

CASCADE

ADS-B

Implementation across Europe

Proposed “enlarged” NIC Encoding
of Surface Position Squitter (BDS 0,6)



Introduction

- Supporting reference: ICAO ASP TSG WP 5-23
 - June 2008, T. Pagano (1090-WP25-03-Proposed_Change_Candidates_2-13-09.doc)
- Proposal to further expand the NIC values for the surface formats beyond the ones defined today:
 - I.e. also allow for non-zero NIC encodings of $R_c = 0.2, 0.5, 1.0$ NM
- It is recognised that:
 - Situational Awareness surface applications assessed today (ATSA-SURF, ADS-B-APT) are likely not to require measurement integrity information, i.e. NIC
 - Higher-end surface applications (e.g. ATSA-SURF IA) might require NIC, but likely higher than $NIC=7$

Justification

- However, NIC values of lower than NIC=8 – and also lower than NIC=7 - provide benefits, e.g. in regards to:
 - Bridging between air-to-air applications, e.g. ATSA-SURF & ATSA-AIRB
 - With respect to their operational overlap (refer also to ground switch provisions)
 - Provision of (some) indication of the measurement integrity
 - Support of situational awareness implementations using GPS SA ON receivers:
 - Along with a SIL encoding only reflecting the measurement integrity, i.e. SIL=3 for GNSS based sources (see related proposal)
 - Mitigating the overly conservative accuracy reporting by referring to actual (historical) performance

Proposal

- In line with ICAO ASP TSG WP 5-23:

TYPE Code	Subtype Code	NIC Supplement	Format (Message Type)	Horizontal Containment Radius Limit (R_C)	Navigation Integrity Category (NIC)
5	Not Present	0	Surface Position	$R_C < 7.5$ m	NIC = 11
		1		$R_C < 0.2$ NM (370.4 m)	NIC = 7
0		$R_C < 25$ m		NIC = 10	
1		$R_C < 0.5$ NM (926 m)		NIC = 6	
7		1		$R_C < 75$ m	NIC = 9
		0		$R_C < 0.1$ NM (185.2 m)	NIC = 8
8		1		$R_C < 1.0$ NM (1852 m)	NIC = 5
		0		$R_C \geq 1.0$ NM ((1852 m) or unknown)	NIC = 0

- Backwards compatibility issues with existing version 1 transponders are recognised but are judged to be minor in practical terms