

# UNDERGROUND INNOVATIONS

NEWS FROM ROBBINS



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## FIELD SERVICE ROCKS AT INDIA'S LONGEST TUNNEL

### ABRASIVE ROCK, FLOODING, AND TIGERS.

The harsh jobsite conditions and other challenges have all made tunneling at India's Alimineti Madhava Reddy (AMR) Water Tunnel a challenge like no other. The 43.5 km (27 mi) long tunnel, being excavated with two 10.0 m (32.8 ft) Robbins Double Shield TBMs, will be the world's longest tunnel without intermediate access once complete. Due to its location below India's largest tiger reserve, no surface excavation is permitted.

In total 90 Robbins field service personnel are working with the contrac-

tor Jaiprakash Associates Ltd. (JAL) at two sites on either end of the tunnel. The machines, about 12 km (7.5 mi) and 6 km (3.7 mi) into the project, will meet in the middle for disassembly.

Challenges began with abrasive rock that increased consumption of cutters and conveyor belt components on the continuous conveyor systems responsible for muck removal: "The geology consists of 60% quartzite and 40% granite. We bored through several fault zones with blocky geology. Large sections of rock caused some damage to conveyor

transfer points. We solved this problem by installing deflection plates in the transfer points to reduce the fall of the rock," said Jim Clark, Robbins Projects Manager India.

In the exceedingly difficult conditions, extensive training was also needed for the JAL crew, who had experience with Drill and Blast but not TBMs: "At the start of the project we had extensive training including TBM maintenance and operation. Typical utilization of the TBM at the start of the project was around 35%, and through the training program we increased this utilization to around 45%," said Clark.

While the obstacles at the AMR Project are not over yet--expected fault zones below a river and a 200 m (650 ft) wide bedding plane between sections of quartzite and granite lay ahead--the contractor is confident: "We are a very close knit team. Robbins is very good and professional, and whenever we have needed help, they came and assisted us with advice," said Brigadier MS Boperai, JAL Joint President.

Field Service Site Manager Pierre Claassen oversees work at AMR, where two 10.0 m (32.8 ft) Double Shield TBMs are overcoming multiple obstacles to bore the world's longest tunnel with no intermediate access.

