*International Civil Aviation Organization*

**SIXTH MEETING OF MODE S AND DOWNLINKED AIRCRAFT PARAMETERS WORKING GROUP (MODE S AND DAPS WG/6)**

Bangkok, Thailand, 28 – 30 March 2023

Agenda Item 6: Interrogator Code (IC) planning and coordination region

# SSR MODE S INTERROGATOR IDENTIFICATION (II) CODE RE-ALLOCATION IN INDONESIA

(Presented by Indonesia)

**SUMMARY**

This paper shares information about SSR Mode S II codes re-assignment in Indonesia and the potential incompatibility with neighboring countries

## 1 INTRODUCTION

1.1. Referring to Mode S DAPs WG/5 – IP/04 presented by Secretariat - OPTIONS FOR VACATING THE SSR MODE S II CODES 14 AND 15 IN THE APAC REGION.

1.2. This paper presents information on the changes of II code 14 on Mode S radar in Indonesia and the potential incompatibility issues with neighboring countries related to SSR Mode S II Code.

## 2 DISCUSSION

2.1. Currently, SSR Mode S II code 14 are set on 2 Mode S MSSR facilities, which are Surabaya and Pekanbaru.

2.2. In order to adopt the practice of reserving Interrogator Identification (II) 14 for testing, research, and development of Mode S Radar and II 15 for military deployable and shipborne radar effectively, the following activities already carried out:

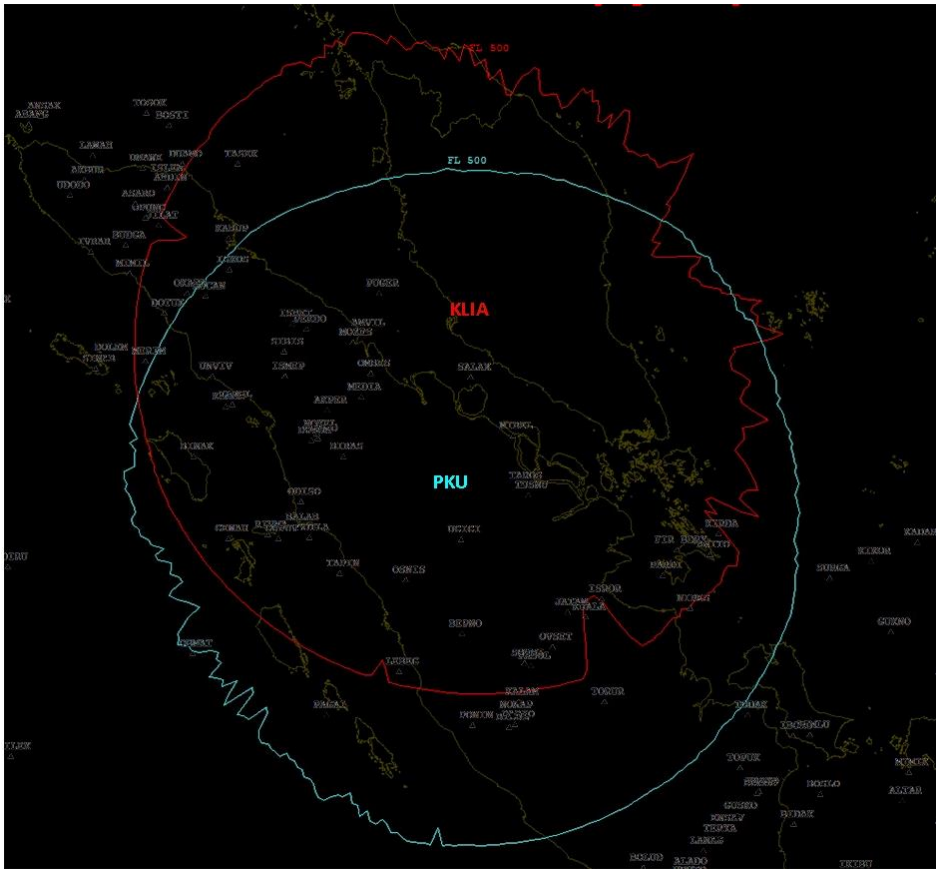
- Reassignment of II code for MSSR Pekanbaru and MSSR Surabaya
- Analyzing the results of the II Code changes on MSSR Pekanbaru.

2.3. Changes to the II Code that already made are as follows:

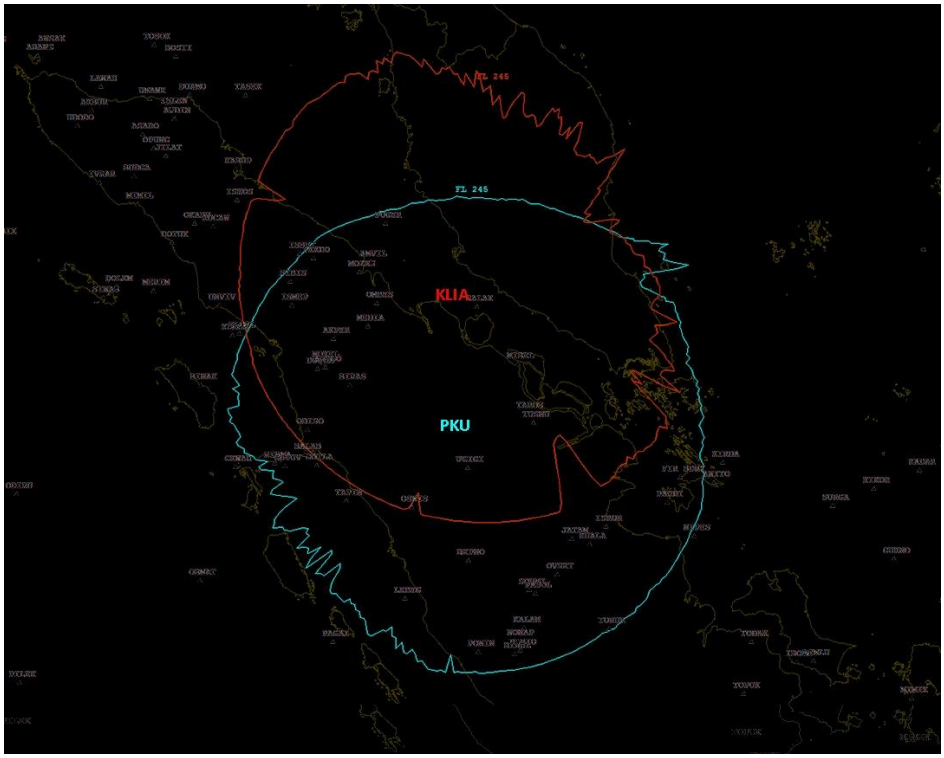
| No | Location | Coordinate | II Code | |
|---|---|---|---|---|
| | | | Old | New |
| 1 | Pekanbaru | 0° 27' 32.65" N<br>101° 26' 52.83" E | 14 | 8 |
| 2 | Surabaya | 07° 22' 27.99" S<br>112° 48' 1.69" E | 14 | 3 |

2.4. Analyzing the results of the II Code changes on MSSR Mode S Pekanbaru

2.4.1. Predicted Coverage PKU vs KLIA (FL500/Maximum)

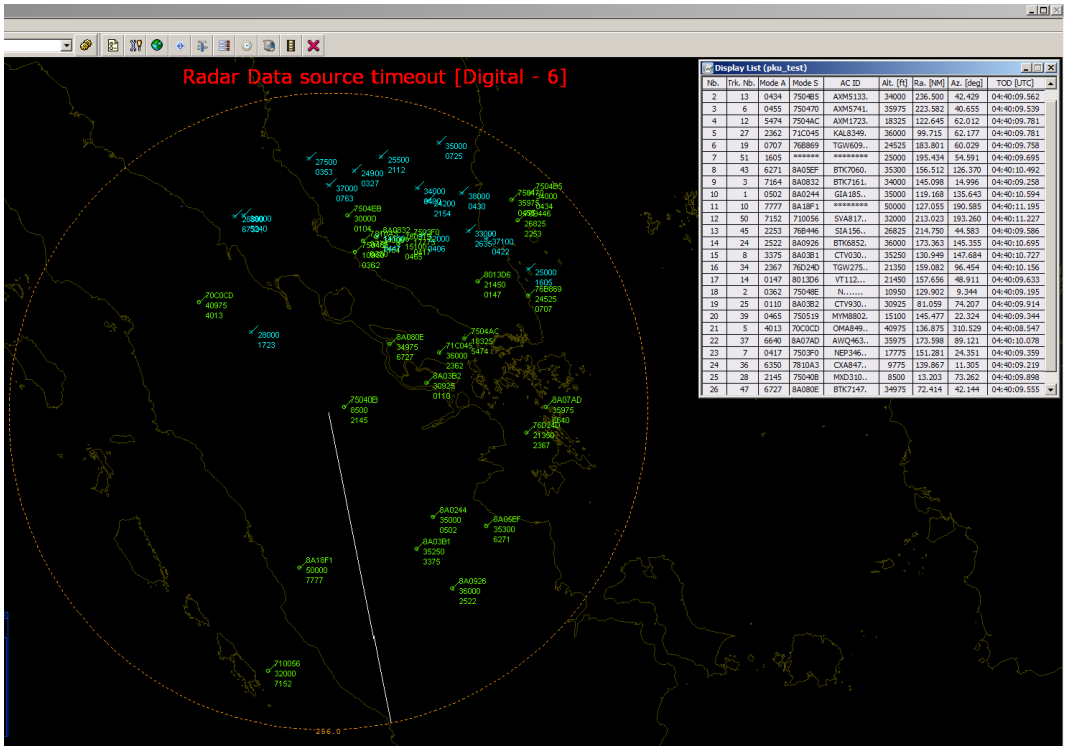



2.4.2. Predicted Coverage PKU vs KLIA (FL245)



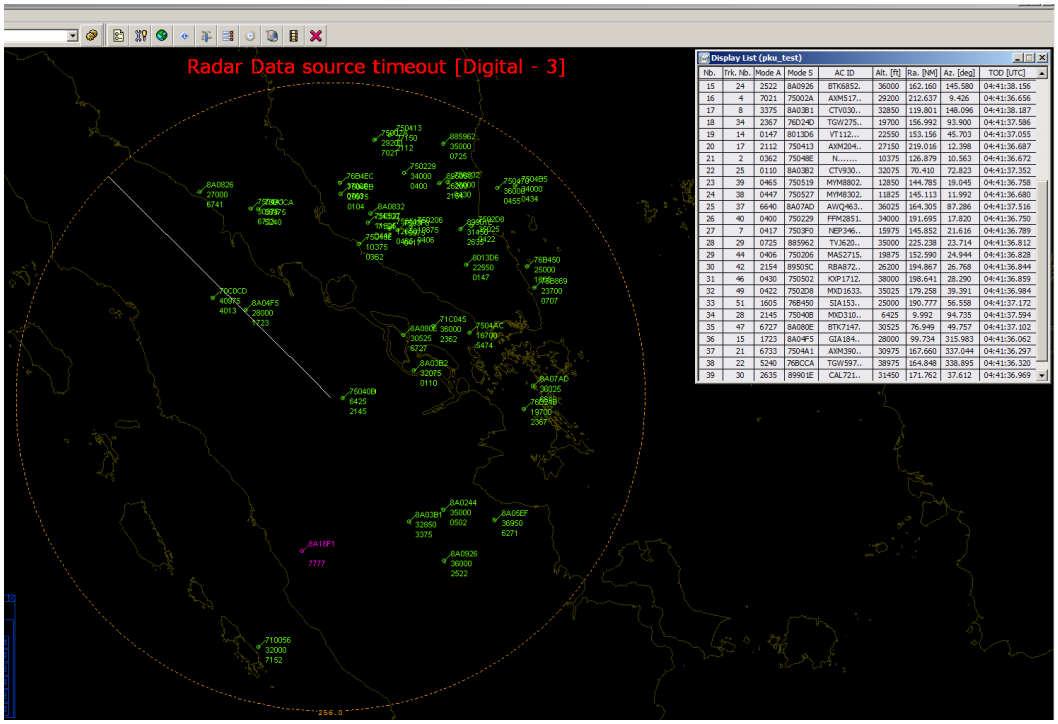

2.4.3. Target detected when using II Code 14

When II Code 14 is used, the number of detected aircraft is 26




2.4.4. Target detected when using II Code 8

When II Code 8 is used, the number of detected aircraft is 39



2.4.5. Conclusions

- The analysis is conducted by recording and observing the targets detected by the radar at nearly the same time.
- The analysis that has been conducted proves that there is a significant impact on the radar with the same II code in the same coverage area.

2.5. Possible incompatibility of II codes allocation between Indonesia and neighboring countries

2.5.1. The Mode S Radars located in the adjacent area are as follows:

| No | Location | Coordinate | II Code | Adjacent Countries |
|---|---|---|---|---|
| 1 | Pekanbaru | 0° 27' 32.65" N<br>101° 26' 52.83" E | 8 | Malaysia, Singapore |
| 2 | Banda Aceh | 5° 32' 30.45" N<br>95° 30' 2.35" E | 10 | India, Malaysia |
| 3 | Tanjungpinang | 0° 55' 26.17" N<br>104° 31' 48.65" E | 1 | Malaysia, Singapore |
| 4 | Natuna | 03° 57' 48.77" N<br>108° 23' 59.57" E | 4 | Malaysia, Singapore |
| 5 | Pontianak | 0° 07' 52.19" S<br>109° 24' 33.71" E | 6 | Malaysia |
| 6 | Tarakan | 03° 19' 25" N<br>117° 34' 12" E | 3 | Brunei Darussalam, Malaysia |
| 7 | Jayapura | 02° 35' 55.38" S<br>140° 31' 40.88" E | 3 | Papua New Guinea |
| 8 | Merauke | 08° 30’ 46.4” S<br>140° 24’ 38.2” E | 1 | Australia, Papua New Guinea |

2.5.2. Predicted coverage of Mode S Radars on adjacent Area on FL500
Please see appendix A to the paper.

## 3 ACTION BY THE MEETING

a) Note the information contained in this paper; and

b) Discuss any relevant matter as appropriate.

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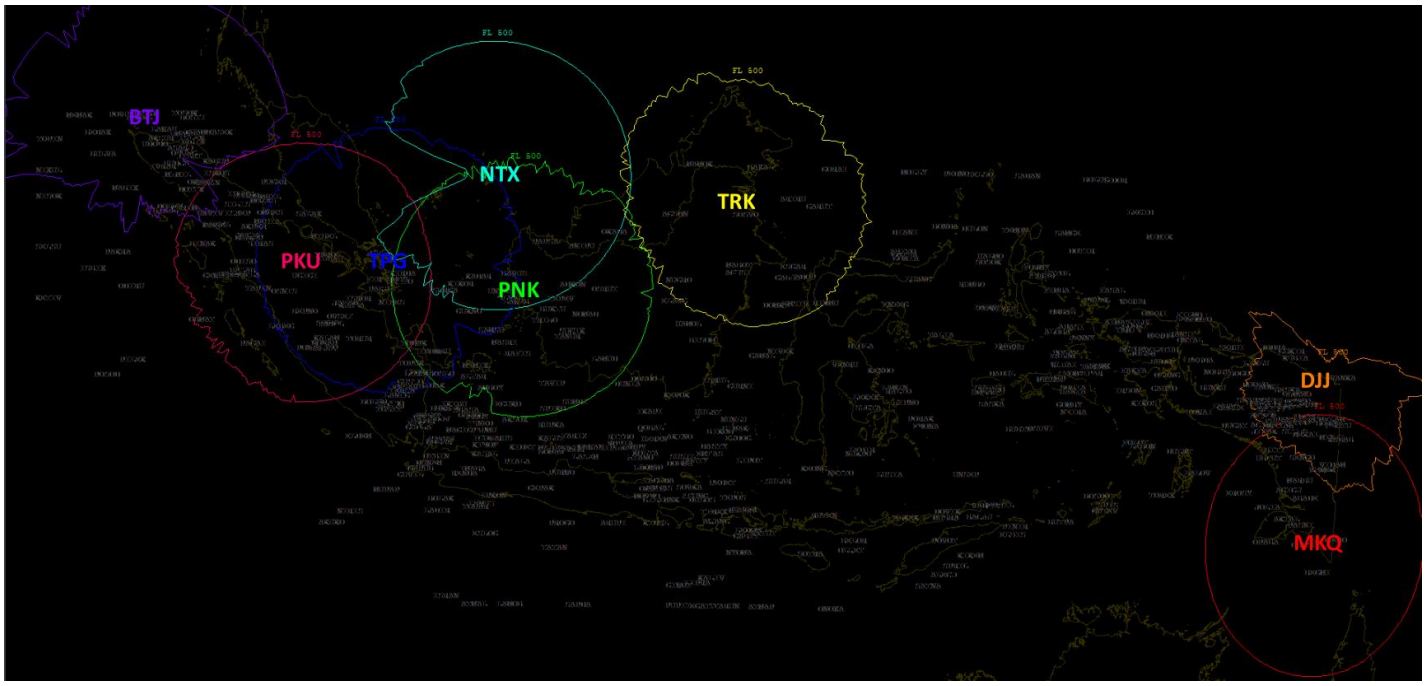
DAPs WG/6
Appendix A to IP/07

**PREDICTED COVERAGE OF MODE S RADARS ON ADJACENTS AREA AT FL 500 (Max)**




| | |
|---|---|
| Banda Aceh (BTJ) | : Intersect with adjacent country India and Malaysia |
| Pekanbaru(PKU) | : Intersect with adjacent country Malaysia and Singapore |
| Tanjungpinang (TPG) | : Intersect with adjacent country Malaysia and Singapore |
| Natuna (NTN) | : Intersect with adjacent country Malaysia and Singapore |
| Pontianak (PNK) | : Intersect with adjacent country Malaysia |
| Tarakan (TRK) | : Intersect with adjacent country Brunei Darussalam and Malaysia |
| Jayapura (DJJ) | : Intersect with adjacent country Papua New Guinea |
| Merauke (MKQ) | : Intersect with adjacent country Australia and Papua New Guinea |