

400kV Restoration Withstands Flooding Advanced Planning Anticipated Effects of River Flooding

Restoration Summary

Line	400kV AC Double Circuit
Conductor	Twin Bundle MOOSE
Time to Restore Circuit*	4 Days
No. of ERS Columns Erected	13
Soil Conditions	Normal, wet
Types of Anchors Used	Manta-Ray, Concrete Block

*After ERS material arrived at site

Powerlinks Transmission Limited operates and maintains power transmission lines in India. The company operates five double circuit transmission lines of 400 KV covering 1,166 Kilometers.

In July 2010 a strong storm cause the collapse of four, double-circuit 400kV AC suspension towers using twin-bundle Moose ACSR (500mm²) conductor on Powerlinks’ Sliguri-Purnea transmission line.

Contractual obligations related to downtime and line availability mandated the line be placed back in service as quickly as possible.

Powerlinks’ engineers determined 13 of Lindsey’s Series-600L ERS structures were needed to bypass the collapsed towers. See Figure 2.



Figure 1. ERS Structure after flooding of the Patna River

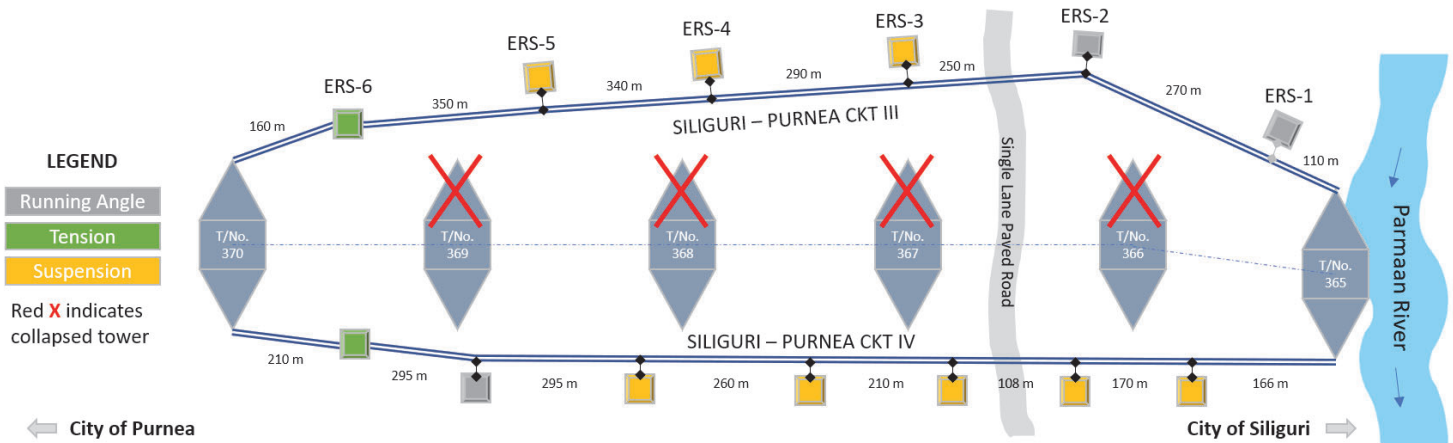


Figure 2. ERS Restoration Scenario for 400kV Siliguri-Purnea Circuits III & IV Transmission Line

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The Challenge:

Complicating the restoration was the proximity of the Parman River. Due to the storm, flooding of the river was anticipated. This would result in erosion of the riverbank, and eventual submersion of one or more ERS tower's foundations. To secure the structures, Powerlinks' crews used a combination of concrete block (See Figure 3) and Manta-Ray anchors to support and reinforce each other.



Figure 3. Concrete block anchors after fabrication on-site

Results:

As feared, the river did overflow its banks. The resulting flooding of the foundations and submersion of the anchors took place without incident. See Figure 1. After the flooding subsided, inspection showed the foundations remained in place and the anchors remained intact. See Figure 4.

Figure 5 shows the restoration looking towards the Purnea end of the line. The complete restoration effort took a total of 4 days to complete. The ERS towers stayed in service for approximately 3 months.

For more details on this restoration, or for more information on Lindsey Emergency Restoration Structure (ERS) systems, contact your local Lindsey representative or email us at

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Figure 4. After flood waters receded, examination of the ERS foundations showed them intact.



Figure 5. Two tension ERS structures pick up the two 400kV circuits from Tower 370 (looking west toward Purnea)