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International Civil Aviation Organization

**ELEVENTH MEETING OF THE SURVEILLANCE
IMPLEMENTATION COORDINATION GROUP
(SURICG/11)**

Bangkok, Thailand, 25 - 27 March 2026

Agenda Item 8: Update on surveillance activities and explore potential cooperation opportunity

II-SI CODE IMPLEMENTATION AND EVALUATION IN JAPAN

(Presented by Japan)

SUMMARY

This paper provides the II-SI code implementation and evaluation in Japan.

1. INTRODUCTION

1.1 JCAB currently operates 21 en-route radars. The en-route radar network consists of SSR with 250 NM coverage area. It is also arranged to provide double coverage in Japanese domestic airspace.

1.2 In order to achieve double coverage with SSRs, each SSR site are located in close proximity, and it is difficult to assign II codes without duplication. Therefore, JCAB plans to assign individual codes to all SSRs using a combination of II and SI codes, and to conduct Mode S operations throughout the entire area under radar coverage.

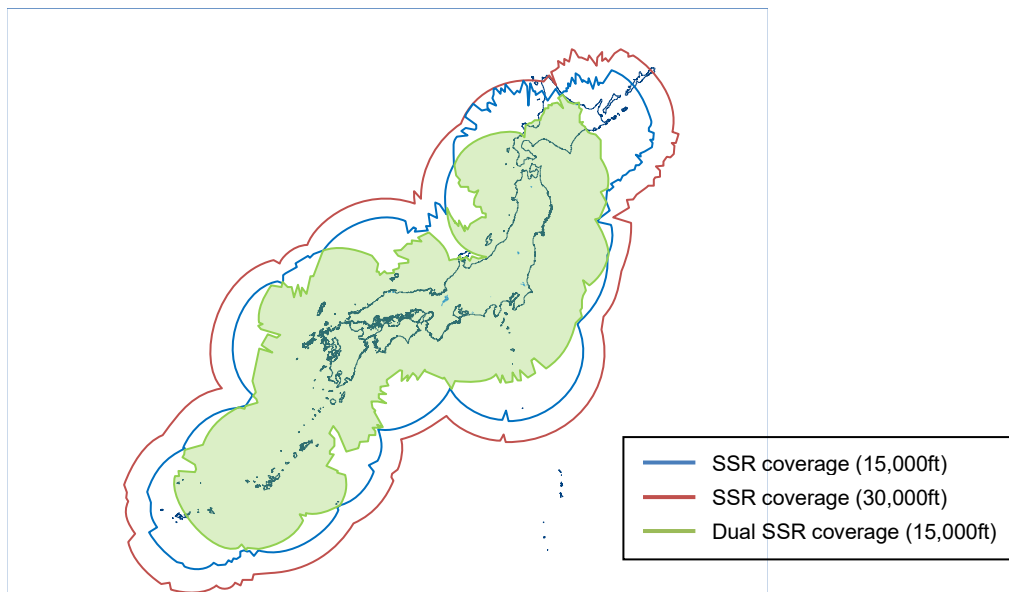


Fig. 1 : SSR coverage in Japan

2. DISCUSSION

2.1 Currently in Japan, Mode S SSR and Mode A/C SSR are mixed because II codes cannot be assigned to all SSRs. By introducing II-SI code operation, migrating SSRs from Mode A/C to Mode S will bring in the following advantages:

- Alleviating surveillance frequency congestion
- Reducing missing target and mis-decoding due to radio interference (garble)
- Expansion of DAPs available area

2.2 Therefore, it is desirable for all SSRs to be in Mode S operation. However, as mentioned above, the surveillance area is configured to ensure double coverage by SSRs in domestic airspace, and it is difficult to assign II codes to all SSRs in Japan.

2.3 Japan began manufacturing new SSRs compatible with the II-SI code in 2024, and initiated the replacement in 2025 to upgrade three SSR sites—Hakone, Mikawa, and Kumejima—to II-SI-compatible SSRs.

2.4 The implementation of SI-code has potential impacts such as the risk of abnormal lockout behavior, which may result missing acquisition of aircraft. Since such situations could have a significant effect on air traffic control operations, JCAB will conduct the following validation tests prior to implementing SI-code operations.

- Validation tests of basic function of SI-code SSR(Hakone)
- Validation tests within overlapping coverage areas between II-code SSR(ENRI) and SI-code SSR(Hakone)
- Validation tests within overlapping coverage areas between SI-code SSRs(ASC and Hakone)

2.5 These validation test will ensure that aircraft capture capability is equivalent to that of existing SSRs and will include confirmation of lockout behavior. The validation are planned to be conducted from 2026 through Q3 of 2027, using the Hakone SSR(not-operation), ENRI (Electronic Navigation Research Institute)'s SSR, and ASC(Aeronautical Safety College) 's SSR.

2.6 Since JCAB needs to coordinate II-SI code assignment with neighbouring states, It has shared each other's contact information and the latest status of en-route SSRs with them since last year. JCAB will continues to share information and coordinate with neighbouring states for future II-SI code allocation.

2.7 Japan's latest II codes assignment have been registered in the Frequency Finder. We will ensure that the information registered in the Frequency Finder is constantly updated to prevent any II code conflicts.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) note the information contained in this paper; and
- b) the results of II-SI operational validation tests will be shared as appropriate.
