

White Paper

Direct-to-Cell Satellite Technology

Current Commercial Capability in Australia & New Zealand

Is it Ready to Replace Dedicated Satellite Safety Systems for Lone and Remote Workers?

A technical assessment of emerging Direct-to-Cell satellite services compared with purpose-built remote worker safety systems



"In lone worker safety, the question isn't whether a message can eventually be sent. The question is whether help can be alerted, coordinated and dispatched quickly when every minute counts."

Guardian Angel Safety
July 2026

Executive Summary

The emergence of Direct-to-Cell (D2C) satellite services has generated significant interest amongst organisations seeking to improve communications for lone and remote workers. Services being introduced by providers such as Starlink, in partnership with mobile network operators, promise to extend mobile phone connectivity beyond traditional cellular coverage without requiring dedicated satellite devices.

For many organisations, the potential benefits are obvious:

- Staff already carry mobile phones.
- Hardware costs may be reduced.
- Users require less training.
- Satellite messaging becomes available without purchasing dedicated satellite devices.

These developments represent one of the most significant advances in satellite communications in recent years.

However, an important distinction is often overlooked.

Direct-to-Cell is a communications technology. It is not, by itself, a complete lone worker safety system.

Protecting workers operating in remote environments requires far more than the ability to send or receive a satellite message.

Effective worker protection relies on a combination of reliable communications, automated incident detection, welfare monitoring, geofence monitoring, continuous location awareness, structured emergency workflows, escalation procedures and professional incident management.

This paper examines the capabilities of current Direct-to-Cell services available in Australia and New Zealand and compares them with purpose-built satellite safety systems to help organisations make informed decisions when reviewing their remote worker strategies.

1. Why Direct-to-Cell is Generating Interest

Remote worker technology has traditionally required dedicated satellite devices operating on networks such as Iridium.

The arrival of Direct-to-Cell changes this model by allowing compatible smartphones to communicate directly with satellites when terrestrial mobile coverage is unavailable.

The concept is compelling.

Instead of carrying a dedicated satellite communicator, workers may eventually be able to rely on the phone already in their pocket.



For organisations managing hundreds or thousands of workers, this naturally raises an important question:

Can Direct-to-Cell replace dedicated satellite safety systems?

The answer depends entirely on what problem the organisation is trying to solve.

If the objective is simply enabling workers to send and receive messages outside cellular coverage, Direct-to-Cell represents an exciting step forward.

If the objective is ensuring an injured worker can reliably summon help and that help is coordinated as quickly as possible, the assessment becomes considerably more complex.

2. Communication Technology vs Safety System

One of the most common misconceptions surrounding Direct-to-Cell is assuming that satellite communication alone constitutes a complete worker safety solution.

It does not.

A communications system enables information to move between two locations.

A safety system is designed to identify incidents, coordinate emergency response and manage worker welfare before, during and after an incident occurs.

Purpose-built lone worker systems typically provide:

- Automated welfare monitoring
- Scheduled check-ins
- Continuous location tracking with breadcrumb trails
- Geofence monitoring
- Emergency escalation workflows
- Professional 24/7 monitoring
- Incident audit trails
- Integration into organisational emergency procedures
- Management visibility of field teams

These capabilities extend well beyond satellite messaging.

In lone worker safety, the question is not simply whether a message can eventually be sent. The question is whether an emergency can be communicated reliably, delivered in a timely manner, and acted upon immediately under the conditions in which the incident occurs.



When evaluating technology, organisations should distinguish between communications capability and worker safety capability. While both may be operationally important, the performance expectations during a life-threatening emergency are fundamentally different.

3. Understanding Direct-to-Cell Technology

Direct-to-Cell enables compatible mobile phones to connect directly with satellites when outside terrestrial mobile coverage.

In Australia and New Zealand, these services are currently delivered through partnerships between mobile network operators and satellite providers.

Current deployments primarily support messaging services, with voice and higher-bandwidth capabilities expected to evolve over time.

The technology continues to mature rapidly, with improvements expected in:

- satellite numbers
- network capacity
- message delivery times
- handset compatibility
- future voice capability
- future data capability

However, future capability should not be confused with today's operational capability when making safety-critical decisions.

While the future potential is significant, current operational capability remains dependent on several factors including compatible devices, battery life, carrier participation, available spectrum, satellite visibility and network availability.

4. Current Operational Considerations

Organisations evaluating Direct-to-Cell should consider how the technology performs under real operational conditions rather than ideal laboratory scenarios.

Satellite selection

Current smartphone implementations generally prioritise terrestrial cellular service whenever it is available.

Where weak or intermittent cellular coverage exists, users may be unable to manually force their phone into satellite mode, potentially preventing the device from establishing either a reliable cellular or satellite connection.

This can be particularly relevant in fringe coverage areas where neither cellular nor satellite communications perform optimally.

Sky visibility

Like all satellite communications, Direct-to-Cell requires adequate visibility of the sky.

Terrain, dense vegetation, buildings and deep valleys may reduce communication performance.

Iridium's cross-linked satellite constellation provides continuous global coverage, subject only to normal satellite visibility limitations such as dense overhead obstruction.

If an injured worker cannot relocate to obtain better visibility, timely Direct-to-Cell communications may become difficult or impossible.

Figure 1. Different satellite architectures designed for different operational purposes



Starlink Direct to Cell



Iridium

Consumer device considerations

Unlike dedicated safety devices, smartphones are designed primarily as consumer communication devices.

Battery performance varies considerably depending on applications running, screen use, environmental conditions and charging practices.

Purpose-built safety devices are typically ruggedised (often IP67 or higher), designed for extended field operation and optimised for harsh environmental conditions.

Service maturity

Direct-to-Cell technology continues to evolve rapidly.

Its future capability is expected to expand significantly.



However, organisations should distinguish between future roadmap announcements and currently available operational capability when making safety decisions.

5. Purpose-Built Satellite Safety Systems

Purpose-built satellite safety systems have been developed specifically for remote and high-risk workers.

Rather than focusing solely on communications, these systems are designed to support the complete incident lifecycle.

Typical capabilities include:

- independent satellite connectivity
- dedicated SOS activation
- store-and-forward messaging
- scheduled welfare monitoring
- automated missed check-in alerts
- continuous breadcrumb tracking
- geofencing with entry and exit alerts
- optional professional monitoring centres
- structured emergency escalation
- full audit records
- Organisation-wide visibility of field teams through live mapping dashboards

These systems are designed not only to identify that something has gone wrong, but also to support the coordination of an effective emergency response, including during widespread weather or disaster events.

6. The Safety Workflow

The critical question is not simply whether a worker can send a message.

The more important question is:

How does help actually reach an injured worker?

A complete safety ecosystem typically consists of multiple integrated stages.



The diagram in *Appendix B* illustrates how these stages combine to form a complete professional lone and remote worker safety ecosystem.

1. Incident occurs.
2. Multiple automated triggers identify a potential emergency.
3. Location and incident information are transmitted through an independent satellite network.
4. Alerts are delivered automatically into monitoring software.
5. Professional operators or designated in-house responders immediately begin incident management.
6. Emergency contacts, supervisors and emergency services are coordinated according to documented response procedures.

Throughout the incident, authorised responders and managers maintain visibility of the worker's location and continue coordinating assistance until the situation is resolved, with a full audit trail.

This workflow significantly reduces reliance on human memory, manual processes and individual decision-making during stressful situations.

7. Failure Mode Analysis

One useful method for evaluating worker safety technologies is to consider what happens when something goes wrong.

Examples include:

- the worker becomes unconscious
- the worker cannot move
- the mobile phone is damaged
- the worker suffers a fall and the phone is no longer accessible.
- the battery is flat
- the Incident occurs in fringe cellular coverage
- severe weather disrupts terrestrial infrastructure
- multiple workers require assistance simultaneously

The more a safety system relies on manual intervention by the worker or their colleagues, the greater the potential for critical failure during high-stress incidents.

Purpose-built safety systems seek to minimise these failure points through automation, continuous monitoring and structured escalation.

8. Operational Risk Considerations

When selecting technology, organisations should consider operational capability beyond emergency communications.

Questions may include:

Can managers see where workers are located during a severe weather event?

Can the organisation identify workers who have missed welfare checks?

Can incidents be reconstructed for investigation purposes?

Can emergency procedures be consistently followed regardless of which manager is on duty?

Can multiple incidents be managed simultaneously?

Can compliance activities be demonstrated through auditable records?

These operational capabilities often become increasingly important as organisations grow and risk profiles become more complex, or in organisations such as councils where workers undertake a wide variety of tasks across diverse environments and risk profiles.



9. Health and Safety Considerations

Across Australia and New Zealand, organisations have a duty to take reasonably practicable steps to protect workers.

While legislation does not prescribe specific technologies, organisations should be able to demonstrate that their chosen systems are appropriate for the risks faced by their workforce, and include an effective means of communication appropriate to the level of risk.

When assessing worker safety technologies, considerations may include:

- reliability
- communication capability during an incident, including whether the worker is physically able to access and operate the device
- incident detection



- emergency coordination
- monitoring
- auditability
- operational resilience

Technology selection should always be based on the specific hazards, operational environment and organisational/role risk profile.

10. Where Direct-to-Cell Fits

Direct-to-Cell represents a significant advancement in satellite communications and is likely to become increasingly valuable as coverage and capability continue to mature.

It is well suited to applications such as:

- recreational users
- occasional remote travel
- communications backup
- extending mobile coverage
- supplementary resilience

For organisations managing high-risk lone or remote workers, current Direct-to-Cell services are generally best viewed as one component of a broader worker safety strategy rather than a complete replacement for dedicated monitored safety systems.

Conclusion

Direct-to-Cell satellite technology represents one of the most exciting developments in remote communications in decades.

Its future potential is considerable.

However, communication capability alone should not be confused with a complete worker safety solution.

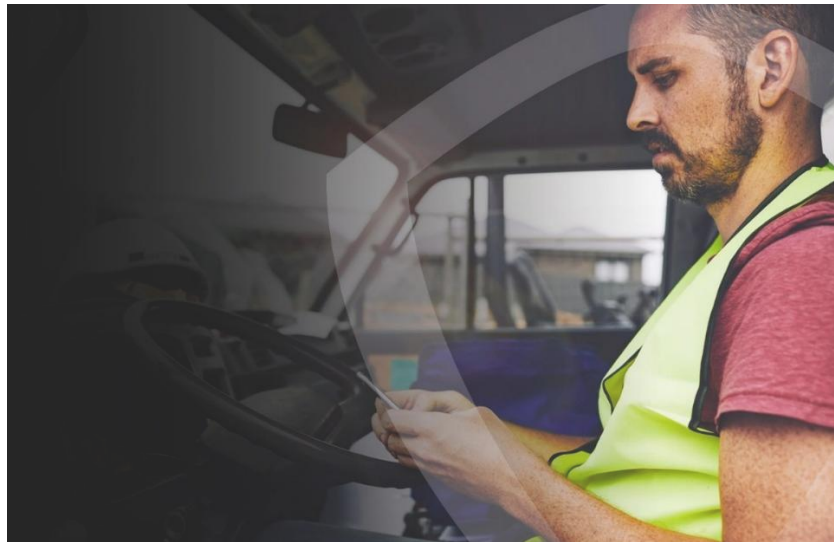
When evaluating technologies, organisations should consider not only whether a worker can communicate, but also how incidents are detected, how emergency response is coordinated, how worker welfare is monitored and how organisational safety obligations can be demonstrated.



GUARDIAN ANGEL SAFETY

For many remote and high-risk operational environments, purpose-built satellite safety ecosystems currently continue to provide capabilities that extend well beyond satellite messaging alone.

Ultimately, organisations are not purchasing satellite communications—they are investing in the ability to get help to an injured worker as quickly and reliably as possible.



About Guardian Angel Safety

Guardian Angel Safety is an Australian and New Zealand specialist in lone and remote worker safety with 12 years experience across a broad range of industries. We provide independent advice, purpose-built safety technologies, implementation services, staff training, API integrations and optional 24/7 monitoring to help organisations protect workers operating in challenging environments whether remote out of cell cover, or high risk in cell cover.

Because we support multiple satellite and cellular safety platforms, our recommendations are based on operational requirements rather than a single technology vendor.

For more information:

info@guardianangelsafety.co

www.guardianangelsafety.co

AU: +61 7 4800 0011 NZ: +64 9 480 0860

Following pages:

Appendix A – Compatibility comparison

Appendix B – Typical Workflow comparison



Appendix A – Capability Comparison

The comparison below reflects commercially available Direct-to-Cell services in Australia and New Zealand as at July 2026. Future capabilities may evolve as networks, carrier partnerships and supported services mature.

Capability	Direct-to-Cell	Purpose-Built Satellite Safety System
Satellite communications	✓	✓
Dedicated SOS hardware	Mobile phone dependent	✓
Continuous breadcrumb tracking	No	✓
Automated welfare checks	No	✓
Geofence monitoring	No	✓
Automated alert delivery to a monitoring platform	No	✓
Integration with monitoring workflows	No	✓
Professional or inhouse monitoring	No	Optional
Structured emergency workflows	No	✓
Incident audit trail	Limited	✓
Designed for harsh environments	Consumer device	Purpose-built device
Extended battery life	Consumer battery	Field-optimised
Multi-worker operational dashboard	Limited	✓
Disaster and weather event coordination	Limited	✓
Store and Forward Messaging	No	✓

Appendix B – Emergency Response Workflow Comparison

Direct-to-Cell vs Professional Lone & Remote Worker Safety Ecosystem

