



Photo credit: Tess  
Brunton RNZ

## NZ Police's Tornado radio network withstands direct hit from cyclone

New Zealand Police





When Cyclone Gabrielle struck the east coast of the North Island of New Zealand in 2023, the NZ Police's Tornado voice backhaul network was put to the test as cell and fiber connectivity was lost.

## SITUATION

As the Cyclone neared New Zealand in February 2023, emergency services were prepared that the impact would be felt along the eastern coast of the North Island.

Fifty-five hours of intense rain led to severe flooding occurring across the region. While life-threatening on their own, the floods also had a double impact by pushing forestry slash down rivers, taking out bridges and destroying the roads which carried the fiber network alongside.

Cyclone-strength winds downed trees, which in turn knocked out power lines, impacting nearby cellphone towers which typically only have battery backup to cover blackouts lasting a few hours. For those cellphone sites which did retain power, connectivity was lost when the fiber backhaul was severed.

With roads destroyed across the region, some of NZ Police's sites could also only be accessed by helicopter – a daunting exercise when faced with cyclone-force winds.



*"These failures with phone connectivity, data circuits and the cellular networks meant that communications-wise, the Eastern Districts were entirely cut off."*

RICHARD HUTCHINSON | INFRASTRUCTURE ENGINEER, NZ POLICE



With three radio links operational in the region where the heaviest rains made landfall, and another three links in areas of extremely high winds, the MimoLink™ voice backhaul network was subject to extreme weather that downed trees, created landslides and washed-out roads and bridges.

## CRITICAL COMMUNICATIONS IMPACT

At the peak of the communications blackout during the three-day event:

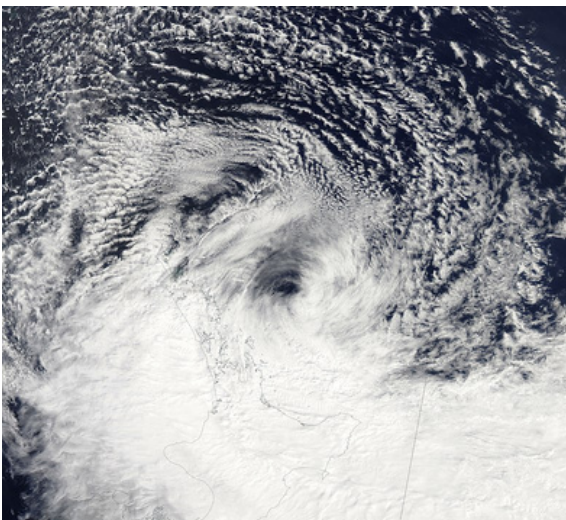
- There were 272 cell sites down in the region resulting in zero cellphone coverage in Gisborne/East Cape area and no ability to call 111 (emergency services), even from landlines
- NZ Police radio repeater sites were running on backup battery and generator power
- Some sites could only be accessed by helicopter — a challenging prospect with cyclone-force winds blowing
- Power was out for several days, meaning cell service could not be restored

## RESULTS

The Tornado links continued to operate as designed - no regional Police or Fire LMR services were impacted.

Despite winds registering 140–150 km/h in some locations, the antennas in the MimoLink network held firm. This was the result of a reasonable degree of effort going into the bracing during antenna installation with an aim to “design for the worst”.

Furthermore, with power out for a number of days, the radio supply voltage indication on the status page for each Tornado radio was also used as a window into the status of the grid in that locality.



### THE SUB 1GHz WEATHER ADVANTAGE

The radio standards organizations, ITU and TIA, both indicate that links below 1 GHz can reasonably ignore rain events unless the links are very long or the rain is extremely heavy.

With some areas of Hawke's Bay receiving 600% of their normal February rainfall over the course of 55 hours, the Tornado radio network was rigorously stress-tested for rain-induced fading with no impact on performance.

*“When full connectivity was restored the status pages showed that the Tornado links had operated as designed with few, if any, errors.”*



Ubiik develops private wireless communications solutions for utilities, oil, mining, governments and public safety which enhance visibility and control - right to the edge of our customer's networks.

Our award-winning MimoLink™ radios utilize Multiple Input, Multiple Output (MIMO) technology combined with full duplex communications and ultra-low latency to provide our customers with communications solutions which optimize data throughput and provide rapid feedback and control of their mission-critical assets.

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