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# PAPUA NEW GUINEA

## AIC

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## IALCHART AT KIUNGA (AYKI) AND CHANGES TO IAL CHARTS IN GENERAL

### 1 - PURPOSE

1.1 – The purpose of this AIC is to inform operators and pilots of the implications of a recent anomaly in the GPS RWY 07 IAL chart for AYKI, and also to provide awareness of charting changes that are occurring progressively in all GPS-based approach charts in Papua New Guinea.

### 2 – BACKGROUND

2.1 – An operator reported an anomaly in GPS RWY 07 IAL chart for AYKI, which created a conflict between the initial approach track, as depicted on the chart, and the direct track indicated by the GPS receiver. The track discrepancy was approximately twenty (20) degrees and, although no information has been issued by the CAA on an acceptable error budget, this was clearly a major anomaly.

2.2 – At the same time that this anomaly was reported, the operator sought to draw attention in the use of an “open star” symbol at the FAWP, in some IAL charts, rather than a “solid star” symbol as specified in section 9.2.4 of AIP Supplement 3/2001.

### 3 - DETAIL

3.1 – It was ascertained that the position of waypoint YKIWA was correct and, therefore, both the track and distance to waypoint YKIWA was also correct. The anomaly was subsequently traced back to the flight validation report that was completed by the organisation engaged to design, check, and produce many of the GPS approach procedures, including the procedure for AYKI. The flight validation report contained a recommendation to re-align the track from YKIWA to YKIWI so that a turn of less than ninety (90) degrees would be necessary at YKIWI.

3.1.1 – According to the completed design and charting documentation that provided to the CAA at the end of the contracted tasks, the recommendation has been adopted. This resulted in new coordinates for YKIWA, but the change was not highlighted to the CAA. Therefore, the original coordinates were notified to Jeppesen for inclusion in their database and, from there, were issued to GPS datacards in the normal update cycle.

3.1.2 – The correct coordinates were subsequently notified to Jeppesen and, according to information received by the CAA, the corrections were implemented in datacards.

3.2 – In relation to the use of “open star” (fly by) and “closed star” (fly over) symbols at the FAWP, use of the “closed star” was mandated in the first release of GPS/NPA design criteria because it was felt that aircraft has to be as close as possible to the final approach track alignment due to the reduction of the Horizontal Integrity Limit and consequent re-scaling of the CDI. There were a number of problems with this, however, because of procedures that require a turn at the FAWP and, in that situation, an “open star” was needed for the turn. The bigger problem was that when Flight Director systems were used to fly the procedure, they tended to manoeuvre the aircraft aggressively in the Intermediate Segment of the approach, to ensure that the final approach waypoint would be overflown.

3.2.1 – The manoeuvring was undesirable because it tended to de-stabilise the aircraft at a critical stage of the approach. It was determined that, if this waypoint was changed to a “fly by” symbol, the problem would cease to exist and the system would still keep aircraft within proper lateral tolerances. Therefore, the final approach waypoint was changed to a “fly by” symbol for all situations and this was reflected in a subsequent amendment to the design criteria in Pans Ops.

3.2.2 – The result of this is that some approaches in PNG have waypoints shown and coded as “fly over” while other are shown and coded as “fly by”.

3.2.3 – By the time this was detected, the CAA was also dealing with amendment to the charting standards in ICAO Annex 4, which required many other changes in all procedures, and not just GPS/NPA. Among other things, the changes affected:-

- a) depiction of “fly by” and “fly over” waypoints;
- b) chart titling, which includes the renaming of “GPS” approach charts as “RNAV<sub>(GNSS)</sub>” approach charts;
- c) inclusion of a 3-degree descent path shown in the Profile View of the procedures as a preference for the way to conduct descent and, thereby, minimise the possibility of CFIT that might otherwise result from the so-called “dive and drive technique for descent;
- d) description of waypoints to provide commonality between conventional and satellite-base approach procedures, such that:
  - i) IAWP becomes IAF;
  - ii) IWP becomes IF
  - iii) FAWP becomes FAF
  - iv) MAWP becomes MAPt;
  - v) MATWP becomes MATP; and
  - vi) MAHWP becomes MAHF.

3.2.4 – The CAA began to incorporate the changes in all charts but progress was hampered when the AIS Cartographic Section lost ability to produce the new charts. Action is now in hand to rectify the situation and, as an interim measure, charts are being produced on the CAA's behalf by AirServices Australia, in Brisbane. All conflicts in “fly by” and “fly over” waypoint depiction will be resolved when the new charts are issued.

3.3 – It should be noted that none of the current approach procedures are invalid or unsafe in their current form. Airborne GPS receivers will correctly interpret waypoint as “fly by, or “fly over”, as appropriate, because no waypoint coding changes have yet been notified to Jeppesen and this will not occur until the replacement chart are available. The CAA will make every effort to ensure that the replacement charts are issued close to the same time as a cyclic database update.

**4 – CANCELLATION**

This AIC will remain current until further notice, pending publication of revised charts for all affected IAL procedures.

**DISTRIBUTION:** Normal

<b>CURRENT AIC:</b>	1985:	5, 8	2001:	2
	1991:	6	2002:	1
	1993:	4, 5	2003:	1
	1994:	1, 3	2004:	1
	1996:	4	2005:	1
	1997:	6, 7, 9, 11	2006:	1
	1998:	1, 3	2007:	1
	1999:	1, 2	2008:	1,
	2000:	1, 2, 3		