

ACMA compliance priority 2019–20

Interference and licensing compliance— licensing integrity: 400 MHz band

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Executive summary

The purpose of this compliance priority was to determine the level of unlicensed or non-compliant activity in the 400 MHz band in Adelaide and Perth.

It builds on the 2018–19 400 MHz band licensing integrity compliance priority, which focused on Melbourne, Sydney and Brisbane. The 400 MHz band spectrum is characterised by very high demand in high-density areas and supports local communications for a wide variety of uses, including government and emergency services, as well as industries such as transport, logistics, construction and service industries. Unlicensed and non-compliant use of the band has a high potential to undermine the utility of the band through congestion and interference to licensed services.

The ACMA's fixed-site monitoring system in Adelaide and Perth was used to monitor a broad range of frequencies within the 400 MHz band. The monitoring was then focused on a subset of those frequencies that showed significant activity.

The results of the fixed monitoring program did not produce indications of any significant non-compliance in the band. However, a small number of interference issues were identified, and a proportionate field response was developed in April 2020. As the field response requires interstate travel by field staff, this work will be undertaken following the lifting of travel restrictions imposed due to the COVID-19 pandemic.

The monitoring and signal analysis undertaken, together with analysis of reactive interference diagnosis tasks, show low levels of non-compliance in the 400 MHz band. In future, 400 MHz band licensing integrity will be managed as part of the ACMA's standing capability to undertake interference diagnosis and rectification by the field operations team.

The ACMA has separately considered the arrangements for the transition of services in accordance with the [400 MHz band plan](#) and agreed arrangements to manage the conclusion of that transition process. That work is not in scope of this compliance priority.

Background

The 400 MHz band supports local communications for government and emergency services, as well as many industries that require communications as part of their operations, such as transport, logistics, construction and service industries.

The purpose of this compliance priority activity was to establish the level of unlicensed operation in the 400 MHz band in Adelaide and Perth because of:

- > licensees continuing to operate when licences have expired
- > the operation of low-cost, non-compliant imported radios.

This work was a continuation of priority compliance work undertaken in 2018–19 in Melbourne, Sydney and Brisbane. The addition of an assessment in Adelaide and Perth was undertaken to provide a comprehensive view of the level of significant non-compliance in the 400 MHz band across the major capital cities of Australia.

The initial focus on licensing integrity in this band was informed by feedback received from licensees, and work conducted by the ACMA on the Gold Coast in support of the Commonwealth Games 2018, which indicated that there may be widespread non-compliant use of the 400MHz band.

The ACMA has separately been administering a program to transition services in the 400 MHz band to align with the 400 MHz band plan. The transition of those services is not within scope of this compliance priority.

Methodology

The methodology developed was similar to that previously used in Sydney, Melbourne and Brisbane in 2018–19. The assessment was conducted in two phases:

1. identify candidate frequencies in each city and monitor those frequencies from ACMA fixed monitoring sites
2. reduce the list of frequencies to those that demonstrated activity that did not appear to be consistent with licensed services on those frequencies, and conduct further fixed monitoring supplemented with field monitoring, if necessary.

In the event that the monitoring identified non-compliance, a field response to address the non-compliance would be initiated.

The initial list of candidate frequencies was developed by extracting a list of services from the Spectra licensing database that met the following criteria:

- > located within 50 km of the CBD of Adelaide or Perth
- > within the frequency range of 403–520 MHz
- > must have expired within the last two years.

The criteria were chosen to target the band of interest within a reasonable time frame, while also considering the location of the fixed monitoring sites.

This list was then combined with a list of known frequencies used by low-cost imported non-compliant radios. This resulted in 308 candidate frequencies in Perth and 196 candidate frequencies in Adelaide.

The fixed monitoring sites, located at Brooklyn Park in Adelaide and Gooseberry Hill in Perth, monitored how often transmissions on those frequencies were received and recorded the interaction. Once the monitoring had concluded, the frequency list was reduced by removing the frequencies with lower interaction counts (those fewer than 200) to focus the monitoring on those with higher interaction counts.

For the second phase of the monitoring activity, the number of frequencies monitored was reduced from 308 to 17 in Perth, and from 196 to 15 in Adelaide. More detailed monitoring was then undertaken on these frequencies, which included recording of any recovered audio.

Determining whether the detected activity was most likely to be licensed or unlicensed activity was achieved by:

- > checking services against the licensing database to see whether any legitimate licensed services were on that frequency in the area
- > listening to any recorded audio to check if the recovered audio is likely to align with the type of activity that the licensee would be conducting.

Results

Adelaide

Of the 15 frequencies selected for further monitoring, six of the frequencies were determined to most likely be licensed operation. The remaining nine were determined to most likely be unlicensed transmissions.

While monitoring the nine frequencies of interest, we were able to determine that a frequency was being used by a commercial entity in West Beach. Further investigation found that this company operates from four locations across Australia—two in Adelaide, one in the Gold Coast and one in Perth.

The company was contacted and advised to cease transmission, and it immediately complied. Staff checked with co-channel licensees who advised that they had not experienced any interference from this unlicensed use. In accordance with our compliance and enforcement policy, in this instance, administrative action in the form of education was undertaken to ensure that the entity was aware of its regulatory obligations.

A field-based response will be required to check the remaining nine frequencies to confirm whether the transmissions are licensed or unlicensed.

Perth

Of the 17 frequencies selected for further monitoring in Perth, there was not enough subsequent detected activity on three of the frequencies to determine whether the channels were in use.

Possible digital use was detected on seven of the remaining frequencies but there was not enough information to come to any reasonable conclusion of compliant or non-compliant activity.

Detected activity on three channels indicated usage other than for the purpose of the licensed co-channel service in the area.

The content on one of the six remaining frequencies indicated that there may be several users in the area including both commercial and non-commercial use.

A field-based response will be required to check these frequencies to confirm whether the transmissions are licensed or unlicensed.

Field response

The results of the monitoring program were analysed, and a priority rating was applied to each. The priority rating applied was based on factors such as:

- > in what part of the band the transmissions were occurring (for example, Harmonised Government Spectrum (HGS), public spectrum or amateur spectrum)
- > whether an existing licensee was identified as operating co-channel (if there is an existing co-channel licensee, then there is greater likelihood that interference will result)
- > how prevalent the transmissions were and how much information we were able to gather
- > the likelihood of being able to resolve the issue.

The tables below show the results of that analysis.

Table 1: Adelaide frequencies selected for a field response

Frequency	Reason for priority rating	Priority
420.475 MHz	HGS and the nearest licensed user is 80 km away	High
450.175 MHz	Frequency licensed for land mobile communications, whereas the transmissions detected appear to be data or telemetry. Licensed local co-channel user	High
462.25 MHz	Licensed local co-channel user. Not a known cheap, overseas, non-compliant radio frequency	High
462.4 MHz	Confirmed to be unlicensed use by a commercial entity. Issue has been resolved	n/a
465.34375 MHz	No licensed local users. Not a known cheap, overseas, non-compliant radio frequency	High
467.4 MHz	Licensed locally, unable to determine if transmissions were from the licensed service and no interference complaints received	Low
467.6125 MHz	Licensed locally, unable to determine if transmissions were from the licensed service and no interference complaints received.	Low
492.1 MHz	Licensed locally, unable to determine if transmissions were from the licensed service and no interference complaints received	Low

Table 2: Perth frequencies selected for a field response

Frequency	Reason for priority rating	Priority
415.05 MHz	HGS, detected transmission was clearly not government use (music being played)	High
415.35 MHz	HGS, some analogue voice detected. HGS transmissions would be digital	High
424.225 MHz	HGS, local licensed user within 17 km of the monitoring site	High
462.6125 MHz	Strong constant signal, possibly telemetry. High likelihood of finding this service	High
494.00 MHz	Digital transmission detected. Licensed local user located 21 km from the monitoring station is an analogue service designed for in-building coverage only. No interference being caused to this service	Low
494.825 MHz	Several different users detected, good chance of being able to locate unlicensed users	High

It is proposed that when COVID-19 travel restrictions are removed, field officers will travel to each city and further investigate the identified frequencies. Field staff will focus on those frequencies deemed to be a higher priority and, if time permits, will then look at those deemed a lower priority.

Summary

A significant amount of monitoring and analysis of data has occurred to determine the level of non-compliance in the 400 MHz band in major capital cities. This assessment has tested both licensees continuing to operate after licence expiry and the use of low cost, imported non-compliant radios.

The targeted compliance priority programs conducted in 2018–19 and 2019–20 have shown some low-level non-compliance. While some field work remains to be done in Adelaide and Perth, the monitoring work has demonstrated that there is no evidence of widespread or significant non-compliance in this band. This is further supported by analysis of all reactive interference complaints where the interference was affecting services operating in the 400 MHz band, which make up around three per cent of our reactive field work. The ACMA's standing capability for interference diagnosis appears to be appropriately managing and resolving interference issues in the 400 MHz band as they arise.