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FAA-STD-043A
May 10, 1994

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Standard

National Airspace System (NAS)

Open System Interconnection (OSI)

Priority

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DOCUMENT CHANGE NOTICE

1. Originator Name and Address SEIC Washington, DC	2. [ ] Proposed [X] Approved	3. Code Identification N/A 5. Code Identification N/A	4. Standard No. FAA-STD-043A 6. DCN No. 1

7. System Designation NAS	8. Related ECR/NCP No. see #14	9. Contract No. DTFA01-84-C-00017	10. Contractual Activity N/A

11. Configuration Item Nomenclature National Airspace System (NAS) Open System Interconnection (OSI) Priority, FAA-STD-043A	12. Effectivity N/A

This notice informs recipients that the standard identified by the number (and revision letter) shown in block 4 has been changed. The pages changed by this DCN (being those furnished herewithin) carry the same date as the DCN. The page numbers and dates listed below in the summary of changed pages, combined with nonlisted pages of the original issue of the revision shown in block 4, constitute the current version of this specification.

13. DCN No.	14. Pages changed	S*	A/D*	15. Date
1	NCP 16347 baselines this standard.		A	5/10/1994

*S = Indicates Supercedes Earlier Pages *A = Indicates Added Page * D = Indicates Deleted Page

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FOREWORD

This standard establishes the requirements for the assignment of priority indicators to messages exchanged between open end-systems in the Federal Aviation Administration (FAA) National Airspace System (NAS). The assignment of priority indicators shall be based on the relative importance of the messages to communicating open end-systems. This standard is only applicable to NAS open end-systems requiring message priority processing.

Priority indicators specified herein facilitate expediting urgent data through the NAS OSI layers. Two types of priority indicators are defined, association control (AC) and application process (AP).

The AC priority indicators will be used to identify the relative importance of associations established in NAS open end-systems and to influence the scheduling of the transmission of data on the subnetwork. They will be used in conjunction with the quality of service (QOS) parameter as defined in ISO 8649 (Application Control Service Element Service Definition), ISO 8822 (presentation layer service definition), ISO 8326 (session layer service definition), ISO 8072 (transport layer service definition) and ISO 8348 (network layer service definition).

The AP priority indicators will be used to identify the relative importance of application process messages. They will be used in conjunction with the priority option defined in application layer protocol standards used by the NAS.

Definitions are included in Section 6.0.

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1. SCOPE

1.1 Scope. This standard establishes the required priority indicators to be used when utilizing the priority option of the Open Systems Interconnection (OSI) protocols while exchanging messages between National Airspace System (NAS) open end-systems. Priority indicators for each of the OSI layers are defined in this standard. Intermediate systems that process messages being exchanged between NAS open end-systems shall pass the priority field unaltered if the priority option is not supported. The protocol that transfers the priority indicators and the abstract syntax that defines the data representation is defined in application layer protocol standards used by the NAS, ISO 8650 (Application Control Service Element Protocol), ISO 8823 (presentation layer protocol), ISO 8327 (session layer protocol), ISO 8073 (transport layer protocol), and ISO 8473 (network layer protocol).

Priority indicators for systems required to interface with the Aeronautical Telecommunication Network (ATN) are specified in the International Civil Aviation Organization (ICAO) ATN Manual, Appendix 5. The priority requirements specified in this standard are consistent with the ATN priority requirements.

1.2 Purpose. The purpose of this standard is to define a common set of priority indicators for use within the NAS. The priority indicators are to be used by the application processes when it is desired to transfer messages, between communicating NAS open end-systems, as a function of their relative importance.

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2. APPLICABLE DOCUMENTS

2.1 Government Documents. The following documents form a part of this standard to the extent specified herein. In the event of conflict between the documents referenced herein and the content of this standard, the contents of this standard shall be considered the superseding requirement.

None.

2.2 Non-Government Documents. The following documents form a part of this standard to the extent specified herein. In the event of conflict between the documents referenced herein and the content of this standard, the contents of this standard shall be considered the superseding requirement.

International Organization for Standardization (ISO)

ISO 8072:1986	Information Processing Systems – Open Systems Interconnection – Transport Service Definition, 1st Edition
ISO/IEC 8073:1988	Information Processing Systems – Open Systems Interconnection – Connection Oriented Transport Protocol Specification, 2nd Edition
ISO 8326:1987	Information Processing Systems – Open Systems Interconnection – Basic Connection Oriented Session Service Definition, 1st Edition
ISO 8327:1987	Information Processing Systems – Open Systems Interconnection – Basic Connection Oriented Session Protocol Specification, 1st Edition
ISO 8348:1987/AD1:1987	Information Processing Systems – Data Communications – Network Service Definition – Addendum 1: Connectionless Mode Transmission, 1st Edition
ISO 8473:1988	Information Processing Systems – Data Communications – Protocol for Providing the Connectionless-Mode Network Service (CLNS), 1st Edition
ISO 8649:1988	Information Processing Systems – Open Systems Interconnection – Service Definition for the Association Control Service Element, 1st Edition
ISO 8650:1988	Information Processing Systems – Open Systems Interconnection – Protocol Specification for the Association Control Service Element, 1st Edition
ISO 8822:1988	Information Processing Systems – Open Systems Interconnection – Connection Oriented Presentation Service Definition, 1st Edition

ISO 8823:1988	Information Processing Systems – Open Systems Interconnection – Connection Oriented Presentation Protocol Specification, 1st Edition

International Civil Aviation Organization (ICAO)

ICAO ATN Manual	Manual of the Aeronautical Telecommunication Network, Second Edition

3. REQUIREMENTS

3.1 General. Two types of priority shall be available to NAS open end-systems: association control (AC) priority and application process (AP) priority. AP priority shall be used to establish relative importance of AP messages between communicating NAS open end-systems. NAS applications shall use the AP priority indicators specified in this standard when exercising the priority option specified in application layer protocols (ALP) used by the NAS.

AC priority shall be used to establish the relative importance of an association and to influence the scheduling of the transmission of data within the subnetwork. NAS applications shall use the AC priority indicators when utilizing the quality of service (QOS) priority parameters specified in ISO 8649, ISO 8822, ISO 8326, ISO 8072, and ISO 8348/AD1.

The use of priority indicators is application specific and will be specified in interface requirements documents (IRD) and interface control documents (ICD). If NAS OSI priority options are not used, default priority values specified in this standard shall be used by NAS open end-systems.

3.2 Application Process Priority. The NAS application process (AP) priority indicator shall be used to specify the relative importance of messages processed by an AP. The application process priority indicators allow the AP to process messages, received from remote computer systems, as a function of the importance of the message. It shall define the priority assigned to the transfer of the corresponding application protocol data unit (APDU) with respect to other APDUs to be exchanged between the application entities (AE). The lower the value, the higher the priority. If several APDUs with the same priority are awaiting transfer, they are transferred "first in, first out".

An application process shall set the AP priority by setting the desired AP priority indicator in the application protocol priority parameter provided. The AP priority indicator will only be processed by the application process that receives the messages. Underlying communication protocols do not process or act on the application process priority indicator since it is not embedded in the protocol header of the lower layers.

Allowable application process priorities shall range from "0" to "14", zero being the highest. NAS AP priority indicators shall be as defined in Table 3.2-1. A priority indicator shall be selected based on the relative importance of the messages to the communicating NAS open end-systems.

Table 3.2-1 NAS Application Process Priority Indicators

Message Classification	AP Priority
Network/Systems Mgmt.(Operational)	0
Distress Communications	1
Urgent Communications	2
Direction Finding and Navigation	3
Flight Safety Communications and NOTAMs	4
Meteorological Communications	5
Flight Regularity Communications	6
High Priority Aeronautical Administrative Communication	7 (Default)
Network/Systems Administration	8
Aeronautical Administration Messages	9
<Unassigned>	10
Urgent Priority Administrative and U.N. Charter Communications	11
High Priority Administrative and State/Government Communications	12
Normal Priority Administrative	13
Low Priority Administrative	14

3.3 Association Control Priority. The application process shall set the association control (AC) priority by setting the desired transport priority indicator, from Table 3.3-1, in the quality of service (QOS) parameter of the Association Control Service Element (ACSE) association establishment request primitive as described in ISO 8649. This indicator shall be passed, through the presentation and session layers, to the transport layer.

3.3.1 Transport Priority. Allowable transport priority indicators shall range from "0" to "14", zero being the highest level. NAS transport priority indicators shall be as defined in Table 3.3-1.

Table 3.3-1 NAS Transport Priority Indicators

Message Classification	Priority Transport
Network/Systems Management (Operational)	0
Distress Communications	1
Urgent Communications	2
Direction Finding and Navigation	3
Flight Safety Communications and NOTAMs	4
Meteorological Communications	5
Flight Regularity Communications	6
High Priority Aeronautical Administrative Communication	7 (Default)
Network/Systems Administration	8
Aeronautical Administration Messages	9
<Unassigned>	10
Urgent Priority Administrative and U.N. Charter Communications	11
High Priority Administrative and State/Government Communications	12
Normal Priority Administrative	13
Low Priority Administrative	14

The transport priority indicator specifies the relative importance of the connection with respect to the following:

a. The order in which connections are to have their QOS degraded, if required.

b. The order in which connections are to be broken to recover resources, if required.

The transport priority indicator shall be mapped onto the network layer connectionless network protocol (CLNP) QOS priority parameter as described in ISO 8073 and ISO 8473.

3.3.2 Network Priority. Allowable network priority indicators shall range from "0" to "14", fourteen being the highest level. NAS network priority indicators shall be as defined in Table 3.3.2-1.

The network layer priority indicator shall be mappable to the appropriate subnetwork layer QOS parameter as described in ISO 8473.

Table 3.3.2-1 NAS Network Priority Indicators

Message Classification	Priority Transport
Network/Systems Management (Operational)	14
Distress Communications	13
Urgent Communications	12
Direction Finding and Navigation	11
Flight Safety Communications and NOTAMs	10
Meteorological Communications	9
Flight Regularity Communications	8
High Priority Aeronautical Administrative Communication	7 (Default)
Network/Systems Administration	6
Aeronautical Administration Messages	5
<Unassigned>	4
Urgent Priority Administrative and U.N. Charter Communications	3
High Priority Administrative and State/Government Communications	2
Normal Priority Administrative	1
Low Priority Administrative	0

3.4 NAS to ATN Priority Mapping. The NAS priorities map directly to the Aeronautical Telecommunication Network (ATN) priorities as shown in Table 3.4-1. A full specification of ATN priority requirements are contained in the ICAO ATN Manual.

Table 3.4-1 NAS/ATN Communication Priority Mapping

Message Classification	Priority Indicators				
	Application	Transport		Network	
		NAS	ATN	NAS	ATN
Network/System Management	0	0	0	14	14
Distress Communication	1	1	1	13	13
Urgent Communication	2	2	2	12	12
Direction Finding and Navigation	3	3	3	11	11
Flight Safety Communications and NOTAMs	4	4	4	10	10
Meteorological Communications	5	5	5	9	9
Flight Regularity Communications	6	6	6	8	8
High Priority Aeronautical Administration Communications	7	7	7	7	7
Network/Systems Administration	8	8	8	6	6
Aeronautical Administration Messages	9	9	9	5	5
<Unassigned>	10	10	10	4	4
Urgent Priority Administrative and U.N. Charter Communications	11	11	11	3	3
High Priority Administrative and State/Government Communications	12	12	12	2	2
Normal Priority Administrative	13	13	13	1	1
Low Priority Administrative	14	14	14	0	0

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4. QUALITY ASSURANCE PROVISIONS

This section is not applicable to this standard.

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5. PREPARATION FOR DELIVERY

This section is not applicable to this standard.

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6.0 NOTES

6.1 Definitions.

Open end-system - any host computer and its resident applications that can be accessed by other computers and their resident applications via a network using a mutually agreed-upon set of data communications protocols.

Open Systems Interconnection (OSI) - standards and guidelines designed to allow applications running on computers from multiple vendors to exchange a wide variety of data in a highly automated manner.

6.2 Acronyms.

AC	association control
ACSE	Association Control Service Element
AE	application entity
ALP	application layer protocol
AP	application process
APDU	application protocol data unit
ATN	aeronautical telecommunication network
CLNP	connectionless network protocol
FAA	Federal Aviation Administration
ICAO	International Civil Aviation Organization
ICD	interface control document
IEC	International Electrotechnical Commission
IRD	interface requirements document
ISO	International Organization for Standardization
NAS	National Airspace System
NOTAM	notice to airmen
OSI	Open Systems Interconnection
QOS	quality of service
RTCA	Radio Technical Commission for Aeronautics

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