



International Civil Aviation Organization

AMHS WORKSHOP

REGIONAL WORKSHOP ON AMHS

AFTN/AMHS GATEWAY SPECIFICATIONS

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General

- ✈ An AFTN/AMHS gateway shall provide for interworking between the AFTN and the ATN such that communication with other AFTN/AMHS gateways and with ATS message servers is possible.
- ✈ An AFTN/AMHS gateway shall consist of the following logical components:
 - a) AFTN component;
 - b) ATN component;
 - c) message transfer and control unit;
 - d) control position; and
 - e) DUA, if the gateway supports the extended ATSMHS.



General (Ct'd)

- ✈ This division into logical components is a convenient way of specifying functions of a gateway. There is no requirement for an AFTN/AMHS gateway to be implemented according to this structure.
- ✈ An AFTN/AMHS gateway shall be able to perform actions upon receipt of any category of AMHS information object by its ATN component.
- ✈ An AFTN/AMHS gateway shall be able to perform actions upon receipt of any type of AFTN message by its AFTN component.
- ✈ An AFTN/AMHS gateway supporting the extended ATSMHS shall be able to retrieve information about AMHS users from ATN directory system agents.



AFTN Gateway Components

AFTN component

- ➔ The AFTN component shall handle the interface to the AFTN and provide an interface to the message transfer and control unit implementing:
- ➔ a) all the applicable requirements of Annex 10, Volume II in a manner so as to be externally indistinguishable from an operational AFTN station by the AFTN centre to which the gateway is connected; and
- ➔ b) additional requirements which are necessary due to the AFTN component pertaining to an AFTN/AMHS gateway.



AFTN Gateway Components

- ✈ If an AFTN/AMHS gateway is connected to an AFTN centre which is capable of using only ITA-2 format, the AFTN component shall convert messages to/from the IA-5 format. This allows the message transfer and control unit to use IA-5 characters internally.
- ✈ The AFTN component shall incorporate an AFTN procedure handler providing for all AFTN functions prescribed for the interface to the AFTN.

Message content profile specification: Additional requirements



- 4.2.1.4 When received by the AFTN component, AFTN service messages as generally specified in Annex 10,
 - Volume II, 4.4.1.1.9 and subparagraphs shall be handled by the AFTN component of the gateway in one of four mutually
 - exclusive manners, depending on the category of the service message:
 - a) transfer to the message transfer and control unit to be processed as specified in 4.4 if the service
 - message is an AFTN acknowledgement message, as specified in Annex 10, Volume II, 4.4.10.1.6.1
 - and 4.4.15.6;
 - b) transfer to the message transfer and control unit to be processed as specified in 4.4 if the service
 - message is an AFTN service message requesting correction of a message received with an unknown
 - addressee indicator as specified in Annex 10, Volume II, 4.4.11.13.3;



AFTN Gateway Components

- ➔ When received by the AFTN component, AFTN service messages as generally specified in Annex 10, Volume II, 4.4.1.1.9 and subparagraphs shall be handled by the AFTN component of the gateway in one of four mutually exclusive manners, depending on the category of the service message:
 - a) transfer to the message transfer and control unit to be processed as specified in 4.4 if the service message is an AFTN acknowledgement message, as specified in Annex 10, Volume II, 4.4.10.1.6.1 and 4.4.15.6;
 - b) transfer to the message transfer and control unit to be processed as specified in 4.4 if the service message is an AFTN service message requesting correction of a message received with an unknown addressee indicator as specified in Annex 10, Volume II, 4.4.11.13.3;



AFTN Gateway Components

- c) processing as specified in 4.2.1.12 if the service message is an AFTN service message requesting from the originator repetition of an incorrectly received message when it is detected that a message has been mutilated, as specified in Annex 10, Volume II, 4.4.11.1 and 4.4.16.2.2; or
- d) processing in compliance with the provisions of Annex 10, Volume II, without being passed to the message transfer and control unit, if the service message belongs to any other category of AFTN service message.



AFTN Gateway Component

- When received by an AFTN/AMHS gateway, AFTN channel-check transmissions as specified in Annex 10, Volume II, 4.4.9.3 and 4.4.15.5 shall:
 - a) be handled by the AFTN component in compliance with the provisions of Annex 10, Volume II; and
 - b) be prevented from being passed to the message transfer and control unit.
- The AFTN component shall pass all messages, other than those referred to in 4.2.1.4 c) and d), and in 4.2.1.5, received from the AFTN to the message transfer and control unit for processing as specified in 4.4, and provided that the conditions of 4.2.1.7 are met.



AFTN Gateway Component

- ➔ The processing by the AFTN component shall ensure that all messages and service messages received from the AFTN and passed to the message transfer and control unit for further processing by the AFTN/AMHS gateway are constructed in strict accordance with the provisions of Annex 10, Volume II, 4.4.15.1 through 4.4.15.3.12 and 4.4.15.6.
- ➔ The AFTN component shall perform short-term retention of all messages transmitted towards the AFTN in a manner equivalent to that specified for an AFTN communication centre in Annex 10, Volume II, 4.4.1.7.
- ➔ The AFTN component shall perform long-term retention of the heading, address and origin parts of all messages received from the AFTN, with the message receipt-time and the action taken thereon, for a period of at least thirty days.

AFTN Gateway Component



- ➔ The AFTN component shall perform long-term retention of all AFTN messages that it generates, in their entirety, for a period of at least thirty days.
- ➔ The AFTN component shall perform long-term retention of the heading, address and origin parts of all messages received from the message transfer and control unit and the action taken thereon for a period of at least thirty days.
- ➔ Upon reception by an AFTN/AMHS gateway of an AFTN service message requesting repetition by the originator of an incorrectly received message as specified in Annex 10, Volume II, 4.4.11.1 or 4.4.16.2.2, the AFTN component shall perform one of the following actions:



AFTN Gateway Component

- a) terminate the procedure and report an error situation to a control position if the referenced subject AFTN message did not pass through the gateway or if the AFTN component is not in possession of an un mutilated copy of the subject AFTN message; or
 - b) reassume responsibility for the mutilated message and repeat the message in compliance with the provisions of Annex 10, Volume II, 4.4.11.3 if the mutilated message is detected as having passed through the gateway and if the AFTN component is in possession of an un mutilated copy of the message.
- The determination whether the AFTN component is in possession of an un mutilated copy of the message may require the assistance of a control position.



AFTN Gateway Component

- ➔ If, for any reason, the message transfer and control unit is unable to accept AFTN messages passed by the AFTN component, the AFTN component shall handle this situation in compliance with the provisions of Annex 10, Volume II, 4.4.1.5.2.3. Such a condition may be caused by the inability of the message transfer and control unit to pass AMHS messages to the ATN component.
- ➔ The AFTN component shall ensure that all information objects constructed by the message transfer and control unit for transmission over the AFTN are handled in accordance with the AFTN procedure in the application of 4.2.1.3.
- ➔ If the AFTN component is unable to handle an AFTN service message or an AFTN channel-check transmission in compliance with the provisions of Annex 10, Volume II, as specified in 4.2.1.4 d) or 4.2.1.5, the error condition shall be logged and reported to a control position.
- ➔ An AFTN address shall be allocated to the AFTN component.



ATN Component

- ➔ The ATN component shall allow the AFTN/AMHS gateway to function as an end system on the ATN.
- ➔ The ATN component shall handle the interface to the AMHS and provide an interface to the message transfer and control unit as specified in 4.2.4, implementing an MTA complying with the profile specification included in 3.2.2, and with the additional profile specification included in 3.2.4 if the gateway supports the extended ATSMHS, so as to be externally indistinguishable from an ATS message server by the ATS message server(s) or other gateway(s) to which it is connected.



ATN Component

- ✈ If, for any reason, the message transfer and control unit is unable to accept messages or probes passed by the ATN component, ATN component shall:
 - a) attempt to reroute the message or probe as specified in ISO/IEC 10021-4, 14.3.4.4; and
 - b) if no alternate route is available in the MTA routing tables or none of such routes can be successfully used, reject the message for all the message recipients, whose *responsibility element in the perrecipient-indicator has the abstract-value “responsible” in the received message, with the non-deliveryreason-code and non-delivery-diagnostic-code elements of the non-delivery report taking the abstractvalues* specified in the base standards (ISO/IEC 10021-4, 14.3.4.4,1).
- ✈ Such a condition may be caused by the inability of the message transfer and control unit to pass AFTN messages to the AFTN component.



ATN Component

- If the AMHS management domain operating an AFTN/AMHS gateway desires to implement message handling system optional FGs in addition to the specification in 4.2.2.2, this shall be performed in the ATN component.
- This applies in particular to the redirection FG. If implemented, redirection may be performed by the ATN component, in response to a failure situation as envisaged in 4.2.2.3, for example.
- The ATN component shall ensure that all information objects constructed by the message transfer and control unit for transfer in the AMHS are handled in accordance with the procedures specified in the base standards for a relaying MTA implementing the profile specified in 3.2.2, in application of 4.2.2.2.



ATN Component

- The ATN component shall implement a traffic logging function identical to that of the MTA included in an ATS message server as specified in 3.2.3.
- The ATN component shall ensure that all AMHS information objects passed to the message transfer and control unit comply with the base standards.
- In an AFTN/AMHS gateway supporting the extended ATSMHS, the ATN component should interface with the DUA component to perform DL-expansion using the ATN directory service, for the implementation of the DL FG.



Message transfer and control unit

- The message transfer and control unit in an AFTN/AMHS gateway shall provide a bi-directional conversion facility between the AFTN component and the ATN component, consisting of:
 - a) a set of general functions as specified in 4.3; and
 - b) AFTN/AMHS conversion functions specified in 4.4 for the AFTN to AMHS conversion and in 4.5 for the AMHS to AFTN conversion, respectively.
- The message transfer and control unit shall use IA-5 characters internally.
- The message transfer and control unit in an AFTN/AMHS gateway shall pass all the AMHS information objects which it constructs in application of 4.4 and 4.5.6 to the ATN component of the gateway, for further conveyance in the AMHS.



Message transfer and control unit

- ➔ For the generation of AMHS messages and reports and the processing of received AMHS messages, probes and reports, the message transfer and control unit shall have the capability to interpret the semantics and to perform actions related to the ISO/IEC 10021 elements of service which are part of the basic requirements of the MT service as specified in ISO/IEC ISP 12062-3:1995 (or a later edition).
- ➔ The message transfer and control unit in an AFTN/AMHS gateway shall pass all the AFTN messages which it constructs in application of Section 4.5 and 4.4.2.1.4.2 to the AFTN component of the AFTN/AMHS gateway, for further conveyance in the AFTN.

Message transfer and control unit



- ➔ The message transfer and control unit shall ensure that all the AMHS information objects which it constructs comply with Section 7 (for IPMs) and Section 8 (for RNs) of ISO/IEC 10021-7, complemented by the additional requirements included in 3.3, and with the Section 12.2.1.1 of ISO/IEC 10021-4 (for messages) and Section 12.2.1.3 of ISO/IEC 10021-4 (for reports).
- ➔ The message transfer and control unit shall ensure that all the AFTN information objects which it constructs comply with Annex 10, Volume II, 4.4.15.



Message transfer and control unit

- The message transfer and control unit of an AFTN/AMHS gateway supporting the extended ATSMHS shall interface with the DUA component of the gateway to:
 - a) determine the level of ATSMHS supported by the intended recipients of the AMHS IPMs which it constructs; and
 - b) allow retrieval of security information from the ATN directory.
- The message transfer and control unit of an AFTN/AMHS gateway supporting the extended ATSMHS shall have the capability to interpret the semantics and perform actions related to the ISO/IEC 10021 security elements of service forming part of the AMHS security policy as specified in 2.2.3.2 and 3.1.4.3.3 to 3.1.4.3.15.
- The message transfer and control unit of an AFTN/AMHS gateway supporting the extended ATSMHS should interface with the DUA component of the gateway to allow retrieval of address information from the ATN directory for the purpose of address conversion.

Interface between the ATN component and the message transfer and control unit



- The ATN component shall exchange information objects with the message transfer and control unit via its
- MTA transfer port as specified in ISO/IEC 10021-4, Section 12.2.
- The ATN component shall invoke the message-transfer, report-transfer and probe-transfer abstract operations, respectively, to pass AMHS messages, reports and probes to the message transfer and control unit.
- The message transfer and control unit shall invoke the message-transfer and report-transfer abstract operations, respectively, to pass AMHS messages and reports to the ATN component.

Interface between the AFTN component and the message transfer and control unit



- ➔ An AFTN message or service message passed by the AFTN component to the message transfer and control unit in application of 4.2.1.4 a) and b), 4.2.1.6 and 4.2.1.7 shall be:
 - a) transferred according to the table of priorities specified in Annex 10, Volume II, 4.4.1.2.1; and
 - b) passed as received by the AFTN component from the adjacent AFTN centre, with the possible exception of an ITA-2 to IA-5 conversion performed in application of 4.2.1.2, and including the unaltered AFTN heading if present in the received message.

Interface between the AFTN component and the message transfer and control unit



- ➔ An AFTN message or service message passed by the message transfer and control unit to the AFTN
 - component in application of 4.2.3.5 shall be:
 - a) transferred according to the table of priorities specified in Annex 10, Volume II, 4.4.1.2.1; and
 - b) passed as constructed by the message transfer and control unit, and thus without message heading as specified in Annex 10, Volume II, 4.4.15.1.1.
- ➔ The AFTN component shall return to the message transfer and control unit, as the result of the transfer operation described in 4.2.5.2, the transmission identification, if any, constructed by the AFTN component for the transmission of the message or service message over the AFTN.



AFTN/AMHS gateway control position

- ➔ The AFTN/AMHS gateway control position shall be used as the place where errors which occurred in the AFTN/AMHS gateway and certain non-deliveries which occurred in the AMHS are reported for appropriate action.
- ➔ The appropriate action to be undertaken on reporting of an error or a non-delivery to an AFTN/AMHS gateway control position shall be either:
 - a) a matter of policy which is local to the AMHS management domain operating the AFTN/AMHS gateway; or
 - b) subject to multilateral agreements.
- ➔ For some categories of error situations, this manual specifies the actions to be taken, e.g. message rejection and generation of an appropriate service message (to the AFTN) or non-delivery report (to the AMHS).
- ➔ The specified actions aim to minimize the assistance of the control position. However, it may be a matter of policy local to the AMHS management domain operating the AFTN/AMHS gateway to try to reduce the occurrence of message rejection with the assistance of the control position.



AFTN/AMHS gateway control position

- ➔ When the action chosen to handle an error situation includes the generation of an AMHS information object, the category of information object used for this purpose shall be an IPM conveying appropriate service information. The service information to be conveyed may be derived, for example, from an AFTN service message. The presentation of the service information is a matter of local policy.
- ➔ In an AFTN/AMHS gateway supporting the extended ATSMHS, the control position should interface with the DUA component to allow the control position to access the ATN directory service.



DUA component

- ➔ The DUA component in an AFTN/AMHS gateway supporting the extended ATSMHS shall comply with the ATN DUA specification as included in Part IV.
- ➔ The interface between the DUA component and other gateway components (ATN component, message transfer and control unit, control position) is a matter of implementation outside of the scope of this manual.
- ➔ The DUA component in an AFTN/AMHS gateway supporting the extended ATSMHS shall be used for the:
 - ➔ a) determination of the level of ATSMHS supported by AMHS users; and
 - ➔ b) retrieval of AMHS security information.
- ➔ The DUA component in an AFTN/AMHS gateway supporting the extended ATSMHS should be used to retrieve information from the ATN directory in support of address conversion.



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Questions?



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Thank you