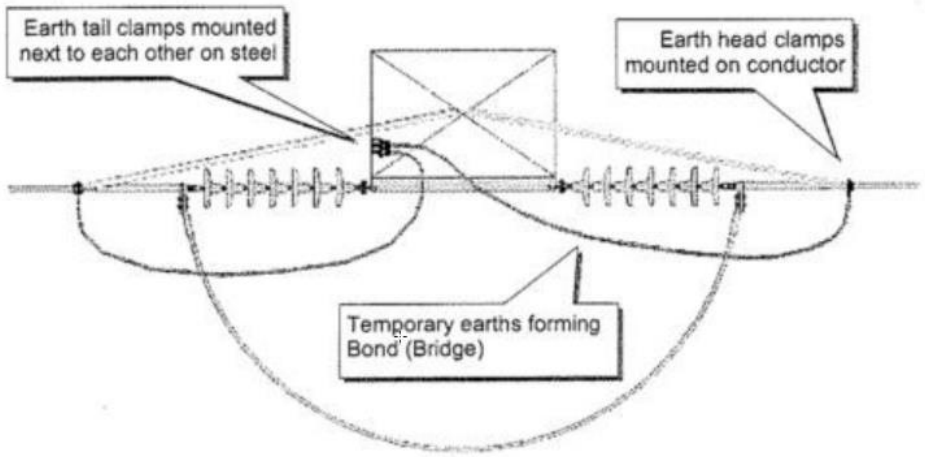
Worker Received Induction Electric Shock (LL266)

Incident	Description	
Event Date: 25/11/2024	**Time:** 3.37 PM	**Location:** Tamarangi Drive, Kawerau
NP Reference / External Reference: OCC14660. Maximo: 176449		

What happened?

A Northpower transmission lines team was tasked with re-insulating and replacing dead ends on a transmission structure. The team accessed the structure from both sides using man cages. Earths were applied on both sides of the structure, outside the dead ends, forming a bridging bond across the jumpers in accordance with Northpower procedures (see image below). However, the last jumper was incorrectly made and installed at an incorrect length.

When a line mechanic unbolted his side of the conductor jumper to remove it, he received an electric shock. This occurred because the line mechanics working on the opposite side of the structure, under the mistaken belief that the job was complete, had already removed their earths. This action broke the bridging bond across the jumpers, disrupting the equipotential zone (EPZ) and creating a dangerous situation for the line mechanic.



What could have happened?

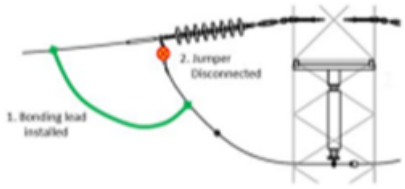
The **ACTUAL** consequence of this incident resulted in the Northpower employee receiving an electric shock due to induction. Precautionary medical checks were carried out clearing the worker unharmed and fit to return to work. The **POTENTIAL** consequences could have resulted in significant harm.

What did we find?

- The earth also acting as a bridging bond was removed out of sequence due to miscommunication.
- EPZ was not clearly understood by the employee who removed the portable earth, with varied levels of understanding within the wider Northpower lines team and potentially the industry.
- Communication issues due to the lack of working headsets available onsite.
- Northpower's Jumper Installation and Maintenance (PEW) Procedure did not include bonding earth directly across the bolted connection as an additional safety measure. And the customer service spec lacked clarity regarding jumper removal and associated bonding requirements.
- The addition of a short bridging bond across the bolted connection would have protected the worker from receiving a shock.

Actions:

- Northpower procedure was amended to include using a bridging bond between the main conductor and the jumper, directly across the bolted connection, before breaking the jumper and rolled out to workers before work recommenced.



- Recommendation to customer to review and clarify service spec and table best practices when removing jumpers at the National Lines Forum.
- Provide all workers required to work overhead with headsets, an effective storage system and reinforce the use of radio headsets when performing overhead works.
- Engage an industry subject matter expert (SME) to undertake earthing and bonding refreshers on a biennial basis (every 2 years).

Supporting References:	*TP. SS 07.23 Worksite and mobile plant temporary earthing and equipotential bonding of transmission lines.* *Northpower' Jumper Installation and Maintenance (PEW) Procedure*
For more information:	Jared Fowler, Operations Manager, Transmission Lines