

The causes of darkness

The failure of an aerial high-tension cable caused a 20-hour blackout involving 1500 families, with damages over 2,000,000 Euros. Our meticulous technical expertise found the cause and the solution to the problem.

In Brief

The Problem:

The catastrophic failure of a high-tension wire

1500 families and numerous industries left without electricity for over 20 hours

Damages for over 2,000,000 Euros

The Challenge:

Find the cause of the failure

The Results:

Cause found: fretting between the cable wires due to oscillation caused by the wind generated mechanical fatigue failure.

The oscillation was diminished by applying dampers. **No more failures.**

Every year the loss of productivity, time and money as a result of unforeseen mechanical failures amounts to hundreds of millions of Euros; fractures add to both the price of a component and to the overall costs due to its consequences.

We have the expertise to locate the exact causes of failures and give you the necessary answers to make sure it will never happen again.

All of your doubts will vanish into thin air after you read about the following Case History of a blackout involving 1500 families and numerous industries, with over 2,000,000 Euros worth of damage.

The failed item was an aerial high-tension cable made up of 5 rings of aluminium alloy wires.

Both visual and Scanning Electron Microscope (S.E.M.) analyses showed the presence of:

- Numerous fractures in the fourth and fifth rings
- Dark-coloured debris
- Oval spots on the fourth ring
- A typical fatigue fracture surface emanating from the oval spots.

The chemical analyses and mechanical testing evidenced that:

- The debris was made of aluminium oxide
- The wires were up to standard
- The failure could not have been due to construction flaws.

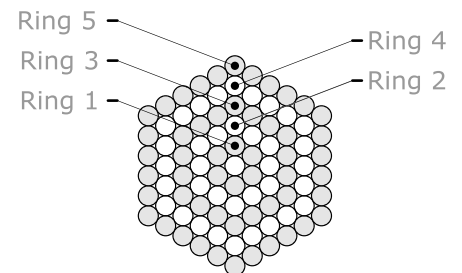
The morphology of the damage along with the test results pointed to the following conclusion:

• The failure was definitely due to fretting between the wires of the fourth and fifth rings

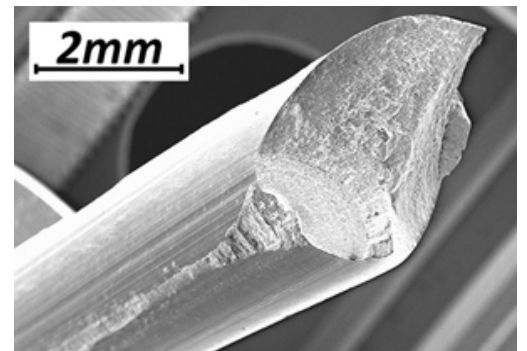
- The fretting induced a wear-and-tear effect on the wires, creating the debris and the oval spots from which the fracture spread

- The fretting was due to oscillation caused by wind hitting the high-tension wires.

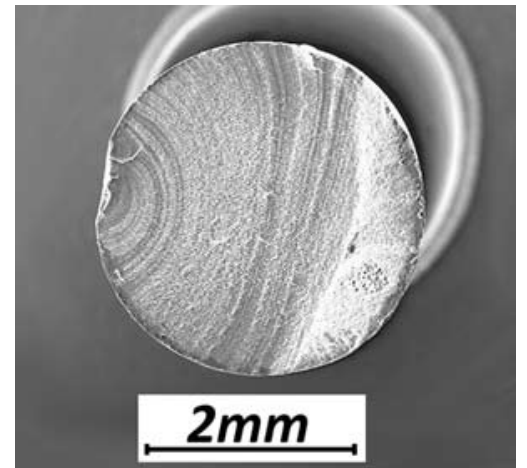
We found the cause of the fracture and set up corrective measures. A number of dampers were applied to the high-tension wires in order to limit oscillation. No failures ever occurred again.



Visual analysis of the cable – the oval spots made by fretting are evident.



Fracture surface – the cracking emanating from the oval spot is evident.



Fracture surface – typical morphology of fatigue fractures.

Don't wait for a fracture to happen..solve your problem now!
Call us at 02/23998225 or visit our website at **www.fa-fe.com**



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