



International Civil Aviation Organization

**EIGHTEENTH MEETING OF THE COMMUNICATIONS/NAVIGATION
AND SURVEILLANCE SUG-GROUP (CNS SG/18) OF APANPIRG**

Asia and Pacific Regional Sub-Office, Beijing, China
(21 – 25 July 2014)

Agenda Item 11: Any other business

**UPGRADE SOFTWARE OF PARTS SUPPLY SYSTEM FOR AERONAUTICAL
RADIO FACILITIES**

(Presented by Japan)

SUMMARY

Japan Civil Aviation Bureau (JCAB) has introduced Aeronautical Radio Facilities Parts and Provision System (APPS) since 1987, to reduce the cost for the stock of parts and to make the budget for efficient. JCAB is preparing the 70,000 spare parts out of 350,000 parts. The stocks management by operating the APPS contributes economical maintenance and acquiring reliability. JCAB has carried out system upgrade for the fourth time in July 2014 and reports the efforts so far.

1. INTRODUCTION

Japan Civil Aviation Bureau (JCAB) installs aeronautical radio facilities in over 80 airports and the number is about 8,000 equipments. Those equipments consist of 350,000 parts. JCAB has introduced Aeronautical Radio Facilities Parts and Provision System (APPS) since Dec. 1987, to reduce the cost for the stock of parts and to make the budget for efficient.

2. DISCUSSION

2.1 Outline of APPS

All system is centered and managed by APPS. The APPS manages 350,000 parts. 280,000 parts from them are equipped in equipment and in operation. 70,000 parts from them are stored as spare parts. It needs a certain time, usually long time, to purchase a new part or repair failed part. 70,000 parts are prepared as spare parts.

The benefit of the installation of APPS is as follow.

- It enables to know the parts condition from 70,000 parts stock and enables to move the parts if the site does not have part to keep the single operation.
- It enables to procure parts or repair failed parts calculatedly, based on the analysis or statistics from the failure rate data.
- It enables to strike the right balance in inventory quantities.
- It enables to manage financial ledger and process ledger sheet automatically.

2.2 Introduction history of the APPS

Before the innovation of APPS, parts are managed by each airport. JCAB has developed the APPS and has operated it since 1987 to reduce the cost of stocks and use the budget efficiently.

2.2.1 First generation; since 1987

- The architecture of the system was a standalone system. FAX and telephone were used for coordination with airport offices.

2.2.2 Second generation; since 1996

- Relational DB technology was adopted in the architecture of the system.
- Software was modified for the Year 2000 problem.

2.2.3 Second generation second release; since 1998

- Online technology was adopted in the architecture of the system. All airport offices can know the condition of stocks and use the automatic reporting process.

2.2.4 Third generation; since 2005

- Universal OS was adopted in the architecture of the system. Stock alert function was equipped.

2.2.5 Third generation second release; since July in 2014

- Predictive function of number of stocks based on the failure rate was equipped in the architecture of the system.
- The prediction function enables to set the right balance of the stocks by failure rate of parts.

2.3 The APPS configuration

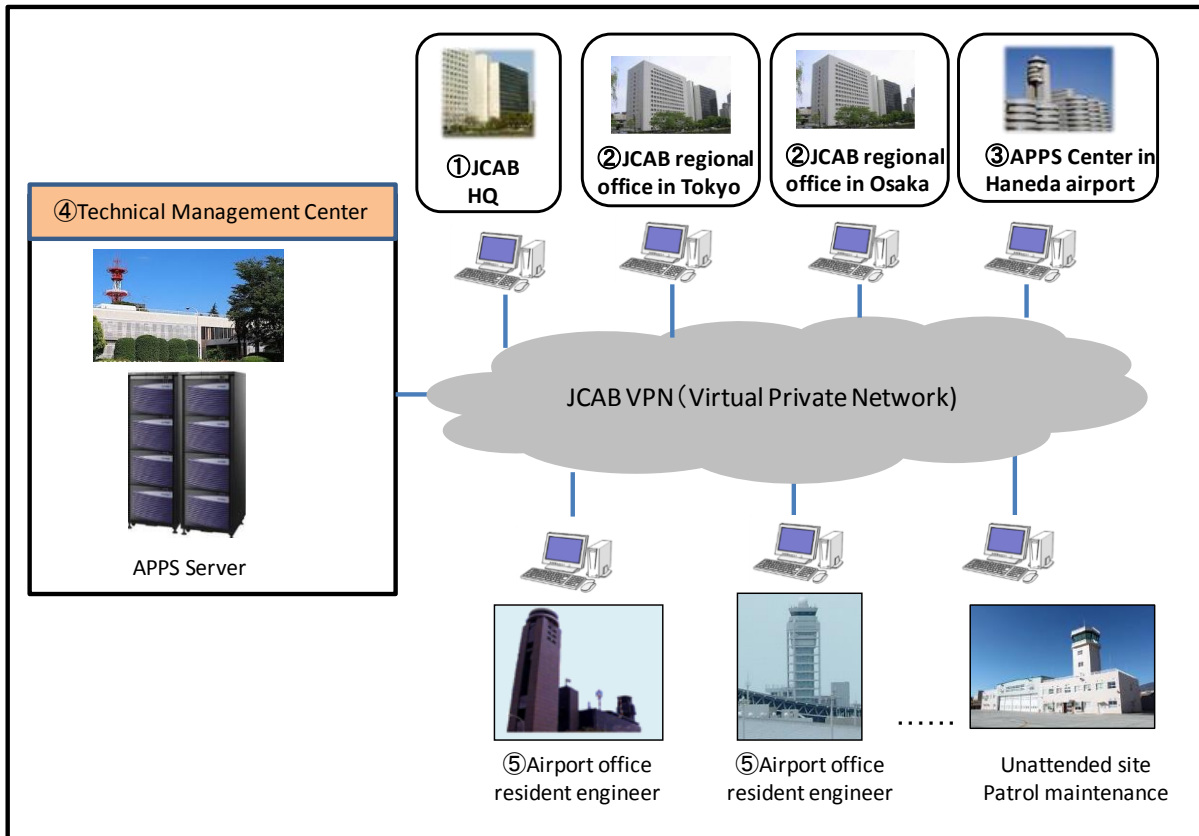


Figure 2.3 : APPS configuration

The latest APPS has installed and started the operation in July 2014. This system became the upgrade fourth time. (Figure 2.3)

The responsibility or role of APPS for each position is as follows.

- ① JCAB Headquarter office (JCAB HQ);
 - Budget request,
 - Institution of the standard for deployment of spare parts,
 - Contract for procurement of spare parts which are treated by APPS
 - Contract for repair of spare parts which are treated by APPS
- ② JCAB regional offices;
 - Contract for procurement of spare parts which are not treated by APPS
- ③ APPS center;
 - Coordination to exchange units between offices
 - Transport arrangement
 - Supply parts
- ④ Technical Management Center (TMC);
 - Maintenance of APPS server
 - Stock control by APPS
 - Management of procurement and repair

- ⑤ Airport office;
Contract for repair of spare parts which are not treated by APPS
Request the delivery of spare parts for maintenance

Note; There are two kinds of parts. One is treated by APPS, which is composed by electronics parts. The other is not treated by APPS, which is composed by electronics parts, such as antenna or mechanical parts of radar.

2.4 The policy of the storage of 70,000 parts

If all 70,000 parts are stored in central, the delivery dates take up to 3 days. And during the time the system will be suspended. The parts, which are directly linked to the provision of services and are not used at redundancy system, are stored in the equipment room. (Figure 2.4.1) Currently 60,000 parts are stored in equipment room of 640 places. On the other side 10,000 parts are stored in APPS center. (Figure 2.4.2) The policy of the parts to store in APPS center is that the parts are used under the dual system and are not directly linked to the suspension of the operation.

And other characteristic to support the APPS, all parts are labeled unique information. (Figure 2.4.3) The information consists of 4 kinds of information, such as parts name, parts type based on the parts specifications, manufacturer, and unique part number. We can identify the parts if we see the label.

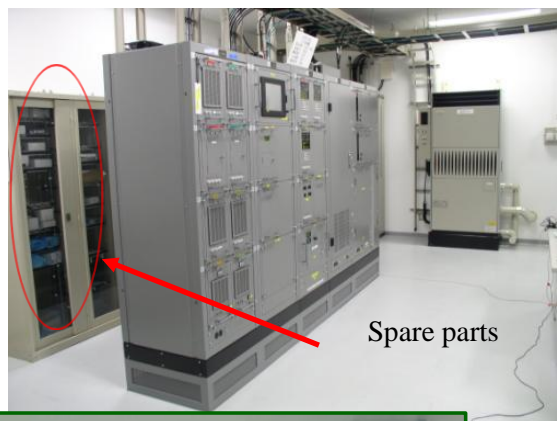


Figure 2.4.1 : Storage condition in an equipment room



Figure 2.4.2 : Storage condition in the APPS center(750 m²)

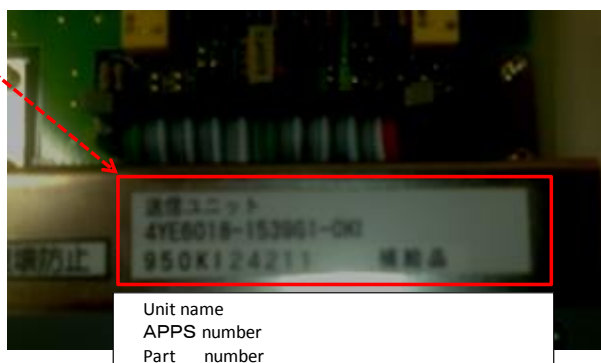
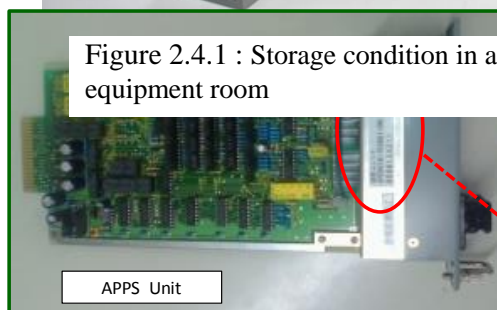


Figure 2.4.3 : All parts are attached label and can know the unique number.

2.5 Example of APPS operation

When a trouble occurs in a CNS system in the A airport and there are no parts in the airport, the A airport requests a delivery of the unit to the APPS center.(1) (Figure 2.5) The APPS center gets to find stocks of the unit through the APPS system. If there is the unit in the stocks in the APPS center, the APPS center ships the unit to the A airport. (2) If there are no stocks in the APPS center, they try to find the stocks in other airports. If they find the stocks in the B airport and it is the shortest case to deliver the unit to the A airport, they instruct the B airport to ship the unit to the A airport.(3) They instruct the shipping company to pick up the unit at the B airport and deliver it to the A airport. (4)

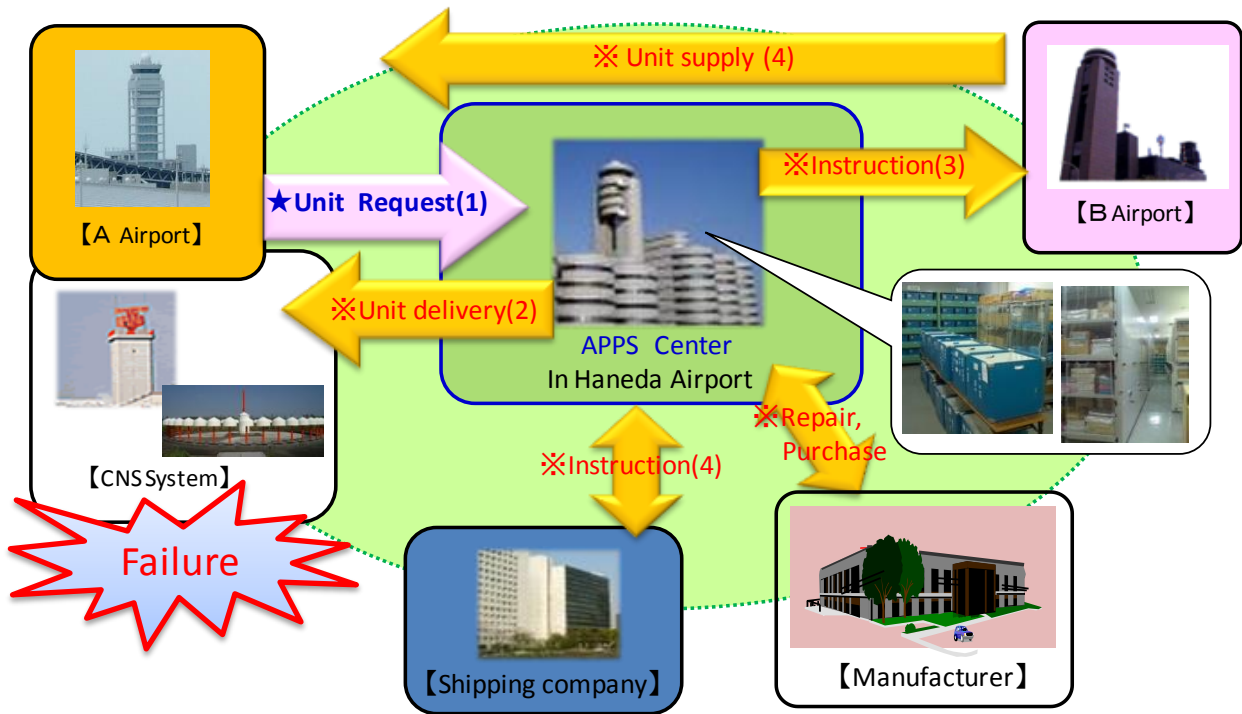


Figure 2.5 : Example of APPS operation

2.6 Actual achievement and output

Actual failure record of aeronautical radio facilities in five years and a half shows that parts exchanges are conducted in almost half of the case, namely 7,200 exchanges cases out of 15,500 failure cases. This means that parts exchanges by spare parts are conducted in 1,300 cases in a year or 3.5 cases in a day.

Before the introduction of the APPS, there was no idea to stock parts at central warehouse. And all parts were allocated at each facility. When we estimate the cost as the current facility, it would take about 427 million dollar or more (about 95,000 parts). However by the introduction of the APPS, it enabled to use the parts supply policy and enabled to operate the stable operation of aeronautical radio facilities by only possessing the parts about 315 million dollar (about 70,000 parts). It becomes cost reduction of about 112 million dollar, which is in a cost savings of 26.3%.

3 ACTION BY THE MEETING

3.1 The meeting is invited to take note of the efficient stocks management strategy made by Japan.
