



ICAO

*International Civil Aviation Organization***Twenty Ninth Meeting of the Communications/  
Navigation and Surveillance Sub-group (CNS SG/29)  
of APANPIRG**

Bangkok, Thailand, 16-20 June 2025

**Agenda Item 10:** Regional implementation review and updates

10.3 Contingency Planning for CNS/ATM Infrastructure

**BUILDING A DISASTER-RESILIENT NETWORK**

(Presented by JAPAN)

**SUMMARY**

This paper introduces the details of the construction of aviation secured information network in Japan, which is maintained by the Civil Aviation Bureau of Japan, and how redundancy is designed in disaster-prone countries.

**1. INTRODUCTION**

1.1 Japan has a history of operating Aeronautical Fixed Telecommunication Network (AFTN) and Common Aeronautical Data Interchange. Network (CADIN) lines, which have been progressed as network technology has advanced. While the combined use of microwave networks and metal communication lines were used, the majority of the network is now replaced by an optical communication network. This innovation was essential for the realization of the airspace realignment project in Japan, which has been implemented since 2020.

1.2 The Air Navigation Information Network in Japan, commonly known as CAS.net, is contracted with telecommunications carriers to maintain and manage the communications network. CAS.net links information necessary for air traffic control services, including voice communications, radar information, and equipment status monitoring signals. CAS.net is a circuit network for reliable and stable aviation secured operations and is constructed and operated as a network dedicated to the Civil Aviation Bureau to prevent unauthorized access from systems outside the Civil Aviation Bureau. The network has redundancy to ensure safe and stable aircraft operations and is used for a wide variety of circuits required between various offices and sites, such as the ATC, airports, and radar stations. This network is built on two different platforms. Each is used for different purposes.

◆ High Quality Platform : Accommodates ATC communication that requires high quality such as low Transmission delay.

◆ Wide Area Platform : Accommodates ATC communication other than high quality platform, and radar target data etc.

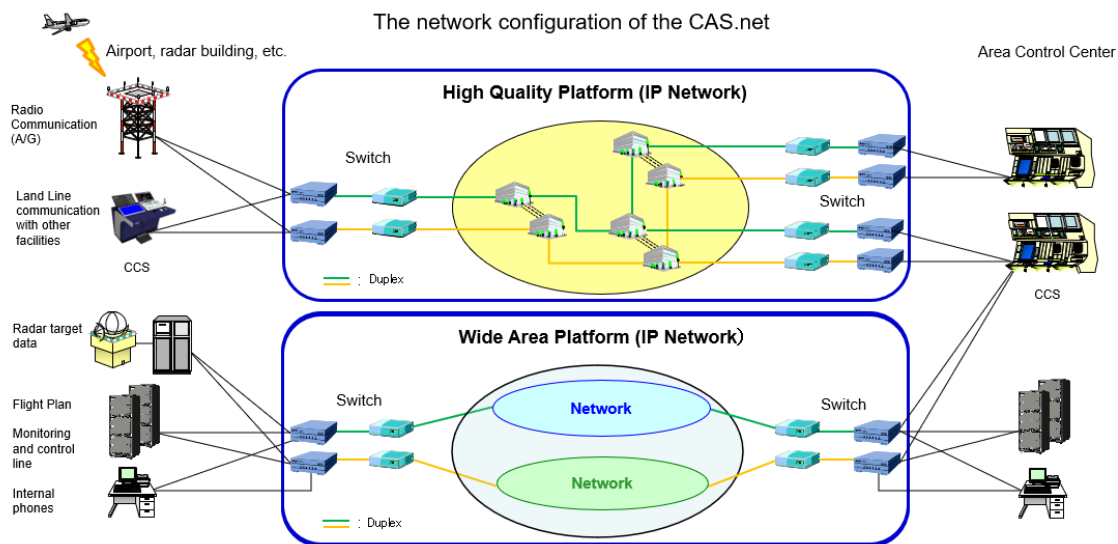


Fig. 1 The network configuration of the CAS.net

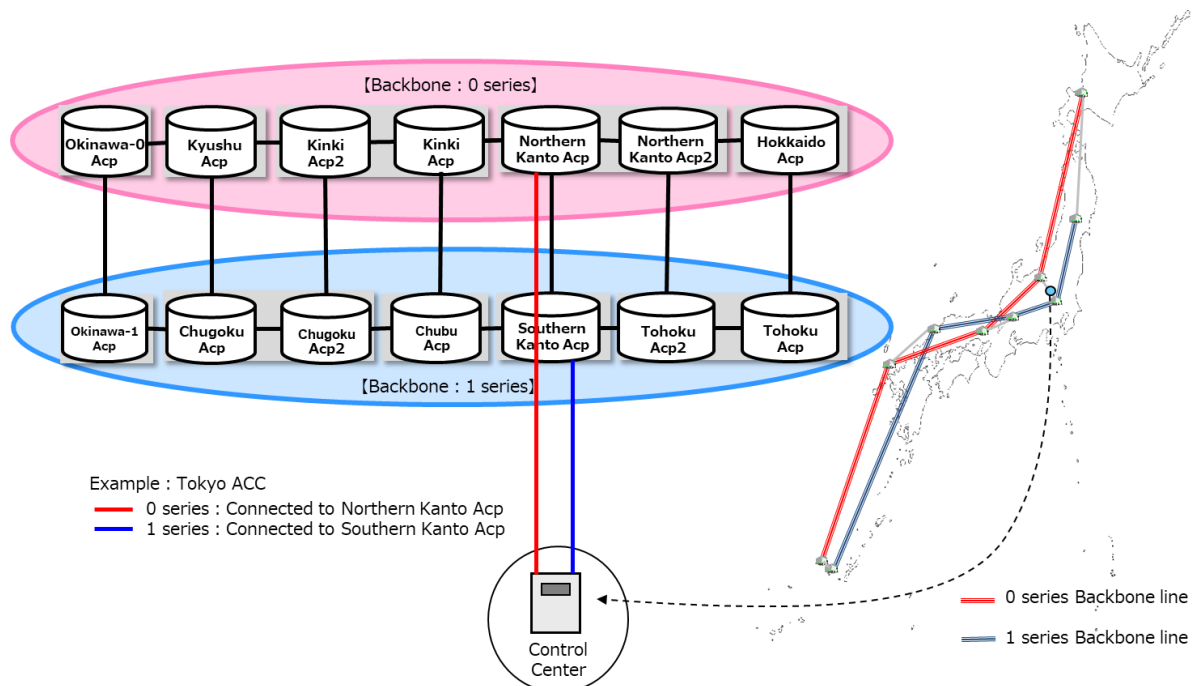
## 2. DISCUSSION

2.1 In Japan, where natural disasters are particularly frequent, weather and earthquake resistance of radio facilities is a mandatory requirement, but the resistance of aeronautical information networks to natural disasters are also required. The impact of typhoons and earthquakes is particularly devastating, and the restoration of service in mountainous and remote areas often takes a long time. For this reason, for example, the construction of two routes is being promoted to improve redundancy and to prevent disconnection due to falling trees or strong winds, and underground burial is being promoted to prevent disconnection due to falling trees or strong winds.

2.2 CAS.net's High Quality Platform is a particularly important communications network that accommodates voice communications such as air traffic control, etc. Therefore, in addition to constructing two routes, it also distributes the bases where facilities are installed in various locations, and uses lines (ladder lines) connecting the access control points (Acp) of Series 0 and 1, so that communications can be rescued as much as possible even in the event of a disaster or other failure at multiple locations. In another words the network is configured so that even in the event of a disaster or other failure at multiple locations, communications can be restored as much as possible.

2.3 All network equipment are monitored by JCAB staff at Network Performance Assessment Center (NPAC), throughout the year to ensure that the network is functioning properly and that there is no degradation in communication quality, occurrence of failures, or signs of such failures. Specifically, the system monitors fail/active, status, threshold, and traps, etc. If a problem occurs, the system will cooperate with telecommunication carriers to deal with the cause of the problem.

2.4 Since cyber security measures are also necessary, a dedicated communication network is constructed using VPN and managed separately from general public lines, reducing the risk of hacking and ensuring high reliability. The VPN is also highly resistant to cyber attacks, which have been increasing in recent years.



**Fig.2 Ladder and access point network of the CAS.net**

2.5 The air traffic development stimulates economic activity in the region, however, underlying this development is the need to improve infrastructure, especially communications, which is one important function that guarantees the safety of its own citizens. In the aviation sector, this will lead to improvement in the quality-of-service provision, not only for air traffic control communications, but also for SWIM, CRV, and other services. In other words, the development of communication infrastructure must contribute not only to the economic development of each country, but also to the development and safety of air traffic.

### 3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) note the information contained in this paper;
- b) Request member countries to consider building resilient and cyber-security resilient networks; and
- c) Encourage countries to actively exchange information on resilience and cybersecurity within the ICAO framework to achieve reliable networking and technical cooperation.

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