A 450-foot-tall chimney at a lignite-coal-fired power plant in Texas was blasted, cleaned, lined with insulating block for corrosion protection, and inspected, all with the aid of a powered float platform custom-designed for the job. The round platform, 31 feet in diameter, provided workers with close access to the interior wall of the plant’s stack. The lining work was performed at the newly constructed power plant from September 2008 through January 2009 and from March through June 2009. As of press time, the plant is “in commissioning”—producing electricity during test runs.

The work platform, equipped with nine traction hoists and having a 13,500 lb capacity, was designed and installed by a large North American manufacturer and distributor of access and safety equipment (Fig. 1). The platform was supported by nine wire ropes connected to structural steel installed at the top of the chimney. This steel was removed once the chimney was lined. A four-foot-square access hole at the center of the work platform with an attached independent work basket allowed workers and materials to be transported from the ground beneath the platform to its topside while the platform remained at the desired work elevation. This feature was essential because the material used to adhere the insulating block to the steel interior wall of the chimney had to be mixed at ground level and quickly transported back to the platform for application.

Another key feature of the platform was its grated decking, which allowed the abrasive material to sift through the platform during surface preparation. Additional lining work was performed on the breaching duct to the stack (the extension of the duct from chimney shell to chimney flue). This section was accessed by “conventional” scaffolding.

The lining work began by controlling and maintaining ambient conditions; all the openings in the stack were closed so that work was largely unaffected by the weather, which the contractor reports included high temperatures, humidity, heavy rains, and high winds. The temperature variations were tackled with the use of high-capacity environmental control equipment, including heaters, dehumidifiers, and air conditioners. Three times per shift, temperature and humidity measurements were taken and documented using electronic equipment. Despite heavy rainfall and high winds, only one workday was reportedly lost, and that was because of lightning, according to the contractor.

Once the proper ambient conditions were achieved, the steel surface of the stack interior was abrasive blasted with red garnet size 30/60. The substrate was blasted to SSPC-SP 10/NACE No. 2, Near-White Blast Cleaning, with a profile of 1.5–2 mils. After blasting, abrasive was vacuumed from the stack interior floor, the steel substrate was cleaned using shop-vacs, and any weld seams greater than 3 mm (1⁄8 in.) were ground to avoid offset in the block installation.

After the inspection, the clean sub-
strate was primed with an etching red wash primer. The 15%-solids-containing primer was spray-applied to a wet film thickness of 5–10 mils and a dry film thickness of 0.6–1.1 mils.

Once the primed substrate was inspected, the blocks were applied using an adhesive membrane (a two-component urethane-asphalt mastic), to bond the block to the substrate. A "double buttering" technique is used, when applying the blocks. All joints, side and back joints, have a minimum thickness of ½ in. (Fig. 2). According to the company that markets it, the block is an inorganic foamed borosilicate glass block, lightweight and impermeable to acidic liquid and gasses. The total installed weight is less than 3 lb/sq ft, the lining contractor says.

An inspector from the lining contractor carried out continuous quality inspections during abrasive blasting, priming, and the block installation process. After block application, a final inspection of the lining was carried out, and any necessary repairs were done. No additional coatings were applied on the blocks (Fig. 3).

A representative from the general contractor (more precisely, the engineering procurement and construction company, or EPC) reports that the subcontracted block lining work on the stack was done well and on schedule. The lining contractor reports that the work performed from September 2008 through January 2009 was completed on schedule, but that more personnel than initially planned were required to meet the deadline; and that the work performed from March through June of this year was completed 10 days ahead of schedule.

Hadek Protective Systems (offices in Rotterdam, The Netherlands, and Pittsburgh, PA) performed the block lining work at the power plant. Spider, a division of SafeWorks (Seattle, WA), designed and installed the work platform and all scaffolding. The abrasive blasting equipment was supplied by Marco (Houston, TX). Henkel Corporation (Lester, PA) manufactures the block lining system.
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