

REGIONAL ASSOCIATION II (ASIA)

THE MEETING OF THE EXPERT GROUP ON WMO INFORMATION SYSTEM (WIS) IN REGIONAL ASSOCIATION II (RA II EG-WIS)

**Tokyo, Japan
25-27 November 2015**

FINAL REPORT



WORLD METEOROLOGICAL ORGANIZATION



Meeting of the Expert Group on WMO Information System (WIS) in Regional Association II (RA II EG-WIS), 25-27 Nov. 2015, Tokyo, Japan

GENERAL SUMMARY

1. ORGANIZATION OF THE MEETING

1.1 Opening of the meeting

1.1.1 At the kind invitation of the Government of Japan, the meeting of the Expert Group on the WMO Information System (WIS) in Regional Association II (RA II EG-WIS) was held from 25 to 27 November 2015 in Tokyo, Japan. The list of participants is given in [Annex I](#).

1.1.2 Dr Toshihiko HASHIDA, Director-General of Forecast Department, Japan Meteorological Agency (JMA), gave an opening address, welcoming all the participants in the meeting. He stressed the importance of implementation of stable and reliable WMO Information System (WIS), as a core WMO service, and pointed out that it is time to achieve good results through effective collaboration with WMO's core activities, including WMO Integrated Global Observing System or WIGOS, Disaster Risk Reduction, and the Global Framework for Climate Services. He also emphasized the importance of incorporating the Region's achievements in introducing new information and communication technologies into meteorological services, and the importance of contributing to the global efforts in developing WIS with the Region's experience in collaborating with the diverse community.

1.2 Adoption of the Agenda

1.2.1 All the participants had no additional items to be discussed. The meeting agreed on the provisional Agenda as given in [Annex II](#).

1.3 Working arrangement

1.3.1 The meeting agreed on its working hours and other practical arrangements for the meeting. It also agreed that all documents submitted for the meeting and presentations delivered at the meeting be posted on the WMO website at <https://sites.google.com/a/wmo.int/eg-wis/>.

2. CONSIDERATION OF THE DECISIONS OF RA II, CBS, AND CONGRESS

2.1 The Fifteenth Session of RA II (RA II-15)

2.1.1 On behalf of the Secretary-General of WMO, Dr Chung Kyu PARK, the Director of the Regional Office for Asia and the South-West Pacific, presented the results of the fifteenth session of Regional Association II (RA II-15) held in 2012 and the operating plan of EG-WIS. The participants were informed of the WMO Strategic Plan and Priorities for the next fiscal years 2016-2019, which were endorsed by the seventeenth World Meteorological Congress (Cg-17) to meet the global societal needs and to contribute to the Post-2015 Sustainable Development Agenda. Among the WMO Strategic Priorities is to strengthen the global observing systems through the implementation of the WIGOS and WIS.

2.1.2 The Secretariat informed the participants of the RA II priority areas identified by the regional survey in December 2014: Members identified the implementation of WIGOS and WIS including GISC as one of the priority areas with aims to maintain and improve real-time

observing systems including META data, the quality and quantity of observations (particularly in mountains, deserts and oceans), improve communication and information sharing, telecommunication and IT infrastructures and database management, regional and national implementation of WIGOS.

2.1.3 The participants were also briefed on the current status of the preparation of RA II Operating Plan (OP) 2016-2019, which has been constructed from plans of the RA II subsidiary bodies and focused on challenges in RA II while reflecting overall WMO Strategic Priorities. The Plan needs to be finalized in time for commencement of the next WMO Financial Period (January 2016 – December 2019).

2.1.4 The participants were informed of and requested to review the decisions of RA II-15 before the sixteenth session of Regional Association II (RA II-16), which is scheduled to be held in February 2017 in the United Arab Emirates (UAE), regarding the RA II WIS Implementation Plan, data rescue and climate data sets, and Manual on GTS, Vol. II – RA II.

2.2 The CBS Extra-Ordinary Session (CBS-Ext. 2014) and the Seventeenth Congress (Cg-XVII)

2.2.1 Mr Peiliang SHI, the Director of WMO Information System Branch, presented the summary of the recommendations from CBS-Ext. (2014) with a link to the associated Cg-17 resolution to allow easy mapping by RA II EG-WIS when considering the progress of WIS implementation in the region, ensuring that the work plans of the group align with the latest technical regulations and guidance that has been agreed since CBS-Ext (2014). He pointed the publishing of the WIS competencies and learning guide essential for Members to be able to ensure that they have staff with the right set of competencies to be able to use and maintain WIS.

2.2.2 The meeting recognized that developing the WIS operational Guidance and the WIS competency and learning guide would be very useful for reliable WIS operation at all WIS centers in RA II.

3. BACKGROUND AND REQUIREMENTS ON THE WIS IN REGIONAL ASSOCIATION II

3.1 Background Information by ex-Coordinator of SG-WIS in RA II

3.1.1 Mr Hiroyuki ICHIJO who is ex-Coordinator of SG-WIS presented background information including his practical suggestions for WIS study from his activity experiences. He first stressed limitations of working resource of EG-WIS and available time to the next RA II session and required Theme Leaders to concentrate on study items prioritized from the Regional view. Subsequently, he presented considerable issues in four categories with key points from his experiences. Details are given in [Annex III](#).

3.1.2 The meeting was pleased to note his presentation with useful information and thoughtful suggestions based on his long experiences of WIS/GTS in RA II. The meeting recognized issues to be considered in EG-WIS for actions for next period 2016-2019, e.g. WIS Part C, Big data, user requirement and so forth.

3.2 Regional requirements on WIS

3.2.1 The co-coordinators gave an overview to the survey on the regional WIS requirements which was made in 2011. The meeting reviewed the requirements indicated in RA II WIS-IP and reported by some GISCs in RA II and noted that the regional WIS requirements mainly focus on improving metadata management, implementing AMDCN and WIS monitoring, as well as capacity building at the current stage.

3.2.2 The meeting recognized that the effective collection of requirements from members is very important to promote the implementation and operation of WIS in RA II and ensure members benefit from WIS. The meeting encouraged RA II GISCs to collect WIS requirements from the members in its area of responsibility through various forms and report them to the Theme Leader in WIS-GTS operations.

3.3 Requirements from RA II WIGOS and other RA II Working Groups

3.3.1 No report from WMO Secretariat.

4. WIS, GTS AND DATA MANAGEMENT

4.1 Regional aspects of WIS, including reports by Coordinator and Theme Leaders

4.1.1 TL in Data communication techniques and structure

4.1.1.1 Dr Sunghoi HUH, the theme leader in data communication techniques and structure (TL-DCTS) reported his activities and proposed activities.

- a) Summary Cg-17 (2015) emphasized strategic 7 Key priorities with 8 expected results. DCTS will make a key role as neural networks for transporting the data and information of forecasting, analysis, and weather and climate services. TL-DCTS has summarized related issues on CBS-Ext. (2014) and Cg-17 (2015) including RMTN and RMDCN status in RAll. NMHSs in RAll are maintaining GTS links, and some of them are downloading meteorological data from their associated GISC. Some members (CMA, JMA, IRIMO, KMA) are providing data dissemination and/or collection service using communication satellite, and the satellite usage will be extended and continuously increased. There have been continuous efforts to improve and secure GTS connections between NMHSs. Secured Internet and TCP/IP would be possible complementation for replacing outdated GTS circuits. The IPv6 issue also has been described, and TL will keep track of the discussion of ET-CTS.
- b) Cooperation with Volunteer Experts (VE) has been emphasized that TL would have two roles of leading the theme (based on ToR) to strength the cooperation between TL and VE and encouraging VE to work together.
- c) TL has raised the issue how we cope with the amendment work for Volume II of the Manual on the GTS (WMO No. 386) that should be discontinued and replaced by web-based documentation as was decided at Cg-17 (2015). The meeting agreed to organize a Task Team (TT) to proceed and create the web-based document. The TL will lead the TT with VE of DCTS, and Mr. Yoritsugi OHNO (member of ET-CTS) would be invited. TL will establish the TT with ToR and submit the draft to RAll Management Group before May 2016. Details are shown in the paragraph 5.3.1 of this report.

4.1.1.2 The TL proposed following actions for the theme of DCTS. The meeting agreed on the actions.

a) Action Required

- Updating RAII Network Diagram and GTS connection status
- Supporting technical issues on GTS and WIS networks such as TCP/IP and Internet Security for GTS circuit, IPv6 and other related issues
- Providing technical guidelines for AMDCN and Message Switching System/File Switching System (MSS/FSS) especially for small NMHS implementation
- Recommend establishment of the Task Team for Amendment of Manual on GTS to RAII Management Group with its ToR (draft)

4.1.2 TL in Data representation & metadata

4.1.2.1 Ms Jitsuko HASEGAWA, the theme leader in data representation and metadata reported her activities, highlighting monitoring results of the status of migration to Table Driven Code Forms (TDCFs) and WIS metadata implementation and results of questionnaire surveys conducted in 2013 and 2015. Details of monitoring and survey results are included in her report.

- a) TDCF migration in the Region, in total, has made a progress, but there are still gaps to be filled:
- For SYNOP, a couple of south-east Asia central-Asia and middle-east countries have not started disseminating BUFR. Some middle-east countries make provide BUFR reports for less station than SYNOP reports, which requires investigation.
 - For SHIP, many of countries who send SHIP countries have not started disseminating in BUFR format.
 - For TEMP, some of south-east Asia central-Asia, east-Asia and middle-east countries have not started disseminating BUFR. Only a few Members are producing native BUFR reports (reports directly produced from raw data, not by converting TEMP message), which is the ultimate solution for the quality issue of upper-air messages in BUFR format that are converted from TEMP.
 - For CLIMAT, about two-thirds of the Members have not started disseminating BUFR reports.
- b) A questionnaire survey on the migration to TDCF was conducted in 2015 and responded by 17 Members (50% of Members who have contact points). The responses gave some new information, including the plan for discontinuing TAC messages (two Members have plans) and Members' view on benefits, challenges and obstacles of producing and using BUFR reports.
- c) WIS metadata catalogue implementation (registration of metadata records or data/products) has almost completed except for the area of responsibility of GISC New Delhi and Uzbekistan. The questionnaire survey showed requirements of further training on this matter especially management of metadata records. According to the survey, most of the Members use WIS metadata catalogue and they find it useful.
- d) The theme leader recommended that Members should update contact points on this matter and that a mechanism be established so that the monitoring/analysis results are shared with, and effectively used by WIS centres, especially GISCs, to improve the status. She also pointed out that questionnaire surveys conducted by the Expert Group

need some coordination to make it one single request and to get higher management's attention at each Member country, for example by sending a request to PRs, in addition to working-level contact points.

4.1.2.2 The meeting reviewed implementation status of the TDCF migration in RA II and confirmed a progress since 15th RA-II (2012). The meeting noted the fact that we were still in the process of migration and encouraged Members to complete the migration. The meeting also reviewed the problems on upper-air BUFR converted from TAC (e.g. TEMP/PILOT series) and recognized the letter from the CBS president. The meeting agreed that RA II members should continue parallel distribution until the problem has been resolved. http://www.wmo.int/pages/prog/www/WIS/wiswiki/tiki-view_blog_post.php?postId=171

4.1.2.3 The meeting noted the DAR metadata is one of the key elements of WIS. The meeting reviewed the implementation status of metadata in RA II and pointed that some Members in RA II haven't started issuing their WIS metadata. The meeting recommended GISC New Delhi to communicate with Bhutan and Maldives and to provide their metadata and requested GISC Seoul to support Uzbekistan to start metadata management through the GISC.

4.1.2.4 The meeting noted that each GISC must have close communication with WIS centres in its area of responsibility. The meeting recognized that there are lots of duplicated survey items between themes and all theme leaders faced the same problems such as updating focal point and response rate. The meeting requested co-coordinators to make coordination among surveys of themes in RA II EG-WIS.

4.1.3 TL in GTS/WIS Operation including Early Warning

4.1.3.1 Dr Shyam Lal SINGH, the theme leader in GTS/WIS Operation including Early Warning reported his activities and suggestions.

- a) There are total 101 links in RA II as per the survey report 2015. RTH New Delhi has 19 links with various centres in the region. Details of monitoring were tabulated and sent to co-coordinators EG-WIS RA II. A New centre (NMC Thimphu - Bhutan) has become operational over GTS having an Internet link with RTH New Delhi. All possible technical supports in establishing the link to Bhutan were provided by RTH New Delhi. Several centres have plans to improve data exchange in the region.
- b) Survey Response
Most of the centres (RTHs and NMCs) responded well during RMTN status survey 2014 and 2015. Centres are using mainly local service providers for leased digital circuits (64 kbps or higher) and Internet, RMDCN-NG from Interoute. IP-VPN technology has been adopted by major centres for communication.
- c) CHALLENGES faced during survey
- d) Following centres didn't respond in spite of reminders:
RTHs Tashkent, Tehran and NMCs Abu-Dhabi, Almaty, Bahrain, Colombo, Doha, Dushanbe, Hanoi, Kathmandu, Macao, Muscat, Phnom Penh, Sanaa, Seoul, Ulaanbaatar, Vientiane, Yangon.
- e) Following centres could not be contacted for survey due to non-availability of contact persons:

NMCs Ashgabat, Bishkek, Baghdad, Doha, Hanoi, Kabul, Pyong Yang.

f) SUGGESTIONS

Corresponding WIS/ RTH focal points may co- ordinate with centres within their area of responsibility to update the 'Contact persons' regularly. Each focal point may share, the information collected, with theme leaders/ co-coordinators. Present monitoring report can be shared with each focal point to have an overview of the information to be collected. The collective effort may lead to complete the survey timely with all latest updates.

4.1.3.2 The meeting noted that EG-WIS organizes the RMTN status survey annually. The result of the survey is very helpful for understanding the status and progress of RA II RMTN. The meeting suggested that EG-WIS include the MSS/FSS status in the survey.

4.1.3.3 The meeting noted that Theme Leaders had difficulties in contacting Members and encouraged all Members to register and update focal points properly. The meeting recognized that the theme leader faced similar problems with TL-DR&M. The meeting requested co-coordinators to take actions together with paragraph 4.1.2.4 of this report.

4.1.4 TL in Climate Data Management/Data rescue

4.1.4.1 No report from the theme leader.

4.1.4.2 The meeting recognized that RA II-15 requested to promote the recovery and digitization of old climate records which remain critical for climate change assessment and the development of climate services in the context of climate change adaptation and the GFCS as a matter of high priority. The meeting noted it is necessary to collaborate with RA II WG on Climate Services. The meeting asked the TL in Climate Data Management/Data Rescue to take actions on keeping under review and report CDMS and DARE project in the region.

4.1.5 TL in Integrated Global Data Dissemination System

4.1.5.1 Ms WANG Chungfang, the theme leader in Integrated Global Data Dissemination System reported the status and future strategy of Integrated Global Data Dissemination Service (IGDDS). During the past year, CMA sent an expert team to meteorological agencies of 9 Asia Pacific countries to provide onsite training and technical support of CMACast and WMO WIS system. EUMETCast Europe Service based on DVB-S2 became operational in August 2014. NOAA coordinates with its partners to add GNC-A stations and provide training. Himawari-8 began operation in July 2015. Himawari-8 imagery is provided mainly in HimawariCast and HimawariCloud services by JMA. GK-2A is scheduled to be launched in May 2018. GK-2A data will be provided to users via landline service such as website, FTP etc. Three stations were added to the RARS in the Asia-Pacific region. WMO convened a coordination meeting to investigate the steps to be taken to integrate the Regional Atoms Retransmission Service (RARS), EUMETSAL Atoms Retransmission Service (EARS) and NOAA Direct Broadcast Real-Time Network (DBRTN) initiatives into DBNet. In the future, it is necessary to collaborate with other WMO expert team and initiatives improve the data availability, user awareness, data access and technological training in RA II.

4.1.6 Co-coordinators

4.1.6.1 Co-coordinators summarized progress of WIS/GTS in RA II since Fifteenth session of

RA II (Doha Qatar, December 2012). In the report, an isolated NMC Thimphu (Bhutan) was come up as a significant progress in RA II. The link between NMC Bhutan and RTH New Delhi was added by Thirteenth session of RA II in 2003 (Resolution 5) but hasn't been implemented more than 10 years. Thanks to RTH New Delhi, EUMETSAT and Japan International Cooperation Agency (JICA), the link has established in July 2015 and NMC Thimphu has started receiving data and products over the GTS. The principal GISC of Ashgabat (Turkmenistan) and Pyongyang (Democratic People's Republic of Korea (DPRK)) were not decided in 15th RA II. After that both NCs have designated its principal GISC, consequently the NC designation in RA II have completed. This designation of DPRK should be reflected in the Manual on the WIS (WMO No.1060).

4.1.6.2 The meeting reviewed trend of the RMTN implementation and noted the RA II RMTN is operated by three major types of communication infrastructure: MPLS/VPLS, Internet and dedicated leased circuit. The meeting suggested that if a center operates GTS link(s) over the Internet, the centre has to carefully consider and understand the characteristics of Internet, in particular, the Internet security and best-effort service (actual link speed: bandwidth)

4.1.6.3 The meeting requested the secretariat to update the information of DPRK in table B.3 (National Centres) of the Manual on the WIS (WMO No.1060).

4.2 Implementation status of WIS/GTS (WIS centres)

4.2.1 GISCs

4.2.1.1 GISC Beijing

GISC Beijing has been fully operational since 15th Aug. 2011. There are 7 NCs, 1 external DCPC and 5 internal DCPCs in the area of responsibility. For the current status of routine dissemination for GISC Beijing's subscription users, dissemination via CMACast takes the major work for subscription service. GISC Beijing provided on-site training to the area of responsibility of GISC Beijing and neighbouring NMHMs in 2014 and 2015. A disaster recovery site (DRS) of GISC Beijing was built in 2014, 21KM away from CMA. When MSS of RTH Beijing, web service of GISC Beijing or network connection to RMDCN has a failure, these services will be continuously provided by DRS in Yungang. CMA is scheduling some connection tests with other GISCs. CMA has started the work to update Beijing WIS Portal system to the 2nd version (v2.0), including developing WIS monitoring service in GISC Beijing and optimizing existing functions. The new system will be in operation before July 2016. GISC Beijing plans to improve AMDCN and continue to prompt the capacity building for the area of responsibility of GISC Beijing in 2016.

4.2.1.2 GISC Jeddah

GISC Jeddah submitted a status report.

a) General

Sixteenth Session of Congress designated Jeddah as a GISC and GISC Jeddah started its GISC full operation from 2 metadata with other GISCs and exchanging data/products intended for global exchange.

b) Managing metadata

GISC Jeddah provides metadata editing interface to NCs and DCPSs in its Area Meteorological Data Communication Network (AMDCN). The NCs and DCPSs in AMDCN maintain their metadata as necessary. All the GISC cache data are searchable

by SRU search function.

- c) GISC backup
In accordance with paragraph 3.5.9.2 of the Manual on WIS, GISC Jeddah is planning to make backup arrangements with GISC Seoul.
- d) GISC Staff Training
GISC Jeddah is holding WIS staff training during November 2015.
- e) Support to NCs/DCPCs
GISC Jeddah is planning to hold a workshop and invite NCs/DCPCs in its AMDCN, in February 2016, to enhance technical and operational skills. GISC Jeddah has a helpdesk and it services 24/7.
- f) WIS Monitoring
GISC Jeddah plans to join the WIS monitoring project and provide JSON file with the pre-agreed data structure.

4.2.1.3 GISC New Delhi

- a) GISC New Delhi organized the Jumpstart training programme imparted by Mr Timo PRESCHODT from WMO in August 2011. GISC audit has been completed in India during September 2013. GISC New Delhi is currently in a pre-operational state. However, it has been endorsed by Cg-17. RTH New Delhi has been endorsed to function as DCPC. The DRS of RTH New Delhi (Mirror RTH at Pune) is in operation since September 2013. Ingesting daily 24hr Cache in GISC New Delhi. There are 42 registered users and it has published WIS-GISC New Delhi metadata catalogue, including 8385 records. It is synchronizing the metadata with JEDDAH, BRASILIA, BEIJING, MELBOURNE, TEHRAN, PRETORIA, SEOUL, TOULOUSE, OFFENBACH, TOKYO, EXETER. GISC New Delhi has been operating traditional GTS (Part-A) and services of WIS Part-B (DAR service, Metadata Management service, GISC Data Cache service, Data Subscription service via GTS/Internet).
- b) WIS centers in the responsible area of GISC New Delhi
 - There are 5 internal DCPCs and 8 external NCs/DCPCs under the GISC New Delhi responsibility area. Most of them need to be endorsed following the standard designation procedures.
 - 5 internal Data Collection or Production Centers (DCPCs) are RTH New Delhi (Endorsed),
 - RSMC for Tropical Cyclone (Under the process of Endorsement), Satellite data Centre New Delhi, NWP Centre New Delhi, National Climate Center Pune.
 - 8 external National Centers (NCs) / DCPC are Bangladesh, Bhutan, Maldives, Nepal, Pakistan,
 - National Centre for Medium Range Weather Forecasting (NCMRWF) Noida, Indian National Centre for Ocean Information Services (INCOIS) Hyderabad, Indian Institute of Tropical Meteorology (IITM) Pune.
- c) Networks
For WIS core network, GISC New Delhi migrated to RMDCN-NG (4 Mbps) in February 2014. For AMDCN, the feasibility to establish any-to- any MPLS VPN Circuit between

AMDCN members shall be looked into.

d) Plans

GISC New Delhi is planning to provide on-site training to NMHS centers under its area of responsibility, including the guidance for WIS implementation and application of subscription data on the weather forecast. The backup GISC implementation for GISC New Delhi shall be looked into. GISC New Delhi is planning to have its DRS at the different geographical location. Internet links shall be established as a backup link with centres in the region through mutual agreement.

4.2.1.4 GISC Seoul

- a) GISC Seoul has been operational since 13 June 2013 and is a principal GISC for DCPC Tashkent, DCPC NMSC, DCPC WAMIS, DCPC LC/LRFMME and NC Seoul. GISC Seoul is a founding member of OpenWIS association, along with GISC Toulouse, GISC Exeter and GISC Melbourne, and an important contributor to the OpenWIS (WMO GISC/DCPC/NC software) development. GISC Seoul and GISC Beijing have migrated WIS/GTS traffic from frame relay circuit (32Kbps) to RMDCN (4Mbps) on 1 December 2015. The migration of WIS/GTS traffic from the dedicated line (128Kbps) to RMDCN (4Mbps) has been completed on 31 January 2016 between GISC Seoul and GISC Tokyo.
- b) GISC Seoul invited four members of DCPC Tashkent to Seoul in November 2013 and provided training on WIS and OpenWIS. GISC Seoul has carried out on-site training for WIS Centres in the area of responsibility in 2015. Since February 2015, GISC Seoul has been harvesting metadata from the GEO (Group on Earth Observations) Discovery and Access Broker (DAB) through a joint project with the GEO/CNR (Italian National Research Council). This WIS and GEOSS interoperability are regarded as a success story by the GEO.

4.2.1.5 GISC Teheran

GISC Teheran submitted a status report.

a) General

Sixteenth Session of Congress designated IRIMO as a GISC and Tehran started its GISC operation from 4 August 2014. Now GISC Tehran is synchronizing metadata with other GISCs and exchanging data/products intended for global exchange.

b) Managing metadata

GISC Tehran provides metadata editing interface to NCs and DCPCs in its Area Meteorological Data Communication Network (AMDCN). The NCs and DCPCs in AMDCN maintain their metadata as necessary. All the GISC cache data are searchable by SRU search function and GISC Tehran's portal search facilities.

c) GISC backup

Unfortunately, GISC Tehran has no arrangements in this regard but is planning to negotiate with some GISCs to start backup arrangements with them.

d) Support to NCs/DCPCs

GISC Tehran held 2 workshops on 2011 and 2014 in Tehran Regional Training Center (RTC) and invited NCs/DCPCs in its AMDCN and some neighboring countries to

enhance technical and operational skills. GISC Tehran has a helpdesk and it services 24/7.

- e) WIS Monitoring
GISC Tehran is planning to join the WIS monitoring project and provide JSON files for WMO Common dashboard in the future.

4.2.1.6 GISC Tokyo

- a) Mr Yoritsugi OHNO reported the current status of GISC Tokyo and JMA experts have visited centres of Area of Responsibility of GISC Tokyo as on-site technical meeting periodically and a WIS workshop was held in Tokyo in March 2010, October 2012 and November 2014.
- b) He also reported the progress of the backup arrangements of GISC Tokyo with GISCs Beijing, Offenbach and Melbourne. The meeting noted that the backup procedures have performed effectively during a system failure.
- c) He informed that GISC Tokyo has connected with 8 GISCs through WIS core network and started exchanging data with GISC Brasilia through The Internet as pre-operational in 2015.
- d) He also introduced a disaster recovery site of GISC Tokyo, The DRS in Osaka has been in operation since March 2015. Some centres finished a connection test while JMA is scheduling a test for other centers.

4.2.1.7 The meeting reviewed the implementation status from seven GISCs in RA II. The meeting recognized that GISC New Delhi is in pre-operational stage and encouraged to move to full operation stage. The meeting requested participants from operational GISCs to do the metadata synchronization test when GISC New Delhi is ready to start operation. The meeting requested TL-DCTS to help GISC New Delhi with their procedure to be operation. The meeting created GISC status dashboard (as of 1st November 2015) to make the status visible. It's shown in **Appendix I** of this document.

4.2.2 DCPCs

4.2.2.1 DCPC GMC and DCPC GMS

Dr Sunghoi HUH has introduced WIS centres in Arabian Gulf Area and DCPC GMC (Gulf Marine Centre), which was endorsed by CBS-Ext. (2014). Qatar has 3 WIS centres of 2 NCs and DCPC, and all they have been published at Manual on WIS at Cg-17 (2015). Arabian Gulf Sea is the key area as the energy and fishery resources, and Qatar and some neighboring countries are sharing the Arabian Gulf Sea. Due to the geospatial importance, there has been regional asking to establish the marine meteorological centre, and Qatar has initiated the centre implementation since 2012. DCPC GMC is aiming to provide Meteorological Marine Service in Gulf Region and will provide the wide range of maritime data & information based on WIS compliance as a regional marine hub. DCPC GMS is also aiming to make a contribution on GMDSS (Global Maritime Distress Safety System), and Qatar has finalized MoU with Pakistan in October 2015 which has responsibility on METAREA IX to establish the mutual backup. It is expected that DCPC GMC will provide the marine NWP products, early warning system data (SYNOP, Buoy, Radar, Rigs, Upper air observation), climate data, and regional fishery information where their metadata will be available before the operation. DCPC GMS is

preoperational so far, and it will be fully operational by July 2016.

4.2.2.2 RCC Tokyo (Tokyo Climate Center) (DCPC)

Mr Atsushi GOTO, WIS Center Focal Point of DCPC RCC, introduced the activities of Tokyo Climate Center (TCC) of JMA from a perspective of data collection and products provision. TCC has served as a WMO Regional Climate Center (RCC) in Regional Association II (Asia) since 2009. TCC supports climate services in National Meteorological and Hydrological Services (NMHSs) in the region through data and information provision and capacity development activities. Most of TCC's products are freely available from the TCC website. Regarding gridded data of long-range forecast and some advances and/or experimental products and interactive tools, however, TCC restricts users to registered NMHSs staff to secure these services and to focus its resources on them. Mr Goto highlighted TCC capacity development activities such as an annual training seminar. TCC recognizes the capacity development as important as communication infrastructures to enhance climate data utilization.

4.2.2.3 DCPC Satellite Centre

Mr Yasunori NAGATA has introduced JMA's next generation geostationary satellite "Himawari-8" and their data distribution service "HimawariCloud". Himawari-8 is the world's first next-generation geostationary meteorological satellites, with its improved spectral, spatial and temporal resolution imager. As a result of improvement of the imager, the data size of Himawari-8 has increased explosively, compared to, previous satellite, MTSAT, about 50 times. To make available the "big data" from Himawari-8, JMA started a new data distribution service "HimawariCloud" accessible via The Internet in July 2015 with optimized cache server located around the globe. As of November 2015, more than 20 NMHSs are using Himawari-8 imagery data via HimawariCloud on real-time monitoring for disaster mitigation, environmental and climate monitoring.

4.2.2.4 DCPC RTH Tashkent

Ms Alyona VDOVENKO reported the implementation status of DCPC/RTH Tashkent. Tashkent has been providing timely and high-quality provision service to its Zone of Responsibility of RTH, Kazakhstan, Kyrgyziya, Tajikistan and Turkmenistan. RTH Tashkent started system replacement to meet WMO requirements and it will complete in next year (2016).

5. FUTURE PRIORITIES

5.1 Regional-WIS Implementation Plan

5.1.1 Fifteenth session of RA II reviewed the initial draft of the RA II WIS Implementation Plan which has been developed by local secondments from CMA and KMA and coordinator of WG-IOS/WIS SG-WIS, and the session requested EG-WIS to complete developing the plan as priority items. In accordance with the agreement and user reviews of the initial draft, co-coordinators of EG-WIS established a Task Team on RA II WIS Implementation Plan (TT-R2-WIS-IP) in May 2013 and invited experts from all GISCs and one DCPC and two NCs in RA II to finalize the WIS Implementation Plan.

5.1.2 The plan is available on the WMO website (<http://wis.wmo.int/file=653>). The Implementation Plan is updated in 2015 and will be submitted to RA II and WMO secretariat by the end of 2016, and it will be available from WMO website. In this time, amendments will be mainly updating WIS Centres Implementation status.

5.1.3 The meeting reviewed RA II WIS Implementation Plan (R2-WIS-IP) Version 1.00 issued in December 2013. The meeting noted the Plan should be updated including progress since the first version has been issued. The meeting noted the IP has status and plan but status already reported in TL's annual report and needs to be restructured to avoid duplication. The co-coordinators of EG will propose a new structure of IP to the next RA II session.

5.2 Support all the programs and projects in RA II

5.2.1 WIS Monitoring

5.2.1.1 WIS monitoring is aimed at monitor availability of WIS centre functions and services in order to ensure stable operation, and the pilot project has been conducted by CBS/ET-WISC and led by two project managers, Remy Giraud (Meteo France) and Weiqing Qu (BoM). In order to exchange Centres' monitoring information, Centres publish on Internet JavaScript Object Notation (JSON) files describing monitoring information such as services status, statistics of metadata record and data and product in the 24h cache, and dashboards fetch the JSON files from Centres and show them. Currently, 10 GISCs are providing JSON files on the Internet, and 3 GISCs, Beijing, Brasilia and Tokyo, are providing dashboard prototypes. The very important deadline is CBS-16. The project is required to submit the amendments for the Manual on WIS and the Guide on WIS which includes the standard practice, and also provide a demonstration to CBS-16. In order to do so, now the project needs requirements for GISC/DCPC/NC. One of the difficult challenges is the inclusion of DCPC/NCs, especially small NCs, so it is necessary to consider a case where a DCPC/NC cannot publish JSON files by themselves. Also, a remaining question is "Who will manage the dashboards in operational phase and how?"

5.2.1.2 The meeting noted the importance of WIS monitoring for stable operation and continuous improvement of WIS services. The meeting noted that GISCs Beijing, Seoul and Tokyo have already participated in the WIS monitoring pilot project which is organized by TT-GISC, and reviewed the pilot dashboards developed by GISCs Beijing and Tokyo. The meeting encouraged all the operational GISCs to consider the implementation of WIS monitoring and start providing JSON files as soon as possible.

5.2.2 RA II/V Application pilot project

5.2.2.1 Mr Norihisa FUJIKAWA, the coordinator of RA II/V Application pilot project reported the status and action plan.

a) Status Report

- PP-App launched in 2012 as a successor of PP-VPN.
- BoM, CMA, HKO, JMA and New Zealand MetService lead PP-App, and 14 NMHSs participate in PP-App and seven applications have been developed in the project and led by CMA or JMA.
- A PDCA cycle is adopted to promote the project because users' comments play a key role in developing better applications.
- To enhance the activity of pilot project from this perspective, PP-App website was prepared by JMA and newsletters which focused on the introduction of theme application were published by CMA and JMA four times. Furthermore, these activities were reported in relevant meetings such as ET-WISC and TT-ApMD.

b) Action Plan

- Some application software will be upgraded to satisfy users' requirements.
- The application software for WIS Monitoring Pilot Project will be into this framework.
- A mechanism such as a user forum will be built on the PP-App website as a useful communication tool not only between users and developers but also among users.
- To develop software effectively and cooperatively, a code sharing system such as GitHub is a useful tool to consider.

5.2.2.2 The meeting reviewed the progress of Application Pilot Project (PP-App). The meeting agreed to continuously support the PP-App. The meeting noted that issuing newsletters (since 2013, twice a year) is a good way to stimulate the project, but all the newsletters were published by only JMA so far. The meeting proposed all participants of the project to contribute issuing newsletters such as providing articles and topics relating WIS and introducing facilities and staffs at individual WIS centres.

5.2.3 Support all programs/projects in RA II

5.2.3.1 WIS is expected to be used as a WMO common network for all WMO-related program and projects. For example, South-East Asia countries started a Pilot Project and their principal GISCs should support the activities. WIS should support these data exchange in RA II. Particularly each GISC is responsible for data exchange in their area of responsibility.

5.2.3.2 WIS is expected to be used for the collection and sharing of information for all WMO and related international programmes (WMO No. 49, PART I.3 paragraph 3.2). WIS should support particularly WIGOS projects, but also other projects and programmes such as DPFS, PWS and so on.

5.2.3.3 The meeting recognized that WIS should support all Working Groups in RA II and related projects. The meeting agreed that the GISCs should support requirements of data exchange/sharing not only for WIGOS but also for other activities in RA II. The meeting requested, particularly GISCs to support activities in its AMDCN in cooperation with other WGs.

5.3 Improvement of communication and information sharing, telecommunication and IT infrastructure

5.3.1 Vol. II of Manual on the GTS

5.3.1.1 The latest edition of Volume II (Regional Aspects) of the Manual on the GTS was issued in 1991 having been updated through RAI-11 (Res. 6), RA II-13 (Res.5, Res.6). Volume II includes lots of absolute technical and operational standards. However, those Resolutions mostly have touched minor parts such as county name and RMTN (Regional Meteorological Telecommunication Network) status where the other Regional associations are not different. There have been continuous efforts to amend the Manual in RAI even after the last amendment (1991), and as the first step, RAI-15 (2012) removed some obsolete items of Volume II of the Manual on the GTS in its Resolution 6. The CBS-Ext. (2014) noted that the Volume is not a regulatory and no longer used for their GTS operation and agreed to discontinue the volume II, and therefore, some necessary items should be migrated to relevant Regulations or WMO website (Recommendation 4, CBS-Ext. (2014)). Finally, the recommendation has been approved by Cg-17 (2015).

5.3.1.2 The Theme Leader in Data Communication Techniques and Structure proposed

establishing a small Task Team under the EG-WIS to address the issue of discontinuing Volume II of Manual on GTS, with a milestone of the term. The meeting requested co-coordinators to establish a Task Team and the Theme Leader to draft a Terms of Reference for the team by the end of 2015. The meeting commented that the task should be harmonized with other regional associations, if necessary. Draft organization details and action plans are shown in **Annex IV** of this report.

6. FUTURE WORKING STRUCTURE AND PROGRAMME

6.1 RA II Operating Plan for the next intersession period (2016-2019)

6.1.1 This item was included in Item 2.1 above.

6.2 Structure of Working Group on WIGOS/WIS and EG-WIS

6.2.1 WMO secretariat showed the current structure of the group and meeting discussed next structure. Co-coordinators will draft a new structure with WMO secretariat. It will be circulated to EG-WIS members to seek comments (by the mid of December). It will be submitted to MG-9 2016.

6.2.2 The meeting reviewed current structure of the group. The meeting noted that it's necessary to establish a new group to coordinate WIS Centres (e.g. Implementation and Coordination Group on WIS). The meeting requested co-coordinators to consider establishing the group in the future structure of WIS in RA II.

6.2.3 The meeting reviewed the designation procedure of the EG-WIS members after the 15th RA II (2012). The meeting noted that the members including Volunteer Experts were approved in the 8th RA II MG meeting in 2014. The meeting agreed that it must have been approved in a short time. The meeting agreed to make a proposal to Management Group to consider the EG members to be approved within 6 months after RA II session.

6.2.4 The meeting noted that continuing participation in the Expert Group would be efficient and effective to achieve deliverables. The meeting invited TLs to be nominated as a member of the group in the next period of RA II (2016-2019).

6.2.5 The meeting discussed utilizing communication tools among EG-WIS members. Normally, this face-to-face meeting is held once four years, and it's not easy to have more frequently. The meeting noted that WMO provides communication service (don't need any additional cost) and CBS expert teams are using WebEx, WIS WIKI, Google group and so on. The meeting agreed to use these services to keep good communications and share the information.

6.2.6 There is less number of members from Middle-East region in this period. The meeting noted that it is important inviting experts to this group from the area.

7. OTHER BUSINESS

7.1 No specific issue was raised under this item.

8. CLOSURE OF THE MEETING

8.1 The meeting proposed outcome for the contribution to better weather, climate and water services to sustainable development in the Region. The recommendations of the meeting are listed in **Annex V** and outcomes are summarized in **Annex VI**.

8.2 Mr Shinichi MITO, Director, Information and Communications Technology Division, thanked all participant for making fruitful discussion and productive achievement during the three days meeting. He mentioned that the outcomes and our collaborative efforts must be admirable, and they will stimulate Regional future activities. He picked up one outcome from this meeting.

8.3 The participants and the representative of WMO expressed their appreciation to the Government of Japan for the successful hosting of the meeting. They also expressed gratitude to the staff of the Japan Meteorological Agency for the warm hospitality and excellent arrangements made.

8.4 The meeting closed at 13:30 hours on 27 November 2015.

LIST OF PARTICIPANTS

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AGENDA

1. ORGANIZATION OF THE MEETING

- 1.1 Opening of the meeting
- 1.2 Adoption of the agenda
- 1.3 Working arrangements

2. CONSIDERATION OF THE DECISIONS OF RA II, CBS, AND CONGRESS

- 2.1 The Fifteenth Session of RA II (RA II-15)
- 2.2 The CBS Extra-Ordinary Session (CBS-Ext. 2014)
- 2.3 The Seventeenth Congress (Cg-XVII)

3. BACKGROUND AND REQUIREMENTS ON THE WIS IN REGIONAL ASSOCIATION II

- 3.1 Background Information by ex-Coordinator of SG-WIS in RA II
- 3.2 Regional requirements on WIS
- 3.3 Requirements from RA II WIGOS and other RA II Working Groups

4. WIS, GTS AND DATA MANAGEMENT

- 4.1 Regional aspects of WIS, including reports by Coordinator and Theme Leaders
 - 4.1.1 TL Data communication techniques and structure
 - 4.1.2 TL Data representation & metadata
 - 4.1.3 TL GTS/WIS Operation including Early Warning
 - 4.1.4 TL Climate Data Management/Data rescue
 - 4.1.5 TL Integrated Global Data Dissemination System
 - 4.1.6 Co-coordinators
- 4.2 Implementation status of WIS/GTS (WIS centres)
 - 4.2.1 GISCs
 - 4.2.2 DCPCs

5. FUTURE PRIORITIES

- 5.1 Regional-WIS Implementation Plan
- 5.2 Support all the programs/projects in RA II
 - 5.2.1 WIS monitoring
 - 5.2.2 RA II/V Application pilot project
- 5.3 Improvement of communication and information sharing, telecommunication and IT infrastructure

6. FUTURE WORKING STRUCTURE AND PROGRAMME

- 6.1 RA II Operating Plan for the next intersession period (2016-2019)
- 6.2 Structure of Working Group on WIGOS/WIS and EG-WIS

7. OTHER BUSINESS

8. CLOSURE OF THE MEETING

BACKGROUND INFORMATION BY EX-COORDINATOR OF SG-WIS IN RA II

1. Traffic Management

- a) After the Internet diffusion, traffic management tends to be disregarded. Because the Internet-based networks are unpredictable and changeable day by day. However, WIS Part A is running on mainly dedicated networks with SLA (Service Level Agreement) because it has time- and operation-critical roles. Therefore, traffic analysis and prediction and also coordination of the new traffic must be indispensable for WIS operation.
- b) The trend of increasing volume and Regional unbalance in global exchange data will be not changed at least for next 10 years.
- c) A required bandwidth should be estimated based on not only bulk but also peak traffic. In a rough calculation, about 6 to 8 Mbps bandwidth is necessary to exchange 15GB data without serious delay at the peak period. However, it seems that most of the links between two GISCs never meet the required bandwidth.
- d) Regional exchange data are increasing as well as global one, especially it is prominent in project cases promoted by international frameworks. Radar Composite Project in Southeast Asia promoted by ASEAN, ESCAP/WMO Typhoon Committee and WIGOS Region II aspect is an ongoing example.
- e) It is necessary to carefully consider and coordinate Regional or inter-Regional data exchange rather than global data exchange. Because Regional links are mostly running at narrow bandwidth and several possible exchange routes exist.
- f) New traffic will be expected due to international cooperation such as GDACS (Global Disaster Alert and Coordination System) which is a cooperation framework between United Nations and European Commission.
- g) The initial concept of a WIS core network is to introduce Full-Mesh topology and to remove traditional store-and-forward switching, as the result true real-time synchronization without switching delay and discrepancy can be realized within the core network. However, the concept becomes feasible on the condition of a reasonable number of GISCs.
- h) According to the outcome of CBS Expert Teams, it is said that the number of GISCs would be less than seven inclusive and that in the case of more GISCs Full-Mesh topology should be avoided. On the other hand, 15 GISCs are identified in the actual centre designation process. Furthermore, data in their responsibility areas are quite different in volume. Considering these facts, full-mesh topology and true synchronization become far from realistic implementation. Traditional switching mechanism will continue for the time being. Therefore, it is necessary to carefully consider various traffic management issues.

2. Big Data Handling (Future Potential)

- a) Urban environment NWP requires fine observations. Environment big data meet the requirement. There are several types of instruments to observe meteorological and environmental elements. StormTag is one of the familiar tiny instruments. The basic model can observe air pressure and temperature and communicate with a smartphone by Bluetooth. In order to collect these kinds of observation data, new concepts and technologies are introduced such as IoT (Internet of Things), Raspberry Pie devices and WOW (Weather Observation Website).
- b) The collected big data are currently used domestically. However, it is said that they will be exchanged internationally before long.

3. Pilot Project under Inter-Regional Collaboration

- a) Under the principle that “Regional initiative and inter-Regional collaboration to facilitate standardization and improvement can be indispensable for sustainable WIS operation” the VPN Pilot Project was established by RAs II & V in 2003. Since initial VPN themes were achieved in 2011, the Project was reformed to the WIS Application Pilot Project in 2012 endorsed by Steering Group.
- b) Required actions to continue the Project are summarized.
 - (i) Update the Project appropriately based on:
 - Study on true and recent “User Requirements”
It was recommended that the GISC initiative method which each GISC should collect “User Requirements” from its responsible area using every opportunity such as workshop, training, missionary visit and so on.
 - “Periodical Review” on progress and achievement
 - (ii) Maintain the official status in both RAs
 - “Annual Activity Reports” on the progress & achievement to RAs
 - “Inter-Regional discussion” by steering group
 - (iii) Enhance activities
 - Enrollment of further participants
 - Timely updating the “Project Web Site” <http://www.wis-jma.go.jp/cms/wisapp/>
 - Circulation of contribution role to “Newsletter” e.g. WIS related articles/topics, introduction of each Center and WIS staff

4. Documentation Procedures on Regional Aspect

- a) With a first priority efficient Procedures and Workload Sharing should be discussed:
 - Is it appropriate and possible to abolish “Manual on the GTS, Volume II Regional Aspect”?
 - How will the virtual WIS Implementation Project Office be continued based on Local Secondment mechanism?
 - Is it reasonable to establish a small group to collect the update information of RMTN status and plans?
 - Is it possible to develop a self-update website under WIS PP-App?
- b) Documentation time frame and voluntary designation should be clarified:
 - Target schedule to update WIS-IP
 - Who are voluntary experts (Local Secondment) and their tenure period?

Annex to paragraph 5.3.1

ISSUES OF MANUAL ON THE GTS (VOL II)**Action required (draft)**

- a) Extracting the unique contents in Manual on the GTS (volume II)
eg.) Zone of responsibility, Network diagram, ...
- b) Updating some contents and reinforcing to be moved to (new) web pages for the web based document
eg.) Transmission programmes between NMCSs, RTH, or RTH and NMCs
Interregional exchanges
Arrangements for the exchange of observational data
Technical specifications of main regional and regional circuits in Region II
- c) Developing regional requirements
- d) Introducing new technologies which are recommended for improving RAII GTS data communication network
eg.) Ground facilities of satellite-based communication system
- e) Introducing WIS networks
- f) Continuous improvement of GTS is the 'Part A' of WIS development, and it may be reasonable to address the status of WIS networks in RAII

Organizing Task Team

- a) Group-1: Publishing on WMO web site: web based doc
This group should summarize and publish non-regulatory parts on WMO website. They should update the related contents periodically. For example, publish operation status, such as RMTN status
- b) Group-2: Merging into the manuals of global aspects (pub. No. 1060, 1061 and 386)
This group should summarize the regulatory contents and submit them to be merged into related WMO documents
- c) Group-3: Reorganizing the Volume II
 - This group should not only categorize obsolete paragraphs to be deleted, but also categorize contents of volume II
 - It's necessary to review details by the wider point of view. It may be better to establish a specialized small Task Team to deal with categorization.
 - This group will categorize the old documents into several parts
eg.) P1: shall be removed
P2: shall be moved without modification to (new) web page or manual (s)
P3: shall be updated or modified before moving
 - Some parts of works will take time to be completed, and support from NMHSs is required (especially for the updating process, P3)

Work plan (draft)

Recommend to EG-WIS to agree on the concept: December 2015

- Draft ToR of Task Team by Theme Leader in DCTS: December 2015
- Establish a task team: Jan 2016
- Draft a list of items in each Group (1-3): March 2016
- EG-WIS approve: April 2016
- Send to RA-II MG: May 2016

Annex to paragraph 8.1

RECOMMENDATIONS**Recommendation 1:** Establish a TT on Vol. II Manual on the GTS

1) Reference:

- Paragraphs 4.1.1.2, 5.3.1.2
- ANNEX IV of this report

2) Request:

- The Theme Leader in DCTS to lead the task team and submit a draft to EG-WIS by the end of March 2016.
- EG-WIS to approve the draft and submit to RA II MG-9 in April 2016

Recommendation 2: provide Metadata management service

1) Reference:

- Paragraph 4.1.2.3

2) Request:

- GISC New Delhi to provide metadata management service to Bhutan and Maldives
- GISC Seoul to provide metadata management service to Uzbekistan

Recommendation 3: integrate surveys in EG-WIS

1) Reference:

- Paragraphs 4.1.2.1 (d), 4.1.2.4 and 4.1.3.3

2) Request:

- Co-coordinators to make coordination surveys in the EG-WIS

Recommendation 4: Amendment of manual on the WIS

1) Reference:

- Paragraph 4.1.6.2

2) Request:

- Secretariat to update information of DPRK in the table B.3 of WMO No.1061

Recommendation 5: Future structure of EG-WIS in RA II

1) Reference:

- Paragraph 6.2.2

2) Request:

- Co-coordinators and WMO secretariat to draft a new structure on EG-WIS to consider establishing ICG-WIS in RA II

Recommendation 6: Designation procedure for expert group EG-WIS in RA II

1) Reference:

- Paragraph 6.2.3

2) Request:

- Management group to consider designation procedure to be approved within 6 months after RA II session

Annex to paragraph 8.1

OUTCOMES

1. The meeting noted that the NMC Thimphu, Bhutan Department of Hydro-Meteorological Service (DHMS) connected to the GTS in July 2015 with support from RTH New Delhi, RTH Bangkok and JICA, and Thimphu has started receiving data/products from the GTS. Their observation data are being collected through EUMETSAT Data Collection Platform (DCP) and plan to distribute it over the GTS in BUFR format. The meeting agreed that the link RTH Bangkok and NMC Thimphu should be added in RMTN as a supplement regional circuit.
2. Pakistan Meteorological Department (PMD) requested EG-WIS to remove the regional circuit between Karachi and Tashkent from RA II point-to-point Regional Meteorological Telecommunication Network. The current status of the link is NI (Not Implementation). The meeting recognized difficulties to deploy telecommunication infrastructure for the area and requested the Theme Leader on DCTS to confirm the intention of Tashkent about removing the circuit from RMTN.
3. The meeting noted that EG-WIS organizes the RMTN status survey annually. The result of the survey is very helpful for understanding the status and progress of RA II RMTN. The meeting suggested that EG-WIS include the MSS/FSS status in the survey.
4. The meeting reviewed implementation status from six GISCs and four DCPCs and identified things RA II need to do next. The meeting drafted a table to make the status visible.
5. The meeting noted that Myanmar changed the location of NMC/NC from Yangon to Nay Pyi Taw. NMC Nay Pyi Taw connected to RTHs Bangkok and New Delhi and started GTS operation in 2013. The change has been reflected in the annual RMTN survey produced by EG-WIS and in the latest RMTN diagram. The meeting requested NMC/NC Nay Pyi Taw to confirm its "CCCC" used for WIS/GTS and report the change to WMO secretariat in proper procedures with the support of its RTH and principal GISC.
6. The meeting reviewed implementation status of the TDCF migration in RA II and confirmed a progress since 15th RA-II (2012). The meeting confirmed the fact that we were still in the process of migration and encouraged Members to complete the migration. The meeting also reviewed the problems on upper-air BUFR converted from TAC (e.g. TEMP/PILOT series) and recognized the letter from the CBS president. The meeting agreed that RA II members should continue parallel distribution until the problem has been resolved. http://www.wmo.int/pages/prog/www/WIS/wiswiki/tiki-view_blog_post.php?postId=171
7. The meeting recognized that RA II-15 requested to promote the recovery and digitization of old climate records which remain critical for climate change assessment and the development of climate services in the context of climate change adaptation and the GFCS as a matter of high priority. The meeting noted it is necessary to collaborate with RA II WG on Climate Services. The meeting asked the TL in Climate Data Management/Data Rescue to take actions on keeping under review and report CDMS and DARE project in the region.
8. The meeting noted some Theme Leaders have been keeping a good communication with Volunteer Experts in their theme, and it built teamwork and stimulated the regional activities. The meeting encouraged all Theme Leaders to consider making collaboration and

sharing the workload with Volunteer Experts.

9. The meeting discussed utilizing communication tools among EG-WIS members. Normally, this face-to-face meeting is held once four years, and it's not easy to have more frequently. The meeting noted that WMO provides communication service (don't need any additional cost) and CBS expert teams are using WebEx, WIS WIKI, Google group and so on. The meeting agreed to use these services to keep good communications and share the information.

10 The meeting noted the RA II RMTN is operated by three major types of communication infrastructure: MPLS/VPLS, The Internet and leased circuit. The meeting noted that if the centers operate GTS over the Internet, centres have to carefully consider and understand the characteristics of Internet, in particular, the Internet security and best-effort service (actual link speed: bandwidth).

11. The meeting reviewed RA II WIS Implementation Plan (R2-WIS-IP) Version 1.00 issued in December 2013. The meeting noted the Plan should be updated including progress since the first version has been issued. The meeting noted the IP has status and plan but status already reported in TL's annual report and needs to be restructured to avoid duplication. The co-coordinators of EG will propose a new structure of IP to the next RA II session

12. The meeting recognized that WIS should support all Working Groups in RA II and related projects. The meeting agreed that the GISCs should support requirements of data exchange/sharing not only for WIGOS but also for other activities in RA II. The meeting requested particularly GISCs to support activities in its AMDCN in cooperation with other WGs.

13. The meeting noted the importance of WIS monitoring for stable operation and continuous improvement of WIS services. The meeting noted that GISCs Beijing, Seoul and Tokyo have participated in the WIS monitoring pilot project which is organized by TT-GISC, and reviewed the pilot dashboards developed by GISCs Beijing and Tokyo. The meeting encouraged all the operational GISCs to consider the implementation of WIS monitoring and start providing JSON files as soon as possible.

14. The meeting reviewed the progress of Application Pilot Project (PP-App). The coordinator of PP-App proposed adding WIS monitoring as a new item for the PP-App. The meeting agreed to continuously support the project and proposal continuing support the PP-App. The meeting noted that issuing newsletters (since 2013, twice a year) is a good way to stimulate the project, but all the newsletters were published by only JMA so far. The meeting proposed all participants of the project to contribute issuing newsletters.

15. The meeting noted that continuing participation in of the Expert Group would be efficient and effective to achieve deliverables. The meeting invited TLs to be nominated as a member of the group in the next period of RA II (2016-2019).

Annex to paragraph 4.2.1

RA II GIS OPERATION STATUS (AS OF 1ST NOVEMBER 2015)

in operation

in process

plan

GISC	Operation	AMDCN (AoR)	AoR's Metadata	GIS Backup	Workshop/Training for AoR	WIS Monitoring
Reference		WIS-IP: Para. 6.1.4	WIS-IP: Para. 6.1.2, 6.1.6, 6.1.7,	WIS-IP: Para. 6.1.2 CBS2014 Rec. 21: WIS Guide 6.3	WIS-IP: Para. 3-b), Para. 7.3, 8.5 CBS2014 Rec. 21: WIS Guide 6.2	WIS-IP: Para. 8.7
Beijing	15 Aug 2011	# Connected to all DCPCs/NCs through Dedicated line or Internet in AoR	# Collecting/managing metadata from all DCPCs/NCs in AoR	# In operation with Tokyo # Made agreements with Offenbach and Melbourne (Disaster recovery site will be in operation in 2016)	# Held WIS workshop 2011 # Holds face-to-face meeting/training for each NC in AoR every year # providing on-site training for neighboring centers (CMACast users) every year	# Providing JSON file # Providing WMO Common Dashboard
Jeddah	02 Oct 2014	# Connected to all DCPCs/NCs through Dedicated line or Internet in AoR	# Collecting metadata from all DCPCs/NCs in AoR	# Under discussion with Seoul (?)	# Holds staff training in Nov. 2015 # Plan to hold workshop in Feb. 2016	# Plans to provide JSON file
Moscow				# In operation with Offenbach		# Providing JSON file
New Delhi	pre-operation	pre-operation	pre-operation	# Plan to start coordination (DRC in Pune was started operation in 2014)	Plan to have on-site training	Plans to provide JSON file
Seoul	13 Jun 2013	# Connected to DCPCs/NCs in AoR # Plan to connect remaining DCPC over VPN/Internet	# Collecting metadata from DCPCs/NCs in AoR # Plan to collect metadata from remaining DCPC	# Plan to start discussion with Jeddah # Arrangement with Moscow, and cooperation with Melbourne on GIS backup	# Held GIS Seoul workshops in '12, '13, '14 # Provided training to DCPC Tashkent in 2013 and DCPCs/NCs in AoR in 2015	# Providing JSON file
Tehran	04 Aug 2014	# Connected to DCPCs/NCs # Plan to connect remaining DCPCs/NCs	# Collecting metadata # Plan to provide metadata service to remaining NCs	# Plan to start arrangement	# Held training workshop in 2011 and 2014	# Plans to provide JSON file
Tokyo	01 Aug 2011	# Connected to all DCPCs/NCs in its AoR over the MPLS. Some CNs are connected via DCPC/RTH Bangkok	# Collecting metadata from all DCPCs/NCs in AoR	# In operation with Beijing and Offenbach # Made an agreement with Melbourne (DRS started operation in March 2015)	# Holds WIS workshop every two years ('10, '12, '14) # Holds on-site-workshop at each DCPC/NC in AoR, at least once a two years	# Providing JSON file including information of all NCs in AoR # Providing WMO Common Dashboard

RA II WIS Implementation Plan

WIS Guide: PART VI (CBS 2014 Rec.21)

<http://wis.wmo.int/file=653>http://www.wmo.int/pages/prog/www/CBS/Reports/2014_Ext14_Asuncion_1140/1140_en.pdf