

Draft Reply from WG-A (and others?)

1. The AMSS priority structures have been a part of Annex 10 since the effectivity date of the AMSS SARPs (Vol. III, Chapter 4), November 1995. Further, the same structures have been incorporated in the following requirements documents:

<u>Document</u>	<u>Publication Date</u>
a) AEEC AMSS Characteristics (741)	November 1988
b) AMSS MOPS (DO-210)	June 1992 (and subsequent revisions)
c) AMSS "MASPS" (DO-215)	May 1993 (and subsequent revisions)
d) AMSS SARPs	Completed Dec 1994; effective Nov 1995
e) VDL MASPS	September 1994
f) AEEC HFDL Characteristics (635)	October 1995
g) HFDL SARPs	Completed Mar 1999; effective Nov 1999

2. The priority structures were developed for a system that supports data and voice communications in both the safety (ATS/AOC) and non-safety (AAC/APC) services. The bases for the structures (integrated in structure but stated separately for data and voice) were all then-existing Annex 10 material relevant to priorities (Vol. II, Chs. 4 and 5) and ITU Radio Regulations (S43 and S44 (old Articles 50 and 51)). Many international sources of input were consulted during the development of this SARP and its validation as a component of Annex 10, Vol. III, Ch. 4.
3. Table 1 compares the original sources of priority structures, the structures that have been adopted for various air/ground subnetworks and the structure proposed by Paper #1. It is readily apparent that all these structures are in agreement except for the proposed ATN structure. The key difference between the proposed ATN structure and that used for AMSS and HFDL is the definition of the dividing line between safety and non-safety traffic. The ATNP proposes to define that line between ATN Network Layer Priority levels 5 and 6, whereas the AMSS and HFDL have defined that line between levels 3 and 4. This is most clearly seen in Table 1.
4. Also from Table 1, it can be seen that the driver of the difference is the interpretation of the Aeronautical Fixed Service Priority Order (ICAO Annex 10, Volume II, Ch. 4) as used in the AFTN. Some polled on this issue note that the title of the message priority category, "[g] Aeronautical administrative messages" may easily have been misinterpreted as being the equivalent of "Aeronautical Administrative Communications" (AAC). AAC is described in DO-210C and DO-215A as "a non-safety-related service that includes cabin provisioning and inventory, seat assignments, passenger travel arrangements, and baggage and parcel tracing." However, reference to ICAO Annex 10, Volume II, Ch. 4 reveals a further explanation of "[g] Aeronautical administrative messages" that clearly relates that category to safety and regularity of flight:

4.4.1.1.7 Aeronautical administrative messages (priority indicator KK) shall comprise:

- a) messages regarding the operation or maintenance of facilities provided for the safety or regularity of aircraft operations;

- b) messages concerning the functioning of aeronautical telecommunication services;
 - c) messages exchanged between civil aviation authorities relating to aeronautical services.
5. Also, the category "[h] Service message", per paragraph 4.4.1.1.9 of ICAO Annex 10, Volume II, Ch. 4, "shall be assigned the appropriate priority indicator." The "appropriate priority indicator" can be any priority level, including distress and urgency messages, as is made clear in the subsequent recommendation:
- 4.4.1.1.9.2.1 Recommendation.-- *When service messages refer to messages previously transmitted, the priority indicator assigned should be that used for the message(s) to which they refer.*
6. From (5) and (6) above, it is clear that these two AFS/AFTN message categories ([g] and [h]) are not AAC non-safety messages, but are safety-related messages—or can be, in the case of "[h] Service message". If a "Service message" were not related to a safety message, it would be given an appropriate priority level below the safety/non-safety dividing line, which action would resolve any safety vs. non-safety issue. Accordingly, the AMSS priority structure specifically recognizes
7. Note 8 says that the AFS priority structure is applicable only to the Aeronautical Fixed Service, and hence is not applicable to an air/ground link. It is not immediately apparent that a message originated in, or transported by, the AFTN should not be transported by the ATN, or that such a message should necessarily be excluded for transport on an air/ground data link. Further, the AFS contained the only priority structure for data messages in ICAO and ITU documentation prior to appearance of the AMSS and HFDL structures in Annex 10. Accordingly, it is the only pre-existing guidance in the matter, as it was for AMSS and HFDL.
8. If the proposed ATN structure were adopted, then not only would changes in all existing SARPs and other standards documents be required, but also the possibility exists of requiring hardware and/or software changes in existing systems and avionics. Also,
9. Equipment containing the ATN's SNDCF (responsible, *inter alia*, for mapping ATN CLNP-level priorities to AMSS and HFDL) presumably will be built to comply with the ATN SARPs, and resides beyond the purview of any air/ground subnetwork implementation. The notation "not applicable" is subject to numerous interpretations (e.g., ranging from "reject—not to be transported" or "map to the next lower available priority level" (i.e., level 3) to "probably will never happen but let's map it across anyhow". It is not immediately apparent what might happen if the "ATN equipment", built to the proposed standard, were to interoperate with equipment built to the existing AMSS and HFDL standards. (The similarly ambiguous "invalid" in the original AMSS structure is being corrected to read, "invalid/reject", with an added note, "Any call attempted at an invalid priority is rejected (specifically, the SNC is cleared)."
10. Regarding other aspects of the proposed table:
- a) Note 3. It is not clear what it was intended to convey with this note. It would seem that "SNC priority in CALL_REQUEST/CALL_ACCEPTED packet" is clear and unambiguous.
 - b) Note 5. Currently there is no reason to anticipate that the priority structure for next-generation AMSS systems will differ from the current structure. On the contrary,

subnetwork interfacing compatibility strongly argues for maintenance of the current structure.

- c) Note 7. AM(R)S frequencies in the VHF band 118-136.95 MHz and the HF band frequencies listed in Aer 27 are for the exclusive use for aeronautical safety communications, with no provisions for other use for the VDL and HF DL cases. Therefore, it would seem that Note 7 is not appropriate for any of the listed systems, unless the ATNP is aware of plans for any of the system types to provide for non-AM(R)S applications and for frequencies allocated to a service other than AM(R)S. Otherwise, we suggest that "restricted" should be changed to "not allowed".
11. The preponderance of opinion gathered so far is negative regarding the proposed table. The greatest concern is the potential of very costly changes in the standards documents and in the manifold derivative documents that have been produced during the past 10 years, not to mention the potential of changes in hardware, software, recertification, change-out, etc. A strong secondary concern is the prospect of a needless discrepancy among standards, even if it were clear that, as a practical matter, there might be no impact on existing or future air/ground data link systems.

Table 1. Comparison of Priority Structures Among Regulations, Requirements and Systems

Biotelephony Priority Order (Annex 10 Volume II, Ch. 5)	Aeronautical Fixed Service Priority Order (ICAO Annex 10, Volume II, Ch. 4)	ATN Message categories – data (priority level numbers defined for the CLNP)	ATN applications	AMSS SNC level data priority order (Annex 10, Vol. III, Ch.4) (Note 4)	AMSS Ckt-Mode (Voice) Priority	SS S
		14 - Network/systems management		[14] Distress communications, urgent communi- cations, network/- systems management	1 SARPs: Distress and Urgency [MOPS/MASPS: Distress, Urgency]	
Distress calls, distress and distress traffic	[a] Distress messages	13 - Distress communications				
Urgency messages, messages proceeded medical transports	[b] Urgency messages	12 - Urgent communications				
Communications relating to finding	(not defined)	(not defined)		[11] Communications relating to direction finding, flight safety messages	2 SARPs: Flight Safety [MOPS/MASPS: Direction Finding, Flight Safety]	
Safety messages	[c] Flight safety messages	11 - High-priority flight safety messages	CPDLC / ADS			
		10 - Normal-priority flight safety messages	AIDC			
Meteorological messages	[d] Meteorological messages	9 - Meteorological communications		[8] Meteorological communications	3 SARPs: Regularity and meteorological [MOPS/MASPS: Other Safety & Regularity of Flight]	
Regularity messages	[e] Flight regularity messages	8 - Flight regularity communications	CM / ATSMHS	[7] Flight regularity communications		
(not defined)	[f] Aeronautical information services	7 - Aeronautical information service	ATIS	[6] Aeronautical information service messages		
(not defined)	(not defined)	6 - Network/systems administration		[5] Aeronautical administrative messages, network/systems administration		
(not defined)	[g] Aeronautical administrative messages	5 - Aeronautical administrative messages			not applicable	
(not defined)	[h*] Service message *priority as appropriate" (see Note 6)	4 - <unassigned>		(see Note 6)	[see Note 6]	[see
(not defined)		3 - Urgent-priority administrative and U.N. Charter communications		[3] Urgent priority administrative and UN Charter communications	4 SARPs: Public Correspondence [MOPS/MASPS: Non-Safety & Regularity of Flight, Private & Public Correspondence]	no
(not defined)	(not defined)	2 - High-priority administrative and State/Government communications		[2] High priority administrative and State/Government communications		

not defined)	(not defined)	1 - Normal-priority administrative		[1] Normal priority/-administrative		
not defined)	(not defined)	0 - Low-priority administrative		[0] Low priority administrative		
beyond scope)	(beyond scope)	??	??	(see Note 7)		

Notes:

1. *Priorities above the bold line are for communications related to safety and regularity of flight; those below, for "non-safety" communications (including AAC and APC).*
2. *Reference ITU RR Article S44.1. Not all message categories and priorities defined by the ITU are matched by the ATN and its subnetworks. Priorities 1-6 are regarded as "safety communications".*
3. *ATN priority level numbers are defined at the CLNP. It is a task of the SNDCF to map these to the particular subnetwork's priority structure, including recognition of invalid codes.*
4. *Some AMSS subnetworks reserve particular internal link-layer priority codes for circuit-mode signaling and other purposes. Otherwise, the link layer and SNC level codes map 1:1.*
5. *Applicable November 4, 1999. The HFDL does not include a definition of categories and priorities of messages, but does specify transfer delay times for two groups of messages priorities. Accordingly, this chart presents HFDL high priority for ATN priorities 11 through 14 and HFDL low priority for ATN priorities 7 through 10.*
6. *AFS (AFTN) exemplified messages in this category as being inquiries about previous messages, which would be assigned a priority indicator the same as that of the message being inquired about. Therefore, there is no fixed priority level for these messages; if they exist in a given service, they are to be handled at the level of the related message category which can range between (a) and (g).*
7. *RTCA MOPS and MASPS add "(AAC/APC)" to the category definitions. For AMSS SARPs, public correspondence is explicitly defined in the circuit-mode structure, but not in the packet-mode structure. Suggest adding "and public correspondence" to "[0] Low Priority Administrative".*

**Aeronautical Telecommunication Network Panel
Working Group 1
16th Meeting, October 1999
Gran Canaria, Spain**

Communique to AMCP

ATN Network to Mobile Subnetwork Priority Mapping

BACKGROUND – The current ATN SARPs includes the requirements for mapping from ATN network to mobile subnetwork communications priority levels based on the category of the message. The working groups of the ATNP are not finalizing the next version of the ATN SARPs and the related technical provisions in ICAO Doc 9705. The proposed revisions to the core ATN SARPs and Doc 9705 Sub-Volume I include revisions to reflect new mobile subnetworks being developed by the ICAO AMC Panel. The draft Core and Sub-Volume I also include a clarification to the message category “Aeronautical administrative messages” to note this category is related only to aeronautical fixed service communications and is therefore not applicable to mobile subnetworks. Also the message category ‘Aeronautical Public Correspondence’ (APC) has been proposed to share the same network priority level as ‘Low priority administrative communications’. These draft revisions will be finalized at an ATNP Working Group of the Whole meeting in late November - early December 1999 and proposed for approved at ATNP/3 in February 2000.

ACTION REQUIRED - The working groups of the AMCP are requested to review the proposed revisions of the following table and to provide comments prior to ATNP/3.

Message categories	ATN network layer priority	Corresponding mobile subnetwork priority (see Note 6)						
		AMSS-1 (see Note 5)	VDL (Mode 1 and Mode 2)	VDL Mode 3		VDL Mode 4 (see Note 9)	SSR Mode S	HFDL
				Frame Mode	ISO 8208 Mode			
Network/systems management	<u>14</u>	14	see Note 2	<i>high</i>	<i>high</i>	<u>high</u>	<u>high</u>	<u>14</u>
Distress communications	<u>13</u>	14	see Note 2	<i>high</i>	<i>high</i>	<u>high</u>	<u>high</u>	<u>14</u>
Urgent communications	<u>12</u>	14	see Note 2	<i>high</i>	<i>high</i>	<u>high</u>	<u>high</u>	<u>14</u>
High-priority flight safety messages	<u>11</u>	11	see Note 2	<i>high</i>	<i>high</i>	<u>high</u>	<u>high</u>	<u>11</u>
Normal-priority flight safety messages	<u>10</u>	11	see Note 2	<i>high</i>	<i>high</i>	<u>high</u>	<u>high</u>	<u>11</u>
Meteorological communications	<u>9</u>	8	see Note 2	<i>medium</i>	<i>low</i>	<u>medium</u>	<u>low</u>	<u>8</u>
Flight regularity communications	<u>8</u>	7	see Note 2	<i>medium</i>	<i>low</i>	<u>medium</u>	<u>low</u>	<u>7</u>
Aeronautical information service messages	<u>7</u>	6	see Note 2	<i>low</i>	<i>low</i>	<u>medium</u>	<u>low</u>	<u>6</u>
Network/systems administration	<u>6</u>	5	see Note 2	<i>low</i>	<i>low</i>	<u>medium</u>	<u>low</u>	<u>5</u>
Aeronautical administrative messages (see note 8)	<u>5</u>	not applicable	not applicable	not applicable	not applicable	not applicable	not applicable	not applicable
<unassigned>	<u>4</u>	not applicable	not applicable	not applicable	not applicable	not applicable	not applicable	not applicable
Urgent-priority administrative and U.N. Charter communications	<u>3</u>	3	restricted - see Note 7	restricted - see Note 7	restricted - see Note 7	<u>low</u> restricted - see Note 7	not allowed	<u>3</u> restricted - see Note 7
High-priority administrative and State/Government communications	<u>2</u>	2	restricted - see Note 7	restricted - see Note 7	restricted - see Note 7	<u>low</u> restricted - see Note 7	not allowed	<u>2</u> restricted - see Note 7
Normal-priority administrative communications	<u>1</u>	1	restricted - see Note 7	restricted - see Note 7	restricted - see Note 7	<u>low</u> restricted - see Note 7	not allowed	<u>1</u> restricted - see Note 7
Low-priority admin. communications & APC	<u>0</u>	0	restricted - see Note 7	restricted - see Note 7	restricted - see Note 7	<u>low</u> restricted - see Note 7	not allowed	<u>0</u> restricted - see Note 7

Note 1.— Priorities above the bold line are for communications related to safety and regularity of flight.

Note 2.— VDL Mode 1 and Mode 2 have no specific subnetwork priority mechanisms.

Note 3.— The AMSS SARPs specify mapping of message categories to subnetwork priority without explicitly referencing ATN network layer priority.

Note 4.— The term “not allowed” means that only communications related to safety and regularity of flight are authorized to pass over this subnetwork as defined in the subnetwork SARPs.

Note 5.— The term AMSS-1 refers to the first generation Aeronautical Mobile Satellite Service.

Note 6.— Only those mobile subnetworks are listed for which subnetwork SARPs exist and for which explicit support is provided by the ATN Boundary Intermediate System technical provisions.

Note 7.— The term “restricted” means for this message category the use of this subnetwork may not be allowed in certain States and/or regions based on ITU radio frequency spectrum authorization.

Note 8.— The message category “Aeronautical administrative messages” refers to an Aeronautical Fixed Service category of messages and is therefore not applicable to delivery over mobile subnetworks.

Note 9.— The VDL Mode 4 subnetwork has only been validated to support the ADS application, which uses ATN network layer priority level 11.

