

# HEAVY

## *Slingmax synthetic slings help lift and move* **Load** *1,000-ton inactive nuclear reactor*

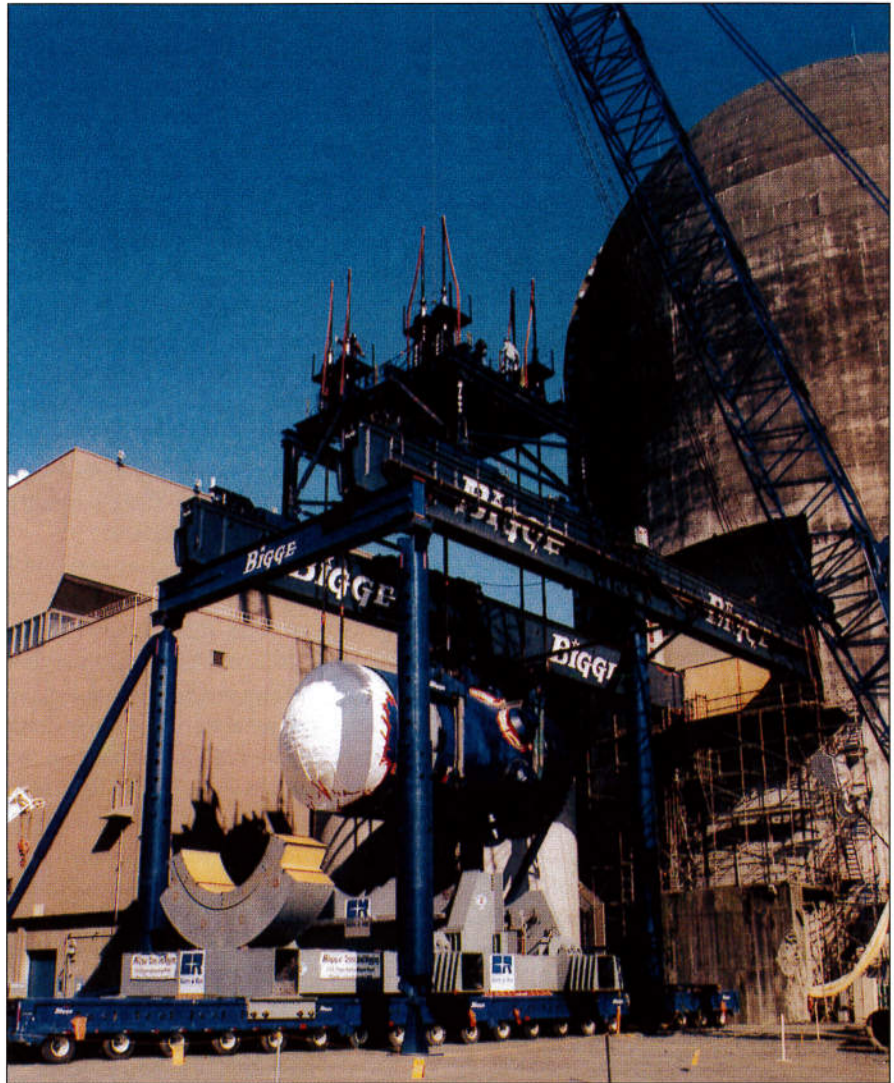
It was perhaps the heaviest load ever lifted with synthetic slings: a 1,000-ton inactive nuclear reactor. It was not only lifted, however. Last fall, the decommissioned Trojan reactor, located near Portland, Ore., was lifted and moved by land and by river to its final resting place at the Hartford Nuclear Reservation in Washington State—some 270 miles away.

This major rigging project involved multiple contractors to dismantle and, ultimately, to bury the largest inactive nuclear reactor to date using high-performance fiber slings. The reactor, owned by Portland General Electric (PGE), was first filled with concrete and encased in six-inch steel. Then, Slingmax® Twin-Path® Extra slings were used to load and restrain the Trojan reactor onto a barge for a journey up the Columbia River to its final burial site.

The reactor was lifted and lashed with Twin-Path Extra endless slings with a proprietary design of outer cover known as Covermax™, which contains double chambers of K-Spec™ high-performance fibers. Twin-Path slings, developed for heavy lifts, are well known in the nuclear industry for abrasion resistance, durability, and safety.

In addition to Slingmax, Inc., Aston, Pa., the move also involved Burns & Rowe of New Jersey, a consulting engineering company; Bigge Crane of California; Carpenter Rigging and Sling Company of California; and I&I Sling Company of Pennsylvania.

Bigge Crane, in developing the logistics of the move, requested Carpenter Rigging to determine the weight, stretch, and length of rigging materials needed to support the weight and bulk of the reactor. Some of the slings Bigge decided to use in the lift were already in



Carpenter Rigging and Sling Co. worked with Bigge Crane to lift the inactive nuclear reactor, the first step in its move to the Hartford Nuclear Reservation.

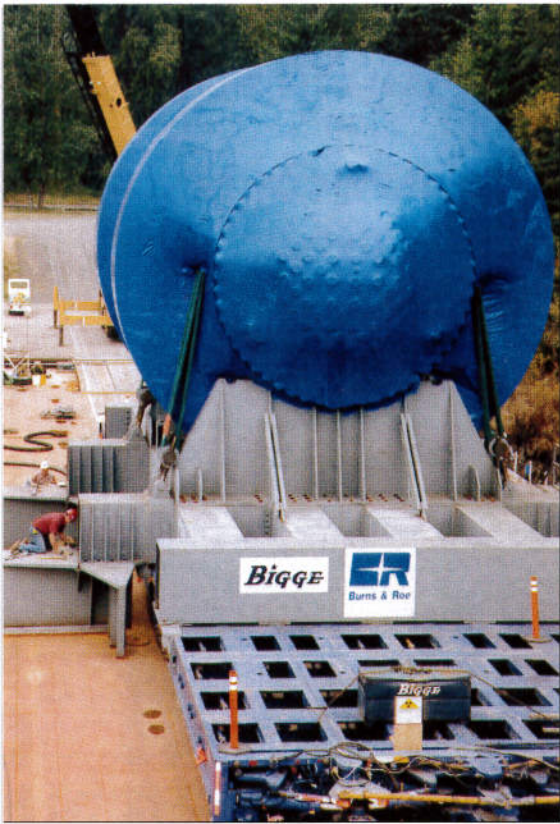
its inventory. Bigge placed the order six weeks before the slings had to be shipped to the site.

Carpenter Rigging provided additional Twin-Path Extra slings that would safely and efficiently lower the reactor from the containment building to a transporter and lift the reactor off of the trans-

porter at the burial site. Ten slings were used. Each had a 150-ton capacity and was 10 to 20 feet long. Bigge had six spare slings on-site.

“We worked from Bigge’s lift plan, which had drawings that showed fixtures and weldments that would affect the location of the slings around the





Slingmax Twin-Path Extra slings were used to load and restrain the reactor onto a barge for the trip up the Columbia River.

reactor,” said Frank Joost, general manager of Carpenter Rigging. “Reverse engineering was critical to ensure that the lengths and tolerances of the existing and new slings matched. Bigge’s confidence in our on-time delivery of the slings as specified allowed them to concentrate on other logistic details. The whole move went off without a hitch.”

Unknown to Carpenter Rigging, I&I Sling had been asked to supply Twin-Path Extra slings to Burns & Roe for the same reactor. But the slings were not for lifting it. Rather, the slings I&I Sling provided were to lash the reactor and transporter onto the barge during the river transportation.

Both sets of slings were shipped at the same time. But the process leading up to the I&I Sling order was more difficult than the one placed with Carpenter Rigging.

To satisfy PGE’s demands, Burns & Roe and I&I Sling started working two years before the shipment of the lashing slings. Because the reactor would travel by barge through populated areas, PGE and Burns & Roe audited every phase of the manufacture and testing of the Twin-Path Extra tie-down slings.

The audits began with the K-Spec fiber that composes the core yard for all Twin-Path Extra slings. Two additional break tests were required on the K-Spec fiber made at I&I Sling’s North Carolina plant. A team of auditors from PGE, Burns & Roe, and I&I Sling’s quality department witnessed these tests.

Mark Wilson, product advisor, I&I Sling, commented: “Manufacturing the slings to such rigid standards was not a problem at all because our production machinery is very precise. We also have an ISO 9001 procedure for Twin-Path sling fabrication. And we are used to the scrutiny since we have worked for more than a decade with the nuclear industry and have been audited many times.

“But the amount of paperwork that this project involved was extraordinary, especially for an order of two slings. The hard part, for me personally, was how long it took from my first

sales call on Burns & Roe until the slings were actually made.”

Then, the manufacturing process was audited at I&I Sling’s Pennsylvania plant where the slings were made. Burns & Roe, which conducted the NUPIC nuclear audit, required I&I Sling’s quality manager to develop an additional ISO 9001 procedure solely for the specifications of this lashing project. The slings also had to conform to the requirements of ANSI N-14.2, the proposed American National Standard for Truck Transport of Radioactive Materials. Two slings were manufactured: Both had 150-ton capacity and were more than 50 feet long.

Finally, the team audited Roberts Calibration of Georgia, which had calibrated and certified I&I Sling’s pull-test machine in Pennsylvania. As on all Twin-Path slings, these tie-downs were proof-tested to twice their working load.

Such challenges are not new to I&I Sling and Carpenter Rigging, which are licensed manufacturers of innovative synthetic rigging products developed by Slingmax. ■

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