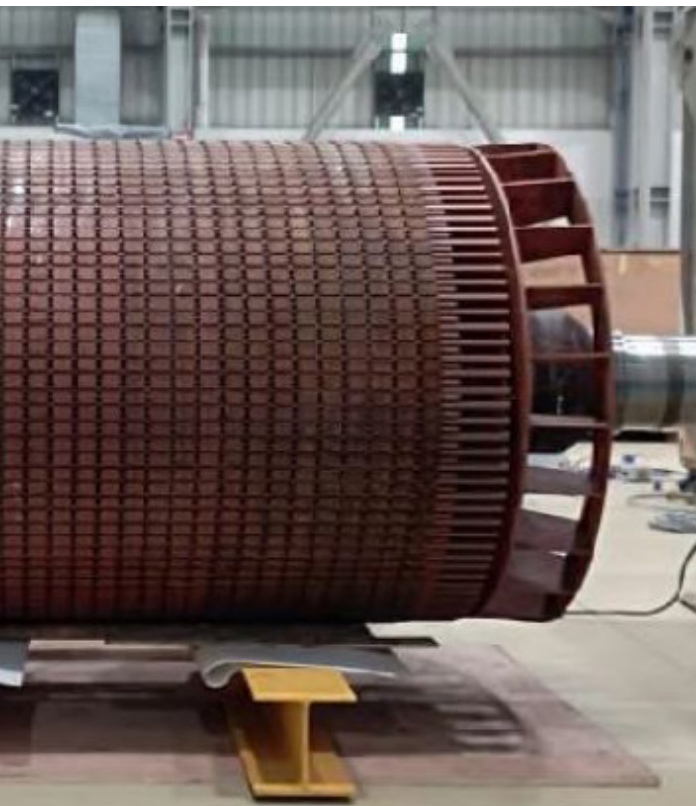


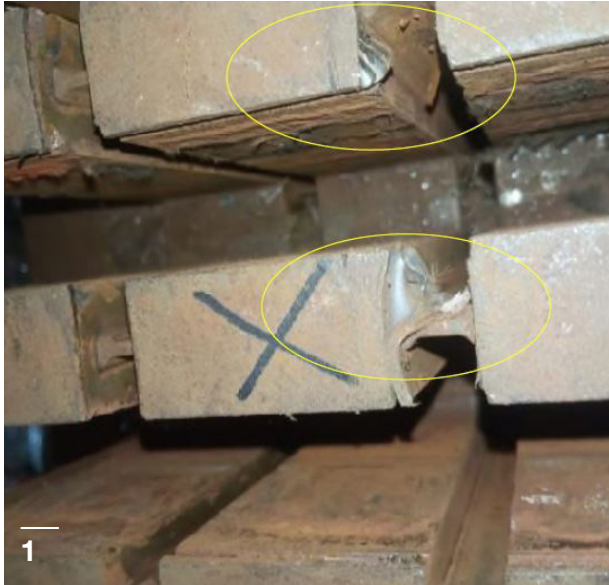
Mitigating deadly mining risks with tight motor repair turnaround

CUSTOMER	A leading international metals company
LOCATION	Papua, Indonesia
INDUSTRY	Mining & metals
KEY SERVICES	1. Motor repair 2. Parts supply



THE CHALLENGE

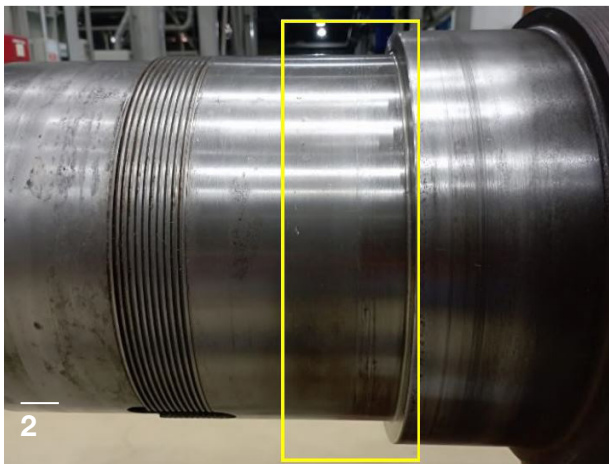
A critical equipment outage puts miners in danger



The customer mines one of the world's largest copper and gold deposits in the Grasberg minerals district in Papua, Indonesia. Its underground tunnel mine operates over 500 kilometers below ground – quite a journey, considering that you'd need to run the equivalent of **12 full marathons** to reach the bottom.

Fresh and constant airflow is crucial to keep miners working at such perilous depths safe. This is achieved through fans powered by high-voltage electric motors, which pump air from the surface down into the mine shafts. So when one of P.T. Freeport's fans short-circuited, we knew we had to act quickly. Key challenges included:

- A Megger test conducted on the IR stator winding failed.
- Several stator winding coils had burned.
- The 5,000 kW Toshiba fan motor was dusty and severely corroded.



1. Stator core

2. Bearing

3. Outer cap

THE SOLUTION

Fast-acting repair returns airflow to hazardous underground mines

The customer requested an expedited repair due to the critical nature of the equipment. We agreed and committed to a repair timeline of four weeks and three days (including time to conduct a test run without load), initially suggesting a maximum of 6 weeks. Moreover, we instilled trust and confidence in our customer by demonstrating our status as a Toshiba Authorized Service Provider in Indonesia.

Acquiring necessary parts (including DE/NDE bearings and seals) under such a tight deadline proved challenging, but our team were able to quickly source these from local vendors without any delay or impact to the project timeline:

- The mine supplied Sulzer with new Resin rich coils, RTDs, lead cables, and an ancillary winding kit.
- The customer collaborated with Sulzer teams to deliver the motor to Sulzer's workshop at least two weeks before the new coils and ancillary winding kits arrived, expediting the process and enabling engineers to seamlessly complete their tasks without delays.
- Sulzer included additional double shifts for its team members in the project scope to expedite the workflow.

We conducted visual and technical inspection upon the motor's arrival, identifying significant corrosion, light rubs, scuffing, and missing parts. Motor components that required attention were:

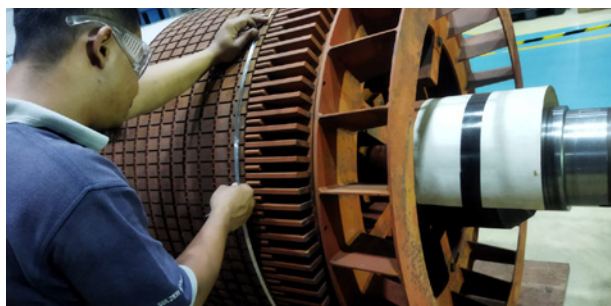
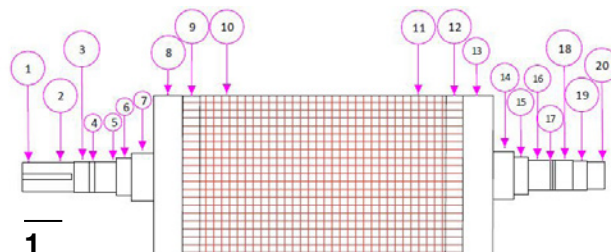
- The rotor, which exhibited minor damage and required polishing.
- The stator, which needed a thorough cleaning and rewind
- The bearings and seals, which needed to be replaced due to wear and tear.
- The fan blades, which required cleaning and repainting.

After the initial inspection and repairs were completed, we re-assembled the motor and ran a no-load test before repackaging. The motor was shipped and delivered within our agreed time frame.

1. Rotor assessment

2. EM shop

3. Stator works



THE CUSTOMER BENEFIT

Thanks to Sulzer's fast-acting repair and expert mitigation strategies, **the mine operator** maintained safe working conditions for its underground miners and experienced no critical downtime throughout its operations.

During our motor inspection and repair process, **the customer** visited our shop facilities in Purwakarta. Upon their arrival, the customer made it clear: our excellent facilities and state-of-the-art repair processes had given them complete peace of mind. They knew their motor was in expert hands.

Had the customer gone for an equipment replacement, the cost difference would have been 2.5 times of the repair cost at 60%, with a much longer lead-time of 6 months.

Given our expertise and adherence to their stringent deadline, our client agreed to open other contracts for projects in the highland area in vicinity, both for surface and underground mines. Despite having its own electrical repair facility and vendors, **the customer** has decided to send new projects out to Sulzer given our rapid response time, extensive access to critical equipment, and depth of experience.



Refurbished

PROJECT KEY FACTS

EQUIPMENT CAPACITY

5MW

REPAIR LEAD TIME REDUCTION

150 days

COST SAVINGS COMPARED TO NEW CAPEX

60%

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