeck for the water wall work. Workers would access the deck through a hole cut in the wall at the proper height.

“QuikDeck in combination with Systems Scaffold worked well for us,” said Taylor. “At Babcock & Wilcox, we’re proud to have excellent engineering and construction teams that work together to meet our customers’ requirements, and the QuikDeck system proved to be an outstanding solution.”

Faster and lower costs

As part of the solution development process, BrandSafway estimated the costs for the QuikDeck/ Systems Scaffold combination and building up scaffold from the V bottom.

“I did a full quote for the boiler scaffold as part of our due diligence, and it turned out that the QuikDeck solution lowered project costs by about \$40,000,” said the BrandSafway manager.

Although QuikDeck costs more per foot than scaffolding, it can be installed and dismantled faster, thus lowering total project costs. A BrandSafway crew averaging between eight to ten people started erection on September 18, 2017, and completed installation of 24 QuikDeck sections and eight levels of Systems Scaffold so that the owner and BWCC could start water wall inspection on September 23. The crew dismantled the scaffold from November 6 to 8 and then, after the new water wall passed inspection, dismantled the QuikDeck on November 13 and 14 — 12 days ahead of schedule.

“The tear out was quite a bit quicker,” confirmed Taylor. “Another benefit was that QuikDeck doesn’t require as much labor, and that automatically reduces the potential for recordable incidents or near-misses, of which there were none on this project.”

Safe, solid platform

As with any new concept, the skilled trade workers performing the maintenance were initially skeptical of using a suspended work platform. However, Taylor explained to them how QuikDeck would create a safer, more worker-friendly solution — and they saw it was almost like a factory floor in the air.

“Once they started working on the platform, they became very comfortable,” he said. “They realized

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that QuikDeck doesn’t swing, and I think they would be very happy to use it again on their projects.”

Overall, he noted that the installation required a little bit of a learning curve, and the engineers needed to confirm how to clamp the QuikDeck suspension elements to the penthouse structure and plan out penetrations in the roof.

That said, he felt that, “Our plan worked out flawlessly. We had a good design.” ‹