

RTCA Special Committee 186, Working Group 3
EUROCAE WG-51, SG-1

ADS-B 1090ES MOPS Maintenance

Meeting #30

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Proposed Text for GPS Alarm
Revision 1

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| Summary |
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| This Working Paper addresses Change Item #22 in WP30-03 for dealing with a GPS Alarm . |

It was brought to the attention of the Working Group that there are situations when a GPS receiver will output an HPL or HIL that should not be used to determine NIC. A non-excluded GPS fault condition is indicated by a RAIM fault flag output, not a change in the containment radius output by the GPS receiver. Therefore, direct loading of HPL or HIL from the GNSS/GPS receiver is not correct in these circumstances. In the case of a non-excluded satellite failure, a GPS sensor will set a separate alarm that needs to be monitored so that the containment radius is known to be invalid. To insure proper handling of this condition, the recommendation was to have the NIC parameter and the NAC parameter both set to ZERO if the sensor alarm discrete is set regardless of the reported containment radius from the GPS. As a result, the following changes are recommended to be incorporated into DO-260B:

1) Table 2-16, Note 4

Modify the Note as follows:

4. a) *If the position source is an ARINC 743A GNSS receiver, then the ARINC 429 data "Label 130" data word from that receiver is a suitable source of information for R_c , the horizontal integrity containment radius. (The Label 130 data word is variously called HPL (Horizontal Protection Limit) or HIL (Autonomous Horizontal Integrity Limit) in different documents.*
- b) *Normally, the R_c can be directly determined from the Horizontal Protection Limit (HPL) or Horizontal Integrity Limit (HIL) output of the GPS/GNSS receiver. However, in the case of a non-excluded satellite failure, the containment radius may continue to be output by GPS/GNSS, but should not be used. In this situation, the position data *has been determined to be invalid*, and the R_c must be set to Unknown (see Table 2-70) and NAC_p (see Table 2-71) must be set to ZERO. For example, air transport category aircraft using the ARINC 743A interface standard, bit 11 of Label 130 would be monitored to detect a non-excluded GPS fault condition.*

2) Section 2.2.3.2.7.2.7 NAC_p Field Encoding

Add a Note at the end of the section as follows:

- Note 3: A non-excluded satellite failure requires that the NAC_p parameter be set to ZERO along with R_c being set to Unknown to indicate that the position cannot be confirmed to be valid (see Table 2-16).*