Impact of the 3G Shutdown on Mobile Reception for Cooling Tower Controllers & Plant Rooms

Overview

In late 2024, all major Australian telecommunications providers shut down their 3G networks, leaving 4G and 5G as the only mobile network options. While this transition allows for faster data speeds and improved network capacity, it has also introduced challenges, particularly for devices operating on rooftops and in plant rooms.

The 3G shutdown has significantly impacted data connectivity in locations such as cooling towers and plant rooms. While mobile infrastructure and resources have shifted from 3G to 5G, the 4G network remains largely unchanged—except for the critical drawback of losing 3G fallback, which previously provided better coverage in challenging environments. As a result, areas that once had stable connectivity may now experience weaker or no signal.

Key Factors Affecting Signal Reception

1. Changes in Frequency Bands

- 3G operated on lower frequencies (e.g., 850MHz), which provided better penetration into buildings and underground spaces.
- 4G generally operates on higher frequencies (e.g., 700MHz, 1800MHz, 2100MHz, and 2600MHz). While the 700MHz band offers better building penetration, 4G does not always operate on a fixed frequency, and network conditions may cause devices to connect to higher bands with reduced penetration.
- Mobile base station antennas are optimized to provide coverage where people are—on the ground or inside buildings. However, cooling towers on rooftops may now fall outside these optimal coverage areas.
- Signal interference from obstacles such as metal structures, chicken wire bird screening, high concrete walls, and other materials that absorb or reflect higher-frequency signals can further reduce reception.

2. Mobile Base Station Antenna Directions

- Many mobile towers previously had dedicated 3G antennas oriented to cover specific areas, including hard-to-reach locations.
- With the 3G shutdown, some of these antennas were decommissioned or repurposed for 5G, leading to changes in coverage patterns for 4G that may not match previous 3G reception.

3. Impact on In-Building Repeaters and Signal Boosters

- Many existing signal boosters and repeaters were designed for 3G frequencies and are now ineffective.
- Legacy 3G boosters no longer amplify any usable signal, meaning sites that relied on them may experience complete signal loss.

Solutions to Restore Connectivity

1. **Use External Antennas**
    - Installing high-gain directional or omni-directional antennas on modems and controllers can help improve reception, especially in rooftop or basement locations.
    - However, higher-gain antennas require precise positioning, and in some cases, a lower-gain antenna (such as a puck antenna) may provide more stable performance.

2. **Install a 4G Signal Booster**
    - If your site previously relied on a 3G booster, replacing it with an **ACMA-approved** 4G signal repeater can help improve reception.
    - Ensure that any booster used complies with Australian regulations to avoid interference with network providers.

3. **Consult an Antenna Professional**

Conclusion

Understanding these changes and implementing the right solutions—such as external antennas, 4G signal boosters, or wired connections—can help restore reliable communication and ensure uninterrupted monitoring and control of your systems.

For assistance in upgrading your system or finding the best connectivity solution for your site, please contact our support team.