



**GOVERNMENT OF INDIA
CIVIL AVIATION DEPARTMENT
OFFICE OF DIRECTOR GENERAL OF CIVIL AVIATION
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Subject: Radio Frequency Congestion

Description

A single radio frequency is capable of handling a limited number of radio messages in a specified time. The maximum number of messages will be determined by the length of each message and its response. Ideally, a pilot should be able to transmit a message at any time of his/her choosing, and receive an immediate reply. As radio traffic increases above the ideal, the frequency becomes congested. The pilot must wait for a break in transmissions to pass a message and may have to wait for a response from the ATCO, who has to judge different priorities.

Persistent (rather than transient) frequency congestion is a frequent contributory factor in communication breakdown, usually in association with other factors.

Effects

- Pilot or ATCO is unable to pass an important message at the desired time.
- A blocked transmission from another aircraft which is trying to communicate is lost or misheard.
- A pilot takes a message intended for another aircraft due to call sign confusion or expectation of clearance.
- Pilot workload and ATCO workload is increased due to the necessity to resolve the confusion.

Defences

ATCUs attempt to reduce the impact of frequency congestion by allocation of sectors and the use of multiple frequencies.

Typical Scenarios

- The pilot, who is awaiting a clearance, takes a clearance intended for another aircraft. The ATCO does not notice the error on read back.
- The pilot takes a frequency change intended for another aircraft, resulting in loss of communication.
- In an attempt to pass the message quickly, the ATCO does not use standard phraseology; this increases the chance of communication breakdown.
- The pilot transmits at the same time as another, leading to a blocked transmission.
- Radio interference makes it difficult to read the call sign in a transmission, which is mistakenly taken by the wrong pilot.

Contributory Factors

- Call sign_confusion;
- Loss of communication;
- Frequency change;
- Non-standard phraseology;
- Blocked transmission;
- Radio interference;
- Language.
- In fructous talk on R/T
- Repeated transmissions thus blocking frequency.
- R/T Indiscipline

Solutions

- **Pilots:**
 - Always use standard phraseology;
 - Listen in on the new frequency before transmitting;
 - Call 'blocked' when you detect a blocked transmission;
 - Check that the PTT (Press to Transmit) switch releases freely at the end of each transmission and if any functional fault is identified, alternative transmit options are used.
- **ATCOs:**
 - Always use standard phraseology;
 - Use short and concise messages;
 - Do not talk continuously but give pilots the opportunity to check in on the frequency by building in rest blocks; In practical terms, it may be best to transfer several aircraft

to their next sectors before checking in new aircraft - this is a matter of judgement for the ATCO.

- Reduce the number of aircraft on a frequency or extend the number of controllers, so that the workload per frequency is lower.
- **Technology**
 - Blocked transmissions can be partly overcome by anti-blocking devices.
 - Design a warning if the mike is pressed too long, for instance by a beep indicating the microphone is still transmitting. (Some aircraft already have such a feature).

Sd/-
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