



International Civil Aviation Organization

CAR/SAM REGIONAL PLANNING IMPLEMENTATION GROUP (GREPECAS)

**Fifth Meeting of the CNS Committee of the GREPECAS ATM/CNS Subgroup
(CNS/COMM/5)**

Lima, Peru, 13 to 17 November 2006

CNS/COMM/5-WP/05

12/10/06

Agenda Item 1: Communication systems developments
1.3 Review of the ATN regional implementation plan.

FEDERAL AVIATION ADMINISTRATION (FAA) ATN AMHS IMPLEMENTATION PLAN

(Presented by the United States of America)

SUMMARY

This paper is a summary of the United States Federal Aviation Administration (FAA) plan to implement the Air Traffic Service Message Handling System (AMHS) service to support the ICAO AMHS Global Implementation Plan.

1. Introduction

1.1 The FAA implemented the AMHS in Salt Lake City, Utah in March 2005. The AMHS service currently operates with the AMHS in the Tokyo Area Control Center (ACC) utilizing the Aeronautical Telecommunications Network (ATN) router on X.25 sub-network protocol as specified in the APANPIRG ATN Router Interface Control Document. Attached to this paper are the Asia/Pacific Regional ATN Router and AMHS Implementation Plans.

2. FAA Plan

2.1 The FAA completed its test platform at its Technical Center located in New Jersey in February 2006 and uses this facility to perform ATN/AMHS conformance tests with other States, and is planning to migrate from Aeronautical Fixed Telecommunications Network (AFTN) to AMHS service in September 2007.

2.2 The FAA test platform has been used to test a variety of AMHS vendors' equipment.

2.3 The FAA AMHS will support both translated-form (XF) and Common AMHS Addressing Scheme (CAAS) addresses. However, based on the guideline from the APANPIRG ATN Implementation Plan and the ICAO Doc. 9705 Edition 3, the FAA would like to support only the CAAS address scheme in the future.

2.4 The FAA AMHS addressing schemes were developed based on guidelines from the APANPIRG AMHS Interface Control Document and other related APANPIRG Implementation documents.

2.5 The FAA has completed the development of its own ATN router that will provide dual stack network protocols (ATN and Internet Protocols). The implementation of the ATN router at its Salt Lake City (SLC) facility was completed in June 2006.

2.6 The FAA is planning to expand the AMHS service to Atlanta (ATL) Center to support facility and network diversification. This will ensure SLC and ATL Centers can backup one another. ATL will support AMHS service to Europe, South America and Caribbean regions in September 2007.

2.7 The FAA and the Chinese Air Traffic Management Bureau (ATMB) are performing a conformance test between ATMB's and FAA's ATN Router and AMHS.

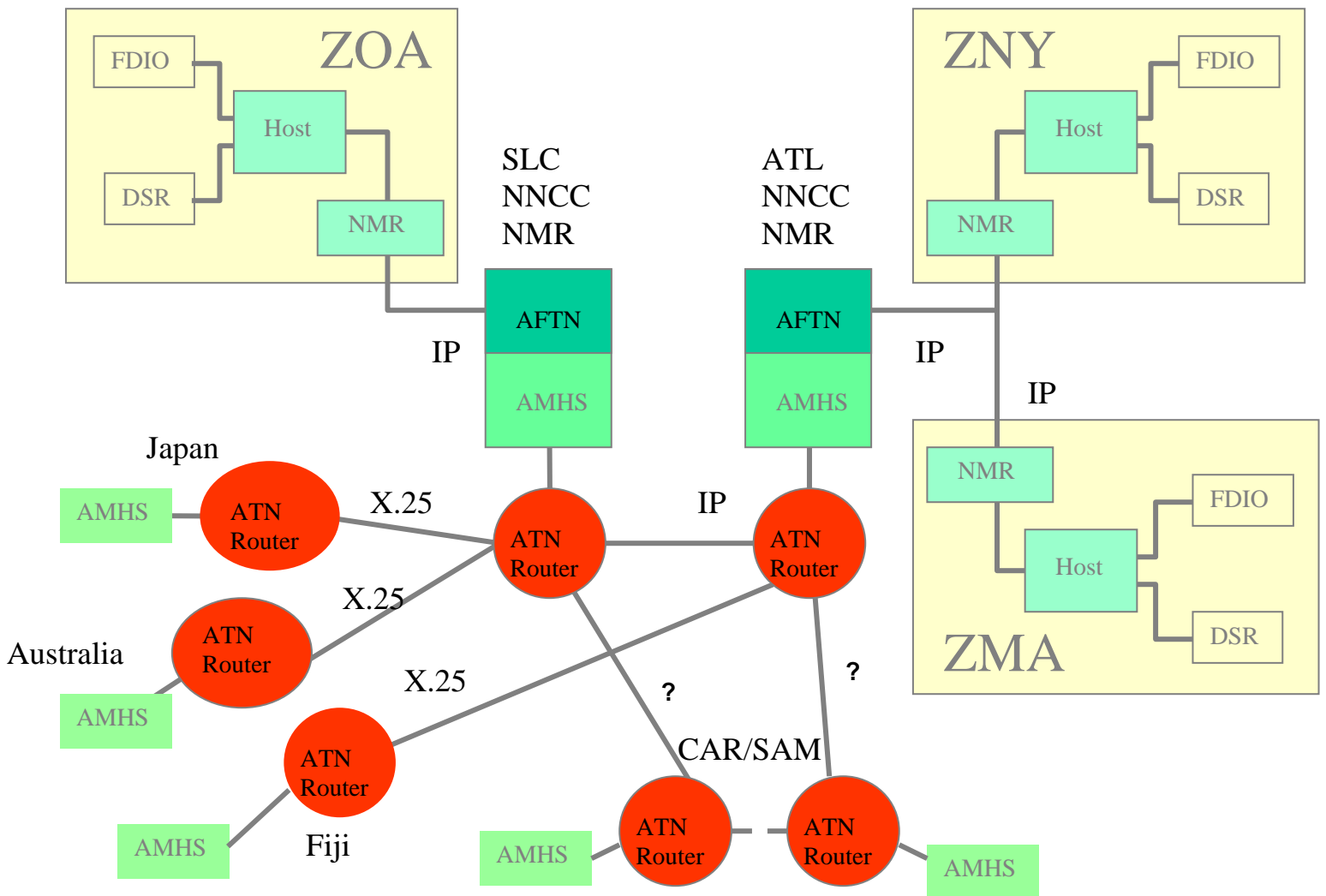


Fig 1: FAA ATN/AMHS Infrastructure

3. FAA Long Term Plan

3.1 The FAA AMHS Extended Service to support Binary Universal Form Representation (BUFR) coded messages and Directory Service, is being considered by the FAA management. A well-defined BUFR generated system interface and its operational impact have to be determined before a decision can be made.

3.2 The FAA will support the development of an Interface Control Document (ICD) between AMHS and BUFR coded message generated system to ensure the characteristics of the BUFR coded generated system (e.g. text format conversion, accuracy/decimal places and network protocol, etc.) will not impact the AMHS service. This approach should be considered since the AMHS is a standardized communication network used to distribute many other ATC operations-related messages.

3.3 The FAA is supporting the development of Internet Protocol Suite (IPS) SARPS for Ground-to-Ground aeronautical data communications.

3.4 The FAA is in the process of converting its internal telecommunication network to the Internet Protocol to reduce its operational cost. The FAA can support States with AMHS utilizing IP protocol.

3.5 The FAA will continue to support ATN Open Systems Interconnection (OSI) via a Dual Stack Router for FIR Boundaries. The FAA encourages those countries that have not made a financial commitment to OSI for ground-to-ground data communications to consider the IPS.

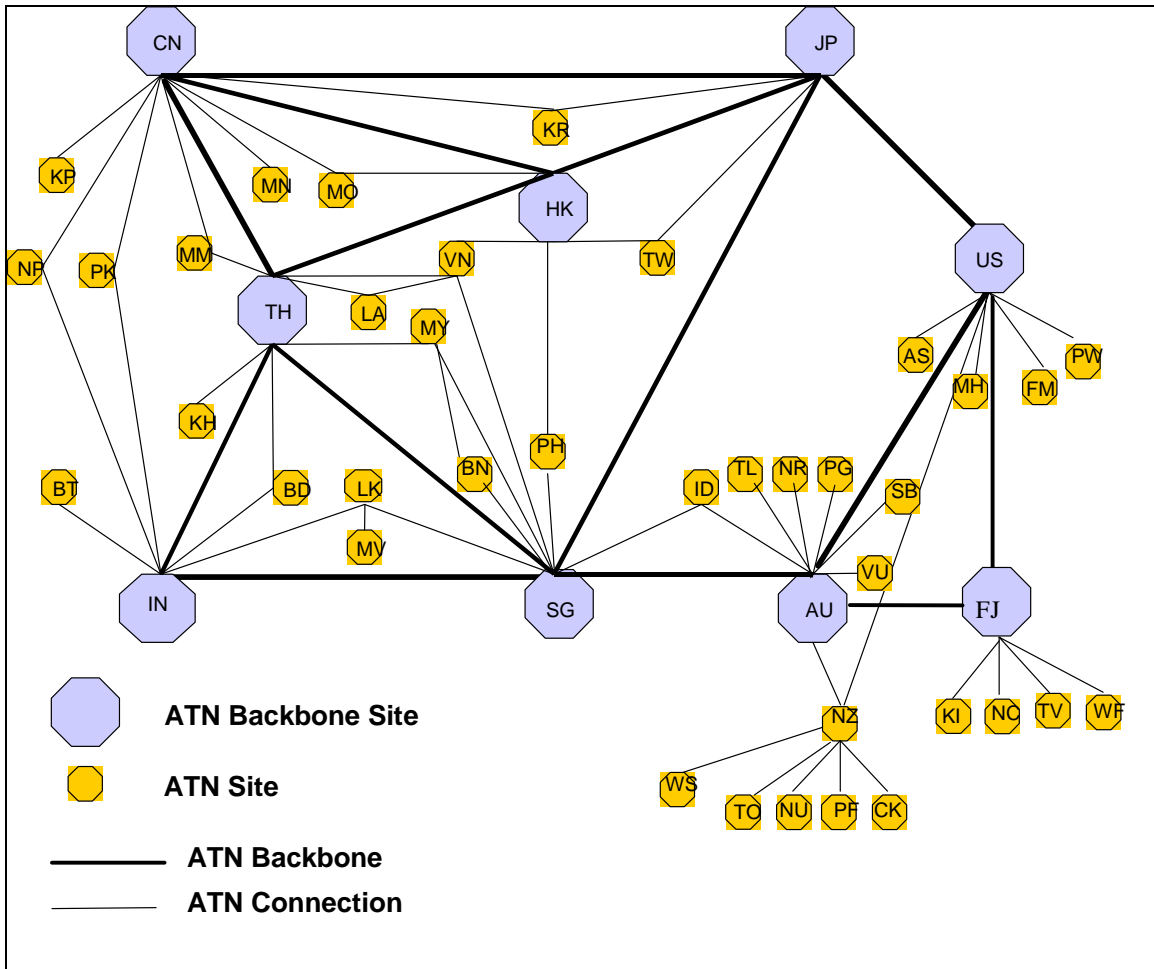
4. Recommendation

4.1 Contracting States are invited to review US plan. It is recognized that the IP interface will require a new IP protocol Interface Control Document, IP routing policy, IP addressing scheme and other implementation and operational related documents. It is recommended that Contracting States utilize the IP for AMHS implementation in the CAR/SAM region.

ATTACHMENT 1

1. CHART CNS 2 - ATN ROUTER PLAN

ASIA/PAC ATN Router Interconnection (Table CNS 1B)



**Attachment to Chart CNS-2
(Table CNS 1 B)**

ISO Country Code

Country	ISO Code	Country	ISO Code
American Samoa	AS	Mongolia	MN
Australia	AU	Myanmar	MM
Bangladesh	BD	Nauru	NR
Bhutan	BT	Nepal	NP
Brunei Darussalam	BN	New Caledonia	NC
Cambodia	KH	New Zealand	NZ
China	CN	Niue	NU
Cook Islands	CK	Pakistan	PK
DPR. Korea	KP	Palau	PW
Timor Leste	TL	Papua New Guinea	PG
Fiji	FJ	Philippines	PH
French Polynesia	PF	Samoa	WS
Hong Kong, China	HK	Singapore	SG
India	IN	Solomon Islands	SB
Indonesia	ID	Sri Lanka	LK
Japan	JP	Taipei	TW
Kiribati	KI	Thailand	TH
Korea, Republic of	KR	Tonga	TO
Lao	LA	Tuvalu	TV
Macau China	MO	United States	US
Malaysia	MY	Vanuatu	VU
Maldives Islands	MV	Viet Nam	VN
Marshall Islands	MH	Wallis and Futuna Islands	WF
Micronesia, Federated States of	FM		

TABLE CNS 1B – ATN ROUTER PLAN

Explanation of the Table

Column

- 1 Administration – the name of the Administration, State or Organization responsible for management of the router
- 2 Location of Router
- 3 Type of Router:
BBIS - Backbone Boundary Intermediate System
BIS - Boundary Intermediate System
- 4 Type of Interconnection:
Inter – Regional
Intra – Regional
Sub – Regional
- 5 Interconnection, Connected to router of: name of the location of the correspondent router
- 6 Link Speed – Speed requirements of the interconnecting link
- 7 Link Protocol – Protocol requirements for the interconnecting link
- 8 Target Date of Implementation – date of implementation of the router
TBD – To be determined
- 9 Remarks

TABLE CNS-1B – ATN ROUTER PLAN

Administration	Location of Router	Type of Router	Type of Interconnection	Interconnection, Connected to router of:	Link Speed	Link Protocol	Target date of Implementation	Remarks	
1	2	3	4	5	6	7	8	9	
American Samoa	Pago Pago			United States				Intra-domain	
Australia	Brisbane			Timor Leste				Intra-domain	
		BBIS	Sub-Regional	Fiji	19200 bps	X.25	2006		
		BIS	Sub-Regional	Indonesia	9600 bps	X.25	2006		
		BBIS	Intra-Regional	Japan	64000 bps	X.25	2007		
				Nauru					Intra-domain
		BIS	Sub-Regional	New Zealand	9600 bps	X.25	2008-2009		
				Papua New Guinea					Intra-domain
		BBIS	Inter-Regional	South Africa	64000 bps	X.25	TBD		
				Solomon Islands					Intra-domain
				Vanuatu					Intra-domain
	Melbourne	BBIS	Intra-Regional	Singapore	64 Kbps	X.25	2006		
		BBIS	Inter-Regional	United States	64000 bps	X.25	2007		
Bangladesh	Dhaka	BIS	Sub-Regional	India	9600 bps	X.25	2007		
		BIS	Sub-Regional	Thailand	9600 bps	X.25	2007		
Bhutan	Paro	BIS	Sub-Regional	India	9600bps	X.25	2008		
Brunei Darussalam	Brunei	BIS	Sub-Regional	Malaysia	9600bps	X.25	2007		
		BIS	Sub-Regional	Singapore	9600bps	X.25	2007		
Cambodia	Phnom Penh	BIS	Sub-Regional	Thailand	9600bps	X.25	2007		
China	Beijing	BIS	Sub-Regional	DPR Korea	9600bps	X.25	2007		
		BBIS	Intra-Regional	Hong Kong, China	64000bps	X.25	2006		
		BBIS	Intra-Regional	India	64000bps	X.25	2006-2007		
		BBIS	Intra-Regional	Japan	64000bps	X.25	2007-2008		
		BBIS	Inter-Regional	Kuwait	64000bps	X.25	2007		
		BIS	Sub-Regional	Macau, China	9600bps	X.25	2007		
		BIS	Sub-Regional	Mongolia	9600bps	X.25	2007-2008		
		BIS	Sub-Regional	Myanmar	9600bps	X.25	2007		

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Administration	Location of Router	Type of Router	Type of Interconnection	Interconnection, Connected to router of:	Link Speed	Link Protocol	Target date of Implementation	Remarks	
1	2	3	4	5	6	7	8	9	
		BIS	Sub-Regional	Nepal	9600bps	X.25	2007		
		BIS	Sub-Regional	Pakistan	9600bps	X.25	2007		
		BIS	Sub-Regional	Republic of Korea	9600bps	X.25	2007-2008		
		BBIS	Inter-Regional	Russian Federation	19200bps	X.25	TBD		
		BBIS	Intra-Regional	Thailand	64000bps	X.25	2006		
	Taipei	BIS	Sub-Regional	Hong Kong, China	9600bps	X.25	2006		
		BIS	Sub-Regional	Japan	9600bps	X.25	2007		
Hong Kong, China	Hong Kong	BBIS	Intra-Regional	China	64000bps	X.25	2006		
		BIS	Sub-Regional	Macau, China	9600bps	X.25	2006		
		BBIS	Intra-Regional	Japan	64000bps	X.25	2005		
		BIS	Sub-Regional	Philippines	9600bps	X.25	2006		
		BIS	Sub-Regional	Taipei	9600bps	X.25	2006		
		BBIS	Intra-Regional	Thailand	64000bps	X.25	Implemented		
		BIS	Sub-Regional	Viet Nam	9600bps	X.25	2006		
		BIS	Sub-Regional	Hong Kong, China	9600bps	X.25	2006		
Macau, China	Macau	BIS	Sub-Regional	China	9600bps	X.25	2007		
		BIS	Sub-Regional	New Zealand	9600bps	X.25		Intra-domain	
Cook Islands	Rarotonga								
DPR Korea	Pyongyang	BIS	Sub-Regional	China	9600bps	X.25	2007		
Fiji	Nadi	BBIS	Intra-Regional	Australia	19200 bps	X.25	2006		
		BIS	Sub-Regional	Kiribati	9600bps	X.25		Intra-domain	
				New Caledonia			TBD		Intra-domain
		BIS	Sub-Regional	Tuvalu					Intra-domain
		BBIS	Inter-Regional	United States	19200 bps	X.25	2007		
				Wallis Islands				Intra-domain	
French Polynesia	Papeete			New Zealand			TBD	Intra-domain	
India	Mumbai	BIS	Sub-Regional	Bangladesh	9600bps	X.25	2007		
		BIS	Sub-Regional	Bhutan	9600bps	X.25	2008		
		BBIS	Intra-Regional	China	64000bps	X.25	2006-2007		
		BBIS	Inter-Regional	Kenya	19200bps	X.25	TBD		
		BIS	Sub-Regional	Nepal	9600bps	X.25	2007		
		BBIS	Inter-Regional	Oman	19200bps	X.25	TBD		

Administration	Location of Router	Type of Router	Type of Interconnection	Interconnection, Connected to router of:	Link Speed	Link Protocol	Target date of Implementation	Remarks
1	2	3	4	5	6	7	8	9
Micronesia Federated State of	Chuuk			United States				Intra-domain
	Kosrae			United States				Intra-domain
	Ponapei			United States				Intra-domain
	Yap			United States				Intra-domain
Mongolia	Ulaanbaatar	BIS	Sub-Regional	China	9600bps	X.25	2007-2008	
Myanmar	Yangon	BIS	Sub-Regional	China	9600bps	X.25	2007	
		BIS	Sub-Regional	Thailand	9600bps	X.25	2006	
Nauru	Nauru			Australia				Intra-domain
Nepal	Kathmandu	BIS	Sub-Regional	China	9600bps	X.25	2007	
		BIS	Sub-Regional	India	9600bps	X.25	2007	
New Caledonia	Noumea			Fiji			TBD	Intra-domain
New Zealand	Christchurch	BIS	Sub-Regional	Australia	9600bps	X.25	2008-2009	
				Cook Is				Intra-domain
				French Polynesia	9600bps	X.25	TBD	Intra-domain
				Niue	9600bps	X.25		Intra-domain
				Samoa	9600bps	X.25		Intra-domain
				Tonga	9600bps	X.25		Intra-domain
		BIS	Inter-Regional	USA	9600bps	X.25	2008-2009	
Niue Islands	Niue			New Zealand				Intra-domain
Pakistan	Karachi	BIS	Sub-Regional	China	9600bps	X.25	2007	

Administration	Location of Router	Type of Router	Type of Interconnection	Interconnection, Connected to router of:	Link Speed	Link Protocol	Target date of Implementation	Remarks
1	2	3	4	5	6	7	8	9
Papua New Guinea	Port Moresby			Australia				Intra-domain
Philippines	Manila	BIS	Sub-Regional	Hong Kong, China	9600bps	X.25	2006	
		BIS	Sub-Regional	Singapore	9600bps	X.25	2006	
Republic of Korea	Seoul	BIS	Sub-Regional	China	9600bps	X.25	2007-2008	
		BIS	Sub-Regional	Japan	9600bps	X.25	2008	
Samoa	Faleolo			New Zealand				Intra-domain
Singapore	Singapore	BBIS	Intra-Regional	Australia	64000bps	X.25	2006	
		BBIS	Inter-Regional	Bahrain	64000 bps	X.25	TBD	
		BIS	Sub-Regional	Brunei	9600bps	X.25	2007	
		BBIS	Intra-Regional	India	64000bps	X.25	2007	
		BIS	Sub-Regional	Indonesia	9600bps	X.25	2005	
		BBIS	Intra-Regional	Japan	64000bps	X.25	2007-2008	
		BIS	Sub-Regional	Malaysia	9600bps	X.25	2006	
		BIS	Sub-Regional	Philippines	9600bps	X.25	2006	
		BIS	Sub-Regional	Sri Lanka	9600bps	X.25	2006	
		BBIS	Intra-Regional	Thailand	64000bps	X.25	2006	
		BBIS	Inter-Regional	United Kingdom	64000 bps	X.25	TBD	
BIS	Sub-Regional	Viet Nam	9600bps	X.25	2006			
Solomon Islands	Honiara			Australia				Intra-Domain
Sri Lanka	Colombo	BIS	Sub-Regional	India	64000 bps	X.25	2007	
		BIS	Sub-Regional	Maldives	9600bps	X.25	2006	

Administration	Location of Router	Type of Router	Type of Interconnection	Interconnection, Connected to router of:	Link Speed	Link Protocol	Target date of Implementation	Remarks
1	2	3	4	5	6	7	8	9
Thailand	Bangkok	BIS	Sub-Regional	Bangladesh	9600bps	X.25	2007	
		BIS	Sub-Regional	Cambodia	9600bps	X.25	2007	
		BBIS	Intra-Regional	China	64000bps	X.25	2006	
		BBIS	Intra-Regional	Hong Kong, China	64000bps	X.25	Implemented	
		BBIS	Intra-Regional	India	64000bps	X.25	2007	
		BBIS	Inter-Regional	Italy	19200bps	X.25	TBD	
		BIS	Sub-Regional	Lao PDR	9600bps	X.25	2006	
		BIS	Sub-Regional	Malaysia	9600bps	X.25	2006	
		BIS	Sub-Regional	Myanmar	9600bps	X.25	2006	
		BBIS	Intra-Regional	Singapore	64000bps	X.25	2006	
BIS	Sub-Regional	Viet Nam	9600bps	X.25	2006			
Timor Leste	Dili			Australia				Intra-domain
Tonga	Tongatapu			New Zealand				Intra-domain
Tuvalu	Funafuti			Fiji			2005	Intra-domain
United States	Salt Lake City	BBIS	Inter-Regional	Australia	64000 bps	X.25	2007	
				American Samoa				Intra-domain
		BBIS	Inter-Regional	Fiji	19200 bps	X.25	2007	
		BBIS	Inter-Regional	Japan	64000bps	X.25	Implemented	
		BIS	Inter-Regional	New Zealand	9600 bps	X.25	2008-2009	

Administration	Location of Router	Type of Router	Type of Interconnection	Interconnection, Connected to router of:	Link Speed	Link Protocol	Target date of Implementation	Remarks
1	2	3	4	5	6	7	8	9
				Marshall Islands				Intra-domain
				Micronesia, Federated State of				Intra-domain
				Palau				Intra-domain
Vanuatu	Port Vila			Australia	9600bps	X.25		Intra-domain
Viet Nam	Ho Chin Minh	BIS	Sub-Regional	Hong Kong, China	9600bps	X.25	2006	
		BIS	Sub-Regional	Lao PDR	9600bps	X.25	2006	
		BIS	Sub-Regional	Singapore	9600bps	X.25	2006	
		BIS	Sub-Regional	Thailand	9600bps	X.25	2006	
Wallis Islands	Wallis			Fiji		X.25	TBD	Intra-domain

ATTACHMENT 2

**TABLE CNS-1C
ATS MESSAGE HANDLING SERVICE (ATSMHS)
IMPLEMENTATION PLAN**

Explanation of the Table

Column

- 1 Administration – the name of the Administration, State or Organization responsible for management of the facility
- 2 Location of Facility
- 3 Facility Type:

AMHS
UA (Location of AMHS)
- 4 Target Date of Implementation – date of implementation of the ATSMHS

TBD – To be determined
- 5 Remarks

AMHS – ATS Message Handling System which may include Message Transfer Agents and AFTN/AMHS gateways services.

TABLE CNS-1C ATS MESSAGE HANDLING SERVICE (ATSMHS) IMPLEMENTATION PLAN

Administration	Location of Facility	Facility Type	Target Date of Implementation	Remarks
American Samoa	Pago Pago	UA (Salt Lake City)	2005	
Australia	Brisbane	AMHS	2006	
Bangladesh	Dhaka	AMHS	2007	
Bhutan	Paro	UA (Mumbai)	2008	
Brunei Darussalam	Brunei	AMHS	2007	
Cambodia	Phnom Penh	AMHS	2007	
China	Beijing	AMHS	2006	
	Taipei	AMHS	2006	
Hong Kong, China	Hong Kong	AMHS	2005	
Macau, China	Macau	AMHS	2005	
Cook Island	Rarotonga	UA (Christchurch)	2006	
DPR Korea	Pyongyang	AMHS	2007	
Fiji	Nadi	AMHS	2006	
French Polynesia	Papeete	AMHS	TBD	
India	Mumbai	AMHS	2005	
Indonesia	Jakarta	AMHS	2006	
	Ujung Pandang	AMHS	2006	
Japan	Tokyo	AMHS	Implemented	
Kiribati	Tarawa	UA (Nadi)	2005	
Lao PDR	Vientiane	AMHS	2005	
Malaysia	Kuala Lumpur	AMHS	2006	
Maldives	Male	AMHS	2005	
Marshall Island	Majuro	UA (Salt Lake City)	2005	
Micronesia Federated State of	Chuuk	UA (Salt Lake City)	2005	
	Kosrai	UA (Salt Lake City)	2005	
	Ponapei	UA (Salt Lake City)	2005	
	Yap	UA (Salt Lake City)	2005	
Mongolia	Ulaanbaatar	AMHS	2006	
Myanmar	Yangon	AMHS	2005	

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TABLE CNS-1C ATS MESSAGE HANDLING SERVICE (ATSMHS) IMPLEMENTATION PLAN

Administration	Location of Facility	Facility Type	Target Date of Implementation	Remarks
Nauru	Nauru	UA (Brisbane)	2006	
Nepal	Kathmandu	AMHS	2007	
New Caledonia	Noumea	AMHS	TBD	
New Zealand	Christchurch	AMHS	2008-2009	
Niue Is	Niue	UA (Christchurch)	2006	
Pakistan	Karachi	AMHS	2006	
Palau	Koror	UA (Salt Lake City)	2005	
Papua New Guinea	Port Moresby	UA (Brisbane)	2006	
Philippines	Manila	AMHS	2006	
Republic of Korea	Seoul	AMHS	2008	
Samoa	Faleolo	UA (Christchurch)	2006	
Singapore	Singapore	AMHS	2006	
Solomon Is	Honiara	UA (Brisbane)	2006	
Sri Lanka	Colombo	AMHS	2006	
Thailand	Bangkok	AMHS	2006	
Timor Leste	Dili	UA (Brisbane)	2006	
Tonga	Tongatapu	UA (Christchurch)	2006	
Tuvalu	Funafuti	UA (Nadi)	2005	
United States	Salt Lake City	AMHS	Implemented	
Vanuatu	Port Vila	UA (Brisbane)	2006	
Viet Nam	Ho Chi Minh	AMHS	2006	
Wallis Is.	Wallis	AMHS	TBD	

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