



International Civil Aviation Organization

Eight Meeting of the Communications/Navigation/Surveillance and Meteorology Sub-Group (CNS/MET SG/8) of APANPIRG

Bangkok, Thailand, 12-16 July 2004

Agenda Item 8: Review of the implementation of WAFS

IMPLEMENTATION OF THE INTERNATIONAL SATELLITE COMMUNICATIONS SYSTEM BY THE UNITED STATES

(Presented by the United States of America)

SUMMARY

This paper summarizes the completed and continuing work of the United States in the implementation of the International Satellite Communications System.

1. BRACKGROUND

1.1 The International Satellite Communications System (ISCS) is composed of two systems for data delivery via satellite. The first system, currently broadcasting on permanent virtual channels (PVCs) 1 through 3, is the World Area Forecast System (WAFS), in support of the International Civil Aviation Organization (ICAO) program for distribution of data to support international civil aviation. The second system, currently broadcasting on PVCs 4 through 6, is the Global Telecommunication System (GTS). The GTS replaced the World Meteorological Organization (WMO) Caribbean and Central America distribution and collection landline systems for WMO Region IV. It is called the Region IV Meteorological Telecommunication Network (RMTN-IV) and is a two-way, or receive and send system. The ISCS uses commercial satellites — INTELSAT VI to broadcast to the Americas (referred to as ISCS1 or Atlantic Ocean Region), and INTELSAT V to broadcast over the Pacific and eastern Asia (referred to as ISCS2 or Pacific Ocean Region). The recurring costs of the point-to-multipoint satellite broadcasts are paid by the United States (U.S.)

1.2 The U.S. is pleased to be a partner with registered ISCS users in a coordinated effort with ICAO and WMO to expand and improve global telecommunications service, weather prediction, and weather planning. The combined efforts, in meteorological and aviation services of States and other WAFS users, and of ICAO and the WMO exemplifies the excellent cooperation and effective teamwork that have accomplished so much since the ISCS system began.

1.3 The deployment and transition of all registered ISCS sites to the Transmission Control Protocol/Internet Protocol (TCP/IP) successor ISCS network, is nearing completion. In addition to equipment modifications, the change in the interface protocol providing the satellite broadcast to a user's workstation is now operational. Cessation of X.25 protocol will occur as soon as the TCP/IP broadcast passes all acceptance tests, which will occur no sooner than May 31, 2004, and probably not before June 30, 2004. Alternative methods to access ISCS/WAFS data have been made available to all end user sites. If a site does not have a TCP/IP compliant ISCS workstation with PD

(What does PD stand for?) Receive Client software (a proprietary software module supplied by MCI) installed at their site, or should they experience any difficulties with their new workstation, they can obtain the data from the National Weather Service (NWS) file server or the WMO file server. All ISCS data and products are stored for FTP access.

1.4 Retrieval procedures for obtaining current ISCS data and product files using File Transfer Protocol (FTP) and Hyper Text Transfer Protocol (HTTP) Applications:

The ISCS/WAFS data is available from NWS at the following web address:

<http://weather.gov/tg/dataproduct.html>

The ISCS/WAFS data is also available from the WMO server located in Geneva, Switzerland at the following web address:

<http://www.wmo.ch/index-en.html>

2. OTHER TECHNICAL ISSUES

2.1 If a site is experiencing technical difficulties receiving data using TCP/IP, the National Oceanic Atmospheric Administration's National Weather Service should be notified. Please contact Patrick Gillis at e-mail Patrick.Gillis@noaa.gov or telephone (301) 713-1743 x104.

3. CHANGES IMPLEMENTED WITH THE NEW ISCS CONTRACT

3.1 The following defines the system changes

3.2 As of 31 May 2004, changes at 75 sites which involved setting the Very Small Aperture Terminal (VSAT) equipment to the frequency of the new ISCS space segment, installing the new network interface, inspecting the antenna for excessive wear (and possibly refurbishing it) have been completed. Fifteen sites remain to be transitioned due to site conditions beyond the control of the contractor (MCI).

3.3 The specific equipment changes are as follows: All Memotec equipment has been removed from transmit/Receive sites, and will be removed from Receive-Only sites following the cessation of X.25 protocol support. Receive-Only sites have had the Hughes Personal Earth Station (PES) indoor unit replaced with a satellite modem by the MCI technician during the transition to the successor ISCS. As of 31 May 2004, approximately 39 sites have replaced their X.25 workstations with a TCP/IP compliant workstation or comparable device (to directly ingest ISCS broadcast data). There is insufficient data available to determine whether or not the remaining 51 sites have obtained an ISCS TCP/IP compliant workstation or comparable device.

4. INTERFACE PROTOCOL CHANGES

4.1 In an effort to improve service and implement a more robust end-to-end communications-meteorology system the decision was made to upgrade the interface between the Very Small Aperture Terminal and the meteorological workstation in the new ISCS to TCP/IP from the old X.25 protocol. TCP is responsible for verifying the correct delivery of data from client to server and IP allows for the sharing of data or resources across a network. As stated above, the MCI technician has installed the new interface at 75 of 90 sites as part of the upgrade to the new ISCS.

4.2 Each Receive-Only site that has been upgraded has both X.25 and TCP/IP broadcasts provided to them, until the cessation of X.25. After this time, only TCP/IP will be available to any ISCS site. It is extremely important that all STAR4, or similar generation, workstations either be replaced or upgraded prior to that time in order to assure continued reception of the ISCS data. The

STAR4 will not accept TCP/IP, and it is not possible to install new system software on the current STAR4 central processing unit (CPU). The exact configuration of the new workstation is for each State and their workstation provider to decide. It is also extremely important that the software module (PD Receive Client), supplied by MCI be installed in all workstations prior to cessation of the availability of X.25.

5. SYSTEM MAINTENANCE

5.1 ISCS maintenance

5.2 Maintenance for the site network interface will be covered by the U.S. for all sites. States will be responsible for obtaining a maintenance agreement from MCI for their VSAT. As in the past, sites will be responsible for their workstation maintenance.

5.3 Satellite Receiving Equipment Implementation

5.4 WAFS - World Area Forecast System, receive-only

5.5 Sites that have been transitioned and have a TCP/IP compliant workstation or comparable device: (See chart) Where is the chart?

6. ISSUES

6.1 The switch to TCP/IP only broadcast has not been accomplished as of 15 June 2004. There has been a consistent loss of approximately 15 percent of the data transmitted over the IP protocol.

6.2 The ISCS service will continue to broadcast both X.25 and TCP/IP communications protocol until 31 July 2004 or when the data loss issue has been resolved, whichever is later.

7. CONCLUSION

7.1 The Meeting is invited to note the progress made by the U.S. in implementing the ISCS.

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AS OF: 18 June 2004

Attachment to ISCS IP for APANPIRG CNS/MET SG/8 - ISCS TRANSITION - International Sites

	Network Interface	Agreement	Software	Workstation	Date to be	Workstation	Site on	VCP Request	Funding	WMO Permanent	Known contact	Contact Phone	Contact email address	Recent Contact?	REMARKS
Receive-Only Sites	Hardware Installed	Signed	Received	Vendor	Installed	Installed	TCP/IP	Submitted	Request?	Representative	person(s)	number			
Australia	8-Dec-03	NO	8-Mar-04	Unknown	Unknown	Unknown	Unknown			John Zillman (Ge	Ian Senior (technical)	613 9669 4293	l.senior@bom.gov.au	01/22/04	3/12 per MCI email final attempt to contact re: license
Australia 2			8-Mar-04							John Zillman (Ge	Kelvin Wong (content)	613 9669 4227	k.wong@bom.gov.au	01/22/04	
Azores	22-Jan-04	NO	NO	Unknown	Unknown	Unknown	Unknown			Prof. Adérito Vice	unknown	351-218-402-02	im@meteo.pt	no	Portugal Met Service?
Bolivia	26-Feb-04	NO	8-Mar-04	Unknown	Unknown	Unknown	Unknown			Carlos Diaz Esco	Carlos Diaz Escobar	591 2 355824	fo.bol@undp.org	no	
Brazil (MET)	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown			Antonia Divino M	Adahil Gusmao	556 13651066	adahil@inmet.gov.br	no	
Brunei	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown			Mr. Muhamad Hu	(Chief Met Officer)	673 2 332735	cmo@brunet.bn	no	
Canada (Downsview)	HOLD	NO	NO	Unknown	Unknown	Unknown	Unknown			Marc Denis Ever	Neil Thompson	604 2737799	nthompson@ataero.co	01/05/04	
Cook Islands	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown			Arona Ngari	unknown	682-20603	angari@met.co.ck	en Tsui at IPM/VCP	
Cuba (Airport)	PENDING	NO	NO	Unknown	Unknown	Unknown	Unknown			Thomas Guterrez	Thomas Guterrez	537 8670712	tomasg@met.inf.cu	no	
Dominica	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown			Webster Shillingf	Welsh Richards	767 4492020	unknown	no	
Fed States of Micronesia	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown			Mr. Ceasar Hadle	unknown	691-320-2248	ceasar.hadley@noaa.gov	en Tsui at IPM/VCP	
Malaysia	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown			Chow Kok Kee	Ooi See Hai	603 79678004	osh@kjc.gov.my	no	
Malaysia 2	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown			Chow Kok Kee	Chang Tin Yee	unknown	unknown	no	
Mongolia	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown			Sevidj Enkhtuvsh	Dagva Maasuren	976-132-6592	maasuren@mcaa.gov.n	no	
New Caledonia	16-Dec-03	NO	8-Mar-04	Unknown	Unknown	Unknown	Unknown			J-P Beysson	Gilles Montesquieu	687 279320	contact-iscs-nc@meteo	12/23/03	3/12 per MCI email final attempt to contact re: license
New Caledonia 2			8-Mar-04							J-P Beysson	Michel Argent	687 279302	contact-iscs-nc@meteo	12/23/03	
Newfoundland St. Pierre	29-Jan-04	NO	NO	Unknown	Unknown	Unknown	Unknown			Marc Denis Ever	Jason Gillis	902 7655079	jasongillis@ec.gc.ca	12/23/03	Met Service?
Niue	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown			Mr. Sionetasi Pul	unknown	683-4600	unknown	Ven Tsui at IPM/VCP	
Papua New Guinea	Restrictions	NO	NO	Unknown	Unknown	Unknown	Unknown			James Nako	James Nako	675 3252788	james.nako@undp.org	no	
Samoa	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown			unknown	Faatoia Malele	685 20855	f.malele@meteorology.g	Ven Tsui at IPM/VCP	
Solomon Islands	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown			Chanel Iroi	unknown	677-21757	met@met.gov.sb	Ven Tsui at IPM/VCP	
South Africa	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown			Jerry Lengoasa	unknown	2712 367-6111	jerry@weathersa.co.za	no	
Uruguay	18-Feb-04	NO	NO	Unknown	Unknown	Unknown	Unknown			Sylvia Bello	Carlos Serrentino	598 2405655	pryndus@adinet.com.uy	no	
Brazil (Airport)	PENDING	YES	NO	Unknown	Unknown	Unknown	Unknown			unknown	unknown	unknown	unknown	unknown	Met Service?
Mexico (Airport)	25-Nov-03	YES	NO	Unknown	Unknown	Unknown	Unknown			unknown	unknown	unknown	unknown	unknown	Met Service?
Bermuda	19-Nov-03	YES	YES	Unknown	Unknown	Unknown	12-Mar-04			Roger Williams	Roger Williams	441 2935067	rogerw@ibl.bm	no	
Canada (Richmond)	12-Dec-03	YES	YES	Unknown	Unknown	Unknown	12-Mar-04			unknown	unknown	unknown	unknown	unknown	Met Service?
Chile	17-Nov-03	YES	YES	Corobor	15-Apr-04	15-Apr-04	15-Apr-04			Hugo Olivia	Jose Carlos Gallardo	562 6763437	dimetchi@meteochile.cl	no	
China (Beijing)	17-Dec-03	YES	YES	Unknown	Unknown	Unknown	12-Mar-04			Qin Dahe	Qin Dahe	86-10684-0666	quoj@cmga.gov.cn	no	
China (Shanghai)	16-Dec-03	YES	YES	Unknown	Unknown	Unknown	Unknown			Qin Dahe	Qin Dahe	86-10684-0666	quoj@cmga.gov.cn	no	
Ecuador	19-Mar-04	YES	YES	Unknown	Unknown	Unknown	Unknown			Ing. Gustavo Gar	Luis Poven	593 2246407	povedal@hotmail.com	no	
Exeter (U.K. MET)	PENDING	YES	YES	Unknown	Unknown	Unknown	Unknown			Peter Ewins	Piet Van Klinkenberg	44 (0) 1392 884	piet.vanklinkenberg@m	01/20/04	
Indonesia	10-Dec-03	YES	YES	Unknown	Unknown	Unknown	12-Mar-04			Dr. Gunawan Ibra	Gunawan Ibrahim	6221 4246703	bmj@cbn.net.id	no	
New Zealand (Auckland)	9-Dec-03	YES	YES	Unknown	Unknown	Unknown	Unknown			John Lumsden	Kevin Alder	64 4 4700720	kevin.alder@metsservice	12/18/03	As of 4/6 they were still not seeing data
New Zealand (Wellington)	9-Dec-03	YES	YES	Unknown	Unknown	Unknown	15-Mar-04			John Lumsden	Kevin Alder	64 4 4700720	kevin.alder@metsservice	12/18/03	
Peru (CORPAC)	8-Mar-04	YES	YES	Corobor	10-Jun-04	10-Jun-04	10-Jun-04			unknown	unknown	unknown	unknown	unknown	Met Service?
Singapore	9-Dec-03	YES	YES	Unknown	Unknown	Unknown	12-Mar-04			Mr. Woon Shih La	unknown	6545 7193	mss_operations@mss.c	no	
South Korea	19-Dec-03	YES	YES	Unknown	Unknown	Unknown	12-Mar-04			M.H. Ahn	M.H. Kim	82 32 7402810	kimmh@kma.go.kr	12/23/03	
Switzerland (MET)	17-Feb-04	YES	YES	Unknown	Unknown	Unknown	12-Mar-04			Daniel Keuerebar	unknown	unknown	unknown	no	
Viet Nam	15-Dec-03	YES	YES	Unknown	Unknown	Unknown	12-Mar-04			Nguyen Cong Th	Duong Lien Chau	844 8247002	dlichau@fpt.vn	no	
Wallis Island	15-Dec-03	YES	YES	Unknown	Unknown	Unknown	Unknown			USA					
Argentina	12-Jan-04	YES	YES	Corobor	25-Mar-04	25-Mar-04	25-Mar-04	YES		Miguel Rabiolo	Jose Afonso	5411 51676711	afonso@meteofa.mil.ar	01/06/04	Emailing! NWS to fund?
Fiji	11-Dec-03	YES	YES	Unknown	Unknown	Unknown	12-Mar-04	YES		Rajendra Prasad	Imtiaz Shameem	679 6736017	imtiaz.shameem@met.g	Ven Tsui at IPM/VCP	
Paraguay	3-Nov-03	YES	YES	Unknown	Unknown	Unknown	12-Mar-04	YES		Augustin Zarate E	Razl Rodas	595 646095	raro@supernet.com.py	01/06/04	
Peru (MET)	6-Feb-04	YES	YES	Unknown	Unknown	Unknown	12-Mar-04	YES		W. Gemarra Moli	Reynaldo Moreno	51 4724180	director@dhm.mil.pe	no	
Philippines (MET)	8-Dec-03	YES	YES	Unknown	Unknown	Unknown	12-Mar-04	YES		Dr. Bernardo M. S	Prisco Nilo	632 9221996	pdnilo@pagasa.dost.go	01/06/04	
Suriname	12-Jan-04	YES	YES	Unknown	Unknown	Unknown	Unknown	YES		Cornelius Becker	Cornelius Becker	597 491143	cbecker@sr.net	02/16/04	
Vanuatu	12-Dec-03	YES	YES	Unknown	Unknown	Unknown	12-Mar-04	YES		Jotham Napat	David Gibson	678 22331	dgibson@meteo.vu	01/07/04	
Venezuela	PENDING	YES	YES	Unknown	Unknown	Unknown	Unknown	YES		Francisco Camar	Carlos Colina	58 243 2378043	tovaro@cantv.net	no	
China (Hong Kong)	12-Dec-03	YES	YES	Corobor	12-Feb-04	YES	25-Feb-04			C. Y. Lam	C.M. Tam	852 2926 8336	cmtam@hko.gov.hk	12/30/03	
										C. Y. Lam	P.W. Chan	852 2926 8337	pwchan@hko.gov.hk	12/30/03	

Japan (Tokyo)	2-Dec-03	YES	YES	NEC	Unknown	YES	26-Feb-04			Koji Yamamoto	unknown	unknown	unknown	no	
Japan (Tokyo) Site 2	2-Dec-03	YES	YES	NEC	Unknown	YES	26-Feb-04			unknown	unknown	unknown	unknown	unknown	Met Service?
Two-Way Sites															
	Network Interface	Agreement	Software	Workstation	Date to be	Workstation	Site on	VCP Request	Funding	WMO Permanent	Known contact	Contact Phone	Contact email address	Recent Contact?	REMARKS
Barbados (CIMH)	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown			Colin Depredine	Selvin Burton	246 4251362	sdburton@inaccs.com.b	no	Contact with Jose Rubiera
Cuba	24-Jun-04	YES	YES	Morcom	24-Jun-04	YES	NO			Thomas Guterrez	Thomas Guterrez	537 8670712	tomasg@met.inf.cu	no	
Haiti	17-Sep-03	YES	YES	Morcom	14-Jun-04	YES	NO			Yvelt Chery	Pierre Souriac	509 2454608	dirag.iscs@meteo.fr	no	
Jamaica	15-Sep-03	YES	YES	Morcom	3-May-04	YES	4-May-04			Sylvia McGill	Bryan Bambury	876-9248404	metja.nmc@infochan.cd	3/26/04	
Mexico	21-Oct-03	YES	YES	Morcom	10-May-04	YES	12-May-04			Michel Rosengau	Concepcion Franco	5255 6268779	cfranco@gsmn.can.gob	no	
St. Lucia	10-Sep-03	YES	YES	Morcom	19-Apr-04	YES	21-Apr-04			H. Regis	Thomas Auguste	758 4553692	director@slumet.gov.lc	12/24/03	Per MCI email 3/22, wkst rcvd but not installed
Cayman Islands	15-Sep-03	YES	YES	GST	22-Dec-03	YES	8-Apr-04	YES	USA	Fred Sambula	Avolan Porter	345 9494528	met.o@gov.ky	1/5/04	
Colombia	23-Oct-03	YES	YES	GST	22-Dec-03	YES	22-Apr-04	YES	USA	Carlos Costa Pos	Francisco Hidalgo	571 6356223	cposada@ideam.gob.cd	3/29/04	
Curacao	9-Sep-03	YES	YES	GST	22-Dec-03	YES	22-Apr-04			Arthur Dania	Haime Pieter	599 9 8393364	hpfdpiet@meteo.an	3/19/04	
France (Guadeloupe)	12-Sep-03	YES	YES	Synergy	26-Apr-04	YES	28-Apr-04			J-P Beysson	Yvan Lemaitre	594 353530	dirag.iscs@meteo.fr	no	
France (Guiana)	30-Sep-03	YES	YES	Synergy	26-Apr-04	YES	28-Apr-04			J-P Beysson	Yvan Lemaitre	594 353530	dirag.iscs@meteo.fr	no	
Guyana	16-Sep-03	YES	YES	Morcom	28-Apr-04	YES	28-Apr-04			D. K. Jalgopaul	Sharon Hermanstein	592 2614489	cimet@networksgy.com	no	
Nicaragua	27-Oct-03	YES	YES	GST	22-Dec-03	YES	18-Mar-04	YES	USA	Claudio Guterrez	Milagros Castro Mejia	505 2331321	metstinop@ibw.com.ni	12/23/03	
Panama	3-Sep-03	YES	YES	GST	22-Dec-03	YES	18-Mar-04	YES	USA	Fernando Diaz	Felipe Alvarado	507 2384654	metprovi@etesa.com.pa	3/26/04	
Saint Maarten	11-Sep-03	YES	YES	GST	22-Dec-03	YES	18-Mar-04			Ashford James	Ashford James	599 5452024	eugenio@meteo.an	1/6/04	
Antigua & Barbuda	10-Sep-03	YES	YES	Morcom	29-Mar-04	YES	14-Apr-04			Patrick Jeremiah	Donald Simon	268 4623229	ismanager@antiquame	12/30/03	
Bahamas	17-Sep-03	YES	YES	GST	22-Dec-03	YES	18-Mar-04	YES	USA	Arthur Rolle	Brian Bane	242 3771754	awr.met@grouper.batel	no	
Barbados (MET)	20-Nov-03	YES	YES	Morcom	1-Mar-04	YES	6-Mar-04	YES	WMO	Chester Layne	Chester Layne	246 4280910	meteorology@sunbeach	no	
Belize	10-Sep-03	YES	YES	GST	22-Dec-03	YES	18-Mar-04	YES	USA	Carlos Fuller	Albert Jones	501-2252012	ajones@btl.net	1/3/04	
Costa Rica	4-Sep-03	YES	YES	GST	22-Dec-03	YES	23-Mar-04	YES	USA	Eladio Zarate	Werner Stolz	506 2581140	wstolz@meteoro.imn.ac	no	
Dominican Republic	3-Oct-03	YES	YES	Morcom	12-Apr-04	YES	14-Apr-04			Jose Maria Duqu	Jose Maria Duqueia	809 7881122	jduqueia@onamet.gov.d	3/29/04	
El Salvador	4-Sep-03	YES	YES	GST	22-Dec-03	YES	18-Mar-04	YES	USA	Luis Garcia	Luis Garcia	503-2832269	lgarcia@snet.gob.sv	12/17/03	
France (Martinique)	5-Nov-03	YES	YES	Synergy	18-Mar-04	YES	18-Mar-04	YES	WMO	J-P Beysson	Yvan Lemaitre	594 353530	dirag.iscs@meteo.fr	3/24/04	
Grenada	12-Sep-03	YES	YES	Morcom	5-Apr-04	YES	5-Apr-04			Tyrone Sutherland	David Robertson	473 4444142	gaa@caribsurf.com	3/19/04	
Guatemala	8-Sep-03	YES	YES	GST	22-Dec-03	YES	18-Mar-04	YES	USA	Eddie Sanchez	Francisco Rojas	502 3314897	congreso@congreso.gd	3/26/04	
Honduras	8-Sep-03	YES	YES	GST	22-Dec-03	YES	16-Mar	YES	USA	Hector Flores	Jose Flores	504 2341045	metehond@sigmamet	3/26/04	
Niger	7-Jan-04	YES	YES	Corobor	19-Mar-04	YES	16-Mar			Mr. Moussa Labo	Kenne Etienne	227 734992	amedis@acmad.ne	no	
Trinidad & Tobago	18-Sep-03	YES	YES	Morcom	15-Mar-04	YES	17-Mar-04	YES	WMO	Willis Mills	Marlon Noel	868 6695465	dirmet@tstt.net.tt	3/26/04	

Color Key:	Has Wkstat TCP/IP - working	Has Wkst Installed Not on TCP/IP	Wkst Inst. Sched. Not on TCP/IP	Status Unknow. VCP Submitted	Status Unkown Entirely
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